# Roadmaps Towards Sustainable and Energy Efficient Buildings and Cooling in Southeast Asia – Workshop

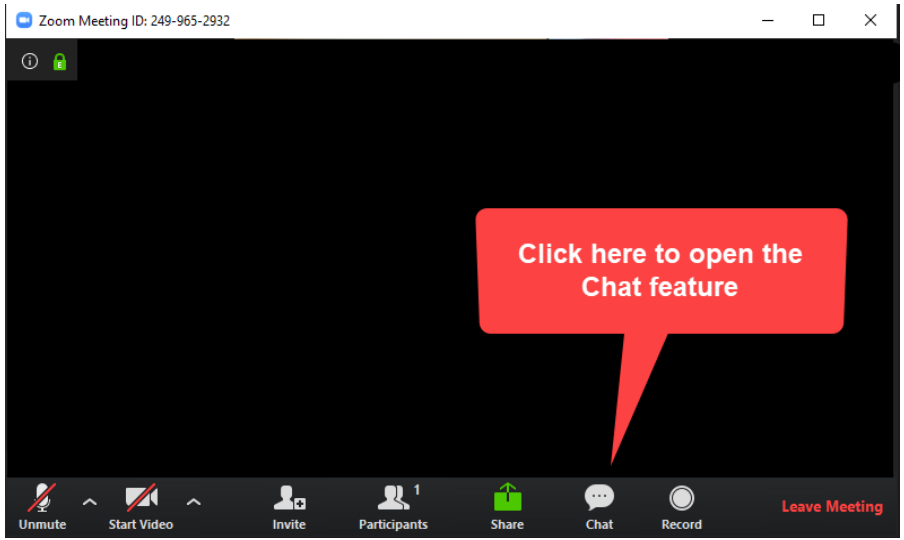
6 April 2021

International Energy Agency

# Workshop Agenda

| | |
|---|---|
| 13:00 | **Welcoming Remarks** |
| 13:15 | **Keynote Address** |
| 13:25 | **Opening Presentation** |
| 13:40 - 15:40 | **Breakout Session 1 – Space Cooling Roadmap for Southeast Asia** |
| 13:40 - 15:40 | **Breakout Session 2 – Buildings and Construction Roadmap for Southeast Asia** |
| 15:40 | **Breakout Session Summary** |
| 15:50 | **Workshop Closing Remarks** |
| 16:00 | **Workshop Close** |

# Please share your questions and comments with us!




Participants should ensure a convenient environment and reduce background noises such as turn-off cell phones and etc.

Participants should mute their microphone and only unmute if they wish to present/speak.

For Q&A sessions:

Those who wish to ask or speak may use the chat function in the control panel.

# Welcoming Remarks

**Nella Nabila**

Communications Officer

**ASEAN Centre for Energy**

**Moderator**

**Abdul Salam Bin Abdul Wahab**

Head of Sustainable Energy Division, Ministry of Energy

**Brunei ASEAN Chair 2021**

**Pongpan Vorasayan**

Senior Professional Electrical Engineer, Division of Energy Regulation and Conservation

**Thailand Ministry of Energy**

**Adrian Gilbert**

First Secretary

**Australian Mission**

# Keynote Address & Opening Presentation

**Nuki Agya Utama**

Executive Director

**ASEAN Centre for Energy**

**Melanie Slade**

Senior Programme Manager

Energy Efficiency in Emerging Economies Programme

**International Energy Agency**

# Energy Efficiency and Conservation under the ASEAN Plan of Action for Energy Cooperation (APAEC) Phase II: 2021-2025

## Roadmaps Towards Sustainable and Energy Efficient Buildings and Cooling in Southeast Asia - Workshop

**6 April 2021**

Presented by:
Nuki Agya Utama, Ph.D.
Executive Director
ASEAN Centre for Energy

One Community for Sustainable Energy

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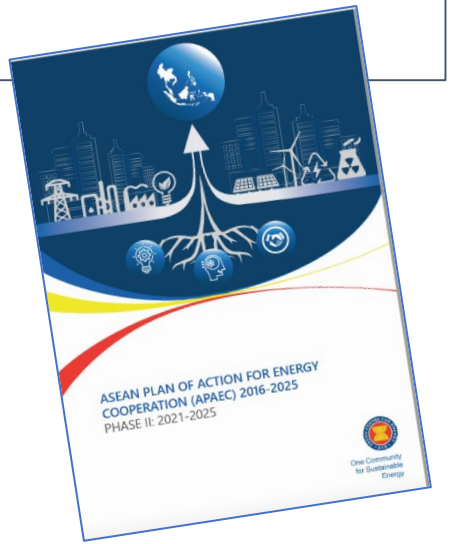
# Key Outcomes of the 38th AMEM




**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"*


- ASEAN Power Grid
- Trans-ASEAN Gas Pipeline
- Clean Coal Technology
- **Energy Efficiency and Conservation**
- Renewable Energy
- Regional Energy Policy and Planning
- Civilian Nuclear Energy

**APS Targets**

**EI REDUCTION TARGET**

Reduce **EI** by **20% in 2020,**
**32% in 2025**
based on 2005 level.

