

# Energy Cooperation & Prospects for ACMECS

## Setting the scene

2<sup>nd</sup> Mekong – Australia Policy Dialogue: Energy & Electricity Futures for ACMECS Members

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Date: 15 December 2020

# Overview

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## **I. Trends in electricity access (SDG7) & Demand**

- ▶ 1. Progress and barriers for universal, reliable, electricity access
- ▶ 2. Energy demand as a driver for electricity sector

## **II. Trends in electricity generation**

- ▶ 3. Role & trends in Hydropower
- ▶ 4. Role & trends in Fossil Fuels

## **II. Opportunities for a sustainable electricity transition**

- ▶ 5. RE Technology
- ▶ 6. Investment
- ▶ 7. Regional connectivity
- ▶ 8. Demand side Management

# Achieving the SDGs

Trends in electricity access & demand

# Universal electricity access

Rapid expansion of national electricity grids but challenge of last mile connections, service reliability and low consumption

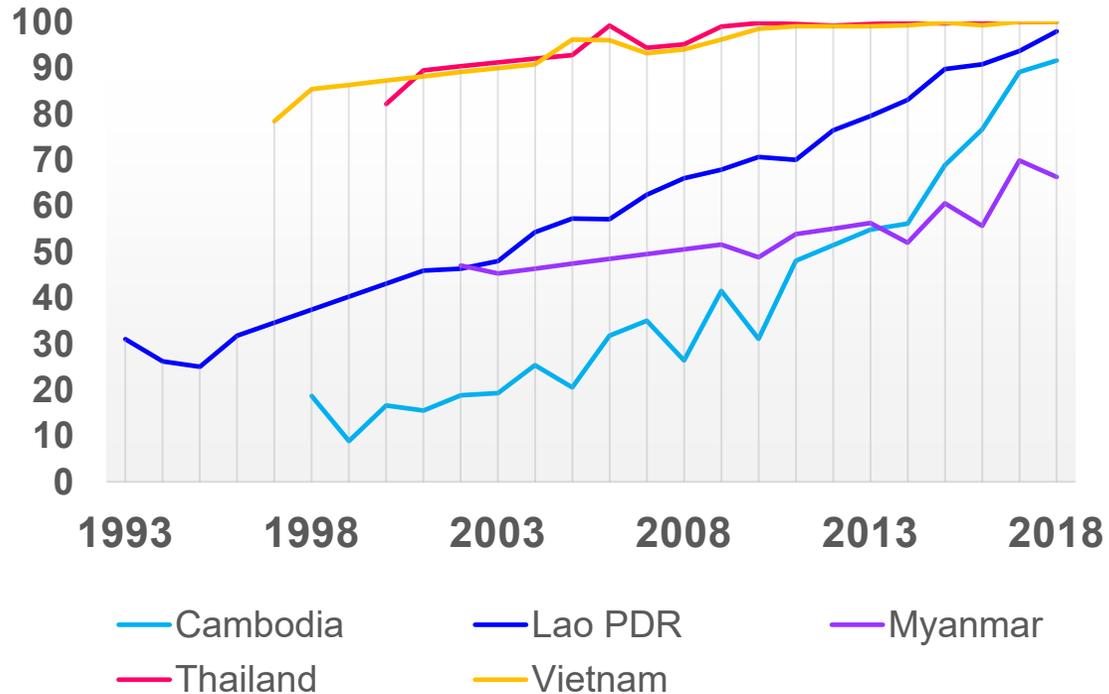


EXHIBIT 1

## Access to electricity (% population)

Source: World Bank, 2020, World Development indicators Database

### Enabling factors

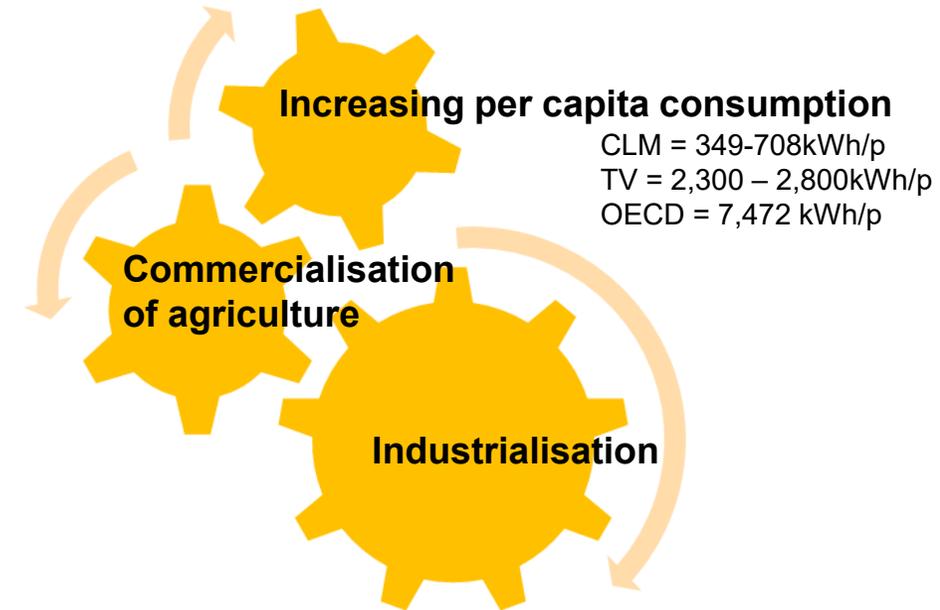
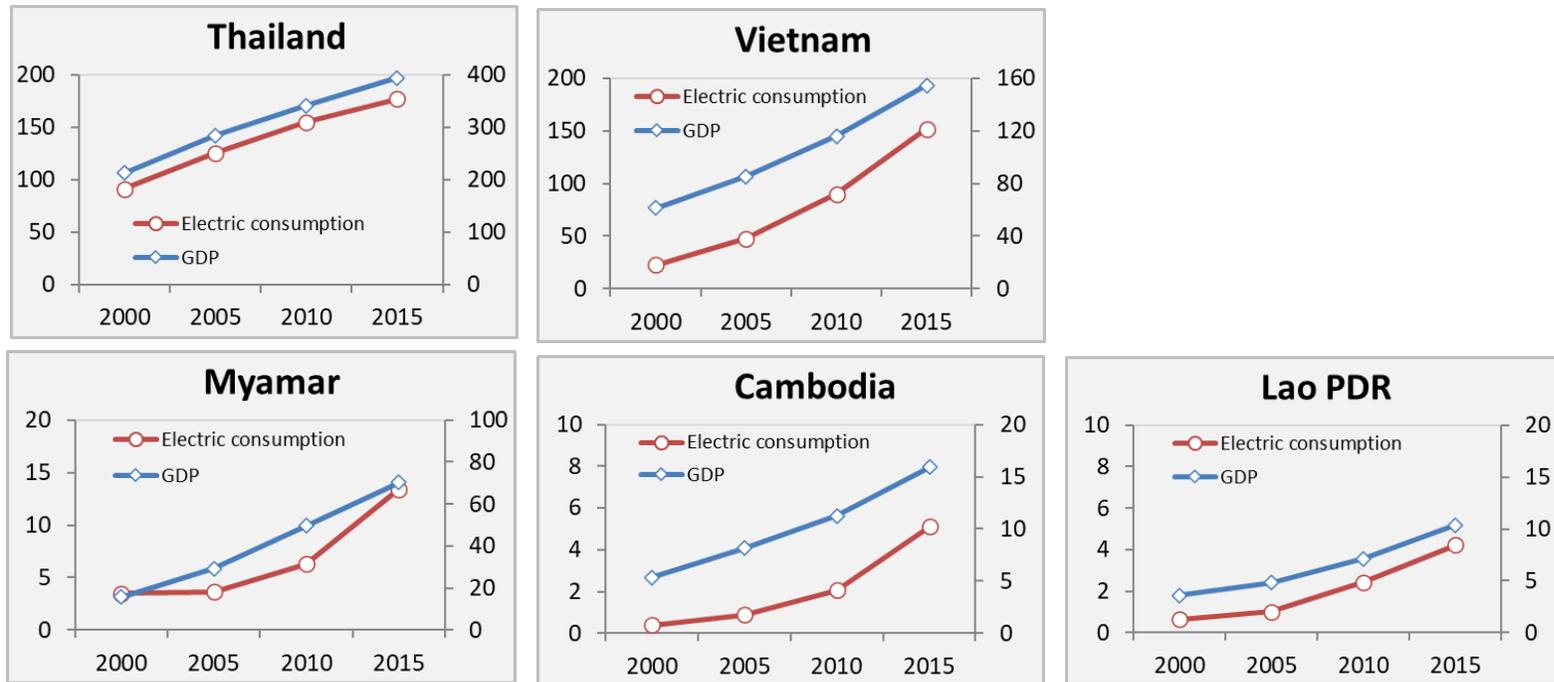
- Political commitment
- Public investment
  - Transmission
  - Rural electrification (inc. decentralised electricity systems)
- Mechanisms for private investment in generation
- Availability of domestic hydropower & fossil fuels

