

Creating enabling conditions for increased private and public sector investment into energy transition in Southeast Asia

June 2023



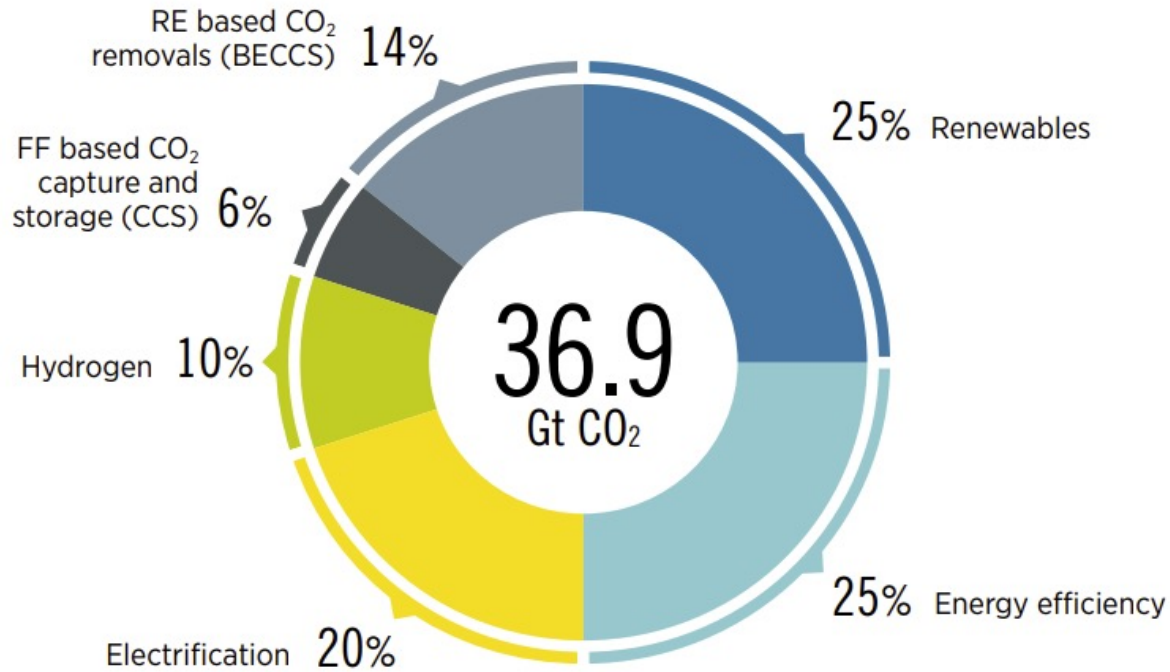
Contents

- 01 | Background and existing energy efficiency initiatives in Southeast Asia
- 02 | The importance on harmonization on S&L in ASEAN and how it would influence the regional trade/market on energy efficient appliances
- 03 | How to enable private sector investment in EE in ASEAN? ESCO or other business models?



Key Levers for Energy Transition

Reducing Emissions by 2050



Technology avenues for the World to stay aligned with 1.5-degree pathway

Source: World Energy Transitions Outlook, IRENA 2022

- ✓ 1.5°C pathway positions electrification and energy efficiency as key drivers of the energy transition
- ✓ Buildings: Major investments in energy efficient renovations and electrification of buildings (USD 1.5 trillion per year)
- ✓ Transport: Massive deployment of smart charging for EVs in cities (USD 86 billion per year)
- ✓ Industry: Special efforts to decarbonize cement, iron and steel, and chemical sectors.
- ✓ Enabling policies to accelerate deployment
- ✓ Rate of energy intensity improvement must rise to 3.1% per year by 2030 (doubling of rate during 2018-20)
- ✓ 65% of share of renewables in global electricity supply
- ✓ Accelerate clean hydrogen related infrastructure development projects
- ✓ Dedicated policies and funds needed to accelerate transformation

Background on importance of EE initiatives in Southeast Asia

SEA needs to improve regional cooperation to speed up the establishment of flexible and reliable power infrastructure and the higher adoption of energy-efficient technologies through end-user electrification

- Economic and population growth will result in a 2.5-fold increase in energy demand by 2050 in SEA.
- SEA still depends heavily on fossil fuels, around 86% of primary energy demand in 2021.
- The region has insufficient supply of fossil fuels for current demand and widening gap into the future. Import dependence is growing.
- New push on global level to reach net-zero emissions around mid-century, and some SEA countries have already pledged to achieve net-zero emissions.
- Renewables have hit historic lows in terms of cost. SEA has significant untapped renewable energy potential.



Source: Renewable Energy Outlook for ASEAN, IRENA & ACE 2022

Forming interlinks to achieve ESG and Net Zero transformation



NET ZERO

- 1st pillar of net zero: Energy Efficiency
- Technology assessment of decarbonization solutions
- Cost benefit analysis
- Implementation support and technical handholding

COST OPTIMIZATION

Collaboration with teams working with private sector players on cost optimization:

- Energy cost in manufacturing is 10-15% of overall cost
- Energy cost reduction through efficiency improvement

ESG

- Emissions reduction
- Waste reduction (waste heat and waste resources)
- Pollution reduction (pollution due to inefficient fuel use)
- Productivity upliftment (manpower and equipment)

Digitalization

- Integration with Industry 4.0 / 5.0
- KPI enables, IoT based cloud Energy Management System – Smart sensors and controls
- Low-cost automation for SMEs through use of digital solutions











*DSM: Demand Side Management; KPI – Key Performance Indicator, SMEs – Small and Medium scale Enterprises, IoT – Internet of Things, ESG – Environmental, Social and Governance