# 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

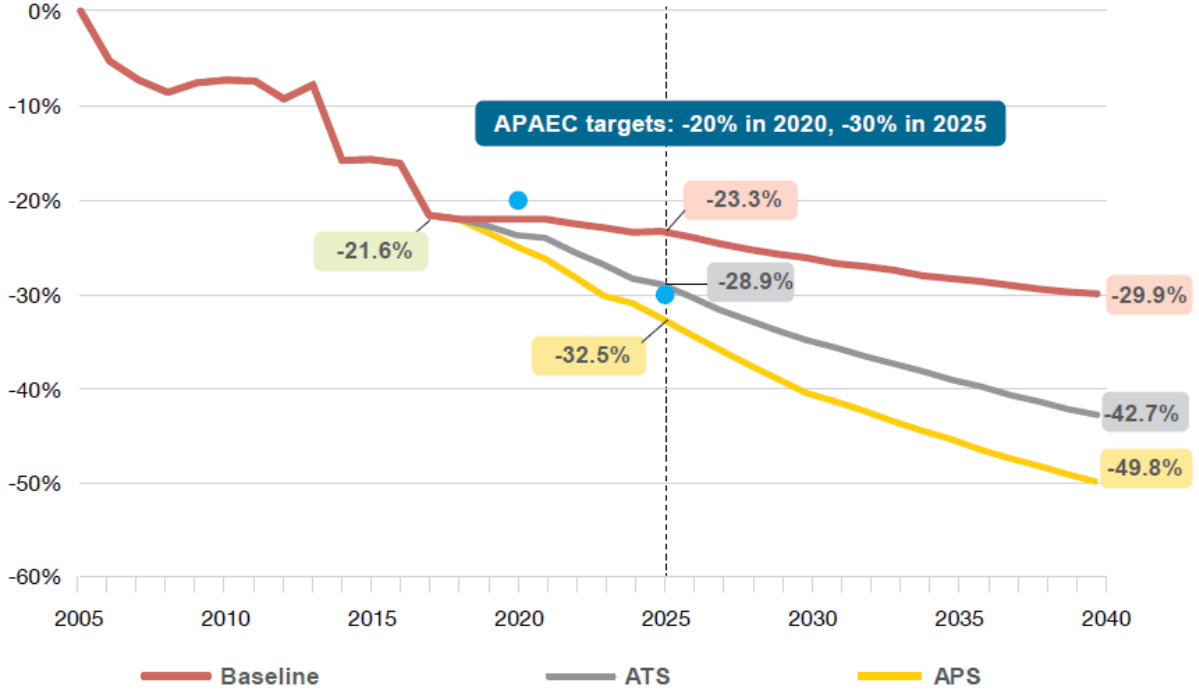
- Energy Management Adoption
- Energy Manager training (AEMAS)
- ASEAN EE Award for Industry
- EE Pilot Projects

### 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.**

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# Energy Demand in Commercial Building Sector

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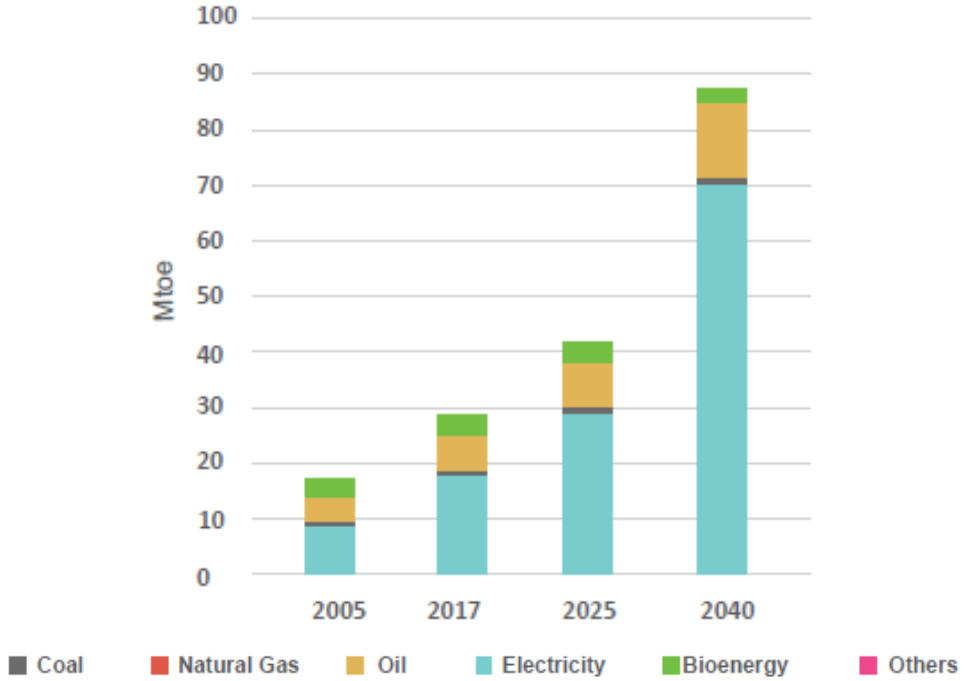
**Final Energy Demand of Commercial Sector, Baseline Scenario**




Source: 6th ASEAN Energy Outlook

- Energy demand projected to increase by 3 times, reaching 87.4 Mtoe in 2040, compared to the 2017 figure of 29.5 Mtoe.
- Electricity demand dominates, with a share of 80%, followed by demand for oil and biomass with 15% and 2% in 2040 respectively.
- This sector will have a notable demand growth, with CAGR of 4.4%.

# Energy Demand in Residential Building Sector

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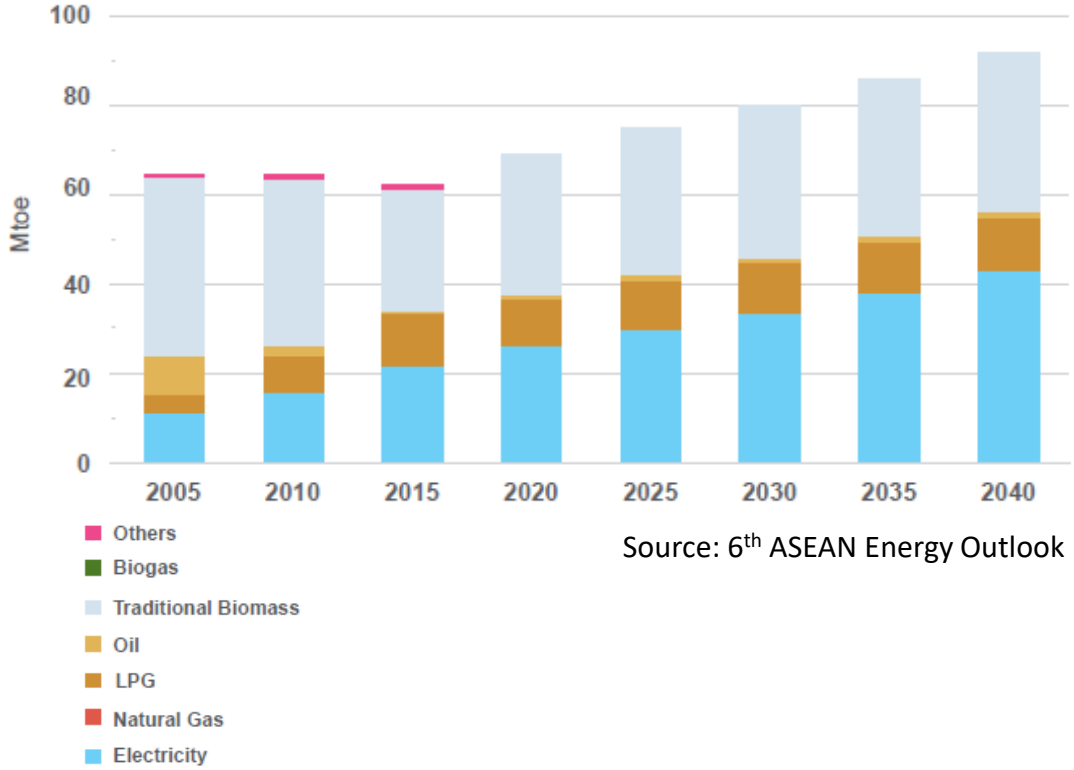
**ASEAN Residential Energy Demand Projections by Fuel, Baseline Scenario**




