



Realizing the Shift of ASEAN's Markets to Energy-Efficient and Climate Friendly Appliances

Hosted by: Brunei Darussalam

Co-organised by: ASEAN Centre for Energy (ACE) and United Nations Environment Programme's United for Efficiency Initiative (UNEP U4E)

05 April 2021



Context of the regional database development and use in ASEAN

Presented by:
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ASEAN Centre for Energy



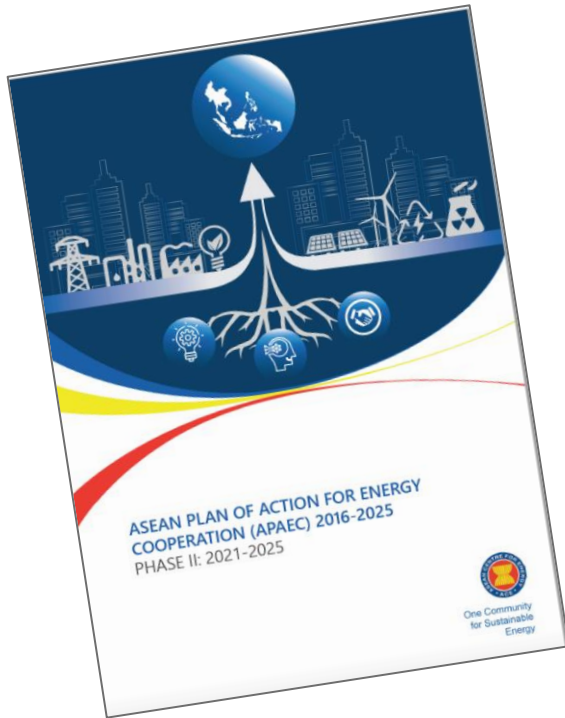
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Table of Contents

-
1. Basic Direction on EE Database under the APAEC Phase II
 2. The Significance of PRS System for ASEAN Region
 3. Utilization of the data at the regional level and linkages to mutual recognition agreement
 4. Key Issues and the Way Forward

Key Outcomes of the 38th AMEM



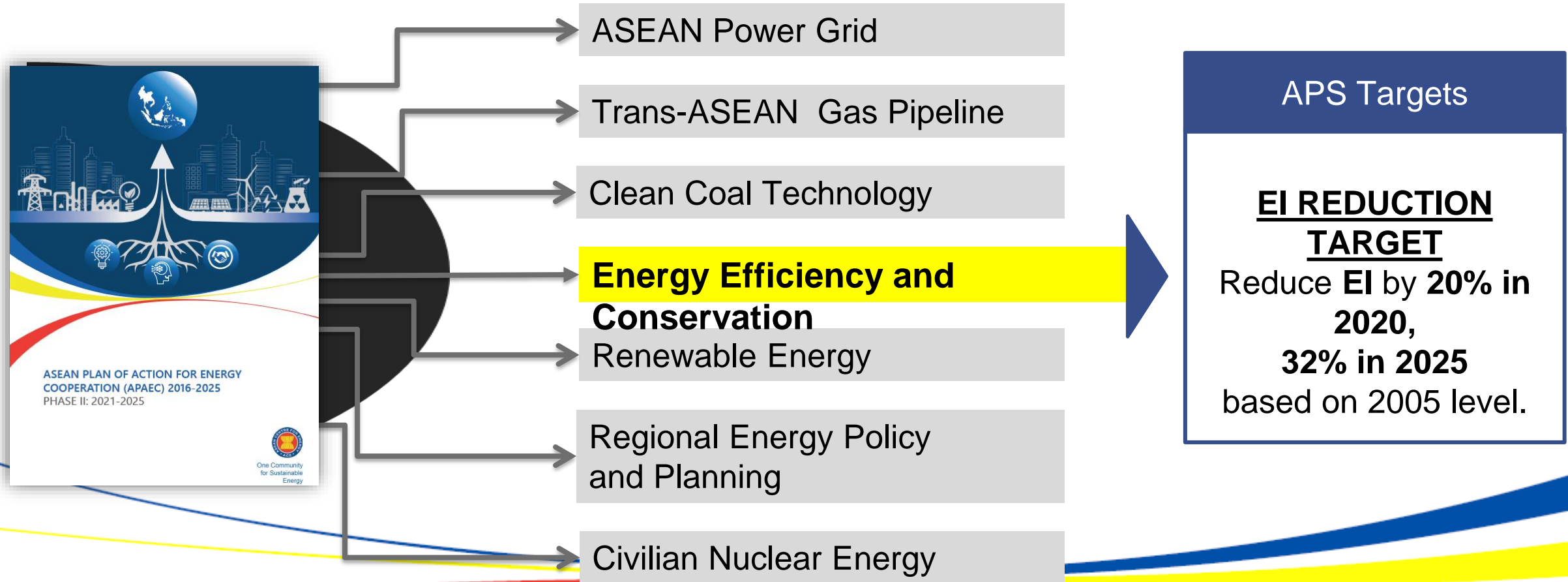
APAEC Phase II: 2021-2025

- ❑ **Endorsed** the ASEAN Plan of Action for Energy Cooperation (APAEC) Phase II: 2021-2025 with a sub-theme of “Accelerating Energy Transition and Strengthening Energy Resilience through Greater Innovation and Cooperation” to serve as the blueprint for the long-term transformation of ASEAN’s energy landscape towards a sustainable future.
- ❑ **Endorsed** the 6th ASEAN Energy Outlook (AEO6) to complement APAEC Phase 2.
- ❑ **Endorsed** the new regional targets for the development of EE&C and RE:
 - ✓ **Energy intensity reduction target of 32% by 2025, based on 2005 levels.**
 - ✓ *RE share target of 35% of Total Installed Power Capacity by 2025, which will contribute to achieving the aspirational RE share target of 23% in the ASEAN Total Primary Energy Supply.*

ASEAN Plan of Action for Energy Cooperation (APAEC) Phase II: 2021-2025



"Accelerating Energy Transition and Strengthening Energy Resilience through Greater Innovation and Cooperation"



Programme Area No. 4: Energy Efficiency and Conservation

'To Reduce Energy Intensity at 32% by 2025'



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Outcome-Based Strategies and Programmes



Harmonised EE Standard

- Harmonised standard for AC and Lighting (existing).
- Expansion plan to cover refrigerator, electrical motor, TV , etc.,.
- MRA



Private Sector and EE Finance

- Energy Efficiency Fund, ESCO Fund, Tax Incentives, Subsidy, Concessional Loan (GCF, IFIs), On-Bill Financing, Blockchain
- Business Forum



Sustainable Building

- Green Building Code
- Roadmap Development
- Energy Audit and training
- EE and Net Zero Award for building
- Sharing Best Practices on Net Zero Building



Industry – EMS technology uptake

- Energy Management Adoption
- Energy Manager training (AEMAS)
- ASEAN EE Award for Industry
- EE Pilot Projects

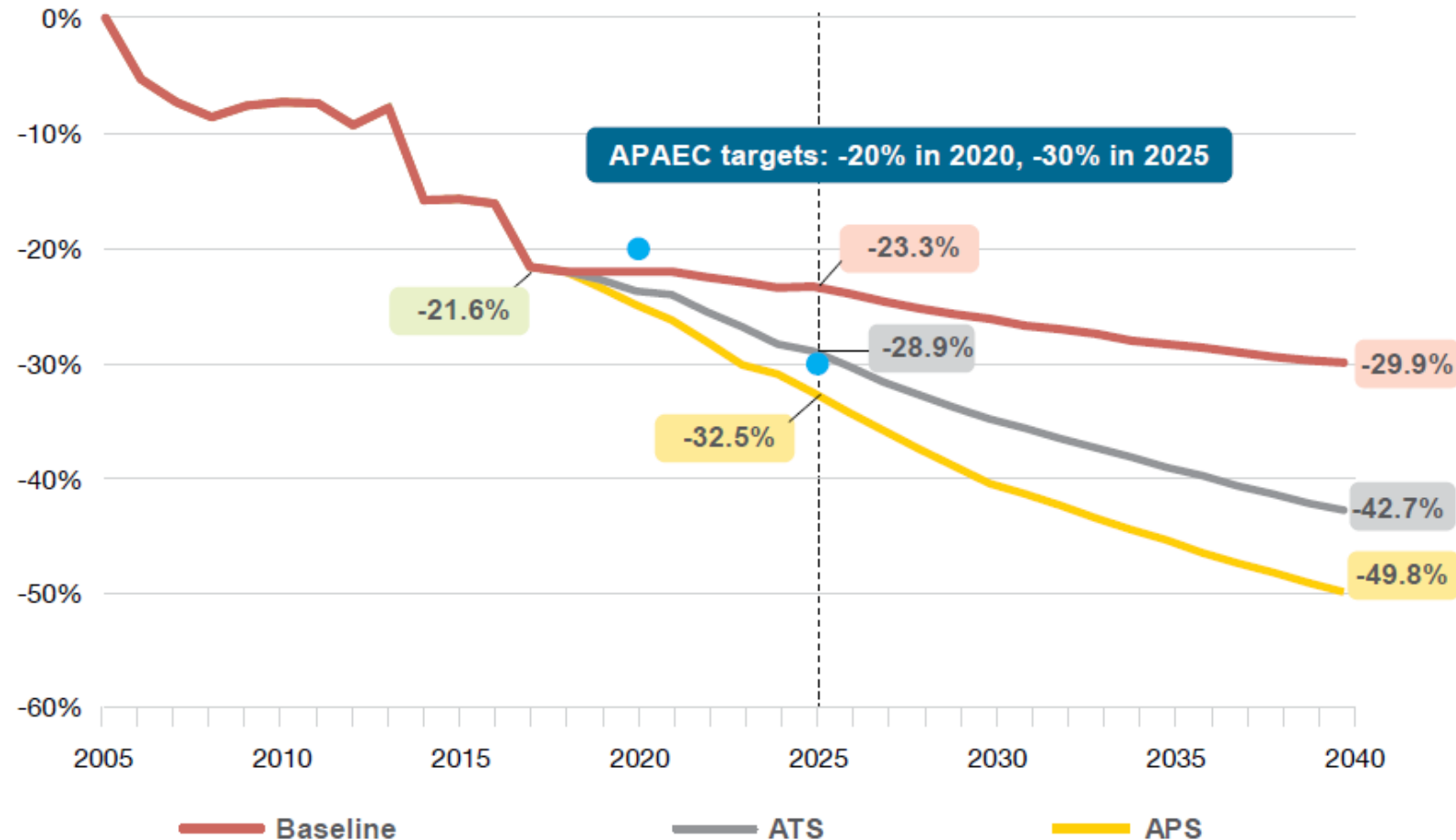


Transport - Fuel Efficiency and EV system

- E- Mobility
- Fuel Economy Standard
- Demand Side Management & Demand Response
- Information sharing on best practices

ASEAN Energy Intensity Reduction (Progress and Projection)

Scenarios from the 6th ASEAN Energy Outlook



ASEAN has attained a 21% energy intensity level in 2018, surpassing the aspirational target of 20% set for 2020.

Basic Directions of Energy Efficiency under APAEC

Phase II: 2021-2025



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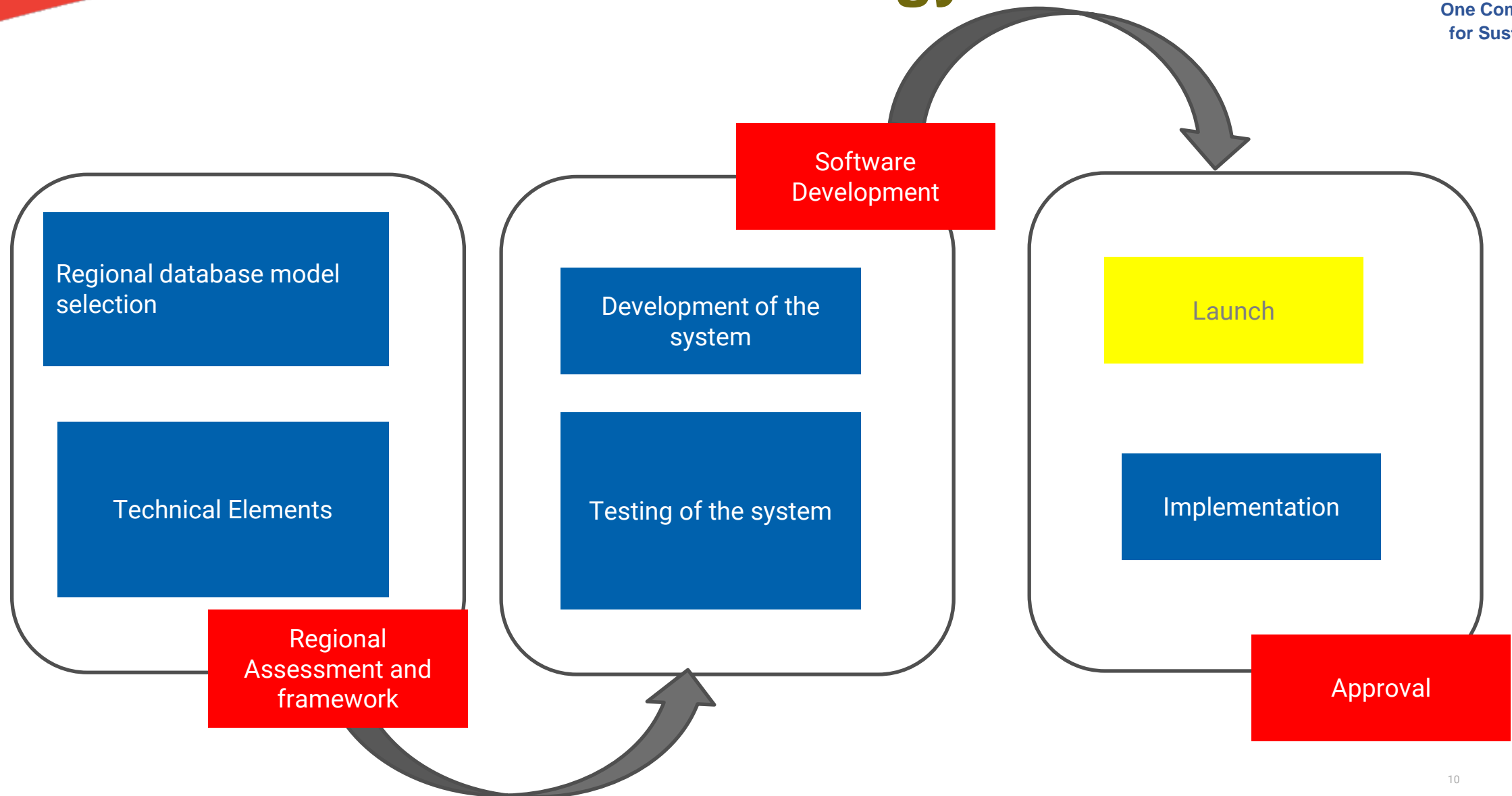
- To achieve the indicative target at the ASEAN level of at least 32% primary energy intensity reduction in 2025
- Expansion on Standard Harmonisation for more appliances and Industry Equipment
- Business forum activities to enhance ASEAN energy R&D and EE investment.
- Strengthen cooperation in EE&C sector, capacity building and sharing on best practices
- Improve the ASEAN energy efficiency database system (data management on building, industry & transport and product registration system for policy making, facilitate exchange information and analysis
- ASEAN Sustainable Energy Manager Training and Certification
- EE investment and financing projects (Mobilizing private Capital in EE investment)
- To increase energy efficiency in all sector including transport and industry

Significance of ASEAN Product Registration System

“ A joint collaboration between ACE and UNEP to support the harmonisation of EE standards in the region “



Methodology



ASEAN Regional Roadmap for EE Harmonisation on AC

Component

1. Harmonization of Testing Methods

- ASEAN will harmonize testing standards referencing ISO 5151-2010
 - ✓ Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam to adopt by 2016
 - ✓ Cambodia, Laos, Myanmar to adopt by 2018

2. Harmonization of Evaluation Methods

- Evaluate fixed speed and inverter ACs separately
- Consider a common evaluation method (CSPF) using ISO 16358-1 by 2020

3. Harmonization of MEPS

- ASEAN countries will notify minimum MEPS of 2.9W/W for EER/weighted EER and 3.08W/W for CSPF
- The MEPS would be reviewed and revised periodically at interval of 5 year or less

4. Testing Infrastructure

- Establish an appropriate framework for round robin testing (RRT) and evaluation process for testing facilities by 2020

5. Mutual recognition Agreements (MRA)

- Evaluate feasibility of incorporating energy performance testing into existing MRA (AHEEERR)
- If existing MRA not appropriate, establish new MRA by 2020

6. Reporting

- ASEAN will establish a regional product database by 2020

Harmonization of Energy Performance Standards for Air Conditioners - A Regional Policy Roadmap

Introduction

Air conditioning represents a large proportion (up to 50%¹) of electricity demand in the residential and commercial sectors in ASEAN economies. The market of room air conditioners is expected to grow at a pace of at least 10% per year over the next 5 years², further increasing energy demand. The economies of the ASEAN countries are moving towards a common market by 2016. It becomes imperative that the product performance standards are harmonized. A number of efforts have already taken place for harmonizing electro technical standards for various products. This paper describes the policy roadmap for the harmonization of energy performance standards of small and medium residential air conditioners. This regional policy roadmap closely follows the ASEAN Plan of Action for Energy Cooperation (APAEC).

