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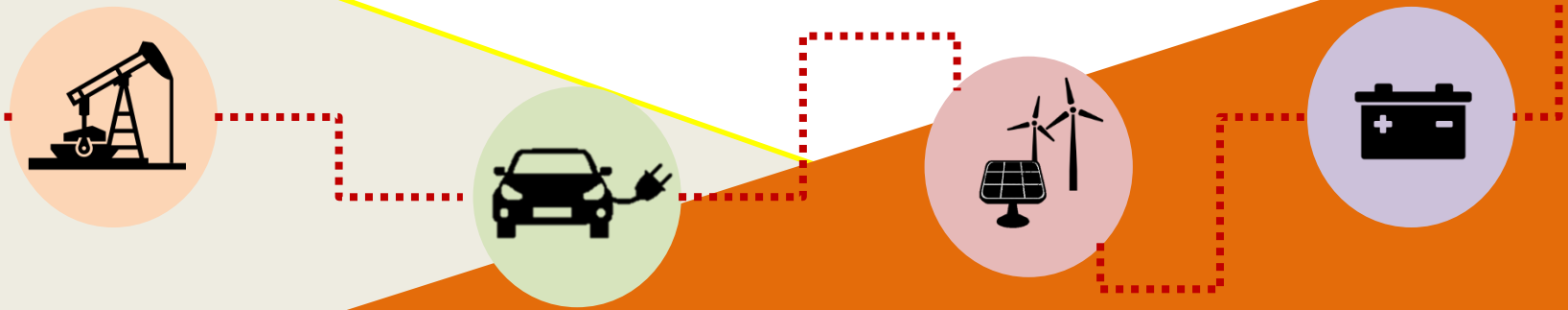
Global Energy Transition



APEC EGEE&C and EGNRET 2018
12 September 2018

Dr. Prasert Sinsukprasert
Inspector General Ministry of Energy

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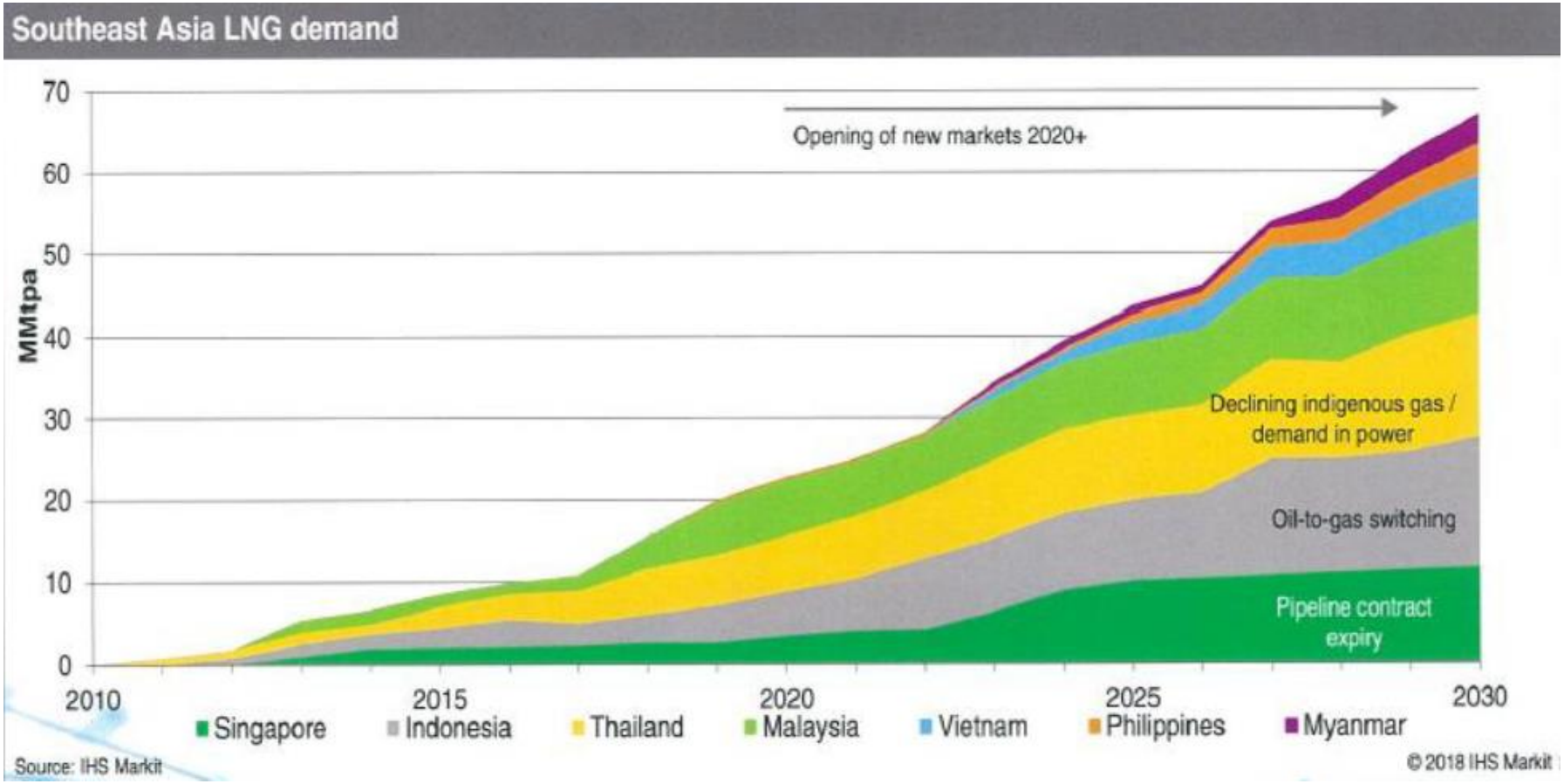
Energy in Transition