Energy Efficiency Targets of Southeast Asian Countries

Country	Energy Efficiency targets	
	Reduction in energy intensity	Reduction in total final energy consumption (TFEC)
Singapore	1-2 % per annum in manufacturing sector (till 2025)	20% in the industrial sector (by 2025)
Thailand	NA	31% from relative to TFEC of 2010 (by 2035)
Vietnam	NA	8% relative to BAU by 2020
Myanmar	NA	20% relative to BAU by 2030
Cambodia	NA	20% by 2035
Lao PDR	NA	10% relative to BAU by 2030
Indonesia	1% per annum till 2025	10% relative to 2011 in specific sectors by 2030
Malaysia	NA	8% relative to BAU by 2025
Philippines	40% relative to 2005 levels by 2040	NA
Brunei Darussalam	25% relative to 2005 levels by 2030 45% relative to 2005 levels by 2035	NA

- Aggregated (and averaged) target of **ASEAN is reducing EI by ~30% in 2025**, relative to **2005 baseline**.
- Majority of the **member countries do not have intermittent targets** which makes it difficult to track progress towards overall country level goals by 2030.
- There is a **large misalignment in setting national EE targets** that could result in uncoordinated policy action.
- **Targets are specified in relative terms** (as per GDP or a year-wise baseline) and **not in absolute emission reduction terms**.
- **Some members have set ambitious targets and some quite conservative**. Poses a barrier towards coordinated aligned efforts towards EE.

Energy Efficiency Mechanisms in Select SEA Countries

EE Policy & Regulatory Mechanisms				
EE Policy / EE Act	Mandatory Energy Audits for DEC's	Appliance S&L	Building Energy Code	ESCO Accreditation & Guidelines
Singapore 	Enforced	Enforced	Enforced	Enforced
Thailand 	Enforced	Enforced	Drafted	Drafted
Vietnam 	Enforced	Enforced	Under Development	Under Development
Myanmar 	Drafted	Under Development	Under Development	Under Development
Cambodia 	Enforced	Under Development	Under Development	Under Development
Laos 	Drafted	Under Development	Under Development	Under Development
Indonesia 	Enforced	Drafted	Enforced	Drafted
Malaysia 	Enforced	Enforced	Enforced	Drafted
Philippines 	Enforced	Under Development	Enforced	Drafted
Brunei Darussalam 	Enforced	Under Development	Under Development	Under Development

Absent

Under Development

Drafted

Enforced

Highlights of Energy Efficiency Measures from Southeast Asia



Singapore, Malaysia, Thailand, Philippines and Indonesia have taken lead in having a robust mechanism for promoting energy efficiency in the building, industry and transport sectors.



These countries have regulations in place complemented by fiscal incentives and market mechanisms to support the uptake of EE in respective sectors



Sustainability reporting / ESG guidelines are becoming common in SEA. The adherence to reporting is mandatory in **Singapore** (select listed firms), **Malaysia** (applies to all public listed firms), **Hong Kong** (comply or explain system), **Philippines** (public listed firms) however it is voluntary in some other SEA countries.



Singapore is the leader in building energy efficiency and green buildings in Asia. The 'Digital Twin' of entire Singapore is available with policy makers to tackle sustainability issues of future. Building EE and green building regulations are being implemented in other SEA countries with few being successful.