### Challenges

- Reaching last mile communities is difficult & uneconomic with grid
- Quality & reliability in rural areas
- Reliance on traditional energy sources.
- Low levels of consumption (tiers 0-2)

# Electricity Demand

Higher growth rate than GDP and likely so in the foreseeable future



• Demand elasticity to GDP (2005-2018):

- VN 1.9 – 2.3 (max 2005)
- Thai 0.85 – 1.2 (max 2010)
- Laos: 0.84 – 2.4 (max 2010)
- Cambodia 2.0 – 2.8 (max 2015)
- Myanmar 0.1 – 2.25 (max 2015)

EXHIBIT 2

**Growth in GDP and Electricity Demand**

Notes: Primary Vertical Axis: billion kWh  
Secondary Vertical Axis: Billion 2010 USD  
Source: World Bank, 2020. World Development Indicators



# Meeting the demand

Trends in electricity generation



# Hydropower

Abundant resource catalysing early growth in national power sectors

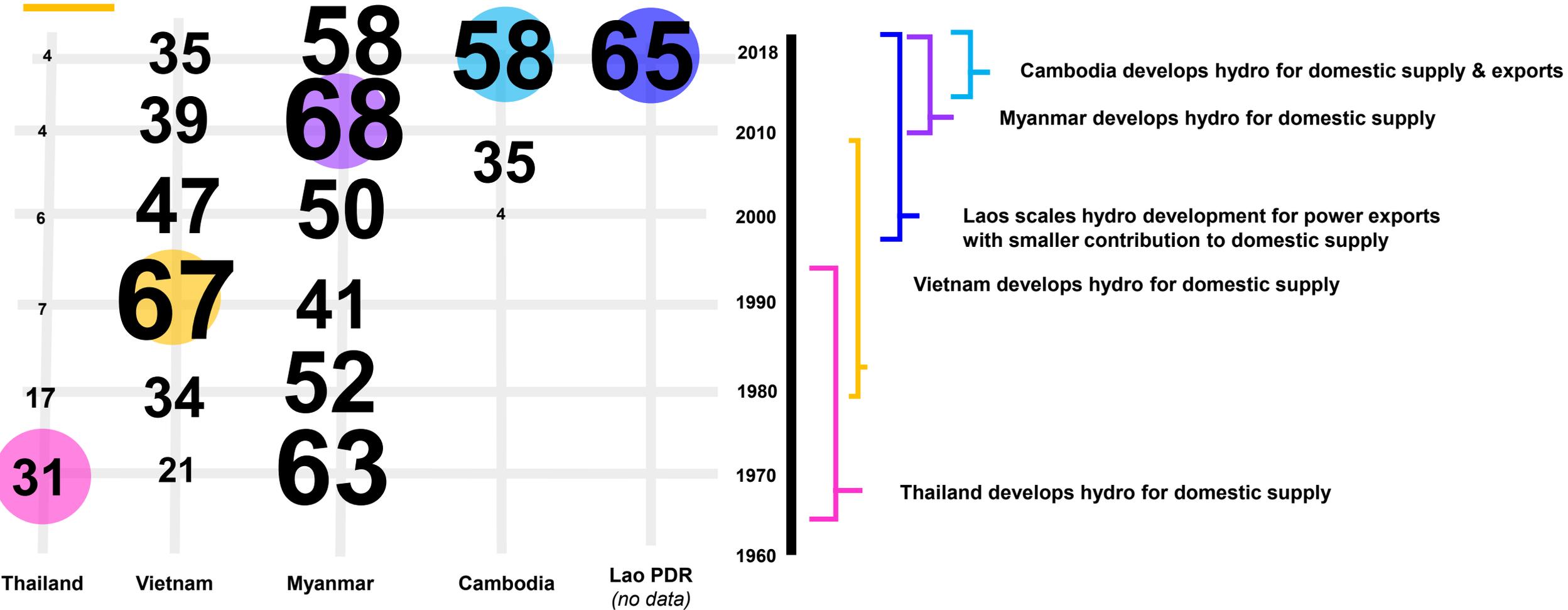


EXHIBIT 3

% hydropower in national generation mix

Source: World Bank, 2020, World Development indicators Database & IEA for 2018

# Fossil Fuels

CLMTV is a region of increasing carbon intensity

Grid emission factor (kg CO<sub>2</sub>/kWh)