Source: 6th ASEAN Energy Outlook

- Electricity is projected to grow steadily, reaching 46% at 43 Mtoe in 2040, followed by the demand for traditional biomass (40%).
- High rate of electrification in all AMS, increasing number of electrical appliances owned by households, and the increase in the number of households are factors that drive this growth.

# ASEAN Total Energy Consumption of Cooling System in 2020-2040

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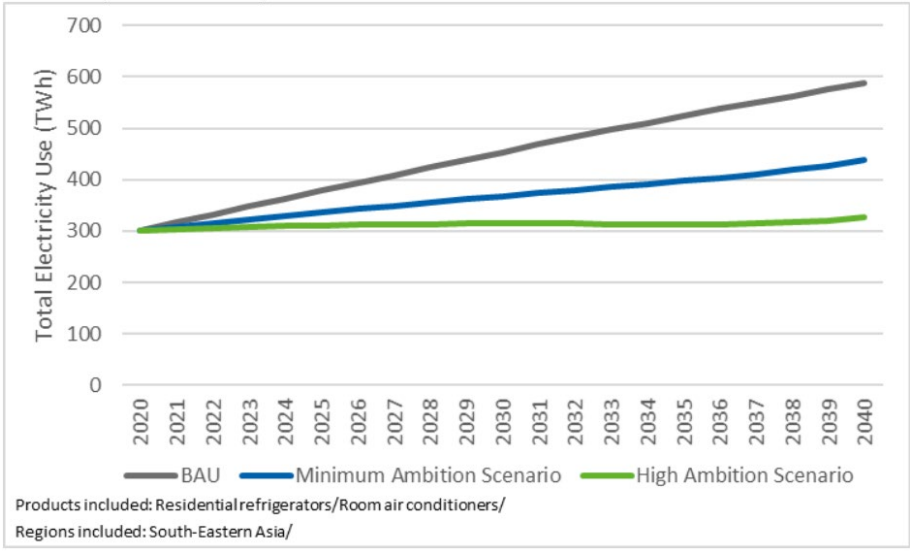


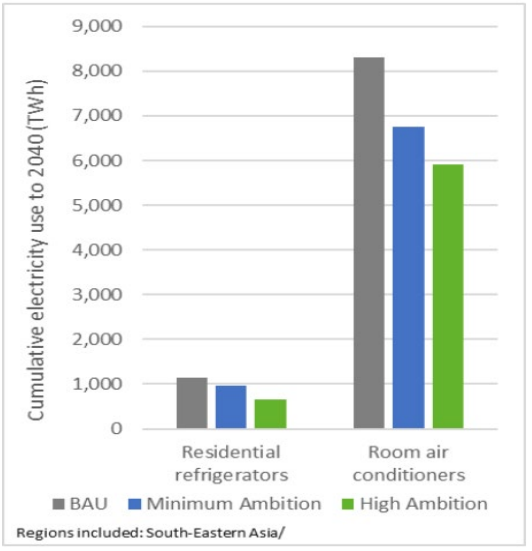


- ASEAN Total energy consumption from both cooling products between 2020-2040 is shown as well as how cumulative energy to 2040 varies in the three scenarios for each product (the policy implementation is assumed by 2020).
- The data shows that the total of energy consumption would increase double from 2020 to 2040. The policy enforcement is very essential to slow the growth.

Source: United for Energy Efficiency

# Energy Efficiency Measures in Buildings and Cooling Systems - ASEAN Region Case

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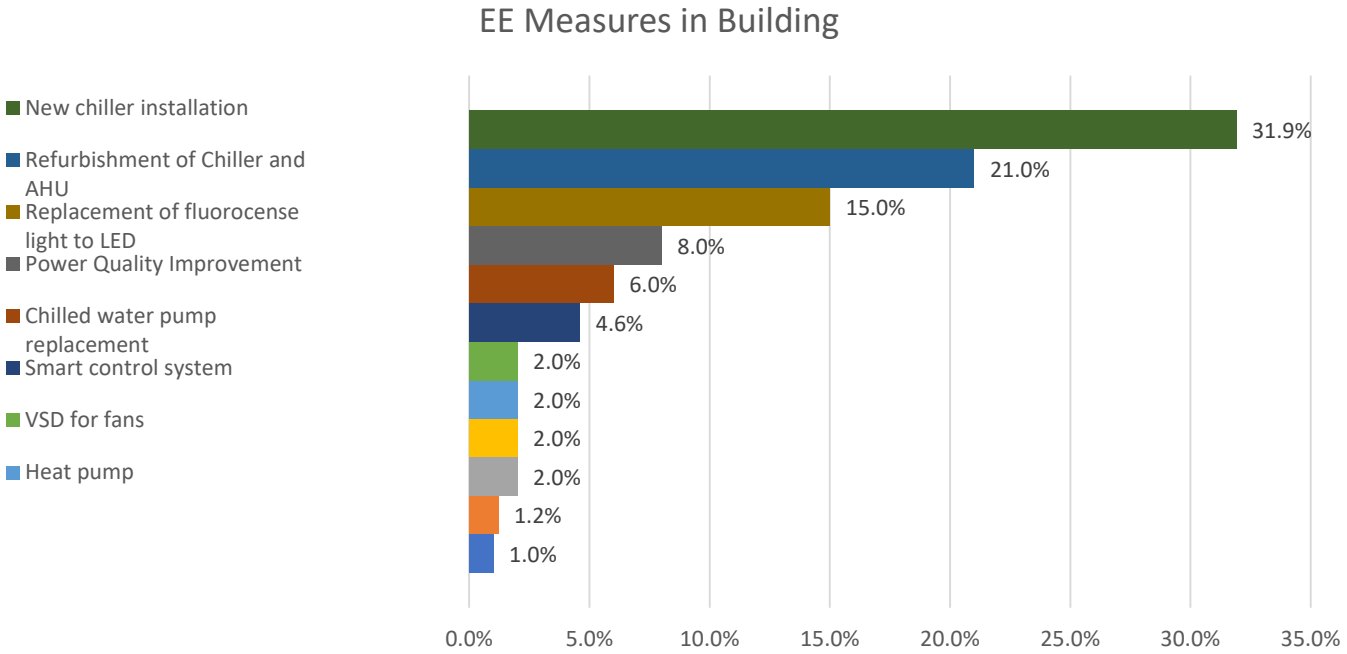


- Energy saving opportunities in the commercial building sector predominantly from the adoption of new chiller system, followed by retrofitted chiller system.