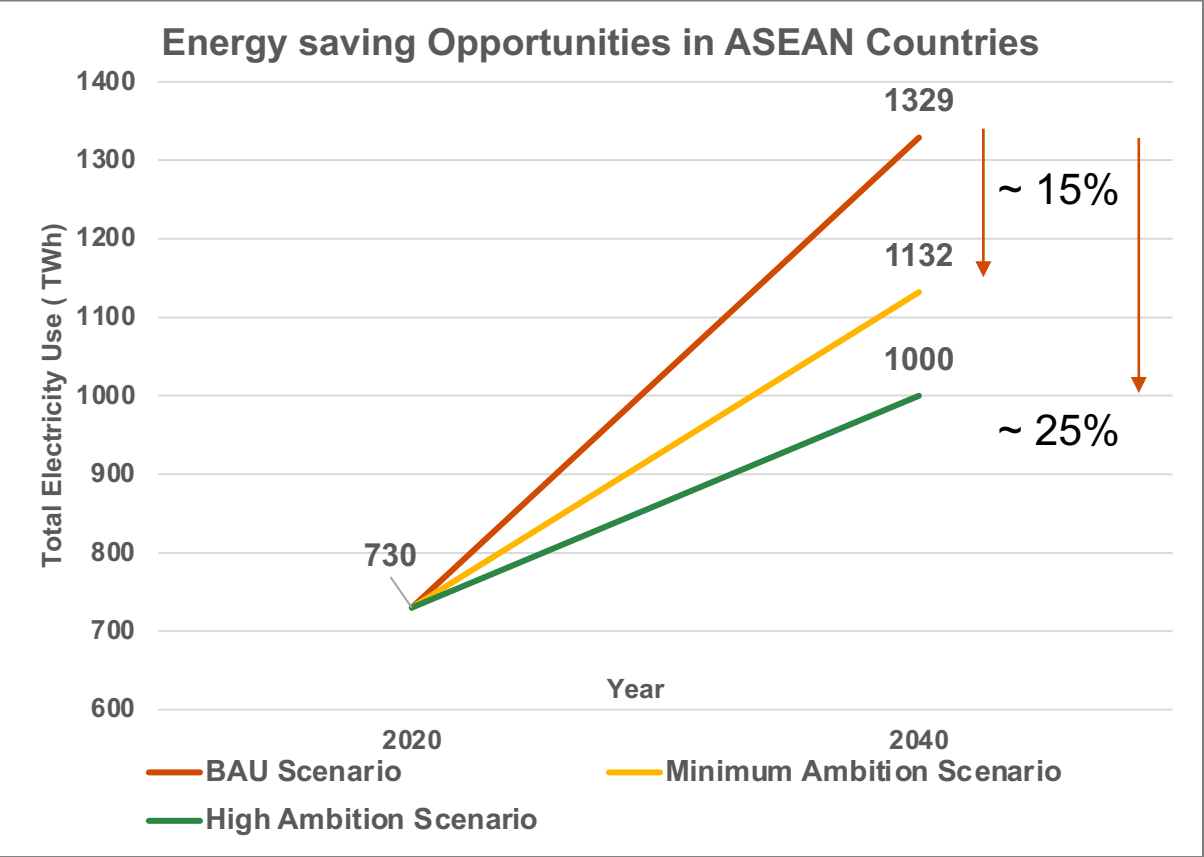


High energy consumers from industry and building sectors have been identified in Indonesia, Malaysia, Philippines, Thailand, Singapore and Vietnam who are asked to report their energy consumption, undertake periodic energy audits and improve their energy intensity.



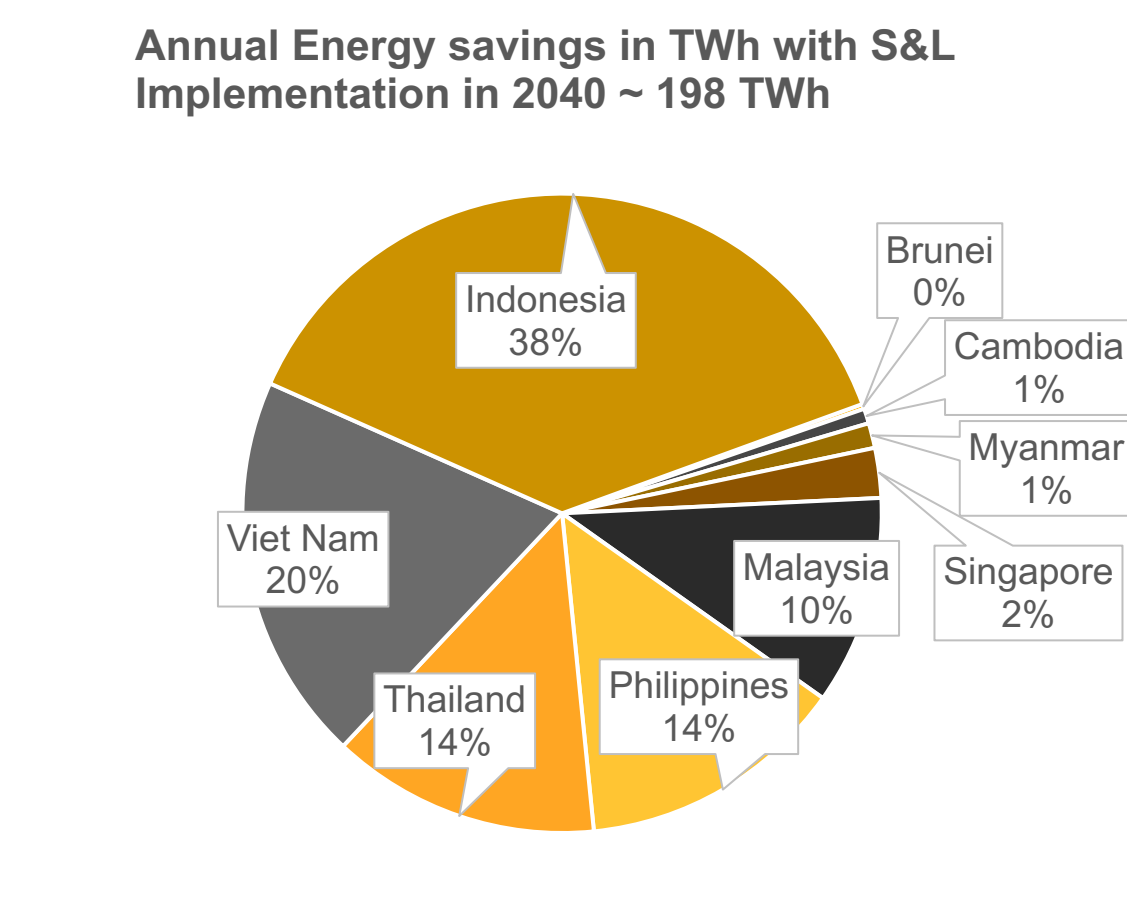
Vehicle fuel efficiency norms as well as labelling for fuel efficiency, fuel switch programs with a thrust to electric vehicles is being promoted in the SEA countries through standard compliance and fiscal incentives and awareness programs

Potential Energy Savings in ASEAN Countries



- BAU Scenario** Assumes no policy Intervention
- Minimum Ambition Scenario** Assumes MEPS are introduced
- High Ambition Scenario** Assumes ambitious MEPS with frequent upgrades and are strictly implemented

