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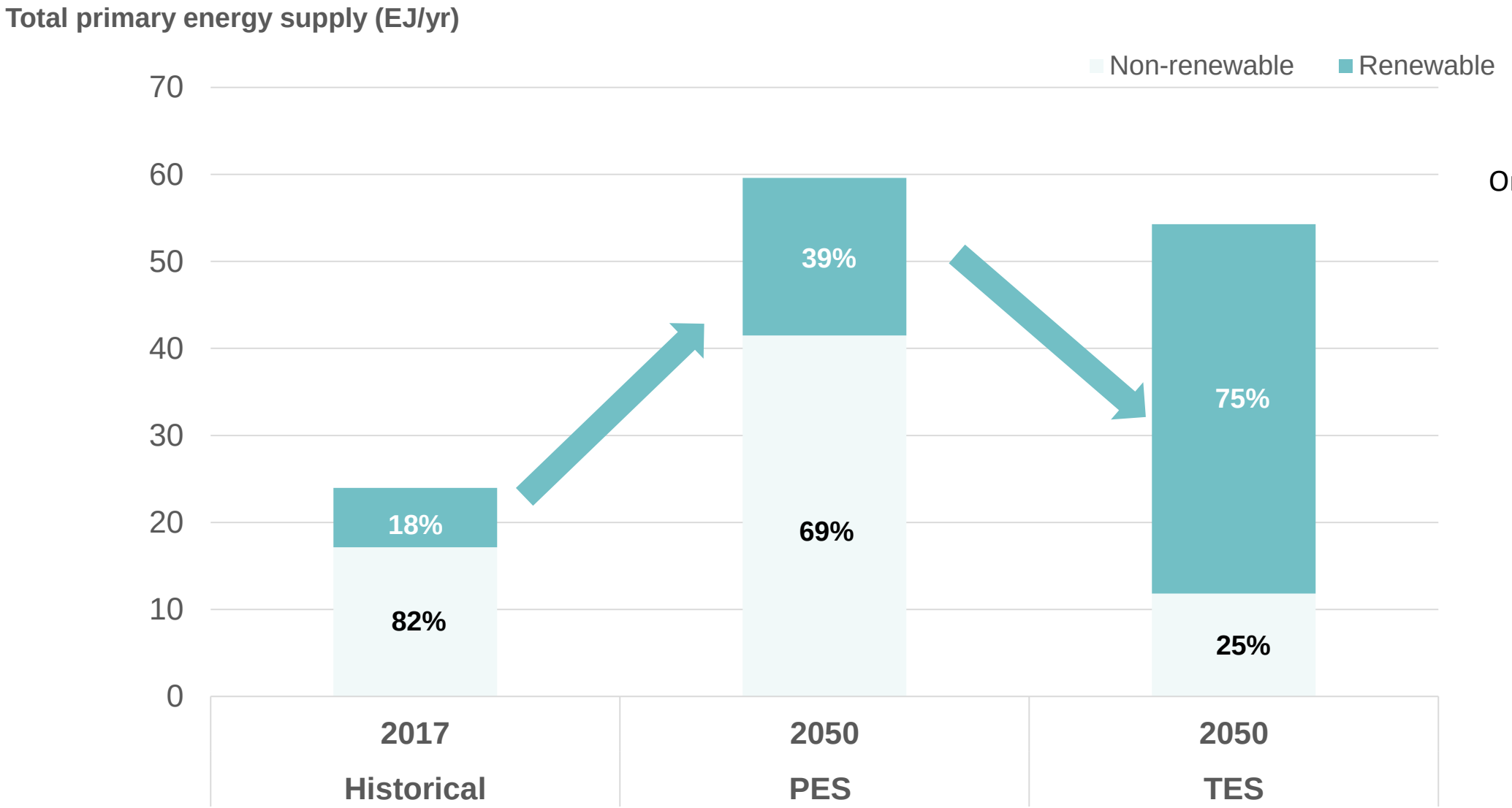
ASEAN Energy Transition Outlook

Dolf Gielen
Director, Innovation and Technology
The global preview to Asia Clean Energy Summit 2020, 18 August 2020

IRENA's Transforming Energy Scenario pathway for South East Asia



Ongoing in-depth study in cooperation with ACE, supported by Denmark:

- ASEAN
- Malaysia
- Indonesia

1st results end 2020

IRENA's Transforming Energy Scenario pathway for South East Asia

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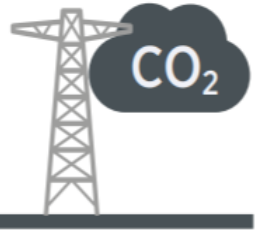
Emissions

Energy-related CO_2 (Gt CO_2/yr)



2017	2030	2050
1.4 Gt CO_2/yr	1.6 Gt CO_2/yr	0.8 Gt CO_2/yr

Renewable energy share in power generation (%)

2017	2030	2050
20%	53%	85%

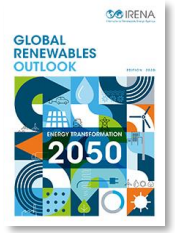
Clean energy investments (USD billion per year)

2016-2030	2016-2050
143 USD bln	141 USD bln

Improved energy efficiency leading to lower energy consumption per capita

Southeast Asia

	2017	Where we are heading: 2030 (PES)	2040 (PES)	2050 (PES)	Where we need to be: 2030 (TES)	2040 (TES)	2050 (TES)
Energy consumption per capita (GJ/capita)							
Consumption (TFEC) per capita	28	29	35	40	29	33	35



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Emerging innovations for the integration of solar and wind power

SYSTEM OPERATION

Operation of a decentralised system

Electrification of end-use sectors

Value complementaries in renewable generation

Encourage flexibility

Empowering consumers

Value spatial complementaries

ENABLING TECHNOLOGIES

Digitalisation

Hydrogen

Blockchain

Storage

Electric vehicles

BUSINESS MODELS

Energy as a service

Peer-to-peer electricity trading

Aggregators

MARKET DESIGN

Today's strong business case for renewable power

Levelised cost of electricity continues to decline

	2010 - 2019	2010 - 2021/23
Solar PV	-82%	-90%
Offshore wind	-29%	-49%
Onshore wind	-39%	-50%

Source: IRENA.
Note CSP LCOE in 2019 excludes projects in Israel.

Renewable power generation is competitive

56% of utility-scale renewable capacity added in 2019 cost less than cheapest new coal option :

- 89% of new hydropower capacity
- 75% of new onshore wind capacity
- 40% of new utility-scale solar PV capacity

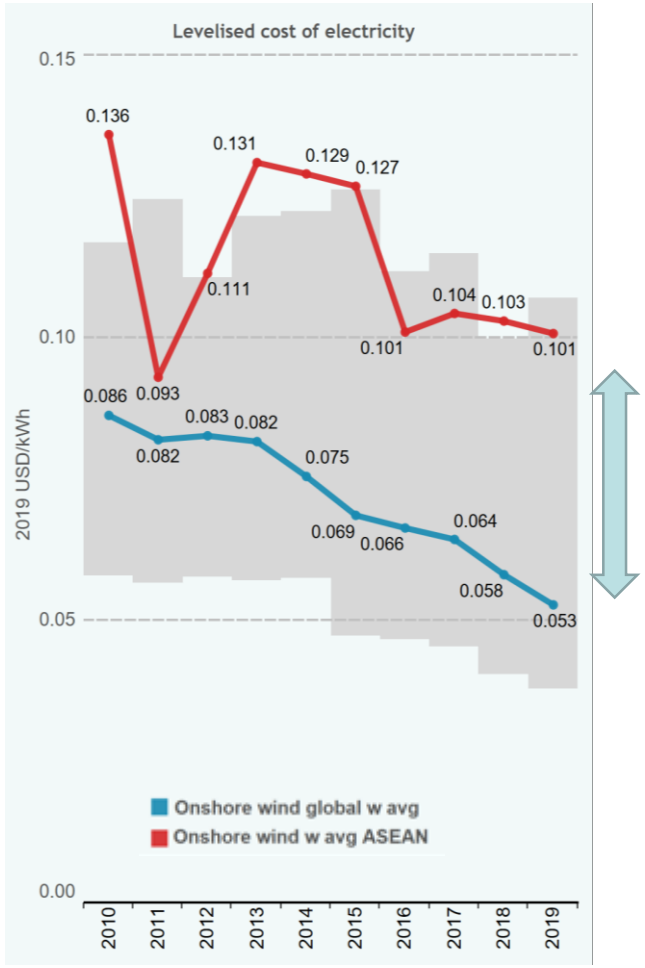
Next years:

- Global weighted average for solar PV and onshore wind will be well below of new utility-scale coal capacity
- Retiring the 500 GW of least competitive existing coal plant could save USD 12-23 billion per year

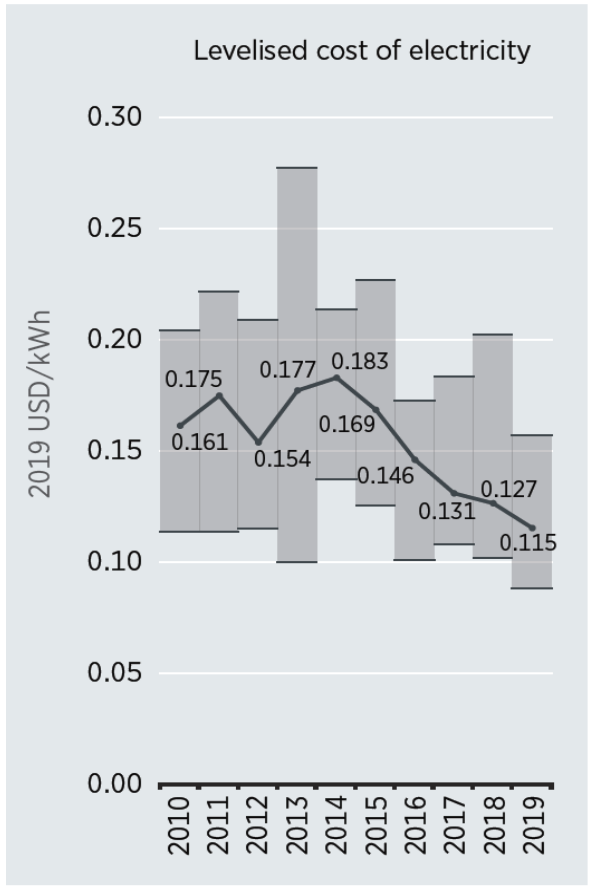
Levelised cost of electricity

Onshore wind, offshore wind, solar PV

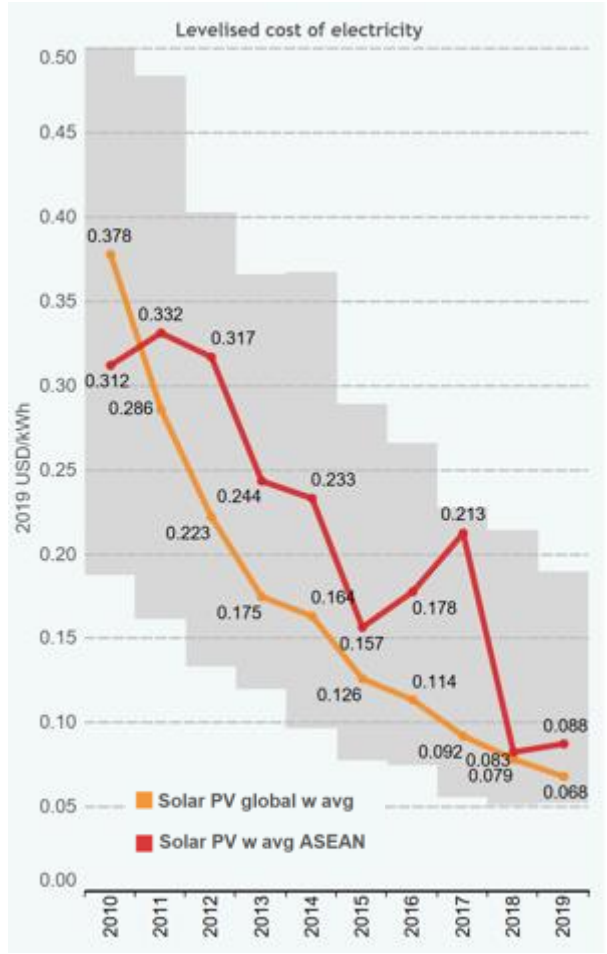
Onshore wind



Offshore wind



Solar PV



Source: IRENA Renewable Cost Database

Global weighted avg (2010-2019):

- Total installed cost reduced by **24% from USD 1 949/kW to USD 1 473/kW**
- Total installed costs **50% higher in ASEAN**