- Geopolitical Hotspots
- Oil Market – approaching 100 MB/D
- Mobility: octane, electric, hydrogen
- Gas Market + Rising LNG Demand
- Renewable Energy & Storage
- Prosumer + Smart Grid
- Innovation, Internet of Things and Data Analysis, Big Data, AI, Digitalization
- Paris Agreement = Low Carbon Development

ASEAN LNG Outlook

Southeast Asia LNG demand to reach 60 MMtpa by 2030



Source: IHS Markit /Global Gas and LNG markets, March 2018

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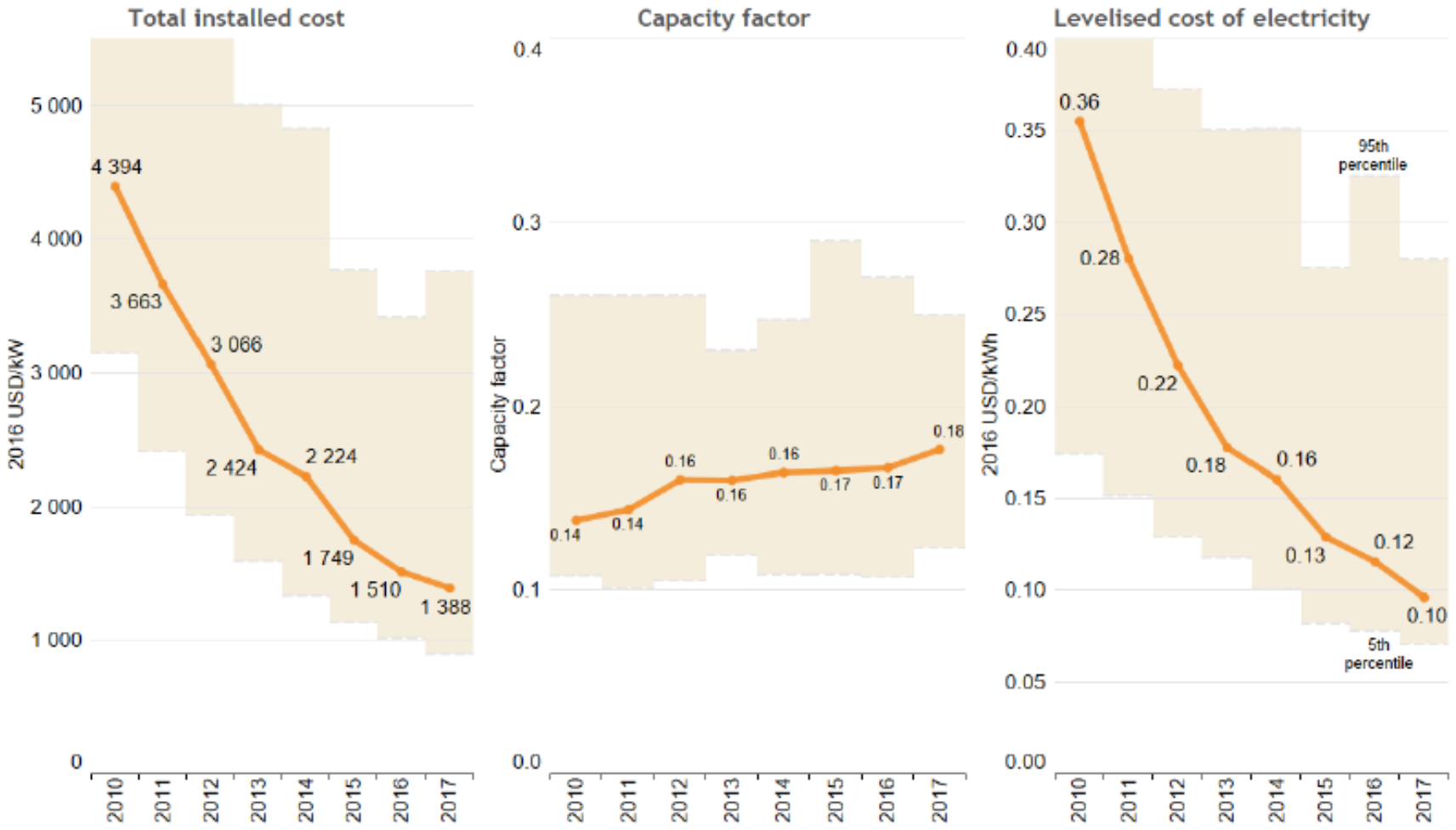
Utility Scale PV Global Trend



IC: High costs persist in some markets (e.g. Japan, United States)