Country Wise Energy savings potential, in a Minimum Ambition Scenario

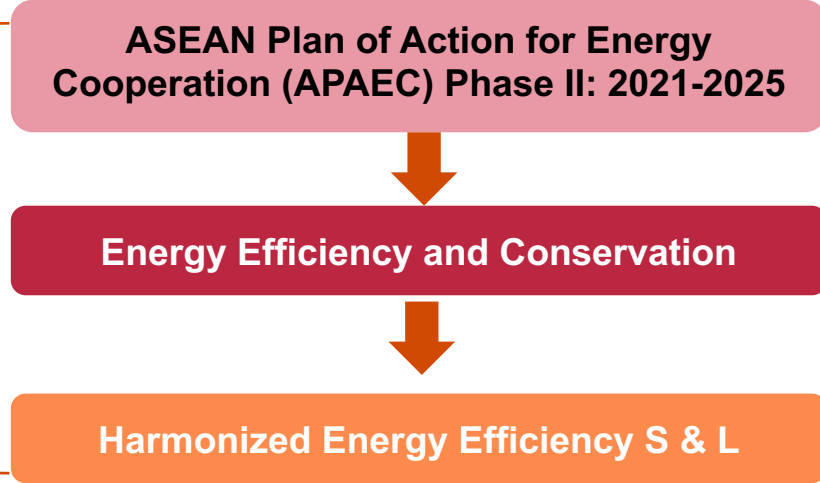


Source: Realizing the Shift of ASEAN's Markets to Energy-Efficient and Climate Friendly Appliances – UNEP & ACE

Harmonization of Energy Performance Standards in ASEAN Countries

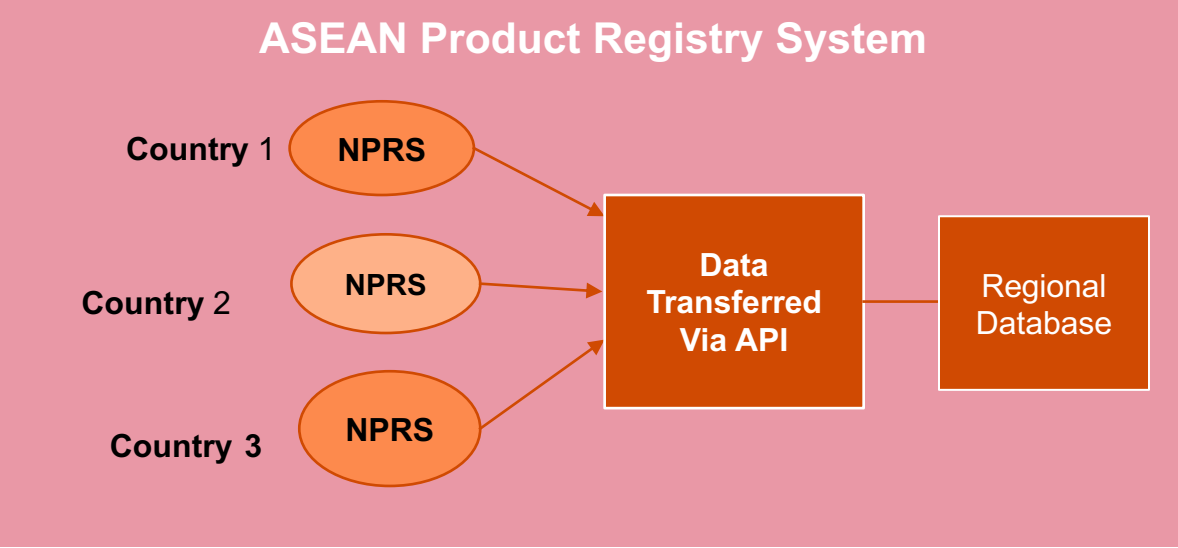
Objective:
 To remove trade barriers amongst ASEAN Countries and maintain a single production base for appliances.
 To curb the sale of unregulated products in all ASEAN countries.

Discussed during 38th ASEAN Ministers of Energy Meeting (AMEM)



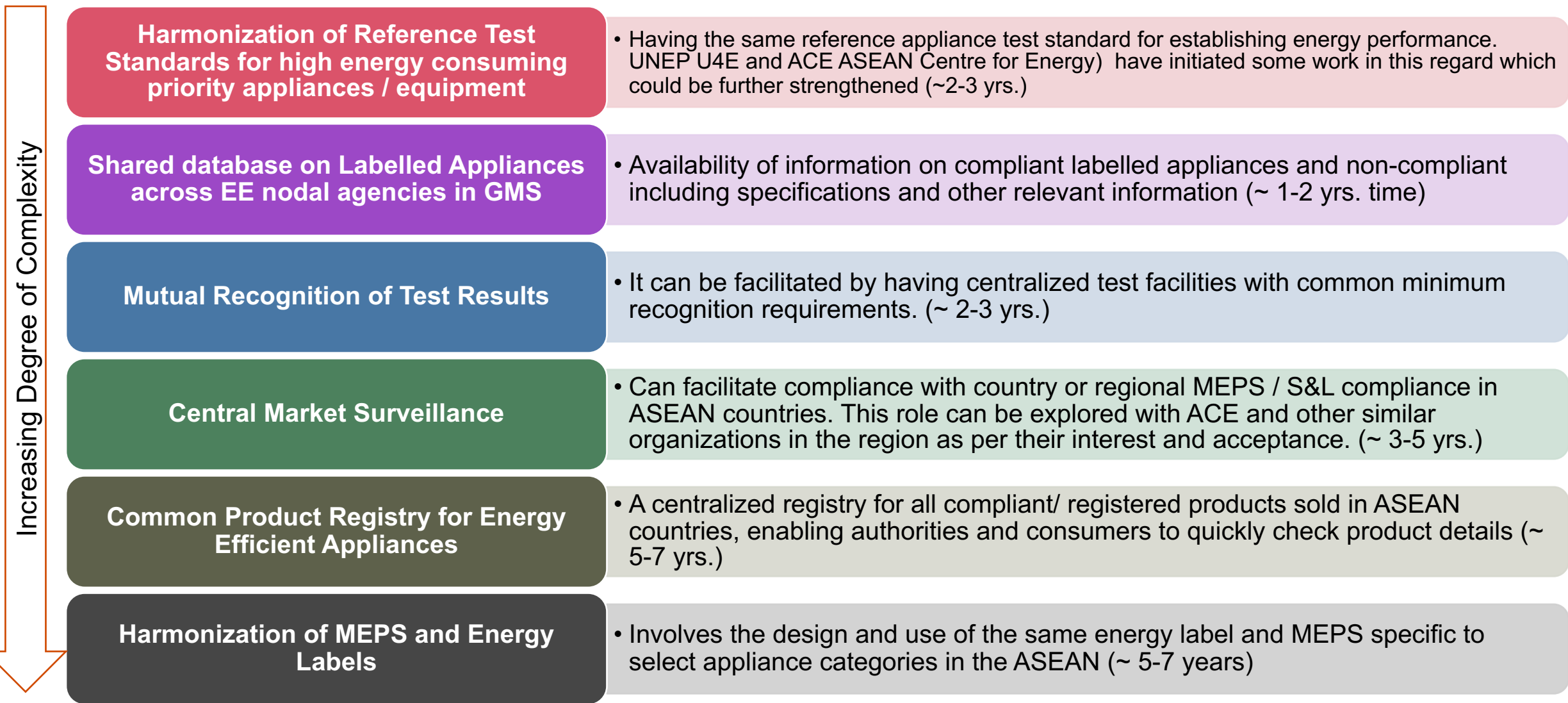
ACE and UNEP has taken initial steps towards the harmonization of S & L in ASEAN Countries