Global weighted avg (2010-2019):

- Total installed cost reduced by **29% from USD 4 650 to USD 3 800/kW**

Total installed costs weighted avg (2010-2019):

- Declined **13% from 2018 and 79% from 2010**
- ASEAN PV costs are in line with global costs

The role of cities in the Big Switch to a low-carbon energy future: Focus on Thailand

Sustained urbanisation must be powered by low-carbon energy supply, specifically renewables

Urbanisation:

- **Global**: over the next 3 decades, 2.5 billion people will become new urban dwellers, 90% of growth from Asia & Africa, resulting the increase of urbanisation rate from the present 55% to 68% in 2050.
- **SEA**: urbanisation rate will increase from 50% to 66%, with variation across member states.

Energy-related emission from cities:

- **Global**: 67-76% of global final energy use contributing to 71-76% of energy-related CO_2 emissions.
- **SEA**: electrification and flexibility in cities offer significant RE potential EV, cooling etc.

Thailand has stepped up its ambition and efforts in its energy transition towards renewable energy

Electric Vehicles (EVs)

- In 2017, IRENA, in collaboration with the Ministry of Energy of Thailand conducted "Renewable Energy Outlook for Thailand https://irena.org/publications/2017/Nov/Renewable-Energy-Outlook-Thailand, facilitating the discussion around RE and Evs.
- In 2020, the Government of Thailand announced a roadmap for EV development, not only for Thailand but also for ASEAN.

Community-owned RE generation

- The Government has launched "Energy for ALL" scheme to support the development of community-owned renewable energy projects with the generation capacity no greater than 10 MW each.
- Part of the updated national power development plan (PDP).
- The expected investment would be around 3.3 billion Euros.
- IRENA has been requested by the Thai Ministry of Energy to assist.

South East Asia: Actions needed

Knowledge creation with **better statistics for renewables**, and wider exchange **of best-practice and technology information** is needed across ASEAN.

Power system flexibility needs to be ensured and transmission grid capacity should be expanded and strengthened for renewables integration**. Electrification of end-uses** is also an key solution that will play a more important role in the future and it requires a resilient and robust grid (electromobility etc).

End-use sector efforts should be significantly expanded as they make up two-thirds of the effort required to close the gap in realising ASEAN's **renewable energy target** for 2025, and make up a significant portion of the longer-term potential needed to transform the region's energy system over the coming decades.

Align energy and climate polices and plans and use those as a central pillar for post COVID recovery. Countries should align climate and sustainability targets with national energy plans, and they should value these plans beyond just the effect on the energy sector and take a more holistic, socio-economic view as the energy transition across ASEAN as is more economically and socially beneficial then business as usual.

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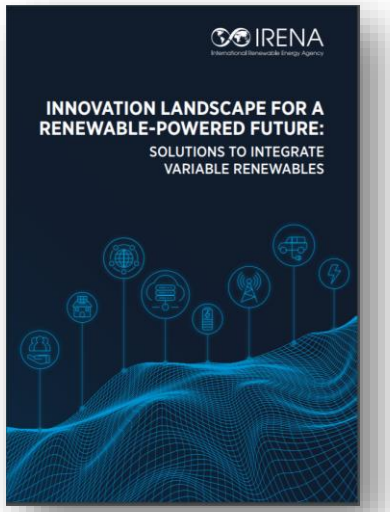
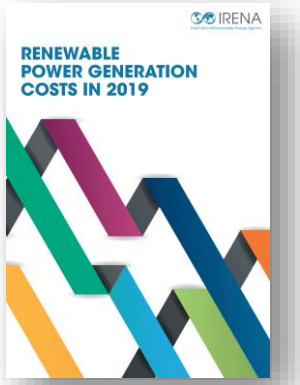
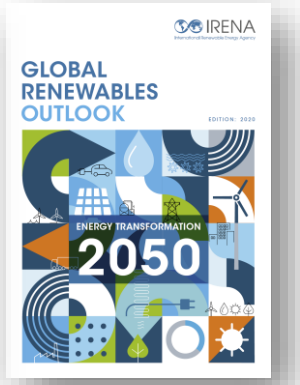
Thank You!



IRENA's Innovation Landscape
July 2020



RE Power Generation Costs in 2019
June 2020



Global Renewables Outlook
April 2020