The policy roadmap herein, enumerates various components that have been recommended by the policy and technical working groups of the ASEAN SHINE project and where concrete action is required.

Objectives:

To provide clear guidelines in the adoption of policies to promote the use of more efficient air conditioning equipment and define the targets to be achieved by all ASEAN countries with regards to the adoption of harmonized energy performance standards of ACs by 2020.

Components:

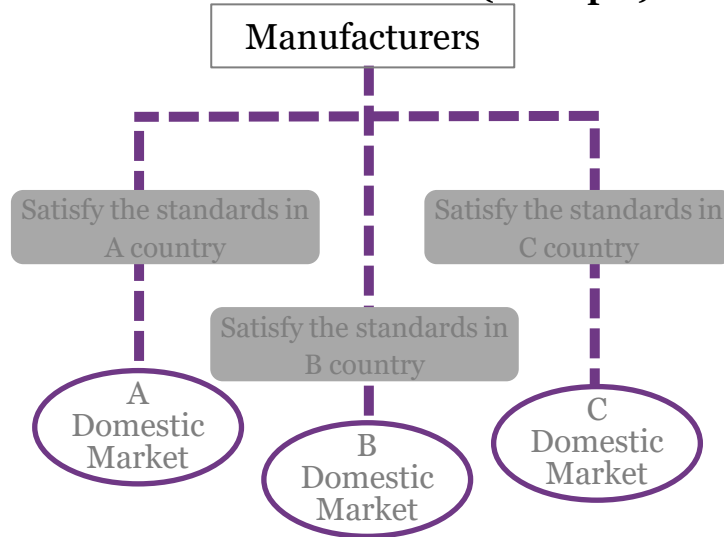
- 1) **Harmonization of Testing Methods:** On the basis of various recommendations the ASEAN countries have agreed for a uniform testing method derived from ISO 5151-2010. These testing methods are to be adopted and notified by countries by 2016. The countries also need to agree to take into consideration metrics to measure part-load energy performance, in accordance with the ISO 16358-1 and any revision to ISO 5151-2010 in the future. Any revision of the harmonized testing standards at the national level should be discussed and coordinated in the EE&C SSN.
- 2) **Harmonization of metrics:** For fixed speed and inverter based ACs the ASEAN countries will report the performance as EER and CSPF respectively until 2018. A common metrics namely CSPF using ISO 16358-1 may be considered after 2020. A

¹ International Copper Association, "Market Study for Harmonization of Energy Efficiency Standards for Air-conditioners and Refrigerators in South-east Asia", Research report, ICA, 15th November 2010.

² Source: Euromonitor.

Benefits of PRS System to Support S&L Harmonization

★ Current Status (Example)



Status

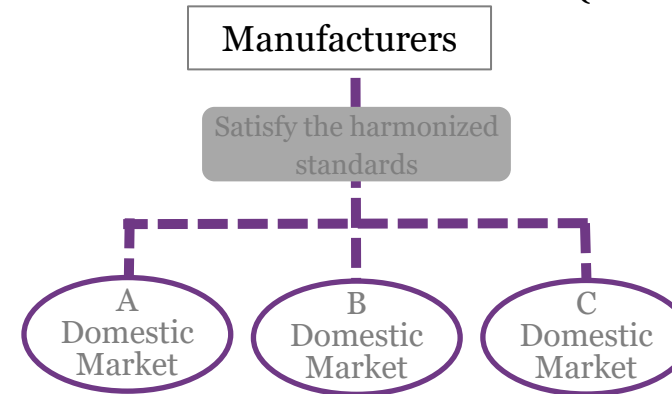
Non-unified energy efficiency standard

- Test standards
- Evaluation index (e.g. APF, CSPF, EER, Weighted EER)
- Energy efficiency standard values
- Rating standards(in the multi rating system)
- Indication rules

Issues

- ✓ Lacking testing laboratories
- ✓ Workloads for administration and manufacturers etc.

★ Harmonization (Example)



Status

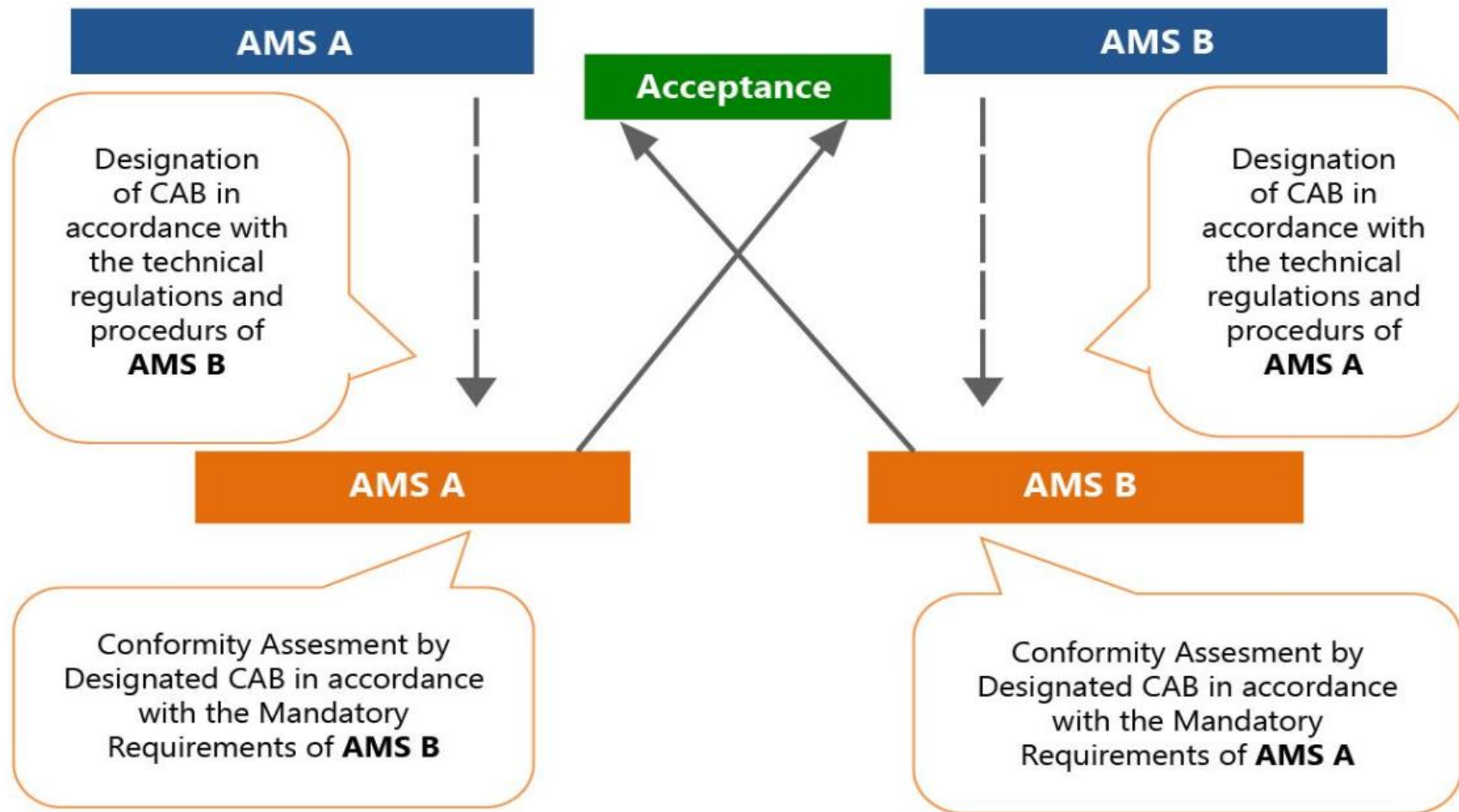
Harmonized energy efficiency standard

- Unified test standards by ISO 5151
- Unified evaluation index by ISO 16358 (CSPF)
- Unified MEPS value
- Common rating standards
- One ASEAN Database
-

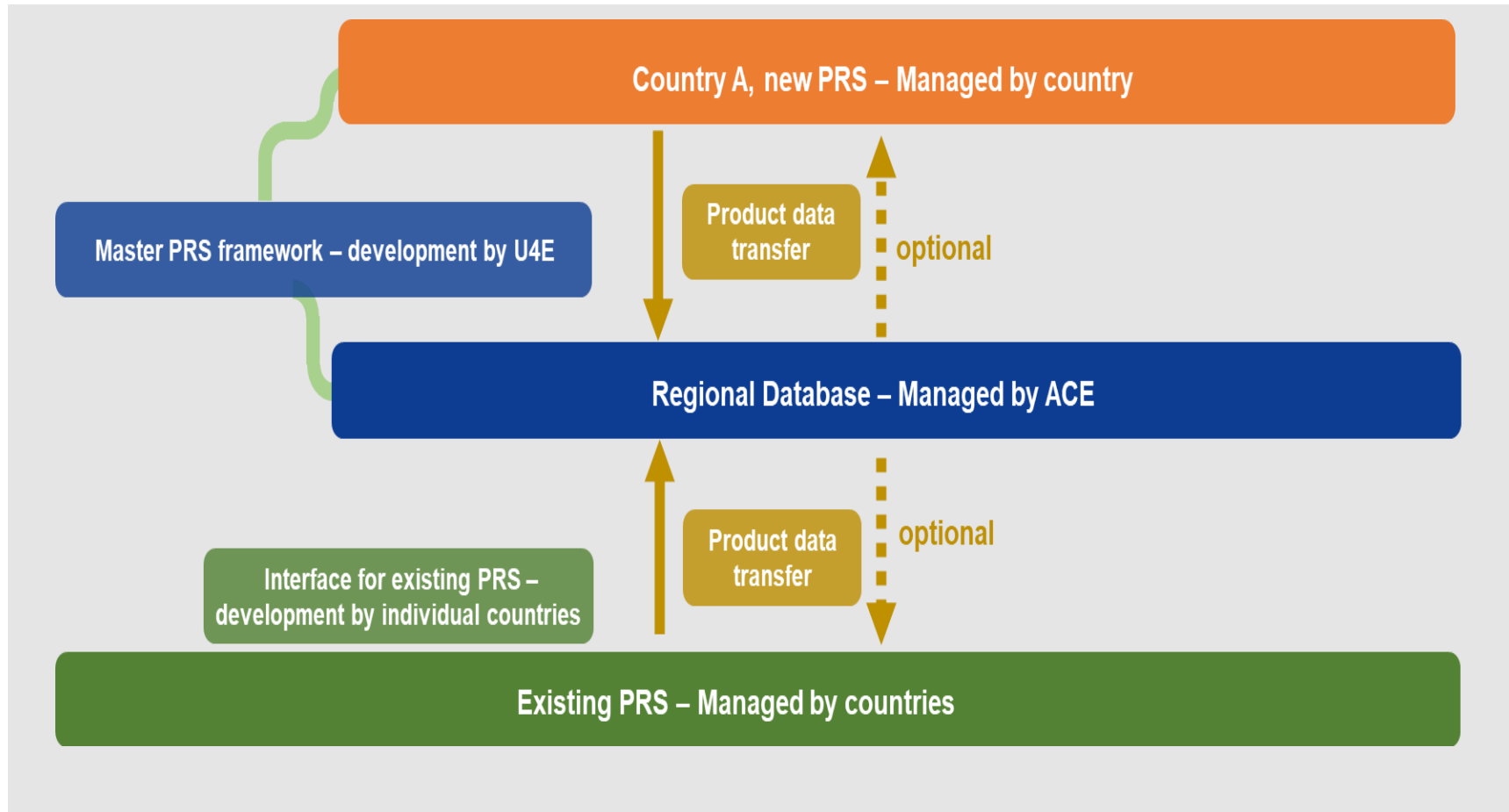
Countermeasure & expected Benefit

- ✓ i.e. Mutual Recognition Agreements(MRA)
- ✓ Mitigation of workloads for administration and manufacturers, etc. by easier and more smooth operation
- ✓ Lower the product price through the administration cost reduction
- ✓ Chances to expand territories to sell RACs

ASEAN Electrical and Electronic Equipment Mutual Recognition Arrangement (ASEAN EEE MRA)