- ### ASEAN Regional Roadmap for EE Harmonization
- Harmonization of Testing Methods
 - Harmonization of Evaluation Methods
 - Harmonization of MEPS
 - Testing Infrastructure
 - Inclusion of Energy testing into existing Mutual recognition Agreement(MRA)
 - Reporting : development of a common product database for all ASEAN member States



Possibilities for S&L Harmonization in ASEAN Countries

Resulting in greater cooperation on recognition of energy efficient alternatives, promote energy efficiency and enhance local manufacturing and trade



Enabling Private Sector Investments in EE

Clear Policies for businesses to invest in EE

- Develop guidelines and incentives like energy performance standards, mandatory energy audits, tax incentives, corporate ESG reporting standards, subsidies for EE technologies, etc.

Strengthen Institutional Capacity

- Enhance capacity of relevant institutions responsible for energy efficiency, such as energy agencies and ministries by providing training and technical assistance to develop expertise in energy efficiency planning, implementation, and monitoring

Raise Awareness & Provide Technical Assistance

- Conduct public awareness campaigns to promote the benefits of EE and educate businesses about available financing mechanisms and technical assistance programs. Provide resources, training, and capacity-building initiatives to help identify and implement energy efficiency measures

Develop Financing Mechanisms

- Establish dedicated financing mechanisms by collaborating with FIs such as creating green investment funds, providing loan guarantees, developing innovative financial products, and fostering partnerships between banks and energy service companies (ESCOs).

Encourage Public Private Partnerships

- Governments can work with industry associations, ESCOs, and other stakeholders to jointly develop energy efficiency projects, share best practices, and leverage resources and expertise

Enabling Private Sector Investments in EE (continued...)

Demonstrate successful projects

- Implement pilot projects and showcase successful EE initiatives in ASEAN countries. These can inspire and educate businesses on the benefits and feasibility of investing in EE. Sharing success stories and lessons learned through workshops, conferences, and case studies can encourage further investments.

Strengthen Regional Cooperation

- Encourage collaboration and knowledge sharing among ASEAN members by establishing platforms for workshops, working groups to facilitate exchange of experiences, best practices, etc. Harmonize energy efficiency standards and regulations across the region to create a level playing field for businesses

Provide technical support and capacity building

- Collaborate with international organizations and development partners to provide technical assistance and funding for capacity-building activities

Support Research and Development

- Invest in research and development to foster innovation in energy efficiency technologies and practices. Promote collaboration between research institutions, businesses, and startups in ASEAN countries to develop and commercialize energy-efficient solutions. Encourage technology transfer and provide support for scaling up successful innovations