Source: ASEAN EE Best Practices Report 2018

# Energy Efficiency Policy and Target in 10 AMS

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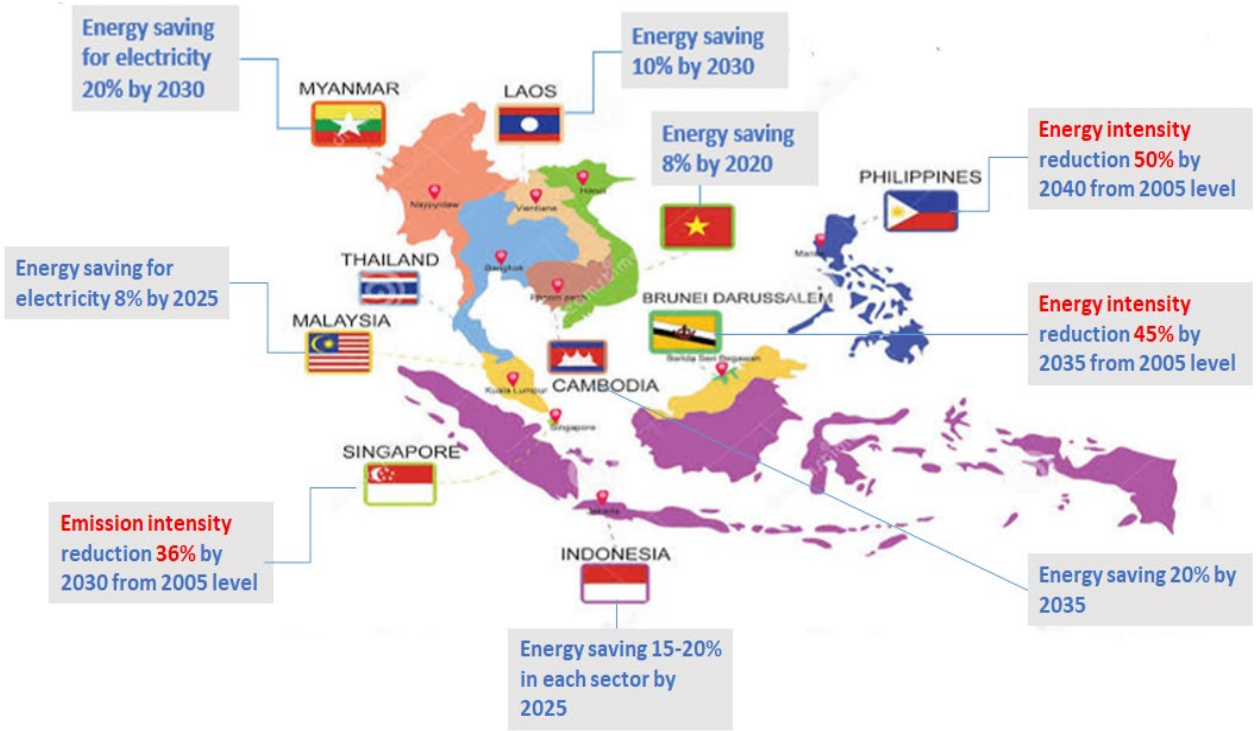


- Most of ASEAN Member States have enacted EE Law, set national energy efficiency targets and Energy Efficiency action plans

Sources: 6th ASEAN Energy Outlook

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# Roadmaps Towards Sustainable and Energy Efficient Buildings and Cooling in ASEAN Project

- A joint collaboration of the International Energy Agency (**IEA**), ASEAN Centre for Energy (**ACE**), the **ASEAN Secretariat**, and the **Energy Efficiency and Energy Conservation Sub-Sector Network**
- The project aims to develop a detailed **roadmap for the buildings** and construction sector and a **roadmap for space cooling** in the ASEAN region, to help reduce energy demand in the sectors and improve stakeholder collaboration.
- The project is funded by the ASEAN-Australian Development Cooperation Project Phase II (**AADCP II**).

# Way Forward in EE in Building and Cooling Sectors :

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- **Strengthening policies** are needed to increase the average efficiency of ACs alongside other building energy efficiency improvements to address the projected growth in cooling demand.  and building sector.

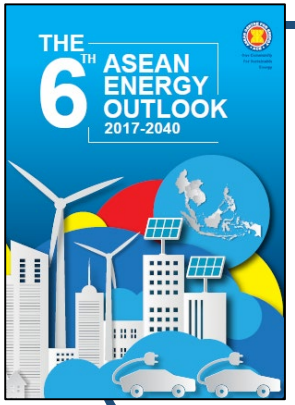
- The AMS will continue **the series of information sharing** that will enhance the AMS's capacity to analyse and implement policies and incentives on sustainable and increasing EE standard of cooling appliances.

- To achieve high-impact energy efficiency improvements and energy savings, the AMS will examine the benefits of new technologies, market mechanisms, and policy support to serve as a basis in **strengthening cooperation amongst EE stakeholders.**

- To develop and maintain an **ASEAN building and cooling database** which contains information regarding physical configurations/ descriptions and energy performance data of building and cooling for future analysis.