CF: 28% relative increase

Dramatic fall in LCOE

Source: IRENA Renewable Cost Database

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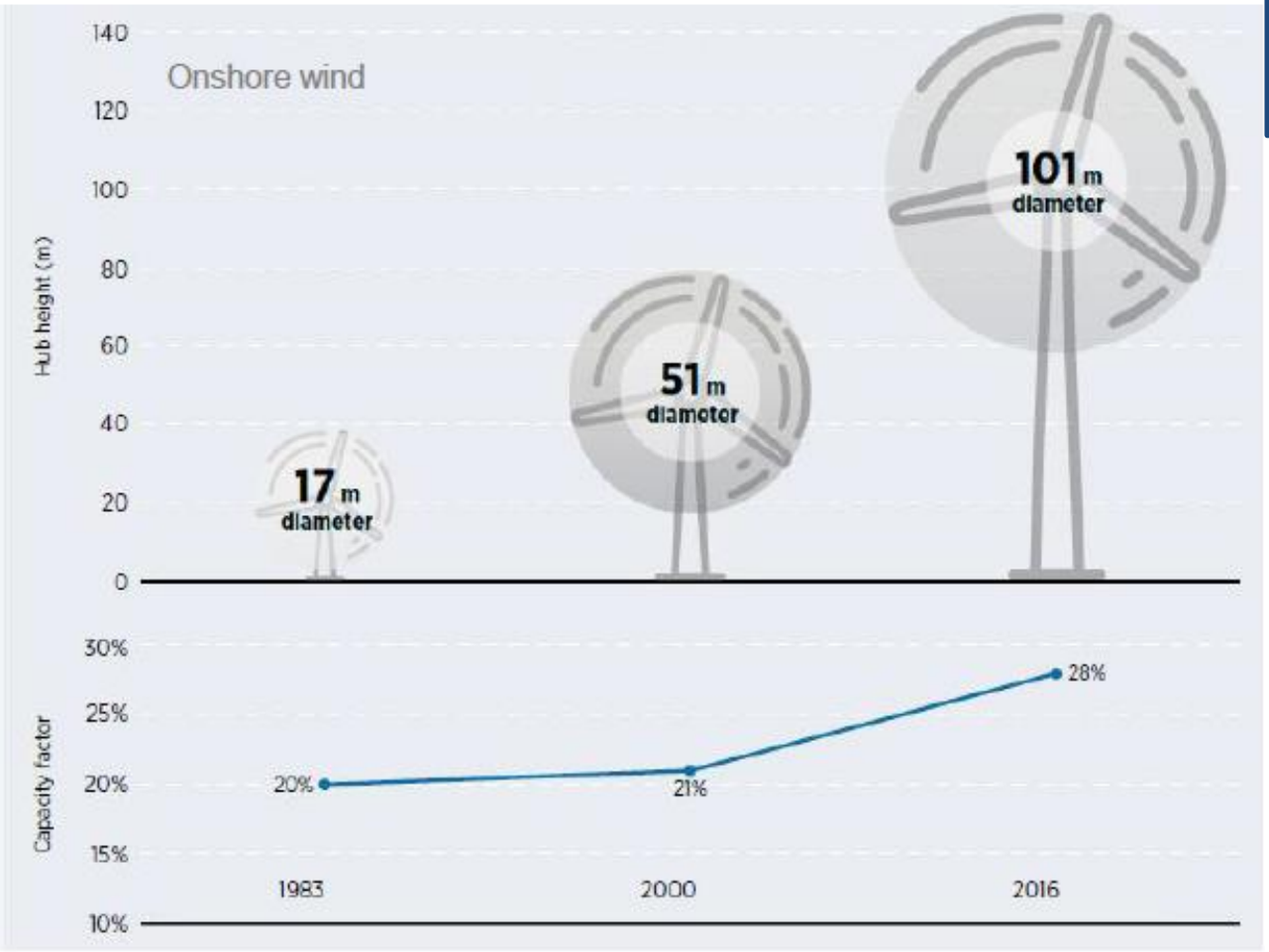
Wind Trends

Wind turbine costs have declined while capacity factors have increased



- Rotor diameters and hub heights have doubled from 2000 to 2016