Monitor & Evaluate Progress

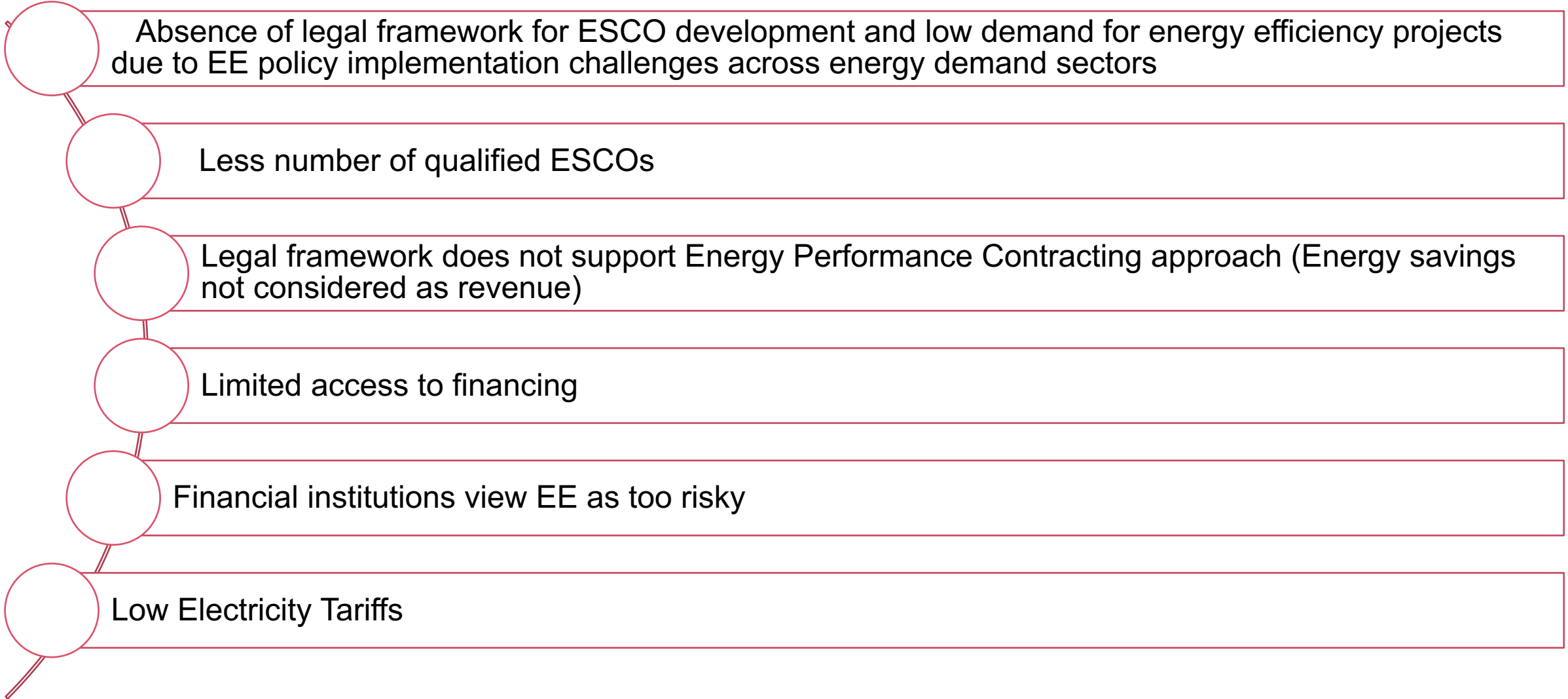
- Establish mechanisms to monitor and evaluate the impact of energy efficiency initiatives and investments in ASEAN countries. Regularly assess the effectiveness of policies and programs to identify areas for improvement and refine strategies accordingly.

A Case for Energy Savings Performance Contracting in ASEAN

While Some ASEAN Members are leading in terms of ESPC services, others such as **Brunei Darussalam, Cambodia, Lao PDR, Myanmar and Vietnam** are lacking in ESPC Market Development

State	Energy Savings Performance Contracting Highlights
Indonesia	<ul style="list-style-type: none">▪ State owned ESCO established in 1986.▪ ESCO Association is active with ~ 17 registered members,▪ Industries regularly undergo energy audits, incentives such as reimbursement of EA costs,▪ ESCO business implementation regulation in place,
Malaysia	<ul style="list-style-type: none">▪ 8 Year project was undertaken (1999-2007) to train and support local ESCOs,▪ Govt. leads initiative of GLBE through implementation of ESPC program in government sector.▪ No. of incentives in place such as Green Technology Financing Scheme (GTFS), income tax exemptions, etc.▪ Dedicated ESCO Association with 61 registered ESCOs.
Philippines	<ul style="list-style-type: none">▪ EE Lighting Initiative (ELI) project involved promotion of ESCO-led efficient lighting projects▪ Legal provision for accreditation of ESCO to offer services under ESPC are in place▪ 37 registered ESCOs, out of which 6 are certified by DOE
Singapore	<ul style="list-style-type: none">▪ Energy Efficiency Program Office (E2PO) administers ESCO accreditation scheme▪ Guaranteed Energy Savings Performance for public agencies building retrofits▪ Several incentives exist such as assistance schemes, grant for EE technologies, etc.▪ 19 accredited ESCOs and 27 Qualified Energy Services Specialists (QESS)
Thailand	<ul style="list-style-type: none">▪ ESCO funding project was kickstarted in 2008 for SMEs▪ 60 registered ESCOs distributed amongst small, medium and large firms▪ Thai ESCO association is promoting ESPC services and is involved in raising awareness

Key barriers for energy services market and EPC Models



Suggestions for development of Energy Savings Performance Contracting

Recommendations	Key Actions
Creating Demand for EE in Public Sector	<ul style="list-style-type: none">• Establish binding targets for EE improvements• Mandate public agencies to develop EE action plans• Develop standardized documents such as energy audit report templates, benefit-cost assessment tools, request-for-proposals (RFP), bidding documents, energy services, contracts and agreements.• Develop simple but effective measurement and verification (M&V) protocols• Capacity building
Removing Barriers to Public Procurement of Energy Efficiency Services	<ul style="list-style-type: none">• Revise legislation to allow public agencies to sign multi-year contracts• Change public budgeting regulations and procedures to allow public agency budgets to retain energy savings from EE projects in order to pay ESCOs• Enact legislation or regulations to allow public agencies to participate in public-private partnerships (PPP) to implement EE projects
Facilitating the Financing of ESCO Projects	<ul style="list-style-type: none">• Consider options such as: establishing EE revolving funds; energy services agreements; funding energy audits of public agencies; providing grants and guarantees; risk sharing facilities;• Creating public ESCO or Super ESCO
Develop and tests simple procurement models	<ul style="list-style-type: none">• Develop a simple and transparent procurement system with well-defined rules, regulations and procedures and supporting documents to facilitate public agency procurement of ESCO service

Simplified ESCO Delivery Models

Early stage ESCOs and developing EE markets need to move towards simplified delivery models to address common barriers to ESPC implementation.