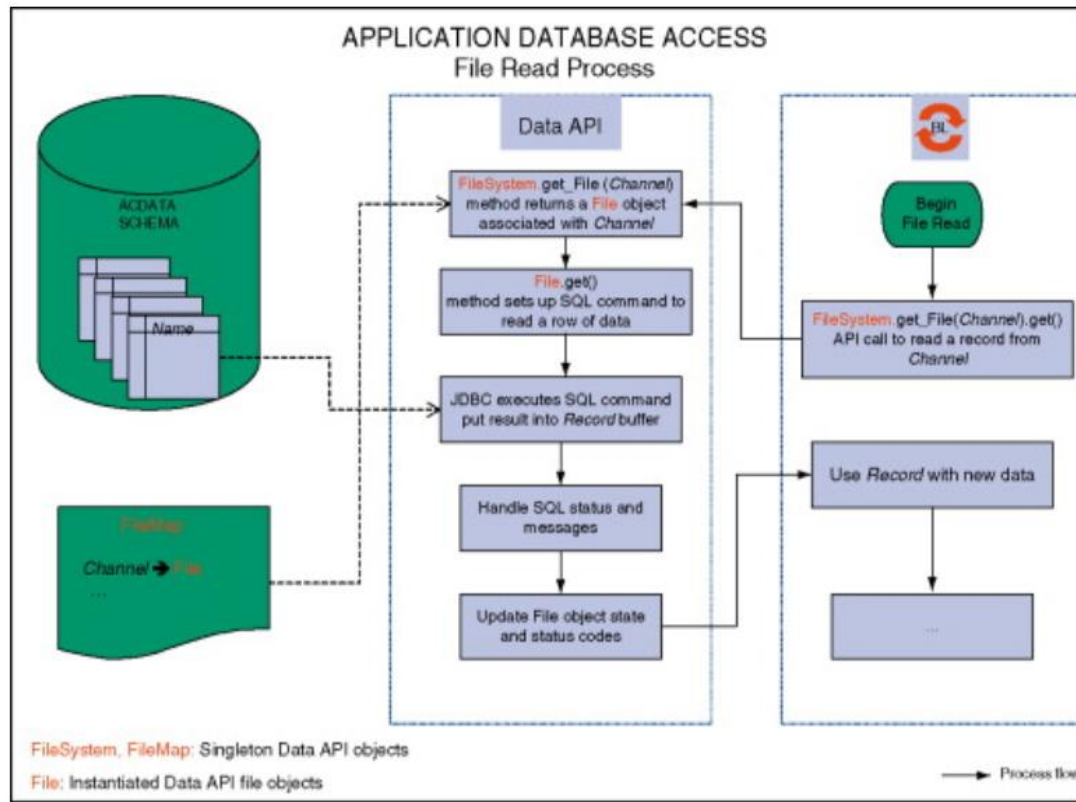
Framework of ASEAN PRS System



Data Features

- Product Characteristic
- Provision of compliances and legislation
- Complement product information with sales data
- International units CSPF (**APF optional**), Watt, etc

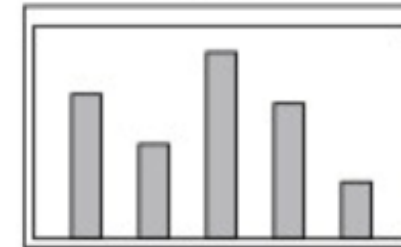
Data Utilization



Query/report

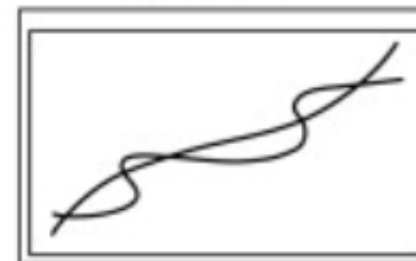
- Technical Requirements Identified

Analysis



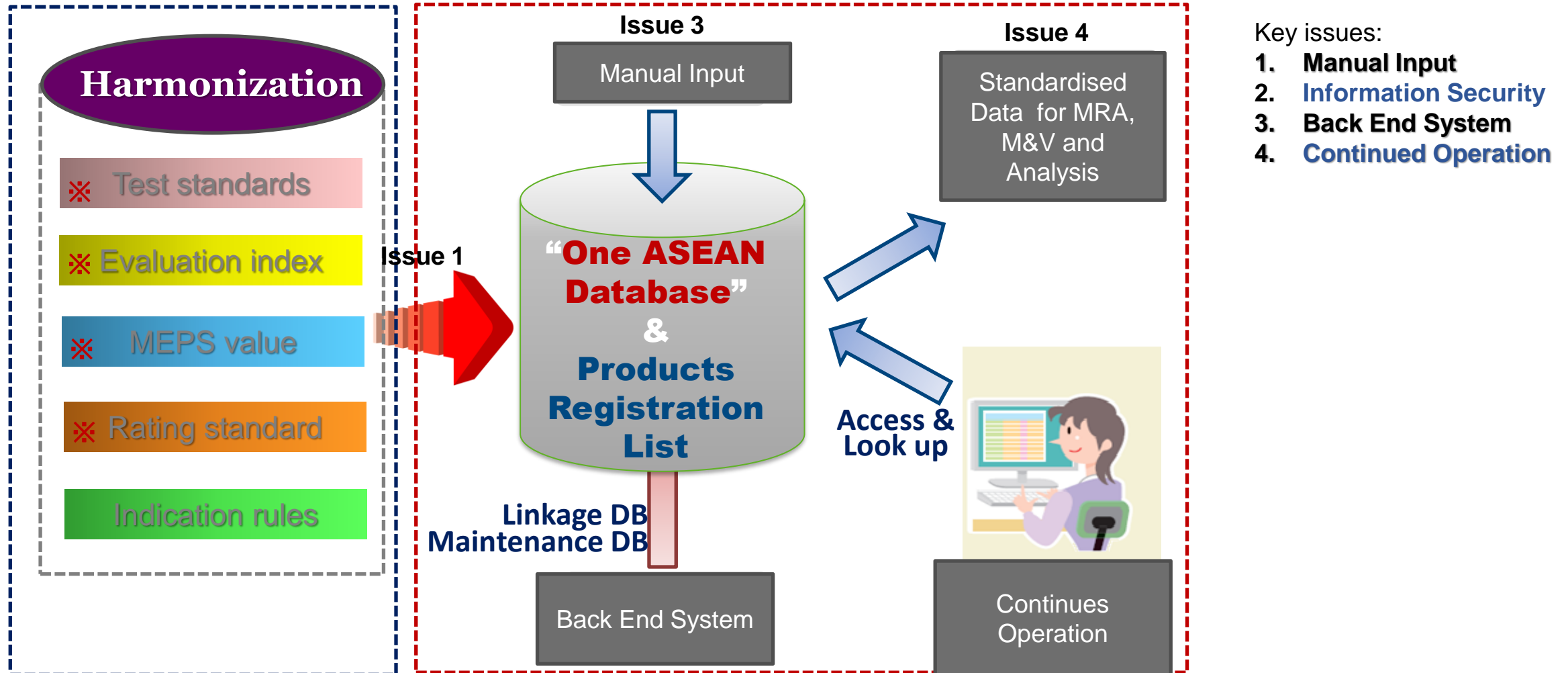
- Policy and Regulation
- Market Mechanism
- Financial Mechanism
- Technology Solution
- Research

Data mining



- Customer behaviour when purchasing appliances

Way Forward on the Database and Identified Technical Issues



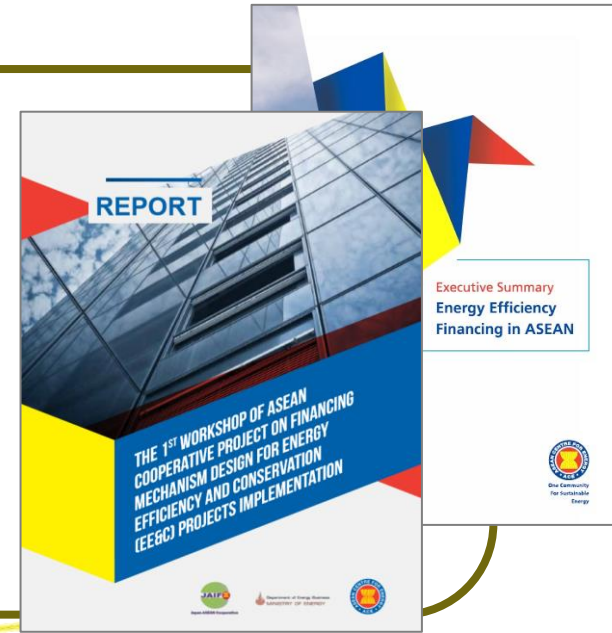
Studies and Publications to Support ASEAN in Achieving its EI Reduction Target

Ways Forward and their Implications for Energy Security, Development and the Environment.

- The 6th ASEAN Energy Outlook 2017-2040

Energy Efficiency Financing

- Mapping of Energy Efficiency Financing in ASEAN
- Financing Mechanism Design for EE&C Project Implementation

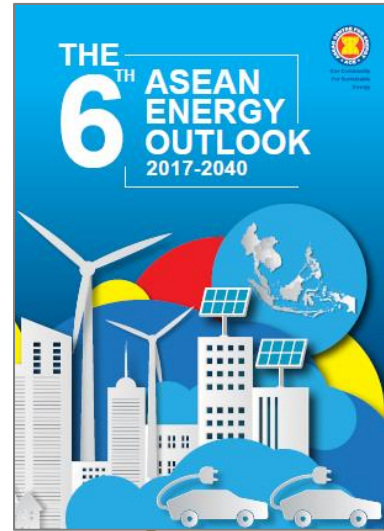
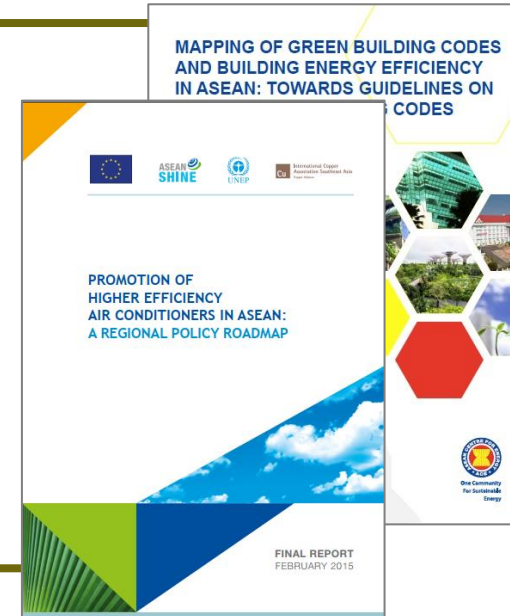


Private Sector Participation

- ASEAN ESCO Report
- ASEAN Best Practices in Energy Efficiency and Conservation

Green Building and EE Codes & Harmonization of EE S&L

- Mapping of Green Building Codes and Building Energy Efficiency in ASEAN
- Regional Policy Roadmap for Promotion of Higher Efficiency of AC in ASEAN





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To know more about the latest ACE Publications, those are available for download from <http://www.aseanenergy.org/resources/publications> or scan QR Code below.

For further information or to provide feedback, please contact ACE at secretariat@aseanenergy.org



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Thank You



With support from:



Development of the regional database

Patrick Blake, Programme Officer, UNEP
Madeleine Edl, Energy Efficiency Specialist, UNEP

05 April 2021

Overview of the Content

Why is Product Registration important and what is it?

- Benefits of Product Registration
- Steps for a product to access the market

What is the ACE-U4E project doing?

- Overview of the project
- Roadmap
- Overview of project activities

What is the ASEAN database and how does it work?

- Overview of the structure of the database
- Need for installing APIs
- Example of a benefit of the database
- Live walk through the database

- General U4E tools on PRS

WHY

SHOULD I IMPLEMENT A PRODUCT REGISTRATION SYSTEM (PRS)?

Transition
your markets to
energy efficient
products!



In countries with a PRS, products must be registered before they can enter the market

Creates a database
with product
information



Policy
development

can be based on detailed
data that is readily available

Monitors which products
are sold in the
market



Ensures
compliance

with national policies,
e.g. on energy efficiency

Places information on environmental
impact of the products at the
fingertips of government



Policymakers

can access baseline data and track
efficiency trends and improvements

Fosters economic
development



Reduces
barriers to

trade by creating transparent
market regulations and protects those
manufacturers complying with requirements

Encourages consumers to
choose energy-efficient
products



Enabling
consumers

to access the database helps them to compare
market offerings to make informed choices about
the energy efficiency of products and lifetime cost

HOW

DOES A PRODUCT REGISTRATION SYSTEM WORK?



TEST PRODUCT



A test laboratory, or conformity assessment body, selects samples of the product and undertakes testing in accordance with the applicable standard.

APPLICATION



The applicant (manufacturer, importer or distributor) opens an account in the product registration system and completes an application form for approval of their product. Supporting information, such as a test report, may also be required.

ASSESSMENT



The programme manager/regulatory authority reviews the submitted application and accompanying documentation for compliance with the requirements of the standards and labelling scheme.

APPROVAL & ACCESS TO MARKET



If the review confirms the product complies with the governing energy efficiency regulations, such as standards and labelling, then the regulator approves the product for import and sale.

SEVERAL COUNTRIES
TOGETHER



STANDALONE SYSTEM

National
PRS



Overview of the Project

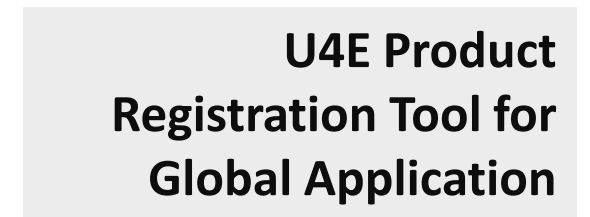
In cooperation with the ASEAN Centre for Energy (ACE):

- Development a regional product registration database that connects all countries in the region
- Information and guidance of policymakers on the options of harmonizing Product registration system (PRS) activities in the ten countries of the region
- Training stakeholders on the use and implementation of a PRS



General U4E tool:

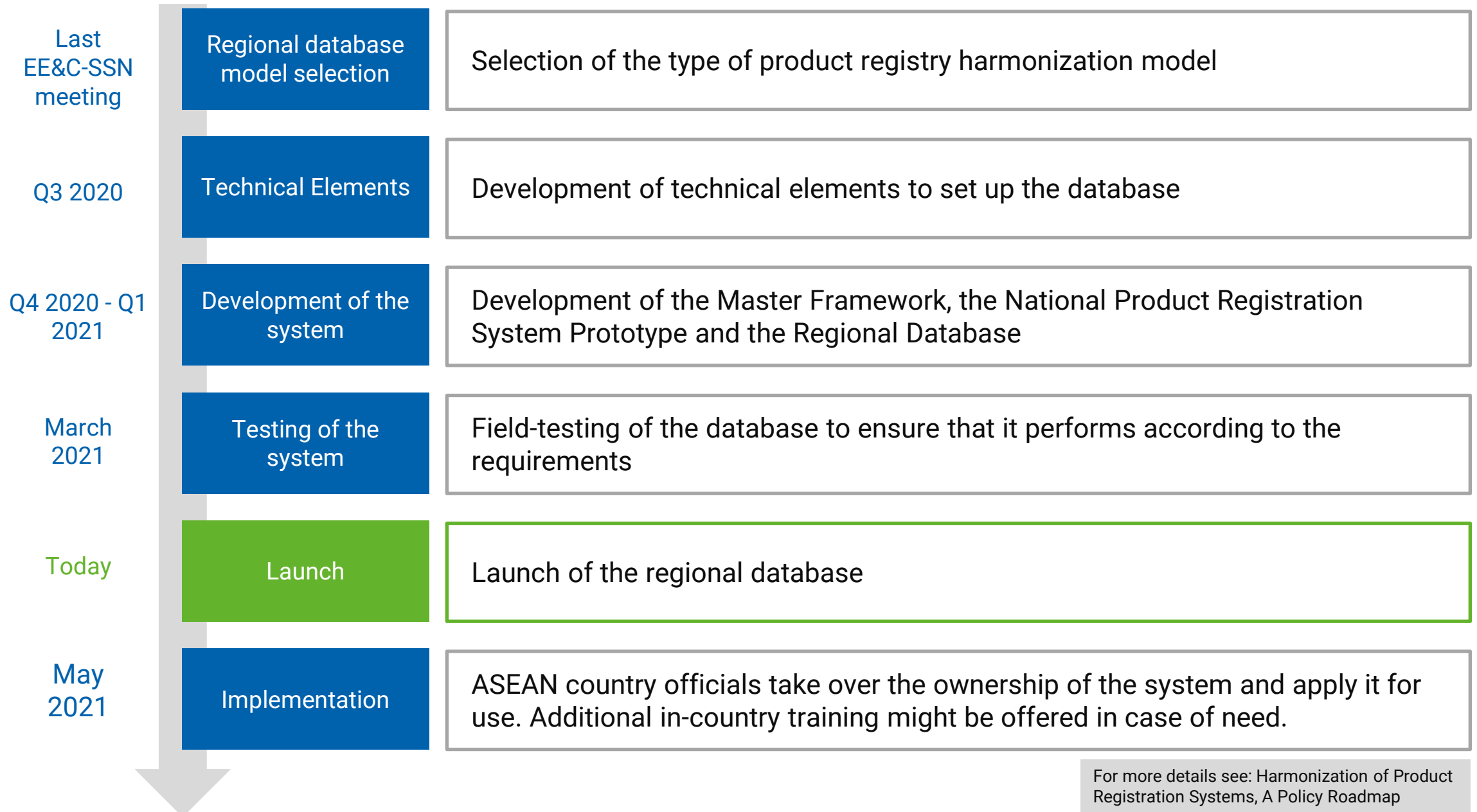
- Development of a prototype PRS system for application in countries without a PRS
- Development of PRS technical specifications