- Capacity factors have increased by a third from 2000 to 2016
- Installed capacity increased by 26 times from 2000 to 2016

Source: IRENA Renewable Cost Database

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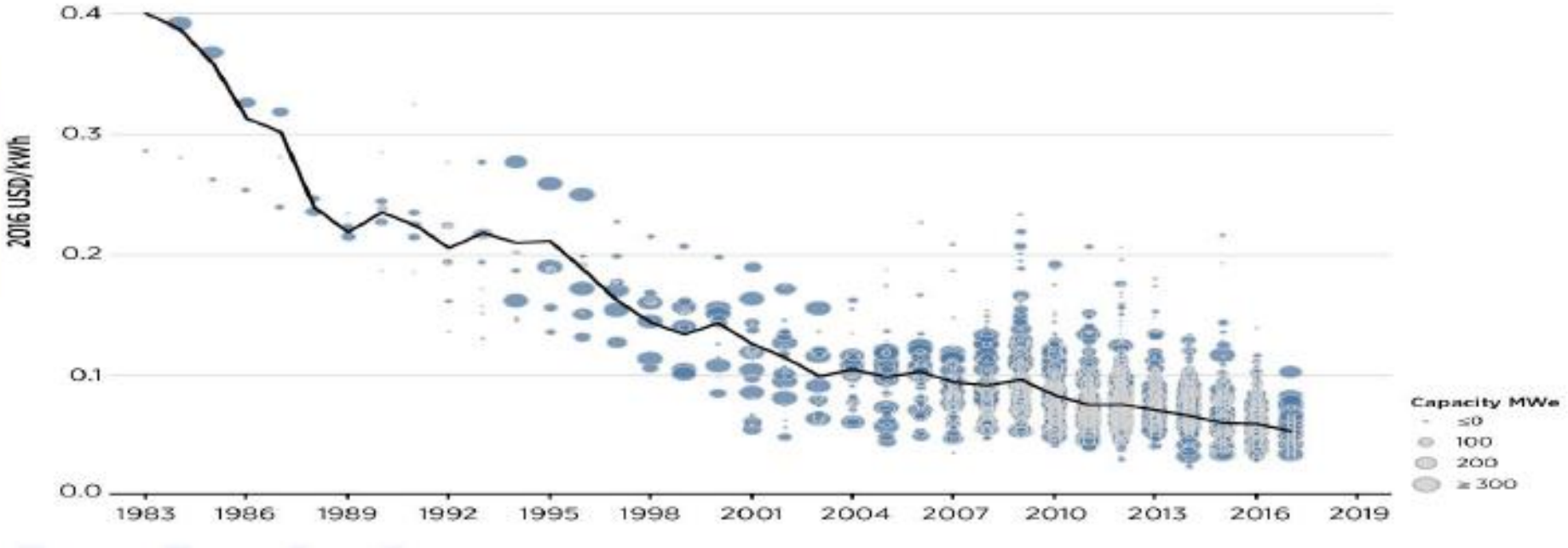
Wind – Global LCOE