Increasing Degree of Complexity

Standard Product Model with Deemed Savings

- Client pays a predetermined amount to ESCO for the installation of EE upgrades for which the energy savings are well-known or agreed in advance. Model is simple to implement without the need for energy audits and M&V.

Equipment Leasing with Verified Savings

- ESCO installs and owns the energy efficient equipment under a leasing model. The facility owner gets ownership of the equipment after all lease payments are made. Model does require a contract between the leasing entity and facility owner

1 year Contract with Partial Performance Payment

- ESCO is paid 60-70% of the investment cost based on measurements taken during commissioning and the remaining is paid after 6-12 months provided there is continued savings

Variable Term Contract

- Contract terms are flexible and can be extended until actual savings are achieved. ESCO receives all the energy cost savings until their costs have been recovered

Energy Service Agreements

- Energy service firm finances and implements the project and recovers the payment through a predetermined fixed cost on an annual basis. Generally, the contracts are typically for 5 to a 15-year period. It is more common in developed economies and is facilitated by close sensor-based monitoring of energy service in real time.

Why Super ESCO?

“Super ESCO” as an organization established by the government to implement energy efficiency projects in the public and private sectors

Challenges for private ESCOs

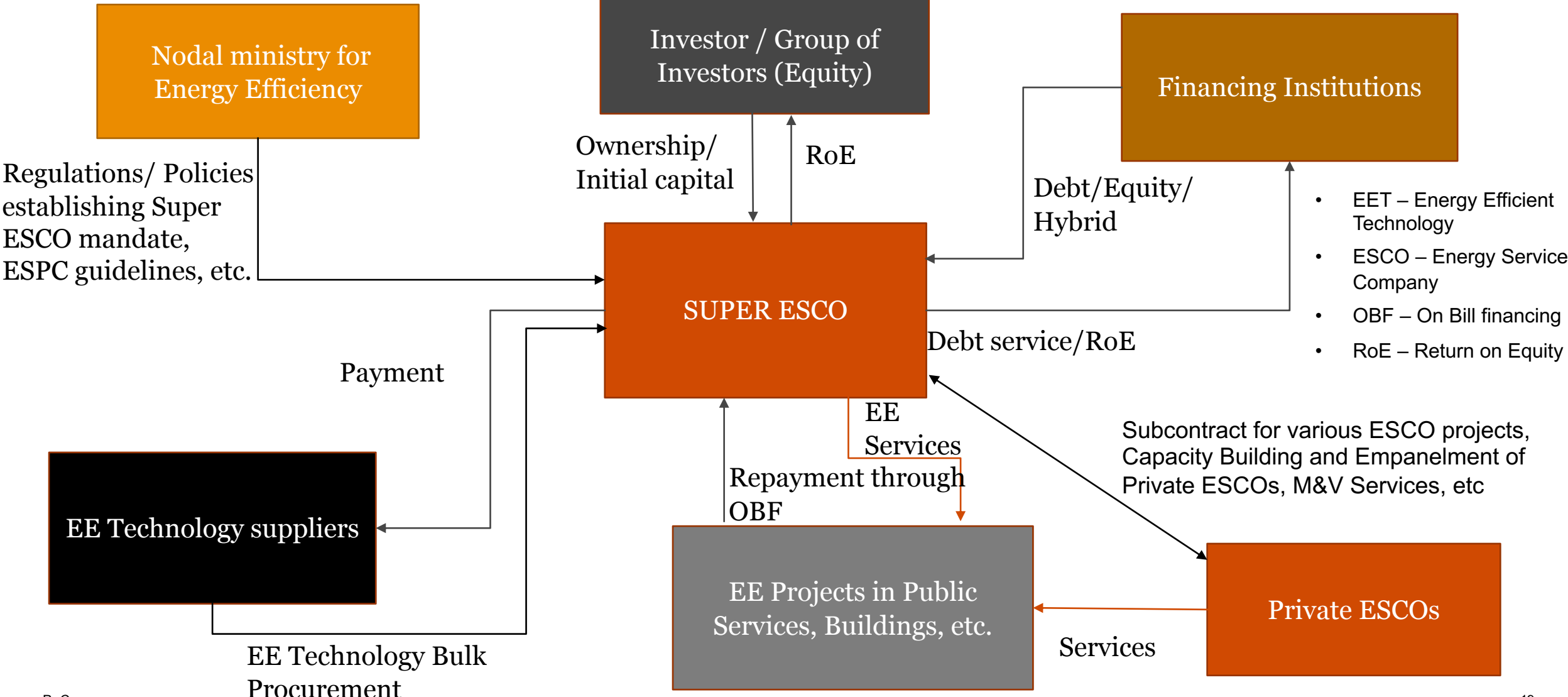
- Public sector departments find it difficult to enter into PPP-EPC agreements with Private entities
- Low credit – worthiness
- Low Technical and Financial capacity of SMEs
- Financial institutions view EE as too risky

How Super ESCO can address challenges

- Super ESCO can be funded for its OPEX and CAPEX directly by the government, or through third – party financing
- Super ESCO will help to create an enabling environment for private ESCOs by:
 - i. Demonstrating the viability of ESCO business models
 - ii. Engaging private ESCOs as key delivery partners;
 - iii. Standardizing technical specifications and transaction templates
 - iv. Raising consumer awareness of energy efficiency