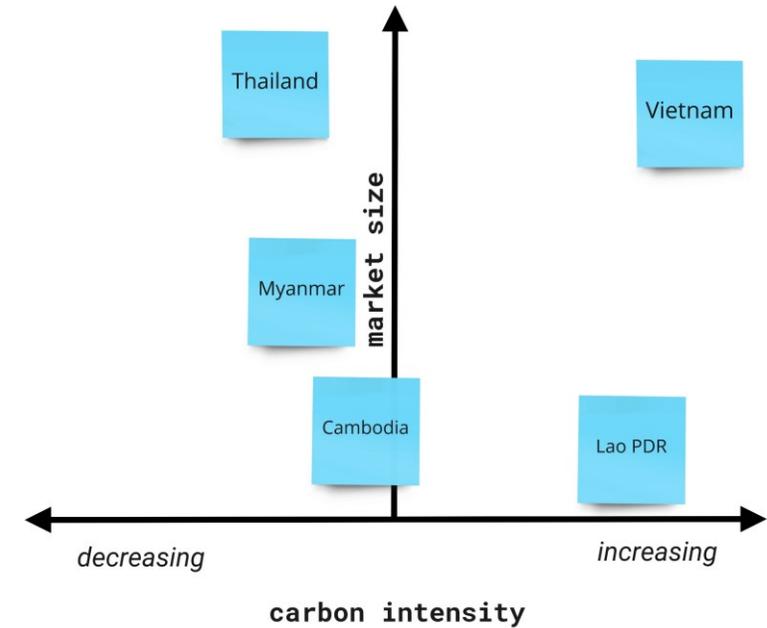
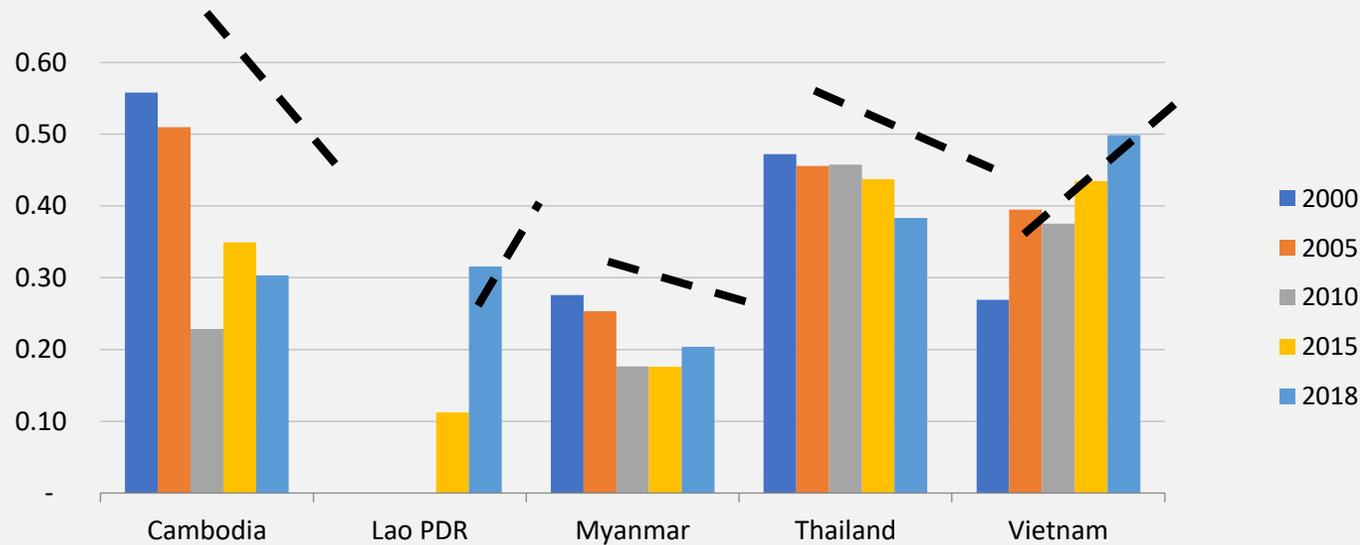