Products included:

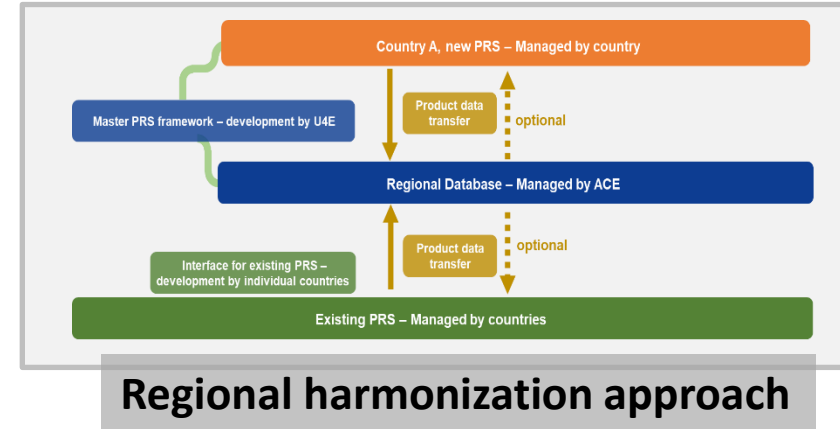


Roadmap

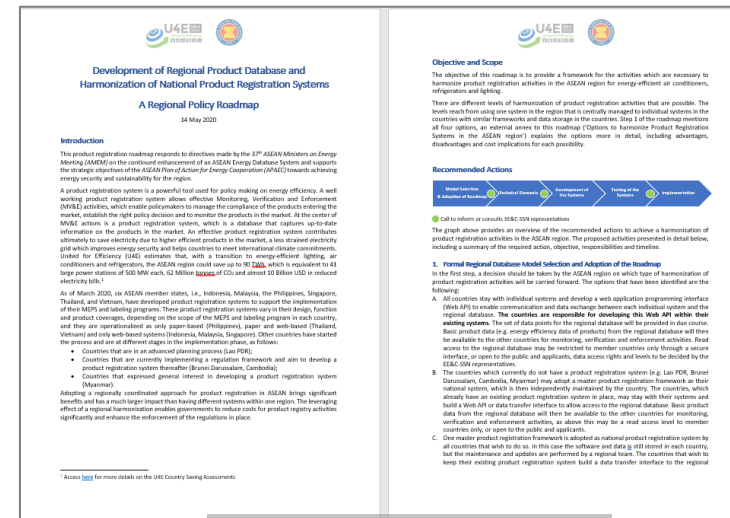


Overview of activities (1)

- In-person workshop in February 2020 in Bangkok, Thailand
- Development of harmonization approach for product registration activities in the region which has been developed based on four harmonization options
- Development of policy roadmap to implement the agreed to harmonization approach



Regional workshop of February 2020



Overview of activities (2)

- Three regional Technical Working Group to guide the software development
- Individual follow-up meetings to address country-individual questions
- Development of common datapoints for regional exchange of data
- Development of mock-up for regional database that has been reviewed by technical experts
- Based on input of countries and ACE development of final regional database



Technical Working Group meeting

Mock-up regional database

General	AC	Refrigerators	Lighting
Country of registration	Testing standard (AC)	Testing Standard (refrigerator)	Testing Standard (lighting)
National registration ID	Brand name	Brand name	Brand name
Product Category	Model number	Model number	Model number
Legislation framework	Family name/other models (if applicable)	Family name/other models (if applicable)	Family name/other models (if applicable)
Legislation entry into force date	Global Trade Item Number (GTIN)	Global Trade Item Number (GTIN)	Global Trade Item Number (GTIN)
Legislation expiry date	Manufacturer's name	Manufacturer's name	Manufacturer's name
Applicant id	Country of manufacture	Country of manufacture	Country of manufacture
Applicant Company name	Date of product availability	Date of product availability	Date of product availability
Applicant Company's main role	Projected annual sales (product units)	Projected annual sales (product units)	Projected annual sales (product units)
Applicant Role of applicant	Website with product information	Website with product information	Website with product information
Applicant Contact person's name	QR code	QR code	QR code
Applicant Contact person's title	HS code	HS code	HS code
Applicant Address: Street, number	General comment	General comment	General comment
Applicant Address: City	Climate group	Product Category	Product Category
Applicant Address: Postal code	Operating modes	Product Sub-category	Product Sub-category

Common datapoints





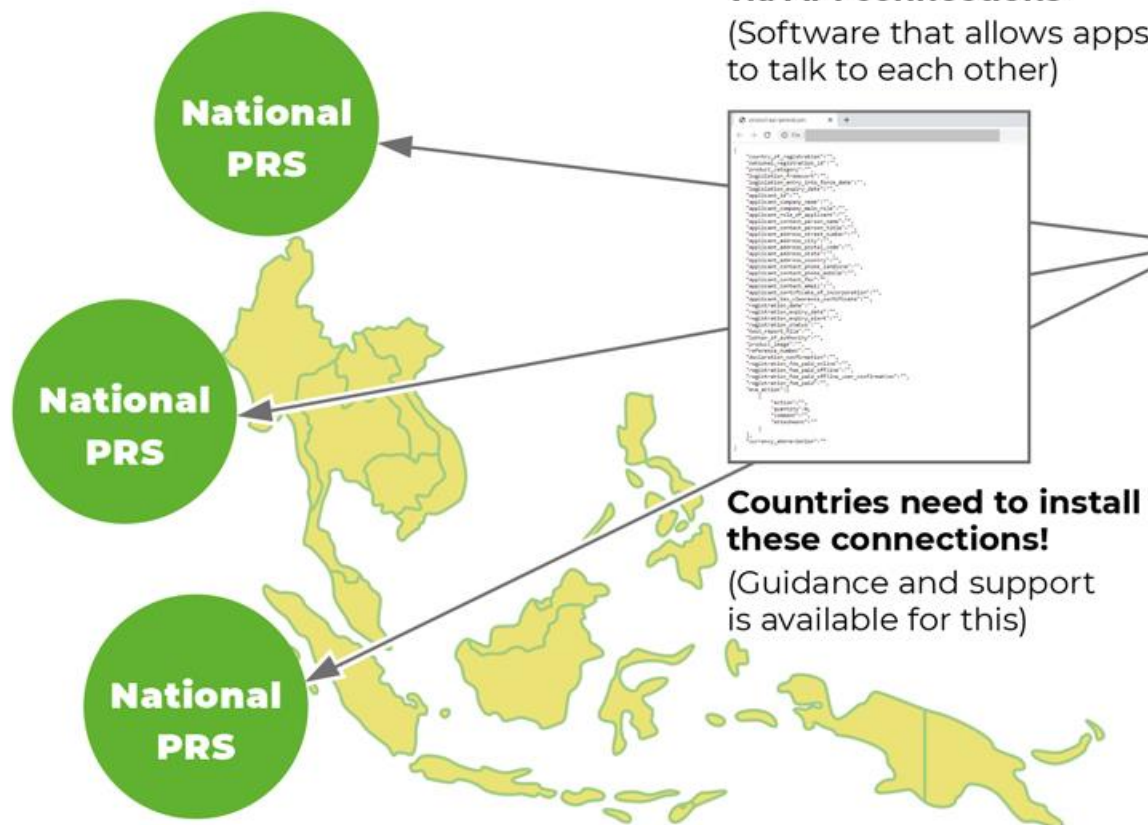
DATA EXCHANGE IN SOUTHEAST ASIAN SYSTEM



Existing national systems

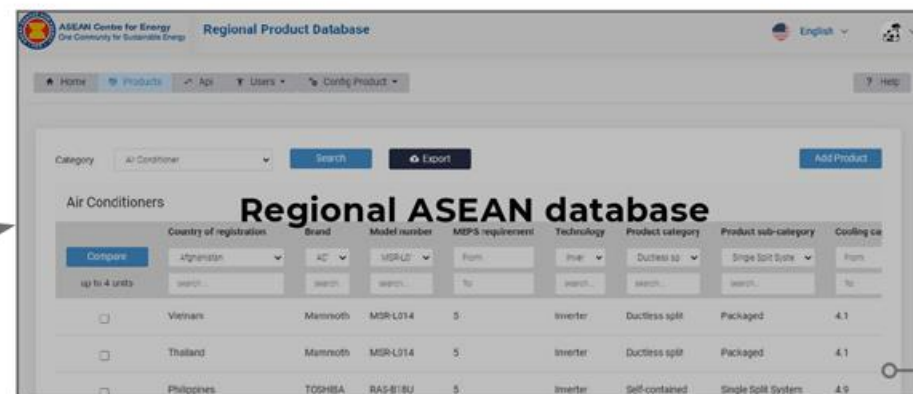
Data transferred via API connections

(Software that allows apps to talk to each other)



Products continue to be registered in existing national PRS

The regional system collects the information from the national systems in a common database

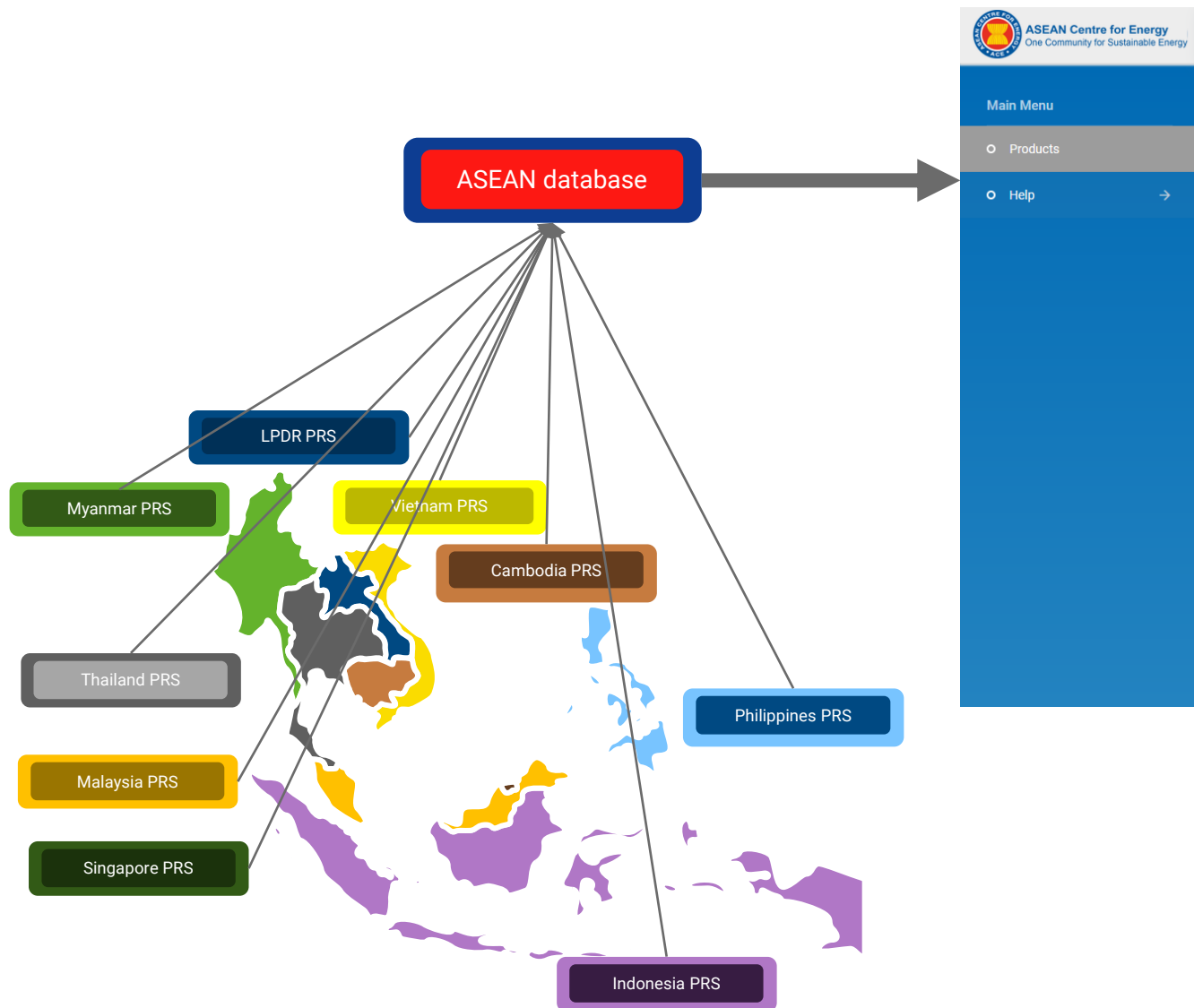


Access to the database is restricted to the ASEAN Centre for Energy and the national regulators from the 10 ASEAN countries.