- The APAEC Phase II will accelerate energy transition efforts by setting a more aggressive energy intensity reduction target of **32% by 2025 based on 2005 level** and encourage further **energy efficiency and conservation efforts and measures.**

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

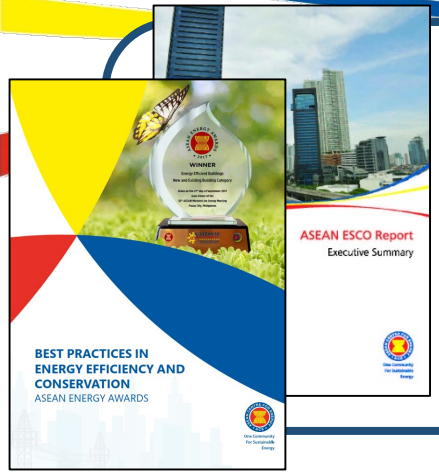



**Ways Forward and their Implications for Energy Security, Development and the Environment.**

- 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

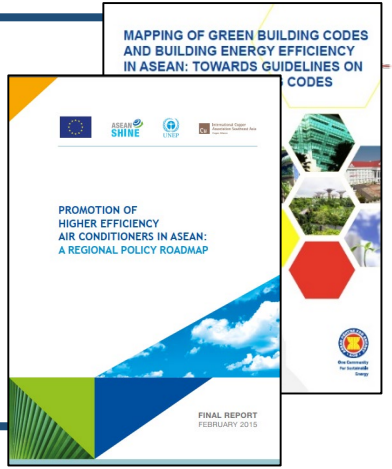




**Private Sector Participation**

- 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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# Thank You

# Roadmaps Towards Sustainable and Energy Efficient Buildings and Cooling in Southeast Asia – Workshop

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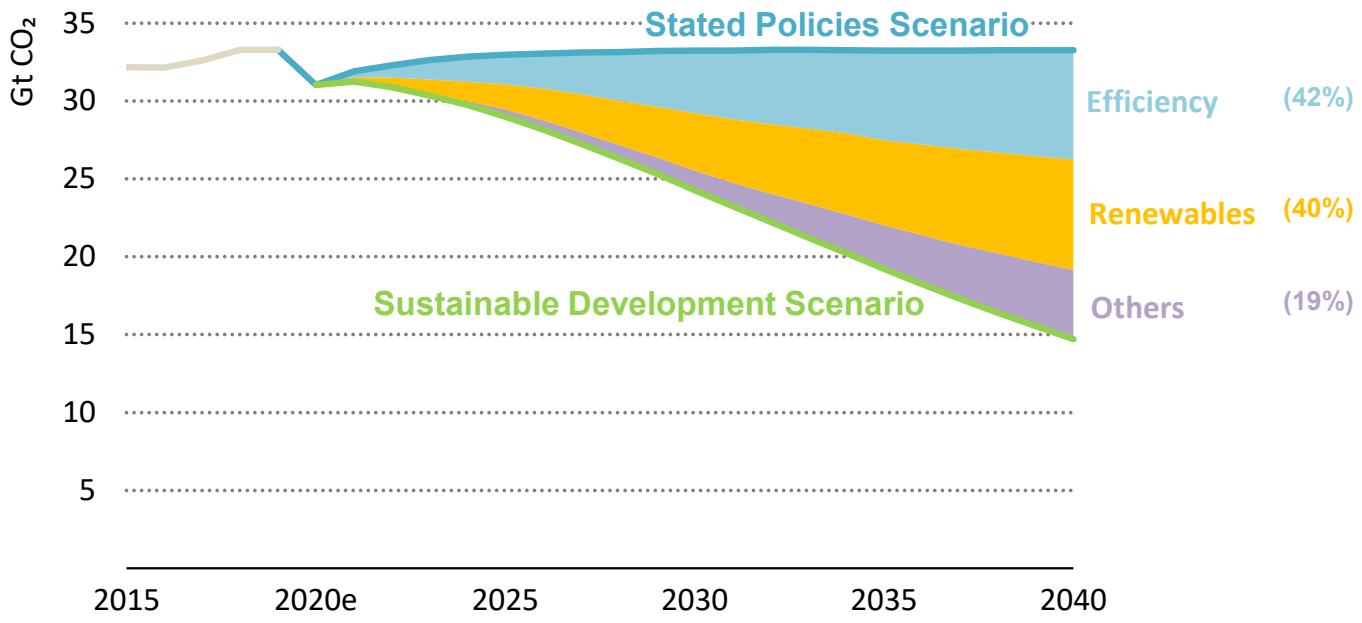
# Tracing the path to low-emissions, efficient and resilient buildings, construction and cooling

Melanie Slade, Senior Programme Manager, Energy Efficiency Division, IEA

6 April 2021

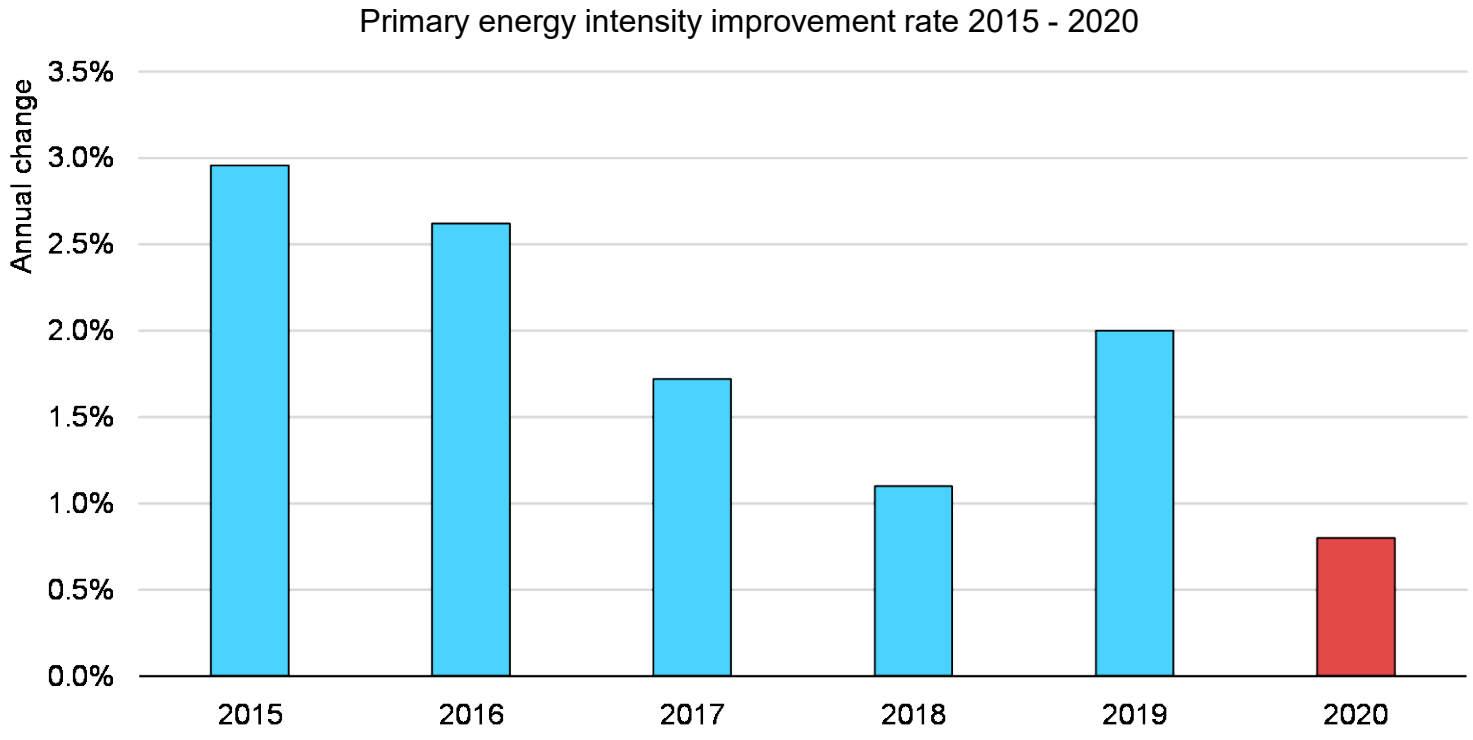
# Energy efficiency is critical to achieving global climate goals