EXHIBIT 4

## Carbon intensity of national power sectors

Source: Author calculations based on IEA data and IPCC guidelines

# Decarbonising CLMTV

Opportunities for a sustainable electricity transition

# Technology

Rapid deployment of non-hydro RE led by policy incentives & falling costs but not yet at scale needed

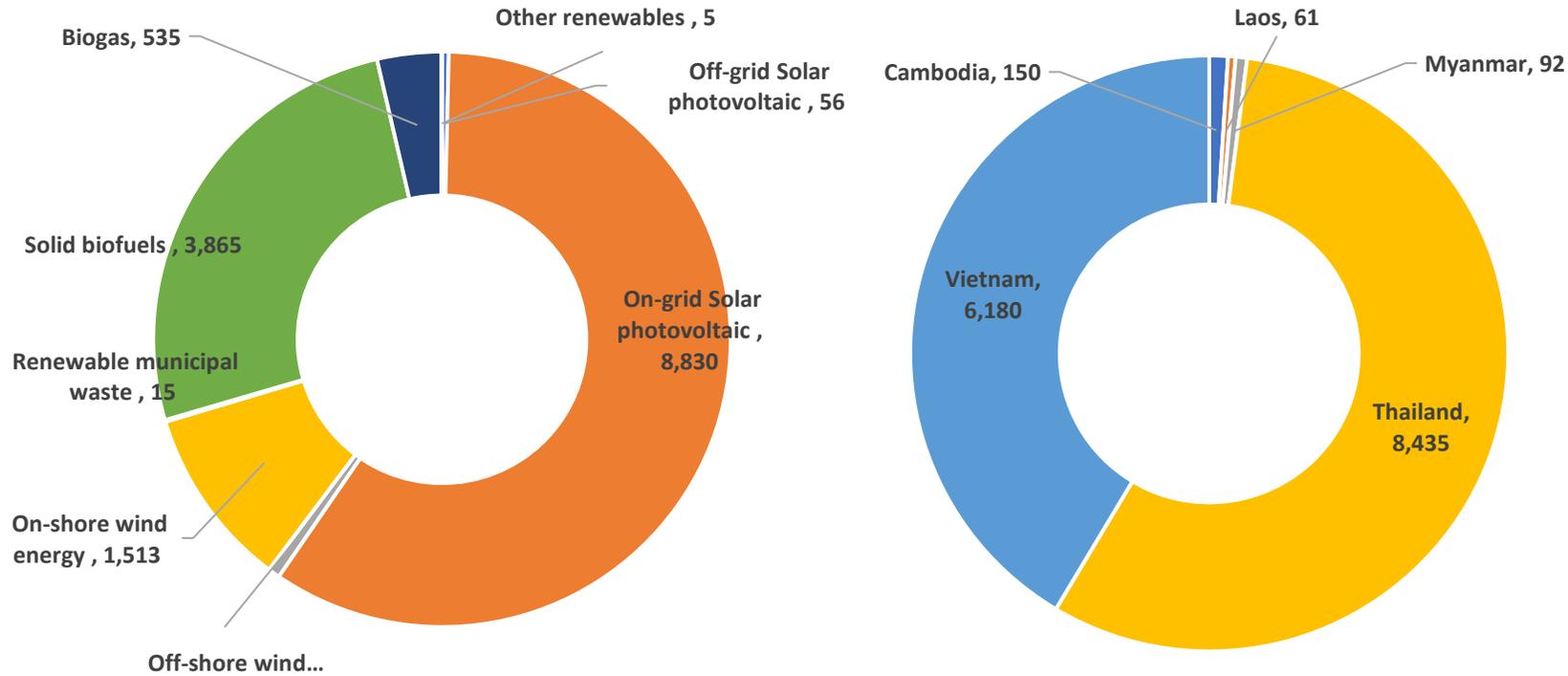