The **benefits** of the regional database for all users are:

- Visibility of products allowed for sale in other countries
- Notification of new products in other countries
- Notification of products revoked in other countries
- Facilitates application of Mutual Recognition Agreements
- Ultimately, this information helps the region to adjust their policies better and to create synergies in transforming their markets to energy-efficient products

Example MV&E support



Regional Product Database

Search Here

English



Products

Category

Air Conditioner

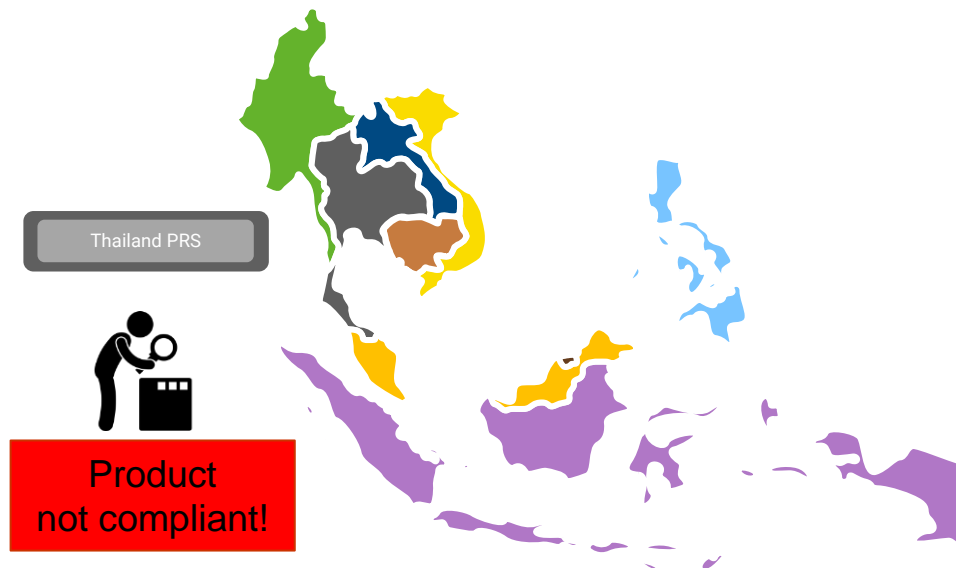
Search

Export

Air Conditioners

Brand	Model	Product type	Country Of	Cooling	Heating	Seasonal	Registration status
ACTRON	MSR-L013	Single Split Syst	Afghanistan	From:	From:	From:	
search...	search...	search...	search...	To:	To:	To:	
Mammoth	MSR-L014	Packaged	Thailand	4.1	5.5	4.0306	Approved View
TOSHIBA	RAS-B18UFV-A/RAS-18SAV2-A	Single Split System	Thailand	4.9	5.8	2.9753	Approved View
GREE	GWH09MB-K3DNA4H(DRED)	Single Split System	Thailand	2.6	2.8	3.7574	Approved View
Mammoth	MSR-L013	Packaged	Philippines	4.1	5.5	4.0306	Approved View
DAIKIN	FDYQN180LB / RZQ180L	Multiple split - VRF	Philippines	20	22.4	3.0527	Approved View

Example MV&E support



ASEAN Centre for Energy
One Community for Sustainable Energy

Regional Product Database

Search Here

English

Products

Category: Air Conditioner

Search

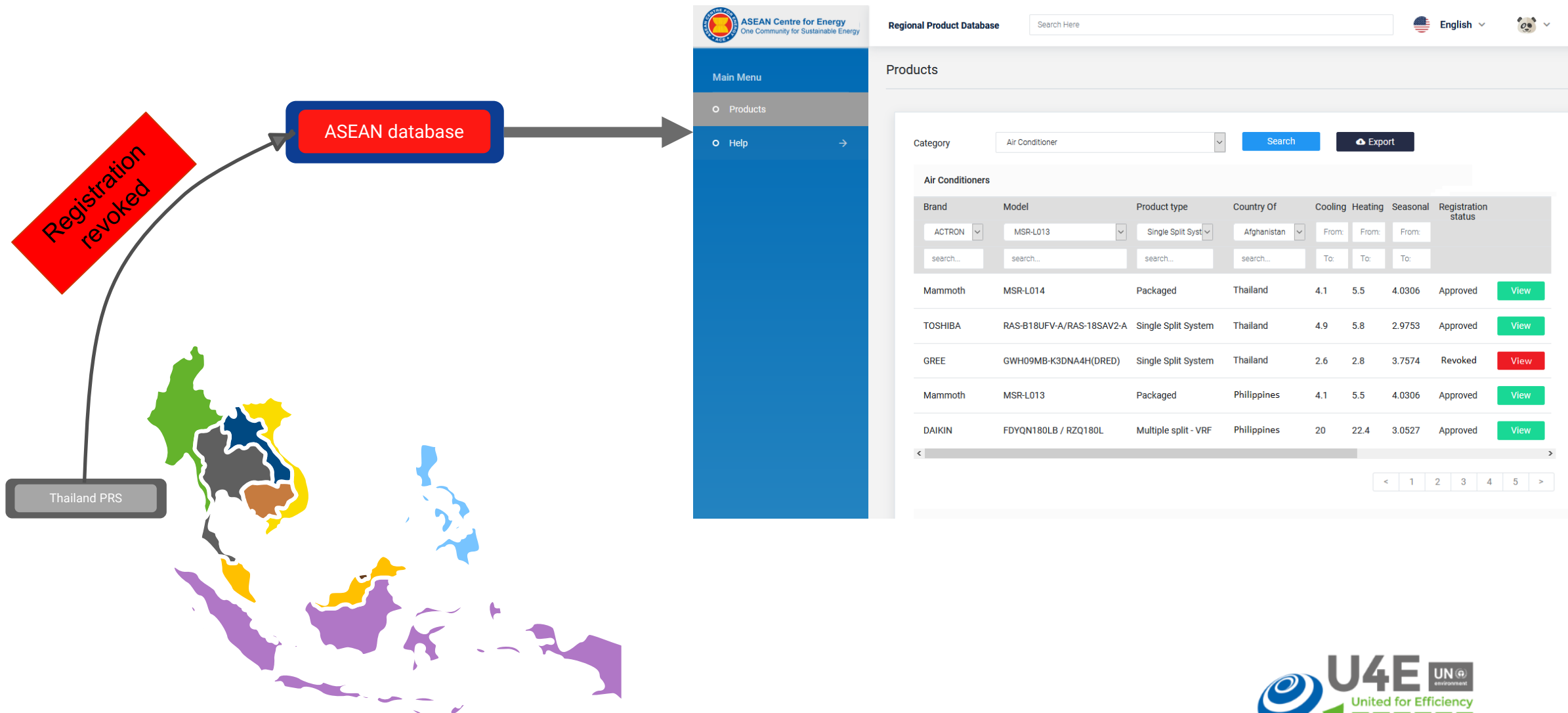
Export

Air Conditioners

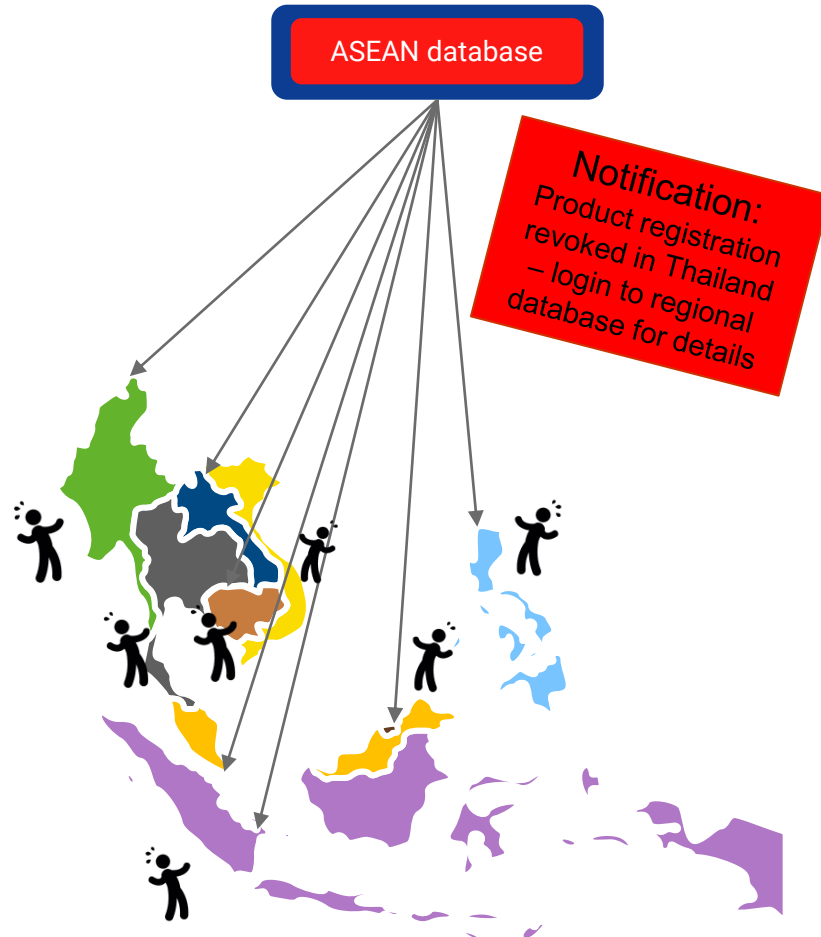
Brand	Model	Product type	Country Of	Cooling	Heating	Seasonal	Registration status
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search...	search...	search...	search...	To:	To:	To:	
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Example MV&E support



Example MV&E support



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Regional Product Database Search Here

English

Products

Category: Air Conditioner Search Export

Air Conditioners

Brand	Model	Product type	Country Of	Cooling	Heating	Seasonal	Registration status
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GREE	GWH09MB-K3DNA4H(DRED)	Single Split System	Thailand	2.6	2.8	3.7574	Revoked View
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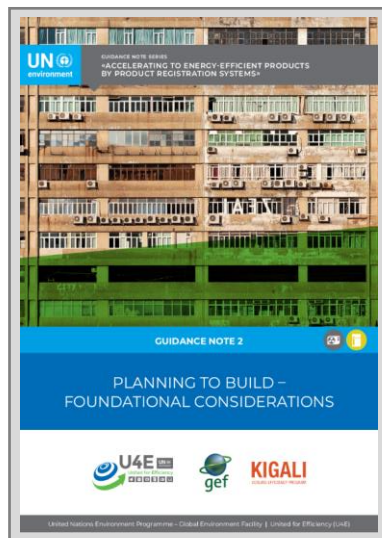
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General U4E Tools & Activities

Product Registration Guides & Tools

Software for national Product Registration System

4 Guidance Notes

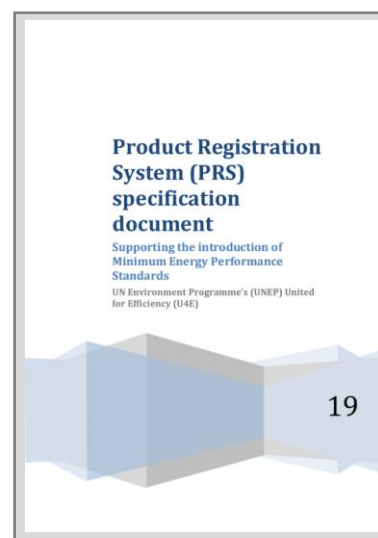


Initial guidance for interested stakeholders

Outline

Framework with recommended pages and fields

Specifications



Specifications for a software developer to develop a PRS

Prototype

Software template that can be implemented by government officials as a National Product Registration System in a country

Resource: <https://united4efficiency.org/product-registration-systems/>

Benefits

- Built-in API for regional database interface
- Based on best-practice functionalities which can be personalized
- Open source
- U4E guidance to implement the framework
- Designed to work with slow connections and data requests
- Flexible deployment: windows/linux, cloud/on-site



With support from:



Transfer of the data from the national systems to the regional system

Victor Minguez, Monitoring and Finance Expert, UNEP
Sommai Phon-Amnuaisuk, Asia-Pacific Director, International Institute for Energy Conservation (IIEC)



05 April 2021



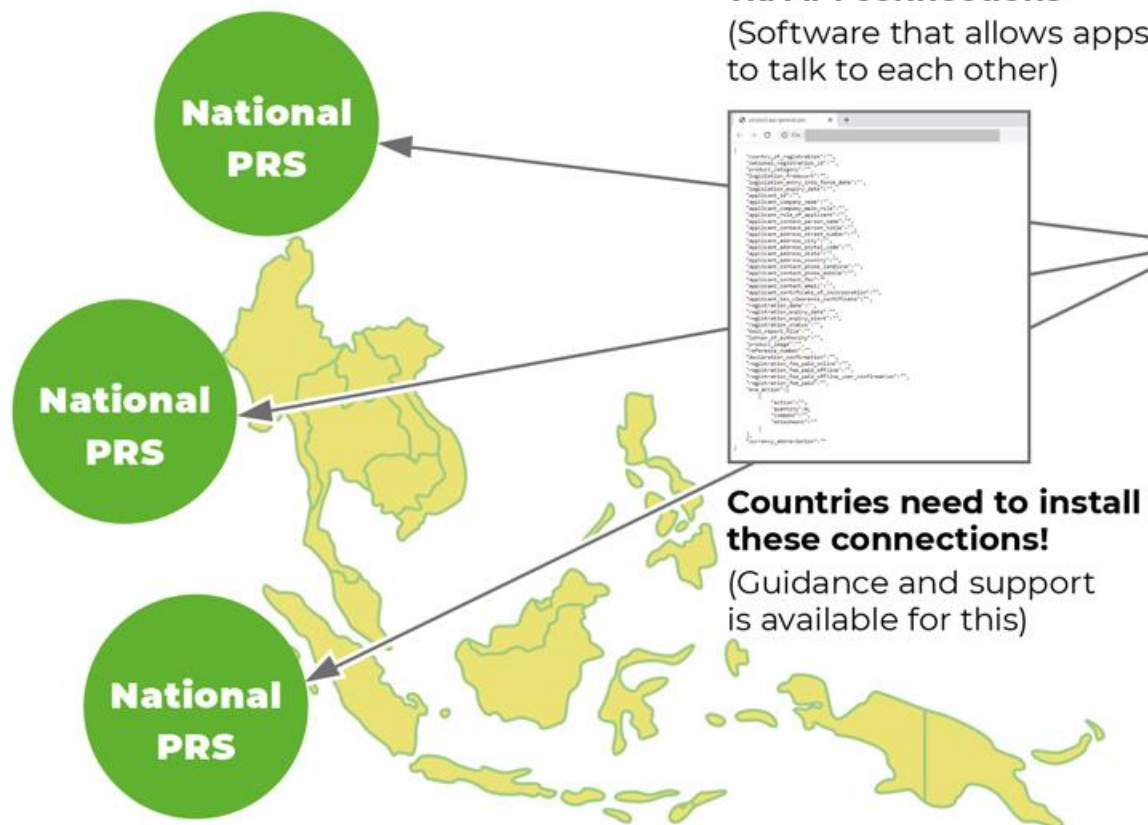
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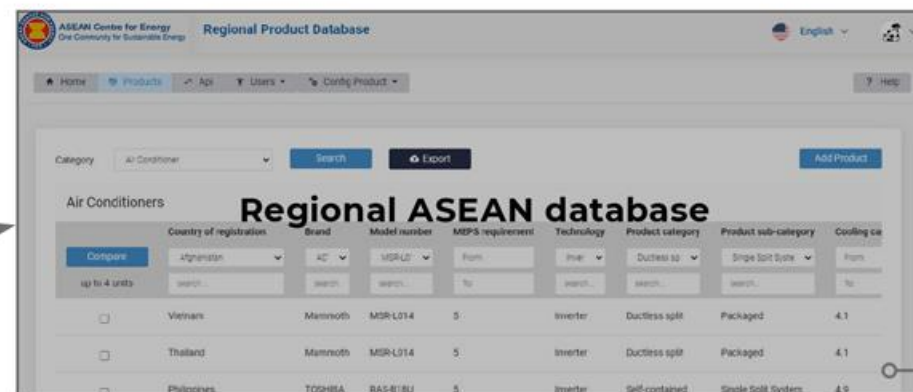
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- Facilitates application of Mutual Recognition Agreements
- Ultimately, this information helps the region to adjust their policies better and to create synergies in transforming their markets to energy-efficient products

Advantages of installing an API



Automation

- Reduces workload for AMS and ACE.
- Product data is available immediately for all AMS.



Efficiency

- Once APIs are setup, running cost is minimal.



Reliability

- Data is transferred without error-prone human interaction.



Unity

- Intangible benefit: AMS brought closer to policy unity.

Instructions and average time needed



OpenAPI instructions available

- Standard to define API characteristics, data points, format, connection security, etc.
- “Blueprint” for IT developers.
- Examples implemented in Regional database and National PRS



Effort required

- Developer familiar with National PRS infrastructure and database.
- 1 work-week for the developer.
- The API may be developed in parallel to the National PRS application (no need to modify existing code of the PRS).