CO2 emissions reductions in the Sustainable Development Scenario relative to the Stated Policies Scenario




**Energy efficiency is expected to contribute over 40% of energy sector GHG abatement up to 2040. A slowdown in energy efficiency today lessens the chance of meeting long-term climate goals.**

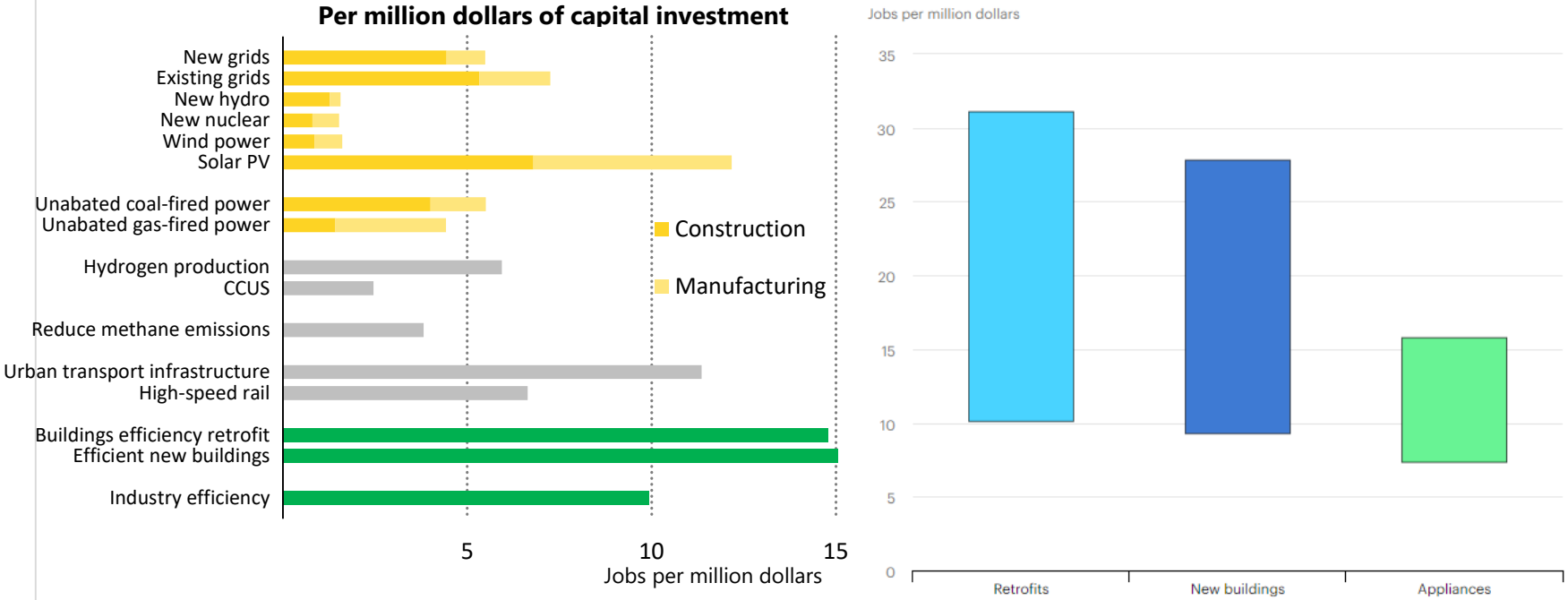
# Efficiency progress faces setbacks from the pandemic




**The Covid-19 crisis has shocked both economic activity and energy demand. Primary energy intensity improvements halved in 2020.**