EXHIBIT 5

**CLMTV Electricity transition in 2019** (units are MW)

Source: IRENA Data and statistics tool 2020

### Enabling factors

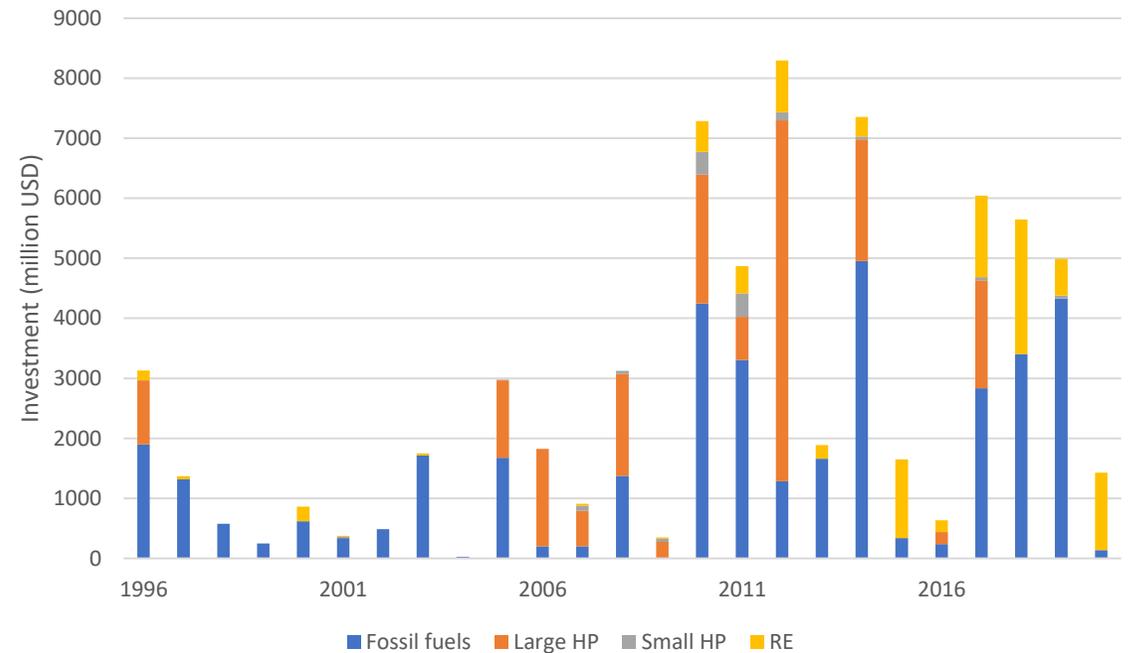
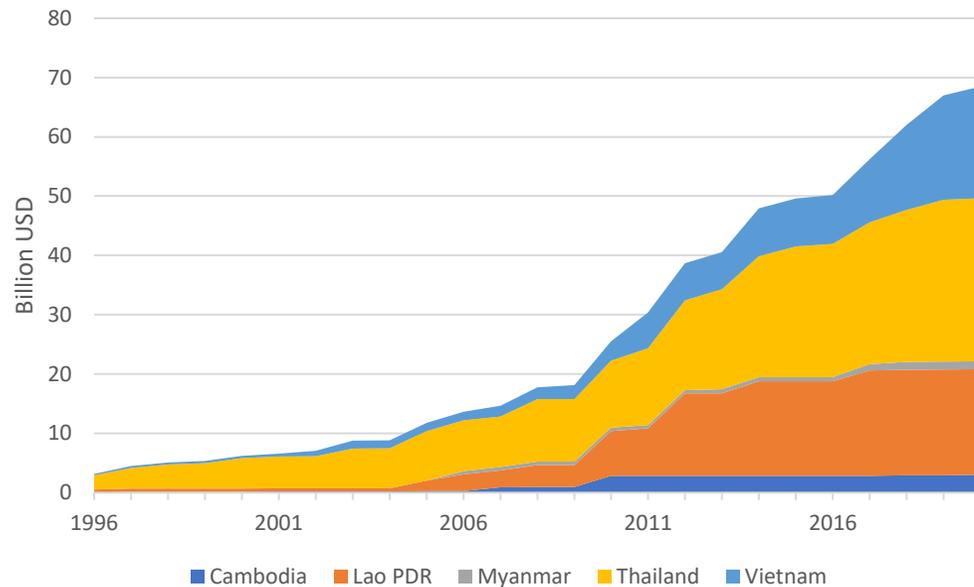
- Falling tech. costs
- Policy incentives

### Challenges

- Variable generation
- Grid integration
- System change.