LCOE of onshore at USD 0.06/kWh in 2017, offshore at USD 0.14/kWh



- Globally, the LCOE of onshore wind declined by 85% from 1983 to 2017

Source: IRENA

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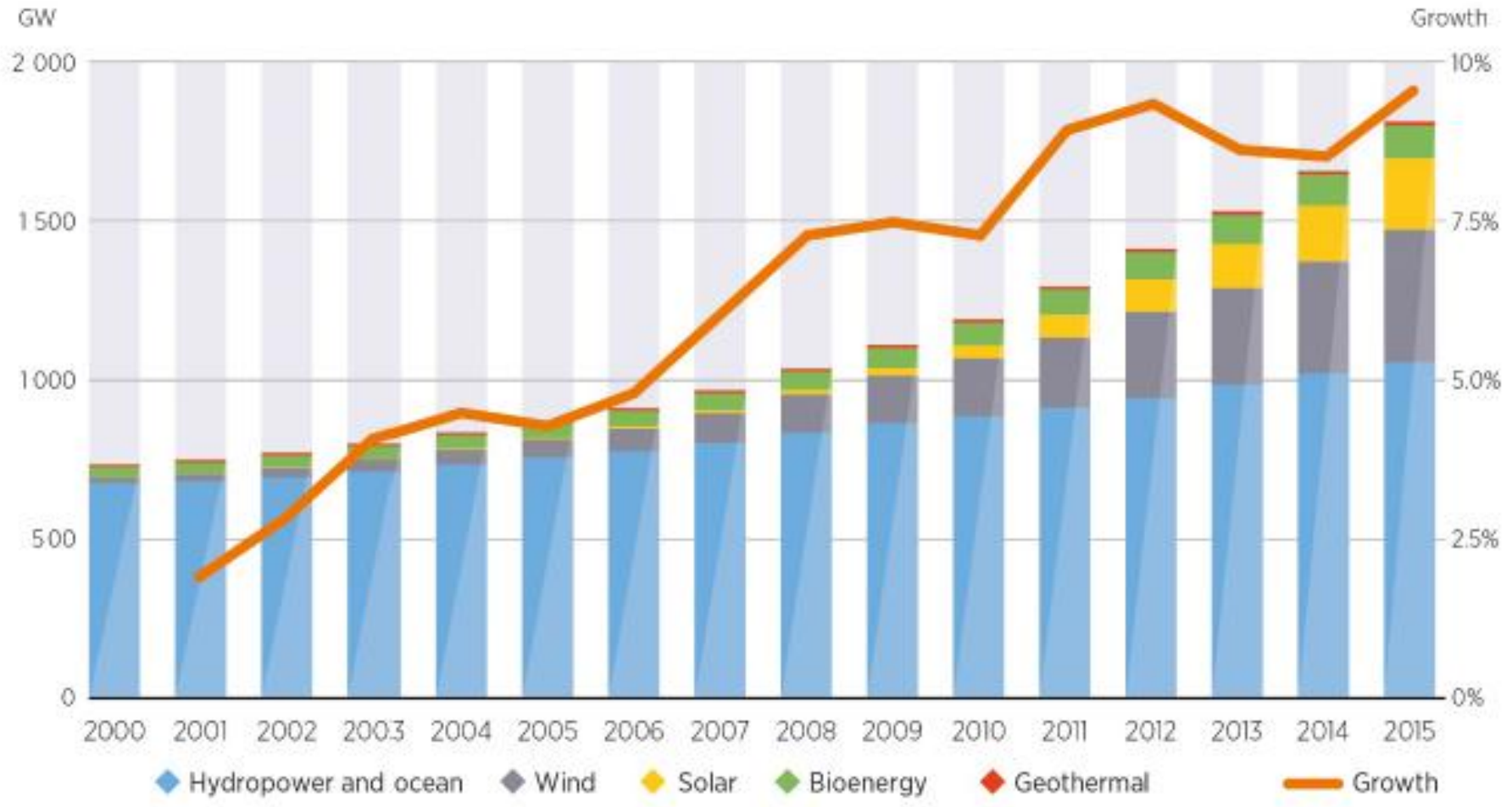
Renewable Power Generation Capacity and Annual Growth Rate