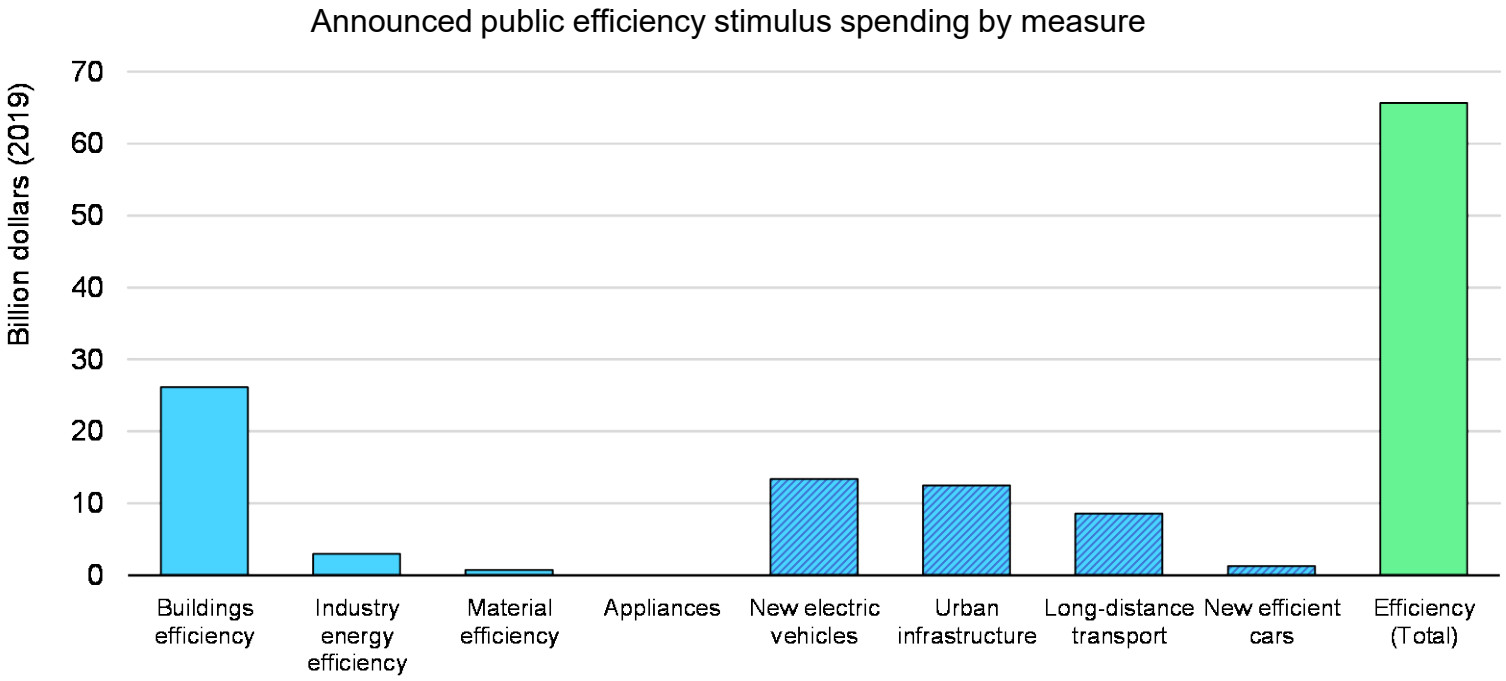
# Energy efficiency is a jobs machine that can power the economic recovery

Jobs created per million dollars of capital investment and spending by measure (left) and Investment impacts on employment in the Sustainable Recovery Plan (right)




**The IEA Sustainable Recovery Plan models energy efficiency related investments as the largest category of spending and creates most jobs per unit of investment**

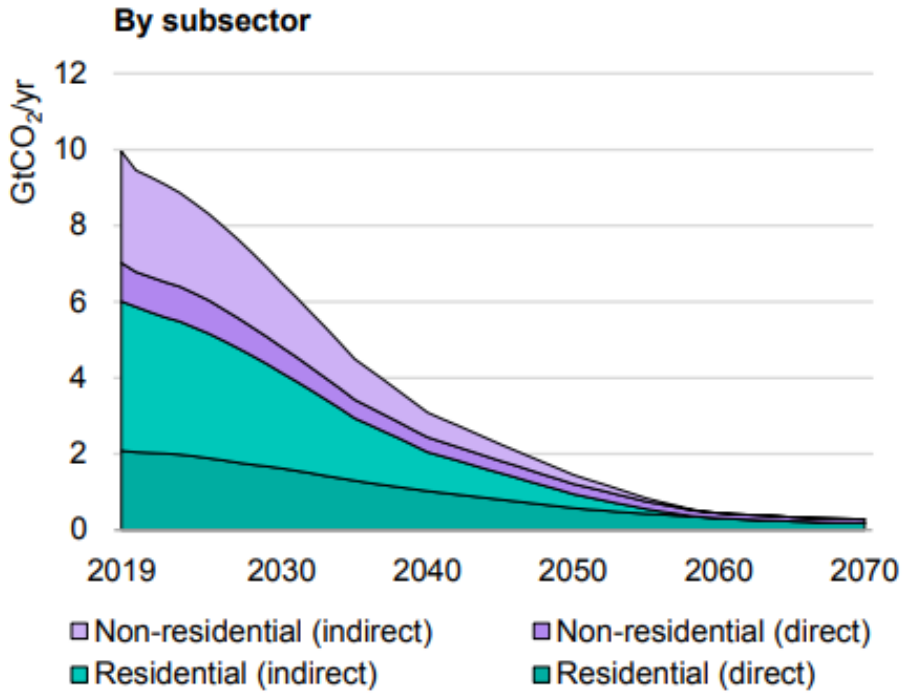
# Governments are supporting efficiency, but spending is uneven




**Governments have announced nearly USD 70 billion in energy efficiency related stimulus to the end of October 2020, with Europe accounting for 85% of the total. Buildings are the main target.**

# The emissions reduction challenge in the buildings sector

CO2 emissions from the use phase of buildings by sub-sector and region in the Sustainable Development Scenario, 2019-70