A Government owned SUPER ESCO entity such as a subsidiary of EE nodal agency or electricity utility, etc. could be well positioned to implement ESCO projects in Public and Private Sector

Illustrative Model for Super ESCO for implementing Energy Efficiency projects

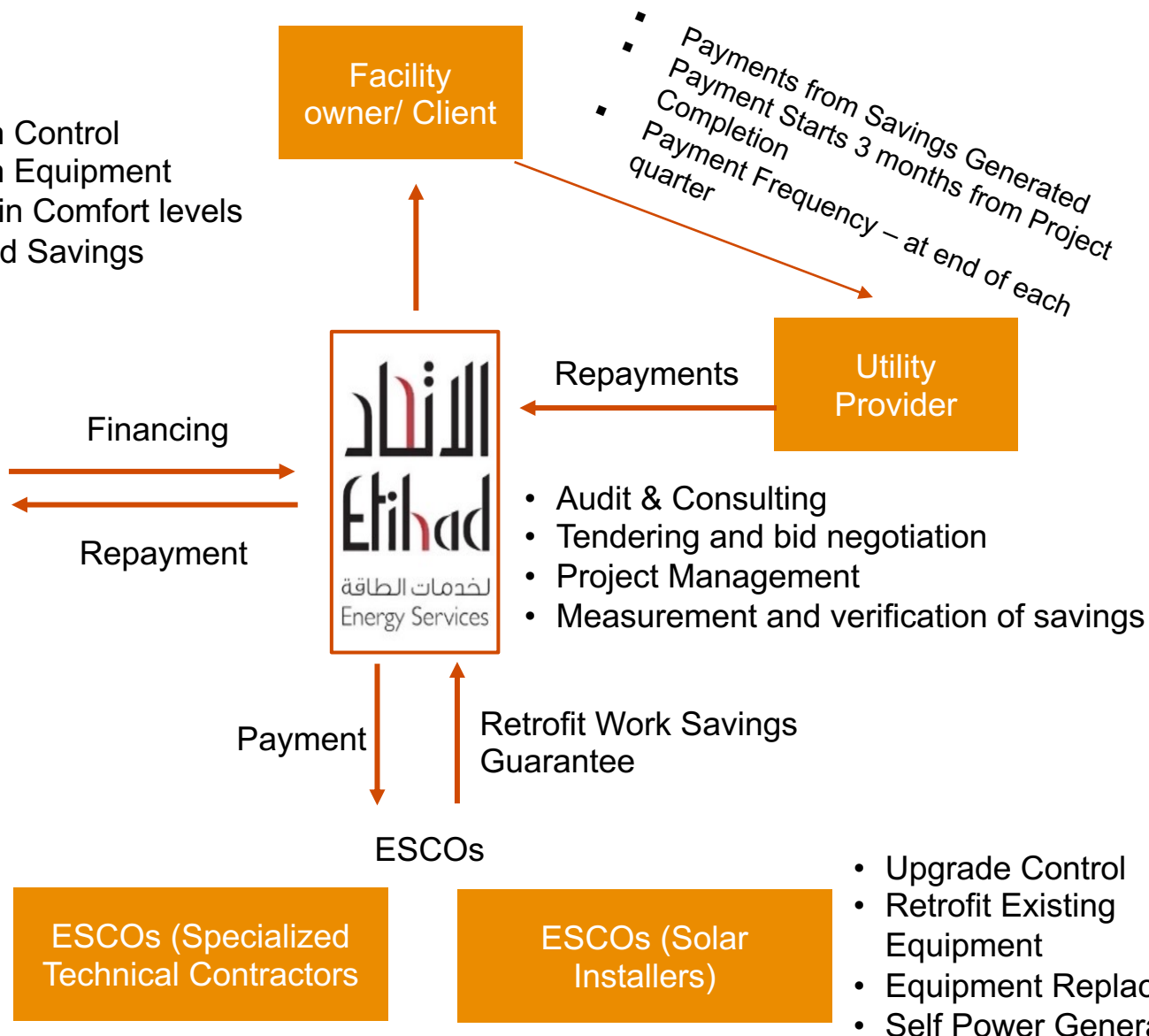


Ethad ESCO Business Model in UAE

- Upgrade in Control
- Upgrade in Equipment
- Increased in Comfort levels
- Guaranteed Savings



Financial Institution



Savings & Repayment Mechanism

1

Defining Project Specific M&V as per IPMVP

2

Pre-retrofit Phase

- Energy Bills before implementation of ECMs

3

ESPC Starts (Contract Duration)






- Payment to ESCO post verification of savings in accordance with IPMVP and established baseline
- Reduced Energy Costs Post ECM implementation used to repay project costs

4

Post Completion of ESPC

- Greater Savings for Client on account of O&M savings

Super ESCOs – Global examples

 Name	 Country	 Establishment Year	 Shareholder	 Funding sources
Fedesco	Belgium	2005	Belgium Federal State	Belgium State
EESL	India	2009	Government of India as a JV between NTPC Limited, Power Finance Corporation, REC Limited and POWERGRID	Government of India and international banks (ADB, World Bank, etc.)
Etihad ESCO	UAE	2013	Dubai Government through the Dubai Electricity and Water Authority	Dubai Green Fund and National Bonds
Tarshid	Saudi Arabia	2017	Public Investment Fund	Public Investment Fund
ADES	UAE	2020	Abu Dhabi Government through TAQA	TAQA



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Thank You