Renewable energy capacity in the power sector has been growing rapidly over the last decade with record growth in 2015

Source: IRENA (2016)

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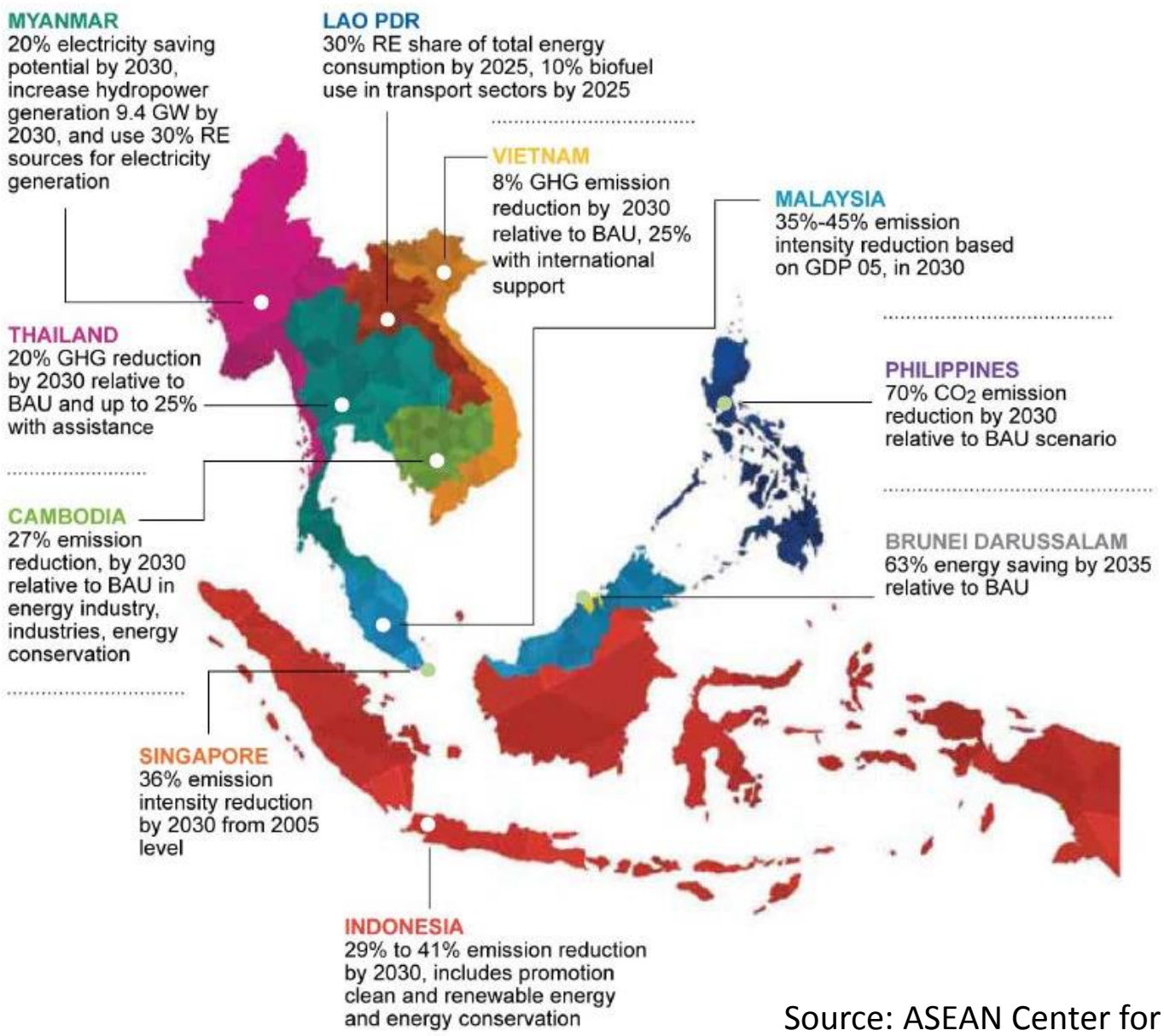
NDC Open for Clean Options