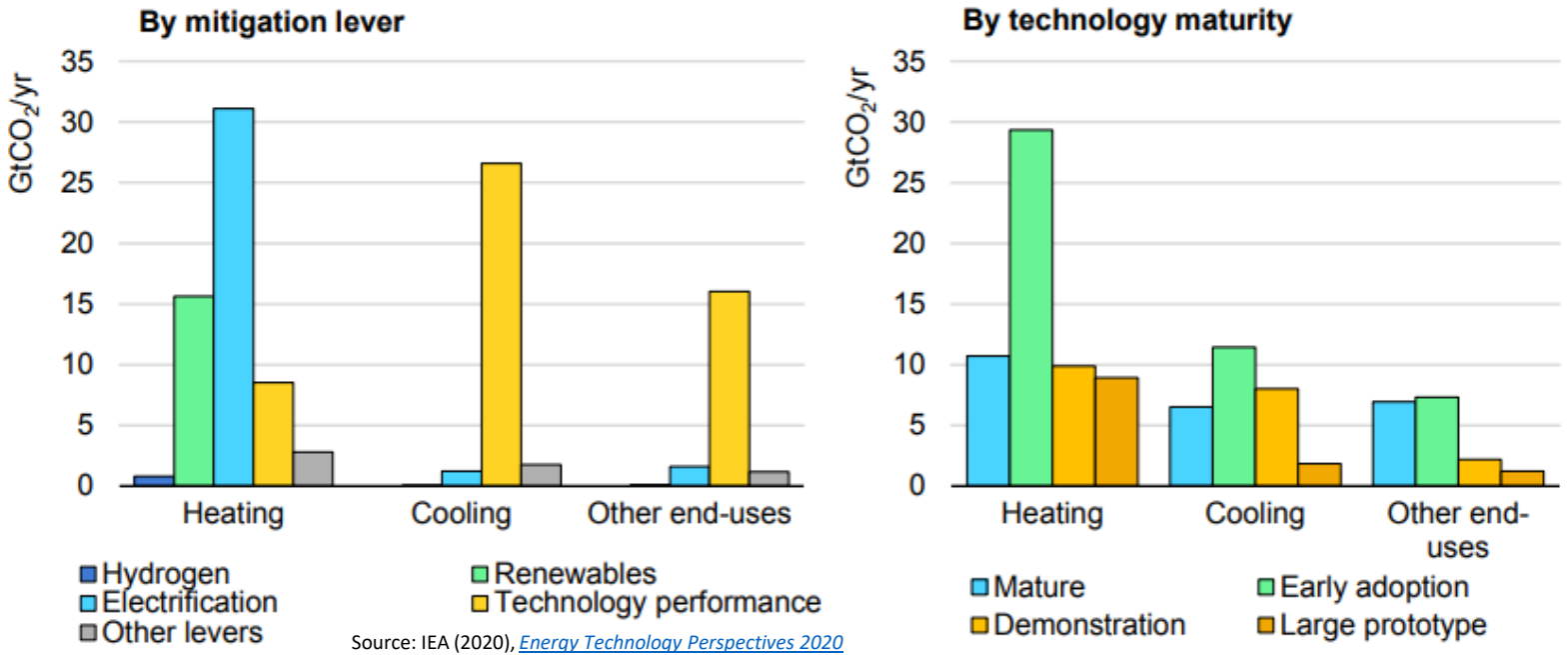



Source: IEA (2020), *Energy Technology Perspectives 2020*

**CO2 emissions in the buildings sector fall to net-zero by 2070 through measures such as high efficiency electrical equipment, phasing out fossil fuel use and decarbonisation of heat and power supply**

# The technologies to drive CO2 reductions exist today

Global cumulative CO2 emissions reductions in the buildings sector by mitigation lever and technology readiness level in the Sustainable Development Scenario relative to the Stated Policies Scenario, 2020-70

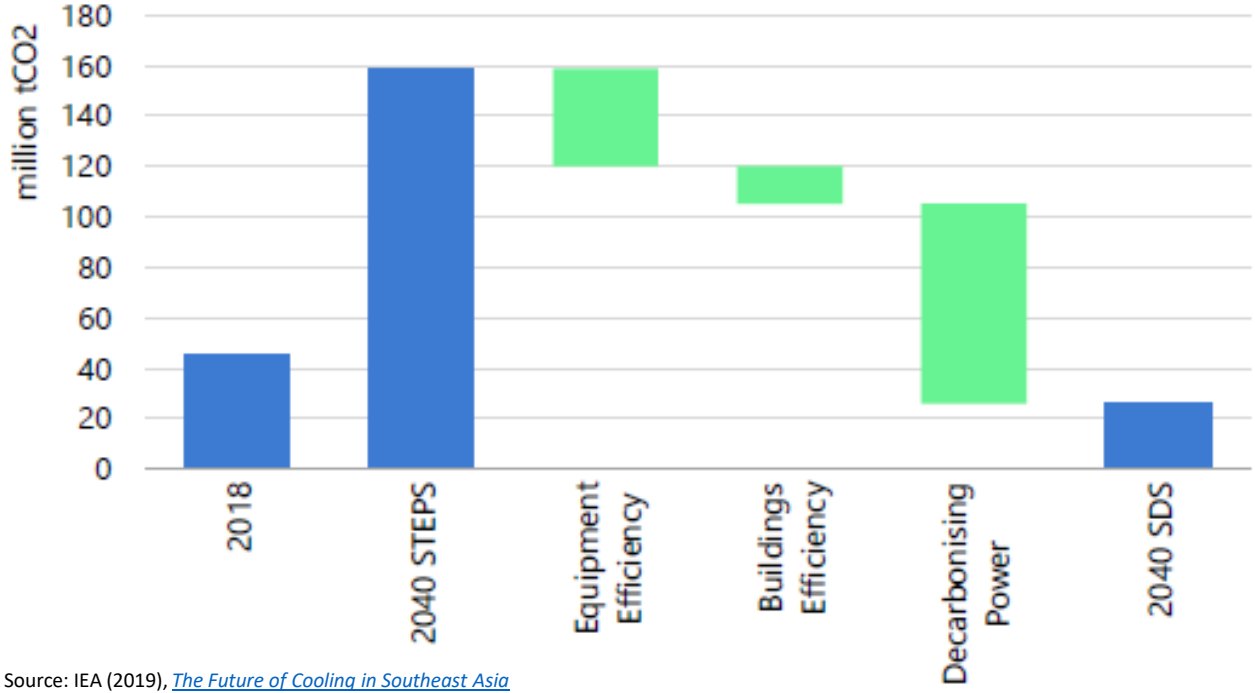



Source: IEA (2020), *Energy Technology Perspectives 2020*

**Three-quarters of what is needed to decarbonise the buildings sector could be achieved through the use of mature and early adoption of technologies: further innovation would bring additional gains.**

# The path towards net-zero emission buildings

Decomposition of factors for reduction of $CO_2$ emissions between STEPS and SDS in Southeast Asia




Source: IEA (2019), *The Future of Cooling in Southeast Asia*

**Decarbonising buildings requires reducing energy demand, embodied carbon, and decarbonising heat and electricity.**

# This roadmap project

- The project aims to help address increasing energy demand and emissions and improve collaboration between stakeholders in the region, by developing two roadmaps:
  - an ASEAN Energy Efficient Buildings and Construction Roadmap
  - an ASEAN Sustainable Cooling Roadmap.
- We intend to make the recommendations in the roadmaps as concrete and actionable as possible.
- We are keen for your input and insights that are essential to making this project a success.
- This process will be as inclusive as possible and this is just the first of a number of opportunities for engagement over the course of the project so if you know of other stakeholders who should be involved please do let us know.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# Breakout Sessions

## Breakout Session 1: Space Cooling Roadmap for Southeast Asia

## Breakout Session 2: Buildings and Construction Roadmap for Southeast Asia

# Breakout Session Summary

**Septia Buntara Supendi**

Manager

**ASEAN Centre for Energy**

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Energy Analyst

**International Energy Agency**

# Workshop Closing Remarks

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Senior Programme Manager

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Head of energy and Minerals Division

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