# Private – sector Investment

Private sector investment increases 10X since 1996, overwhelmingly generation (coal + hydro)



## EXHIBIT 6

Cumulative investment (left) and by technology type (right) invested in by private sector

Source: World Bank, PPI data base 2020

# Demand management

Thailand and Vietnam have embarked on Demand side management however still substantial room to for deployment in all countries

## Energy Efficiency

- Reduce energy consumption
- Key measures include:  
Enforcement of building code,  
MEPS deployment and  
promoting greater use of LED.

◀ **EE**

**R** ▶

**DSM** ▶

## Demand Side Management

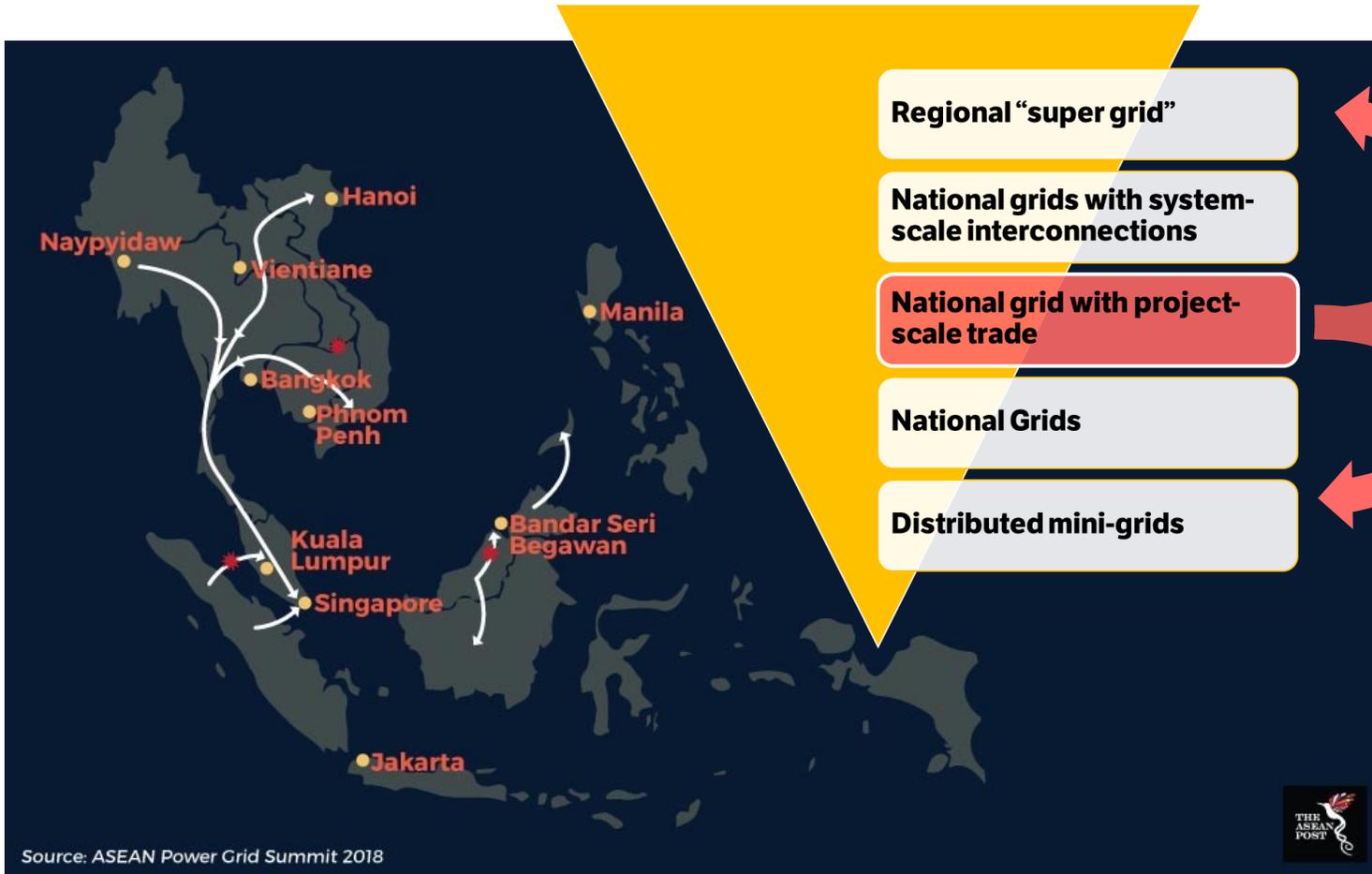
- Financial & educational measures to reduce peak load
- Targeting large consumers
- Most successfully used in Thailand with price incentives
- Vietnam has a voluntary DSM scheme

## Distributed Energy Resources

- Behind the meter energy generation
- Rooftop solar has been deployed in Vietnam and Thailand
  - Vietnam 1 GWp in 20 months, 2GWp in 24months, maybe 3GWp in 26months!
  - Thailand: introduced roof top solar 2013-2015 but not as successful due to cancellation of the FIT.