Source: ASEAN Center for Energy (ACE)

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The future of ASEAN smart cities

- A recent smart cities index ranking list was released by the EasyPark Group for the year 2017. Singapore was the country ranked 2nd, while Malaysia was ranked 84th.
- Indonesia for example has plans to develop at least a 100 smart cities over the next two years.
- Vietnam has various tentative smart city plans in development, of which most notably is the Nhat Tan-Noi Bai project.

Source: The ASEAN post, November 2017

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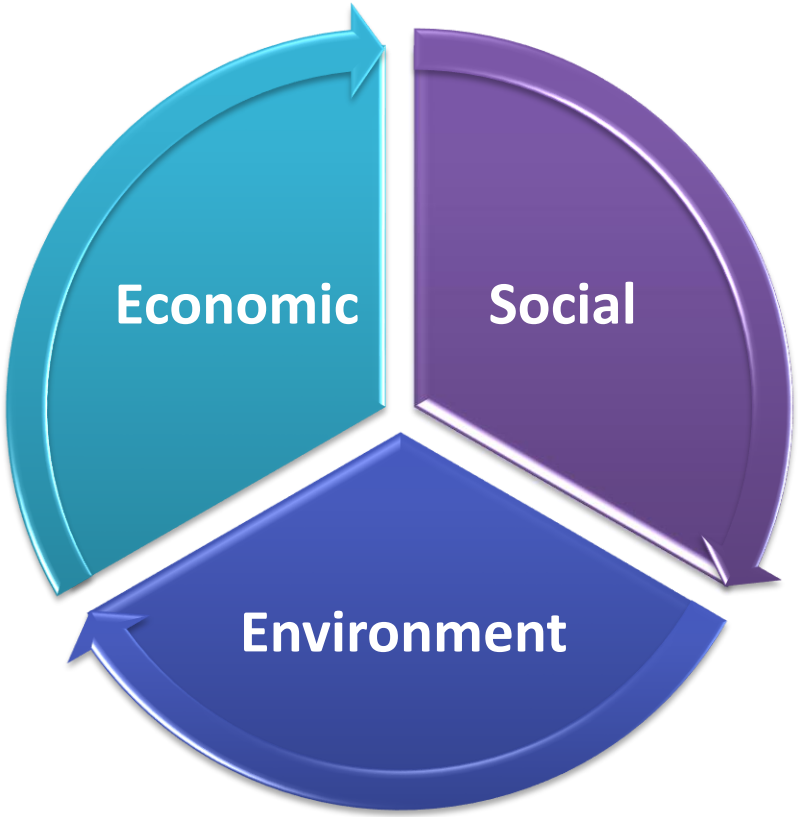
Key Drivers for Energy Investment

- High growth of economic and energy demand
- Decrease in cost of RE
- Transform to competitive market structure
- Require significant investment in infrastructure



- Need to improve life quality
- Prosumer trend
- Untapped potential from agricultural activities

- Target of GHG mitigation (NDC)
- Energy-Water Nexus

- Thank you -
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