Sustainability of Regional Database: To Do List for AMS

- **Commit to regular data sharing**
Data to be shared periodically, at least once a quarter.
- **Inform local industries**
Commitment of each AMS to share data to the Regional Database
- **Nominate National Focal Points**
Facilitating the regular data exchange after the completion of the Regional Product Database development project



Final Lighting National Roadmaps

Bintang Widhana, Renewable Energy and Energy Efficiency Officer, ACE
Madeleine Edl, Energy Efficiency Specialist, UNEP

05 April 2021

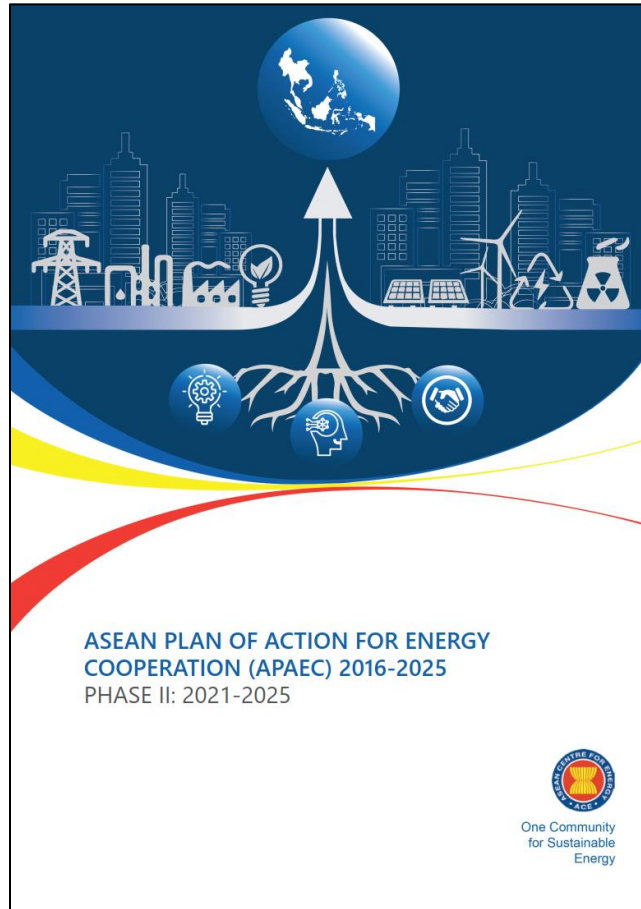
Aim and context of the project

“

To provide clear guidelines in the adoption of policies to promote the use of efficient lighting products and define the targets to be achieved by all ASEAN countries in achieving regional harmonisation of the nominated lighting products by 2023.

”

Aim and context of the project



APAEC PHASE II: 2021-2025

- In the area of Energy Efficiency and Conservation (EE&C) programme, ASEAN achieved an Energy Intensity (EI) reduction of 21% by 2018, surpassing its aspirational target of 20% in 2020 (over 2005 levels).
- Regional Policy Roadmap Mutual Recognition Agreement (MRA) announced at 37th AMEM in 2019 was another key achievement.
- Market transformation in favour of energy efficient technologies most likely to expand to include motors, transformers, and the like.

The regional lighting roadmap

Harmonisation of Test Methods:

Based on various recommendations, the ASEAN countries have agreed for uniform testing methods of:

- a) **CIE S025** (testing of photometric requirements) and **IEC 62612** (testing of functional performance requirements) for non-directional Light Emitting Diode lamps,
- b) **CIE S025** (testing of photometric requirements) for double-capped linear Light Emitting Diode lamps, and
- c) **CIE 084** (testing of photometric requirements) and **IEC 60081** (testing of functional performance requirements) for double-capped Linear Fluorescent Lamps.

The regional lighting roadmap

- Non-directional lamps (LED)

Feature	Requirement
Features within scope of another standard	Included within scope of IEC 62612 <ul style="list-style-type: none">• a rated power up to 60 W;• a rated voltage of > 50 V a.c. up to 250 V a.c.;• a lamp cap as listed in IEC 62560
Lumen range	$\geq 130 \text{ lm}$
Wattage	$\leq 60 \text{ W}$
Caps	E14, E27, B15, B22d

The regional lighting roadmap

- Linear lamps (LED)

Feature	Requirement
Length	550 mm to 1300 mm

- Linear lamps (Fluorescent)

Feature	Requirement
Features within scope of another standard	Included within scope of IEC 60081

The regional lighting roadmap

Harmonisation of Minimum Energy Performance Standards:

- The ASEAN countries will progress towards agreed target reference MEPS of **80 lm/W by 2023**, as mandatory MEPS for all non-directional LED lamps and linear LED and fluorescent lamps within the agreed scope.

Testing Infrastructure:

- Establish an appropriate framework for round-robin testing, staff skills training and evaluation process for testing facilities by 2022.

Mutual Recognition Agreements (MRA):

- Evaluate the feasibility of incorporating energy performance testing or establish new MRAs if necessary **by 2022**.

Development Process of National Lighting Roadmaps

Goal of the National Roadmaps: Implementation of the Regional Roadmap

ASEAN Regional Roadmap for
Lighting Products Endorsed by AMEM

September 2019



JOINT MINISTERIAL STATEMENT
OF THE 37th ASEAN MINISTERS ON ENERGY MEETING
4 September 2019, Bangkok, Thailand

UNEP-U4E & ACE ASEAN Inception Meeting on
Product Registration Systems and Lighting

February 2020



Virtual meeting with EE&C-SSN to discuss the update on the latest policies in lighting as a major
basis for the development of the draft national lighting roadmaps.

April 2020



Drafting of national lighting roadmaps & distribution of first draft to countries

October 2020

Update of roadmaps & distribution of second draft to countries

January 2021



Follow-up calls with countries to address individual questions

March 2021



Structure of the National Roadmaps

1. Definition and Rationale
2. Vision
3. Goals and Targets
4. Government Ministerial Structures and Responsibilities Related to the Lighting NRM
5. Actions and Measures
 - Policy and Project Management
 - Minimum Energy Performance Standards
 - Testing and evaluation methods & Testing infrastructure and Mutual Recognition Agreements
 - Monitoring, Verification and Enforcement
 - Supporting policies to promote products with better energy performance at the national level
6. Additional considerations for the priority areas of the NRM
7. Clauses and Sections

Current Status of the Roadmaps

Country	Status of roadmap	Comment
Thailand	Approved by DEDE	
Indonesia	Third version is currently being drafted	Roadmap will be enlarged to additional activities that had been requested through a follow-up call
Singapore	Third version has been sent	Third version was needed due to follow-up questions
Cambodia	Roadmap has been sent	Second version
Malaysia	Roadmap has been sent	Second version
Myanmar	Roadmap has been sent	Second version
Philippines	Roadmap has been sent	Second version
Brunei	Roadmap has been sent	First version
Lao PDR	Roadmap has been sent	First version
Vietnam	Roadmap has been sent	First version

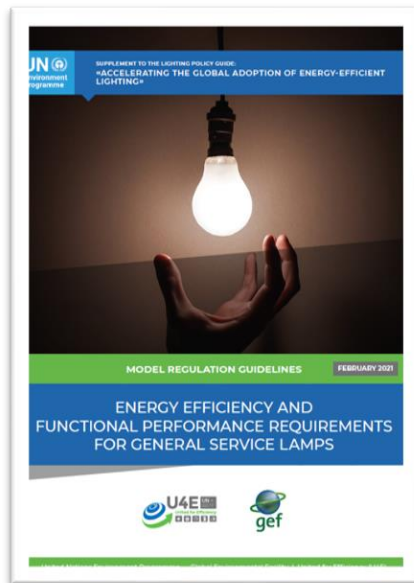
Model Regulation Guidelines

U4E Model Regulation Guidelines are:

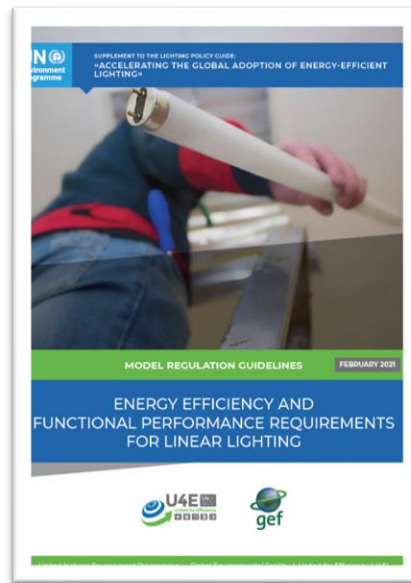
→ intended as a guideline to help **inform regulatory authorities and policy makers** in developing and emerging economies.

→ sets a **minimum efficiency floor** to prohibit future sales of inefficient products from the market.

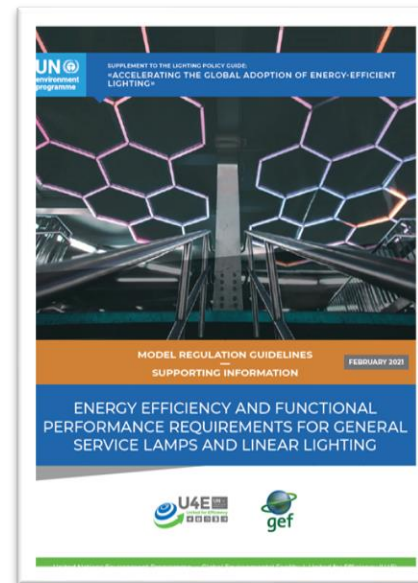
A range of stakeholders, including governments, manufacturers, technical institutions and environmental groups have contributed to their development.



**Model Regulation
Guidelines on General
Service Lamps**



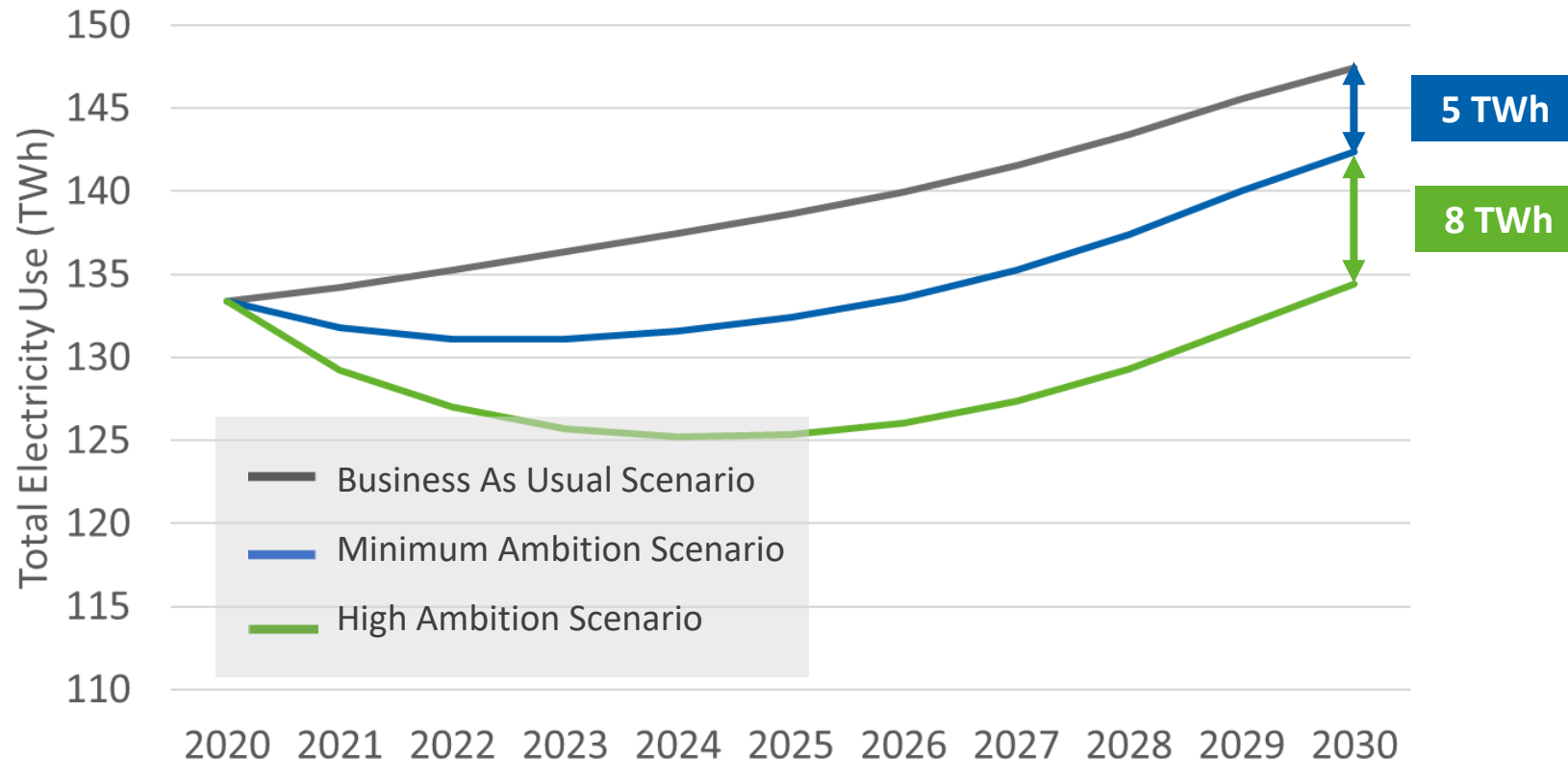
**Model Regulation
Guidelines on Linear
Lighting**



Supporting Information

Available [here!](#)

Saving Opportunities in ASEAN from Energy-Efficient Lighting



Annual Savings in 2030:

5 TWh of electricity consumption, which is equivalent to:

- **2 Power stations** [500 MW each]
- **3.4 Million tonnes of CO₂**
- **600 Million USD on electricity bills**



Modelling the Impact of Energy Efficient Appliances in ASEAN

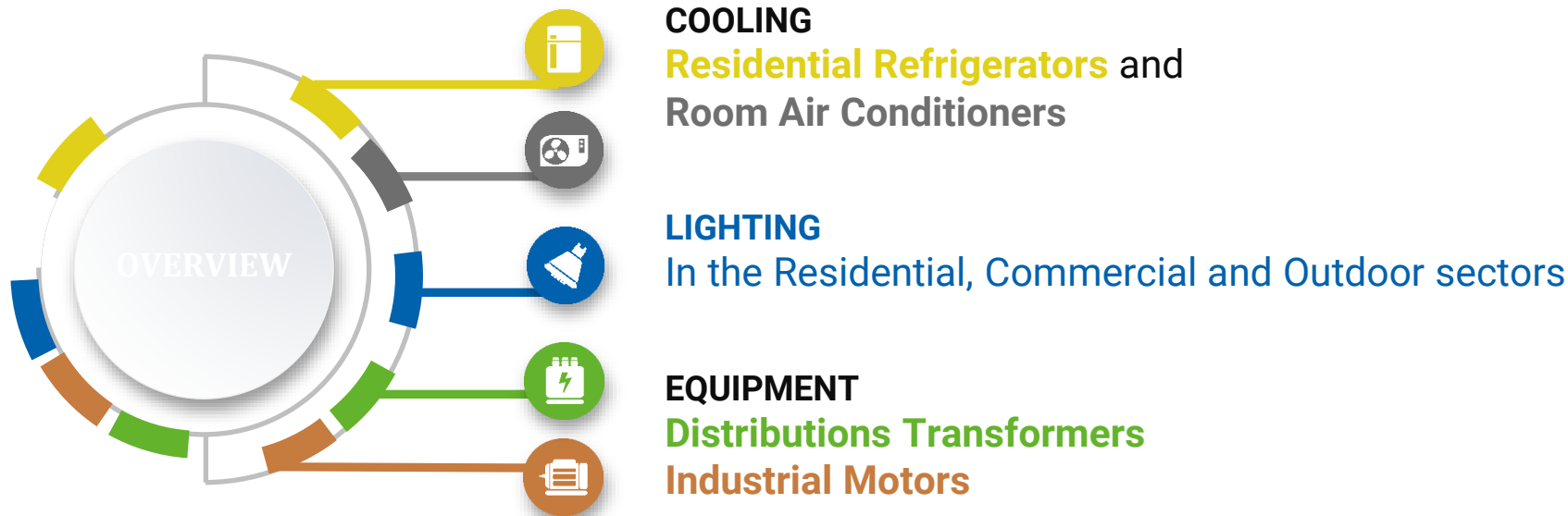
5 April 2021
David Wellington

Contents

- Overview of the UNEP U4E Country Savings Assessments
- Current analysis for the ASEAN states
- Introduction to current collaboration with ACE to update the ASEAN analysis