# Regional electricity trade

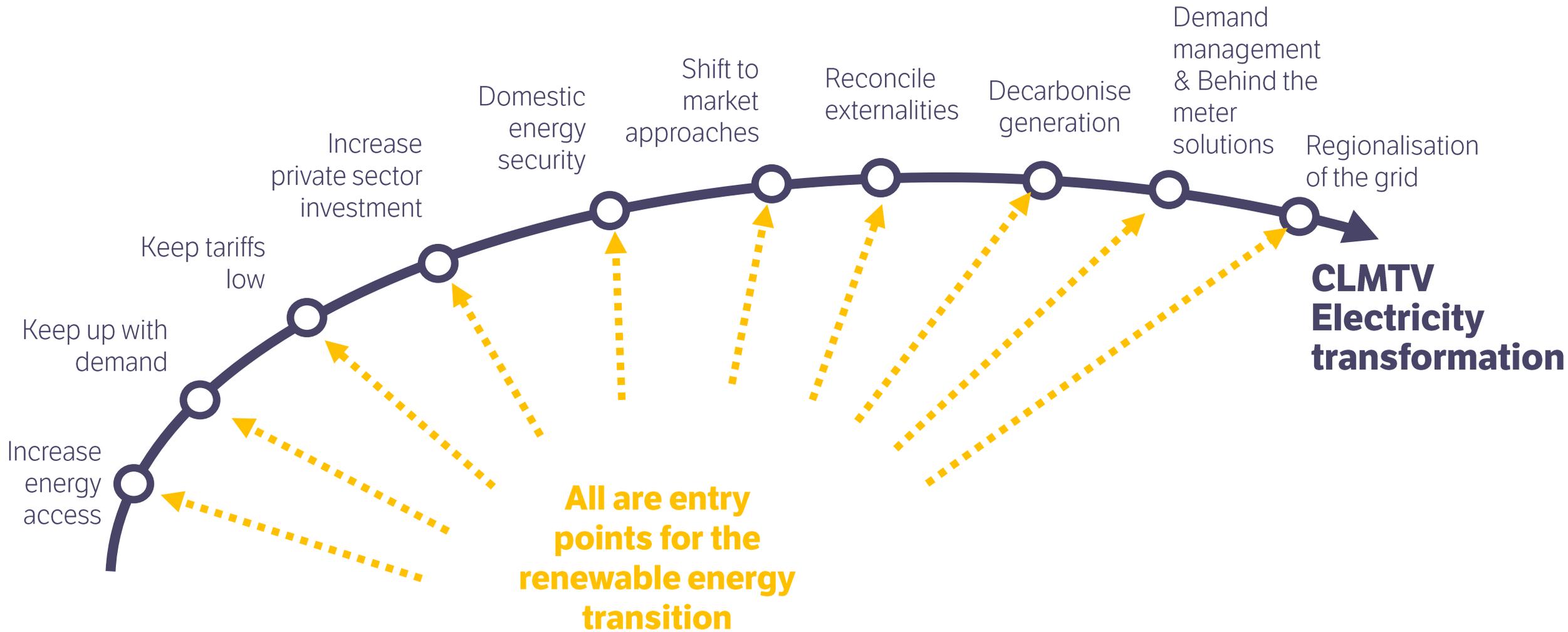
Renewables & Hydro offer opportunities to take advantage of super & sub-national scales



Source: ASEAN Power Grid Summit 2018



- Super-grids (all)
  - More efficient & economical
  - Allow increasing share of variable RE
  - Less curtailment
  - Lower reserve margins
- Distributed grids (Myanmar, Cambodia)
  - Faster progress on universal electricity access for rural areas
  - More economic national power system
  - Higher RE penetration



Thank you...

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