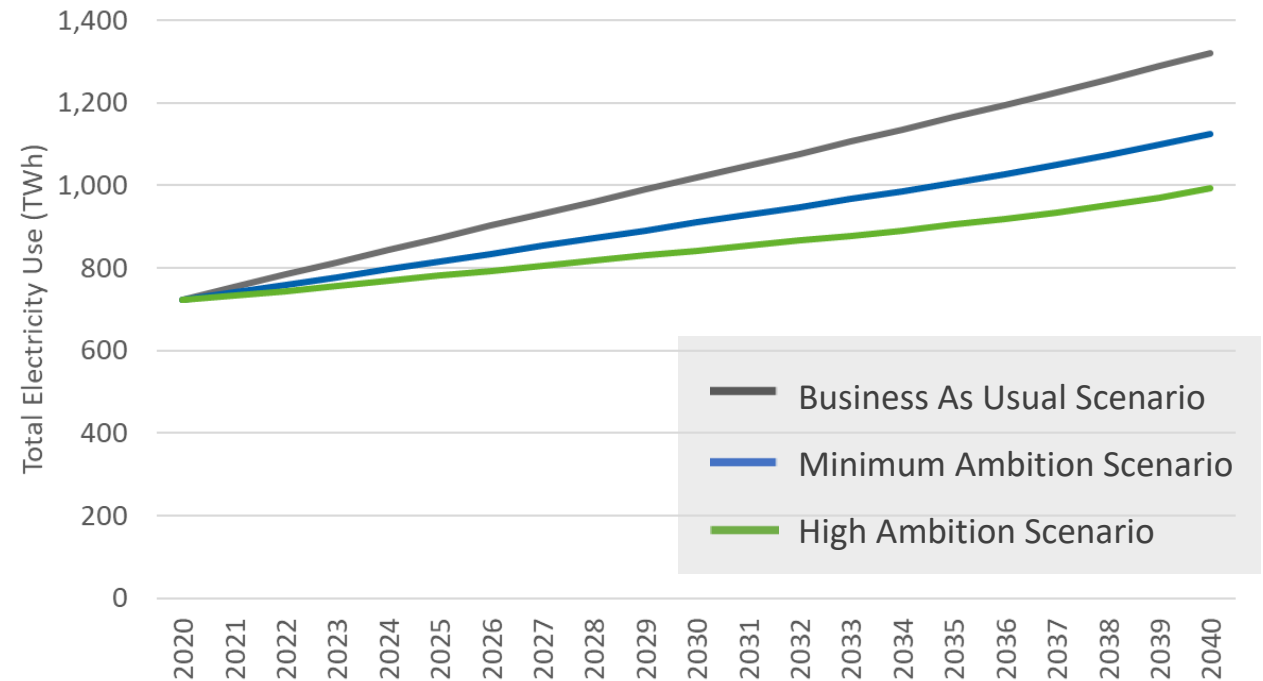
Country Savings Assessments overview



- Analysis of the energy use of 5 products that account for >50% of global electricity use
- Analysis highlights the benefits of energy-efficient products:
 - Energy: reducing consumption, peak loads and power plant demand
 - Financial: savings to government, industry and consumers
 - Environmental: lowering CO₂ and other emissions
- Aim to give an evidence base for the development of projects to promote energy-efficient products
- Results are presented in an overview and three detailed reports on cooling, lighting and equipment:



Overview of U4E analysis approach

- Estimate total electricity use of each product from 2020-2040 using U4E models
- Consider three scenarios
 - **Business As Usual (BAU):**
assumes no policy interventions
 - **Minimum Ambition:**
assumes Minimum Energy Performance Standards (MEPS) are introduced in line with the U4E model regulations
 - **High Ambition:**
Assumes MEPS introduced at a more stringent level



		Unit Energy Consumption (UEC: kWh/y) or Efficiency Level (Eff.)			Typical product/usage pattern assumed to be:
Cooling (UEC)	Product	Business As Usual	Minimum Ambition Scenario	High Ambition Scenario	
	 Residential Refrigerators	342	259	129	2-door refrigerator freezer of average size 250 litres
	 Room Air Conditioners	3417	2229	1661	A mix of 3.5 kW and 7 kW split units with a weighted-average cooling capacity of 4.2 kW

Country Savings Assessment reports

Overview report:

- Summary of key benefits by 2030
- Higher ambition and other benefits
- Detailed benefits in 2030/40 by product
- Assumptions and methodology

Product reports:

- Summary of key benefits by 2030
- Detailed benefits in 2030/40 by product
- Assumptions and methodology

Regional report:

- Summary of key benefits by 2030
- Higher ambition and other benefits
- Detailed benefits in 2030/40 by country
- Detailed benefits in 2030/40 by product
- Assumptions by products
- Country data and methodology



Current results for each country from U4E website

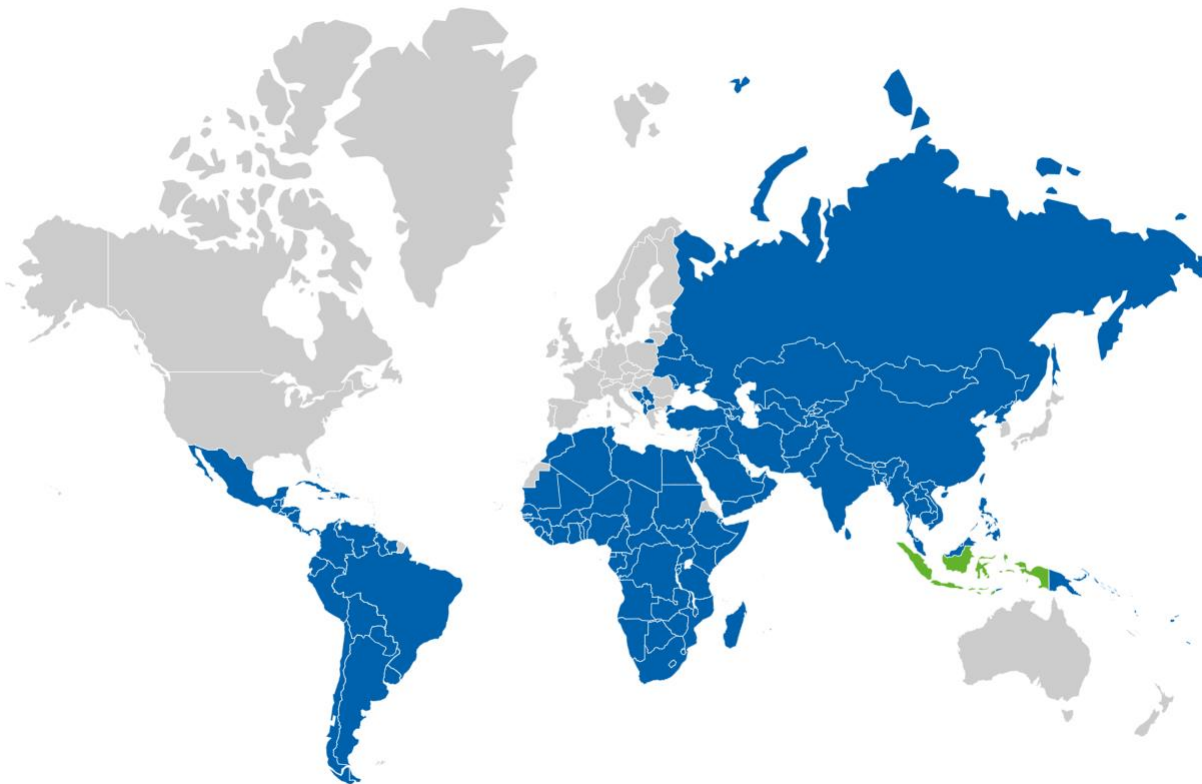


[HOME](#) [ABOUT](#) [OUR APPROACH](#) [COUNTRY & REGIONAL ACTIVITIES](#) [RESOURCES](#) [NEWS & EVENTS](#)

Savings and Policy Assessments

The U4E Global Map includes Country Savings Assessments showing the potential financial, environmental, energy, and societal benefits that are possible with a transition to energy-efficient lighting, refrigerators, room air conditioners, electric motors and distribution transformers. The Global Map also includes Country Policy Assessments showing the status of policies promoting the use of energy-efficient products. If you have questions or comments on the assessments, please email U4E@unep.org.

To find out more on the savings potential and policy status of country, click on a country to download the respective assessments.



<https://united4efficiency.org/countries/country-assessments/>

INDONESIA

Indonesia is a country partner to en.lighten.

Country Savings Assessment by product

[VIEW](#)

Download Country Assessments

[English](#)

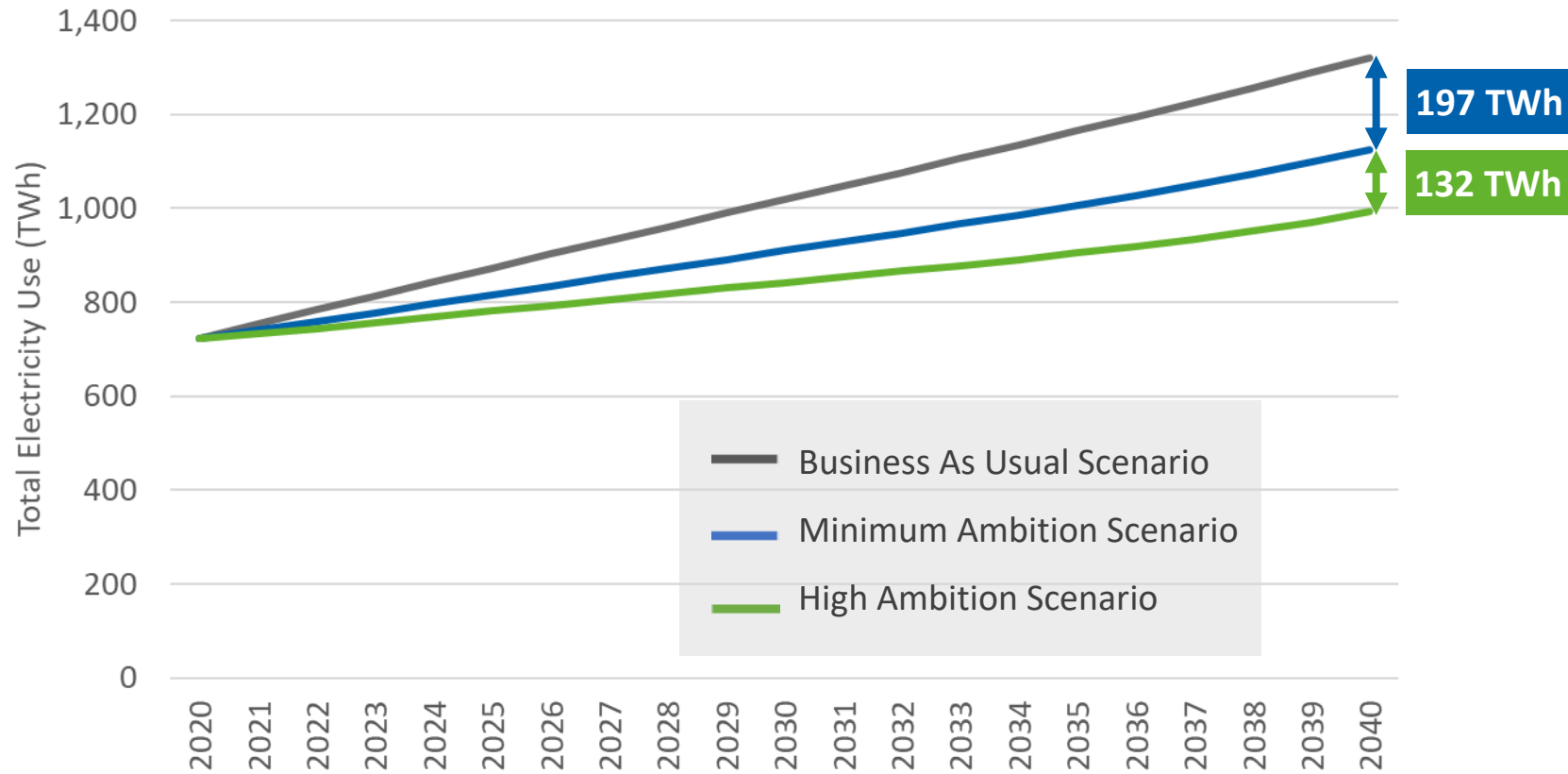
LIGHTING [English](#)

COOLING [English](#)

EQUIPMENT [English](#)



Saving Opportunities in ASEAN from Energy-Efficient Lighting, Appliances and Equipment



Annual Savings in 2040*:

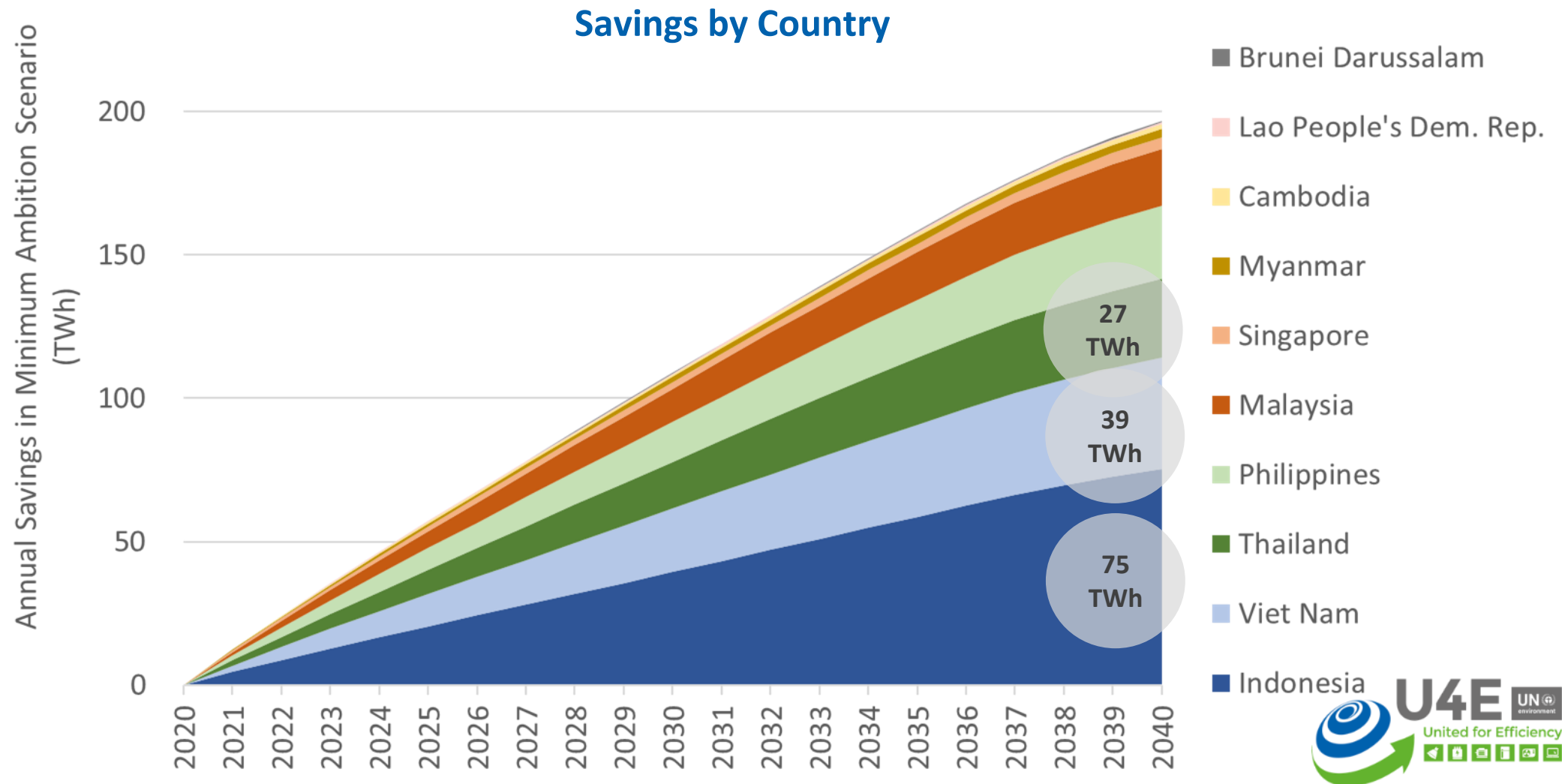
197 TWh of electricity consumption, which is equivalent to:

- **90 Power stations** [500 MW each]
- **136 Million tonnes of CO₂**
- **21 Billion USD on electricity bills**

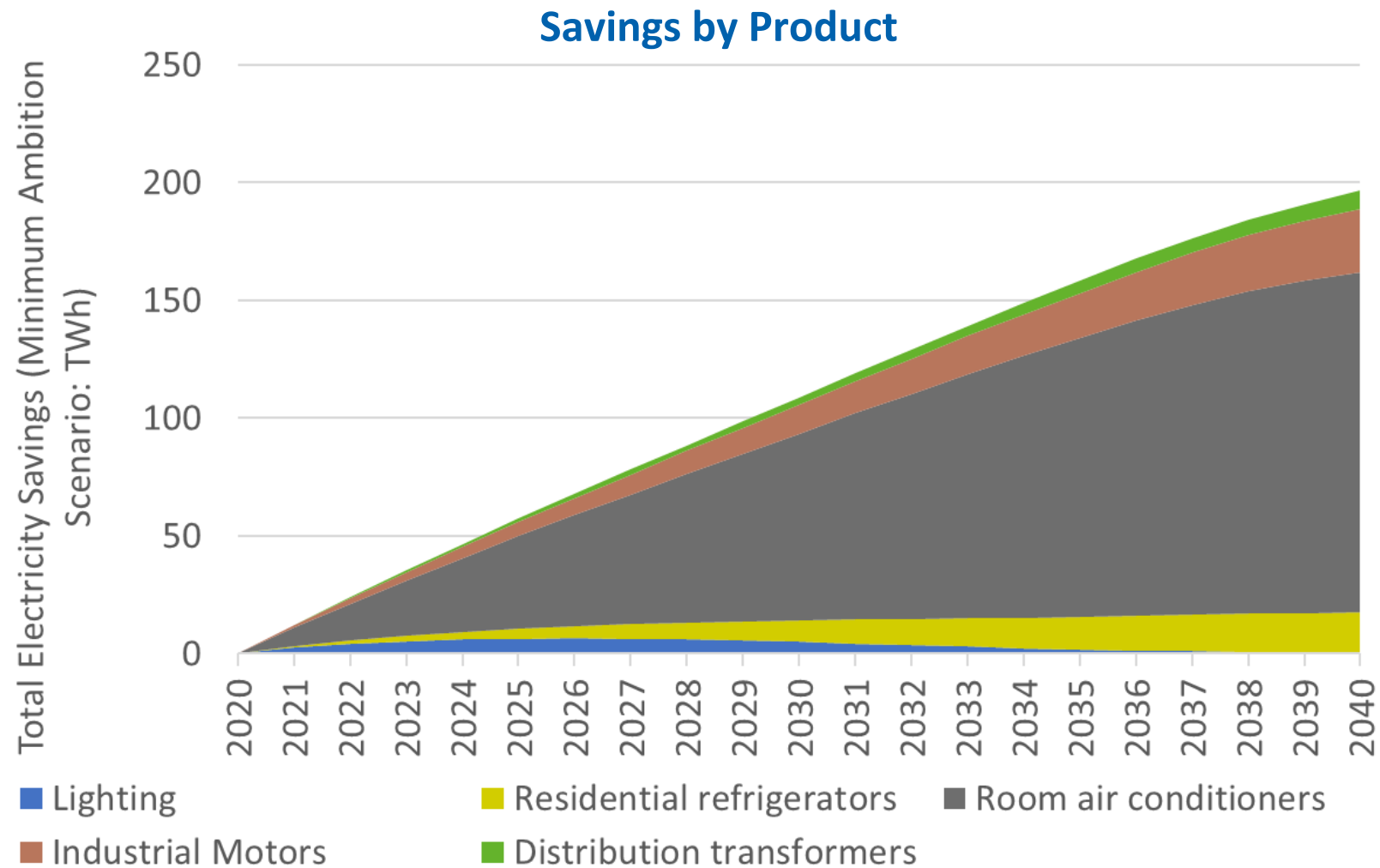


*Savings of all five products with Minimum Ambition Scenario, displayed savings in 2040

Saving Opportunities in ASEAN from Energy-Efficient Lighting, Appliances and Equipment



Saving Opportunities in ASEAN from Energy-Efficient Lighting, Appliances and Equipment



Savings refer to the Minimum Ambition Scenario.

Introduction to current collaboration with ACE to update the ASEAN analysis



Main components

- Update of ASEAN Country Savings Assessments
 - Rebuild models for new timeframes
 - Gather data to refine and validate analysis
 - Update input assumptions and savings projections
 - Publish a regional savings Assessment for ASEAN
- Capacity Building on energy efficiency modelling with ACE



Current activities

- Updating CSA models
- Developing data collection plan
- Capacity building through online training sessions

Key analysis updates



Refrigerated appliances:

BAU UEC assumptions, current sales and stock levels.



Room Air Conditioners:

BAU UEC assumptions, current sales and stock levels.



Lighting:

Current market shares of lamp types, future demand projections.



Distribution Transformers:

BAU typical product assumptions, electricity demand projections.



Industrial Electric Motors:

BAU efficiency assumptions, current motors electricity demand.



Timeframe

February – May 2021


















Summary of upcoming activities and opportunities for 2021-22

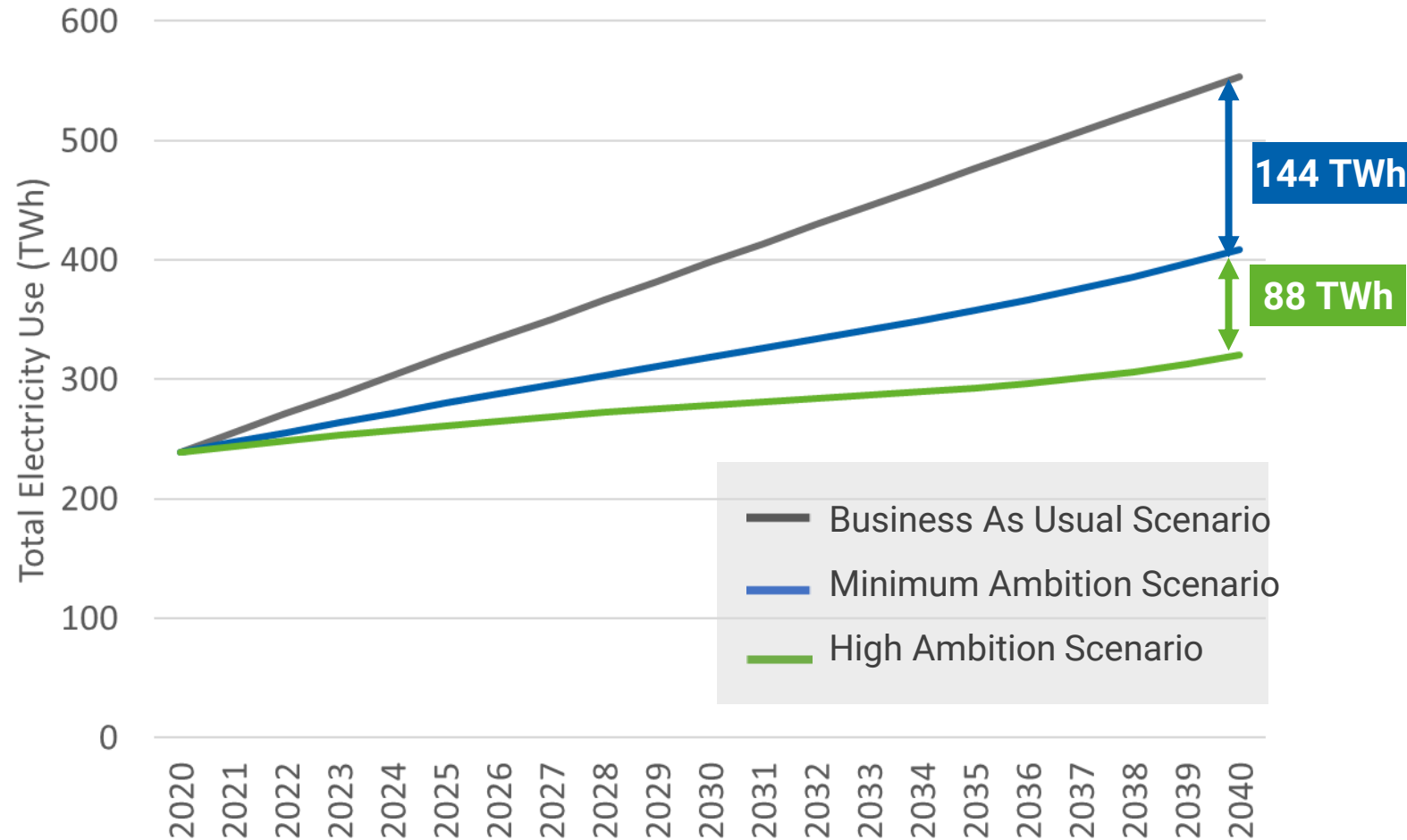
Patrick Blake, Programme Officer, UNEP

05 April 2021

Overview of Current Workstreams

Workstream	Content	Timelines	Focus products
Lighting National Roadmaps	<ul style="list-style-type: none"> Drafting of national roadmaps Country-individual advice Guide on how to develop roadmaps 	Q4 2019 - Q2 2021	
Product Registration Database	<ul style="list-style-type: none"> Software development Training and Advice Guidance on Implementation 	Q4 2019 - Q2 2021	  
Technical Support on Air Conditioners	<ul style="list-style-type: none"> Technical recommendations Update of roadmaps 	Q2 2020 - Q1 2022	
Energy Efficiency Modelling	<ul style="list-style-type: none"> Regional saving assessment Capacity building for ACE 	Q1 2021 - Q2 2021	    
Refrigerator Status Report	<ul style="list-style-type: none"> Development of a status report Technical recommendations 	Q2 2020 - Q4 2021	
Sustainable Public Procurement	<ul style="list-style-type: none"> Report on SPP Capacity Building & Advice 	Q4 2020 - Q4 2021	 

Saving Opportunities in ASEAN from Energy-Efficient Air Conditioners



Annual Savings in 2040*:

144 TWh of electricity consumption, which is equivalent to:

- **66 Power stations** [500 MW each]
- **101 Million tonnes of CO₂**
- **16 Billion USD on electricity bills**

Harmonization of Air Conditioners Testing Standards



Main components

Support to the ACE-JAIF CSPF project through:

- Developing a Comparative Analysis Report on Room Air Conditioners in ASEAN Region
- Providing Technical Recommendations for Adoption of the Model Regulations Guidelines for Air Conditioners in the ASEAN Region
- Conducting Data collection in four additional ASEAN member states
- Delivering of training to on energy-efficient and climate friendly cooling



Timeframe

March 2021 - December 2021

Donors:



Partners:



Energy Efficient Refrigerators



Main components

Development of a refrigerator status report, including

- Policies in place
- Trends in use of refrigerators
- Opportunities for harmonization of projects, policies and strategies



Future opportunities

- Development of a regional roadmap with recommendations for MEPS and labels, e.g. similar to the adopted roadmaps for air conditioners and lighting
- Development and update of national MEPS and labels for refrigerating appliances

➔ Refrigerator status report can be used as a basis for this work



Timeframe of current activities

May 2020 - December 2021

To date only half of ASEAN countries have mandatory MEPS on refrigerators in place.

U4E estimates that by 2040:

- The electricity consumption is going to increase by over 80%
- With energy-efficient refrigerators 17 TWh of electricity consumption could be saved.*

Donors:

KIGALI
COOLING EFFICIENCY PROGRAM



Partners:



*Annual savings with Minimum Ambition Scenario.

Sustainable Public Procurement (SPP)



Main components

- Report on SPP in ASEAN and Sub-Saharan Africa
- Mapping of SPP activities in the regions
- SPP toolkit for cooling
- Capacity Building Workshops for each region
- Development of a case study
- Technical Assistance to a subset of countries



Current activities

- Approach for data collection determined and Interviews conducted
- Draft of SPP Market Mapping Report
- Draft database with SPP mapping developed
- Draft toolkit for cooling developed

Donors:



Partners:



Approach



Legislation framework

International: NDC, Kigali, ILO, etc.
National: Public finances & procurement



Financing models

"Regular" capex procurement
Alternative delivery models



Sustainability requirements

Product: primarily environmental
Supplier: primarily social & governance



Soft factors

Additional community benefits
Political buy-in



Timeframe

October 2020 - October 2021



Funding Opportunities

Green Climate Fund

Example of projects

Opportunity

Each country has a [National Designated Authority](#) (NDA) that has access to **1 million grant per year**.

Activities that are supported

The activities that can be funded include capacity building, governance mechanisms, and planning and programming frameworks, such as the **development of MEPS and labels**.

Support from UNEP

UNEP-U4E drafts funding proposals in cooperation with governments that request the support. Several **successful funding proposals** had been granted currently.

Timeline

Proposals must be submitted by June for the 2021 cycle.

Approach for ASEAN

Multi-country proposal (see example from Central America) with AMS that commit GCF resources, which provide economy of scale and support to regional harmonization efforts

