Energy sector developments in Southeast Asia

Linking current/future transitions to higher education

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Outline

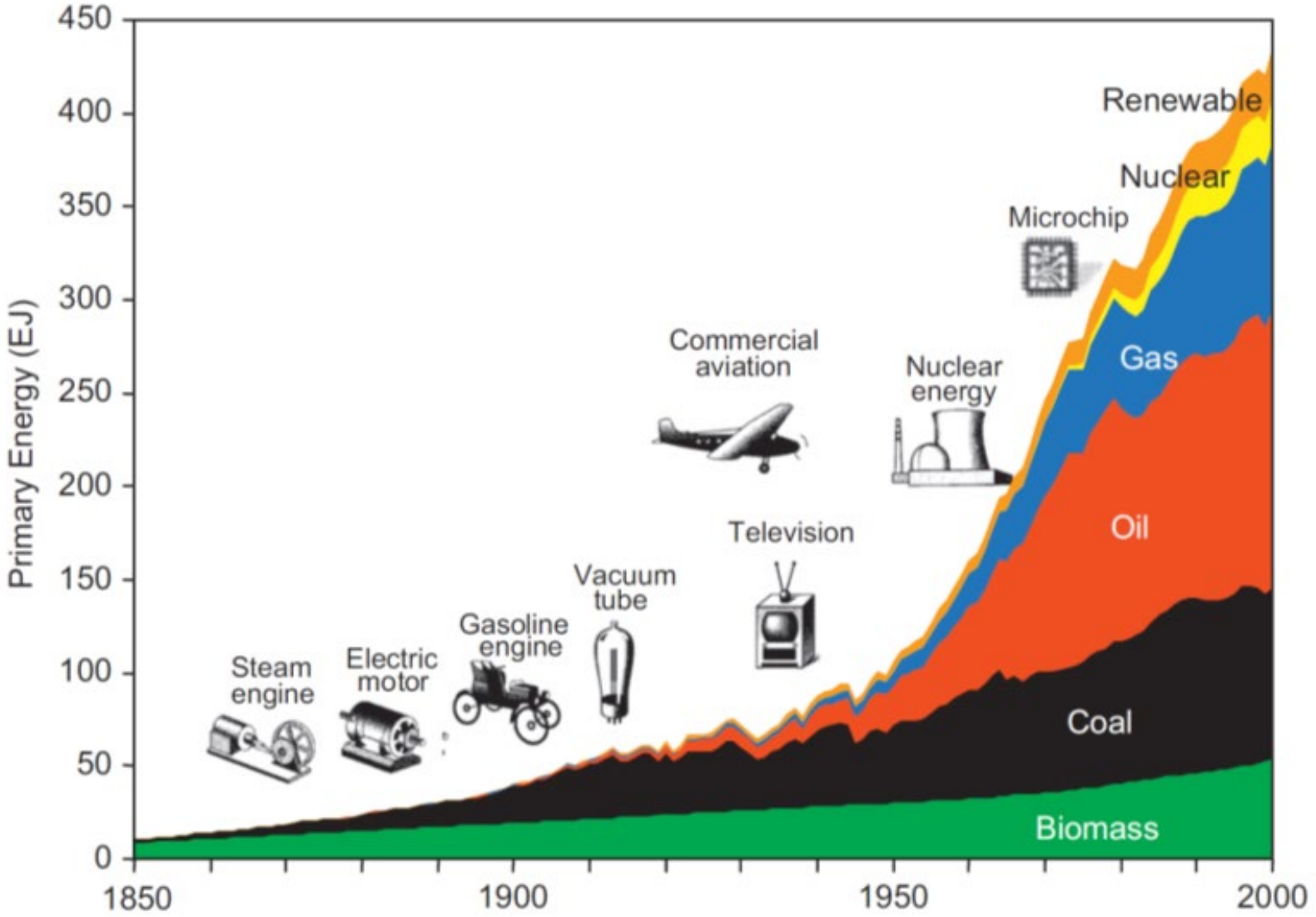
1. Conceptualising energy transitions

2. Characterising dominant energy regime(s) in Southeast Asia

3. Some emerging niches/alternatives

4. Relevance of transitions thinking for higher education + MEEE project

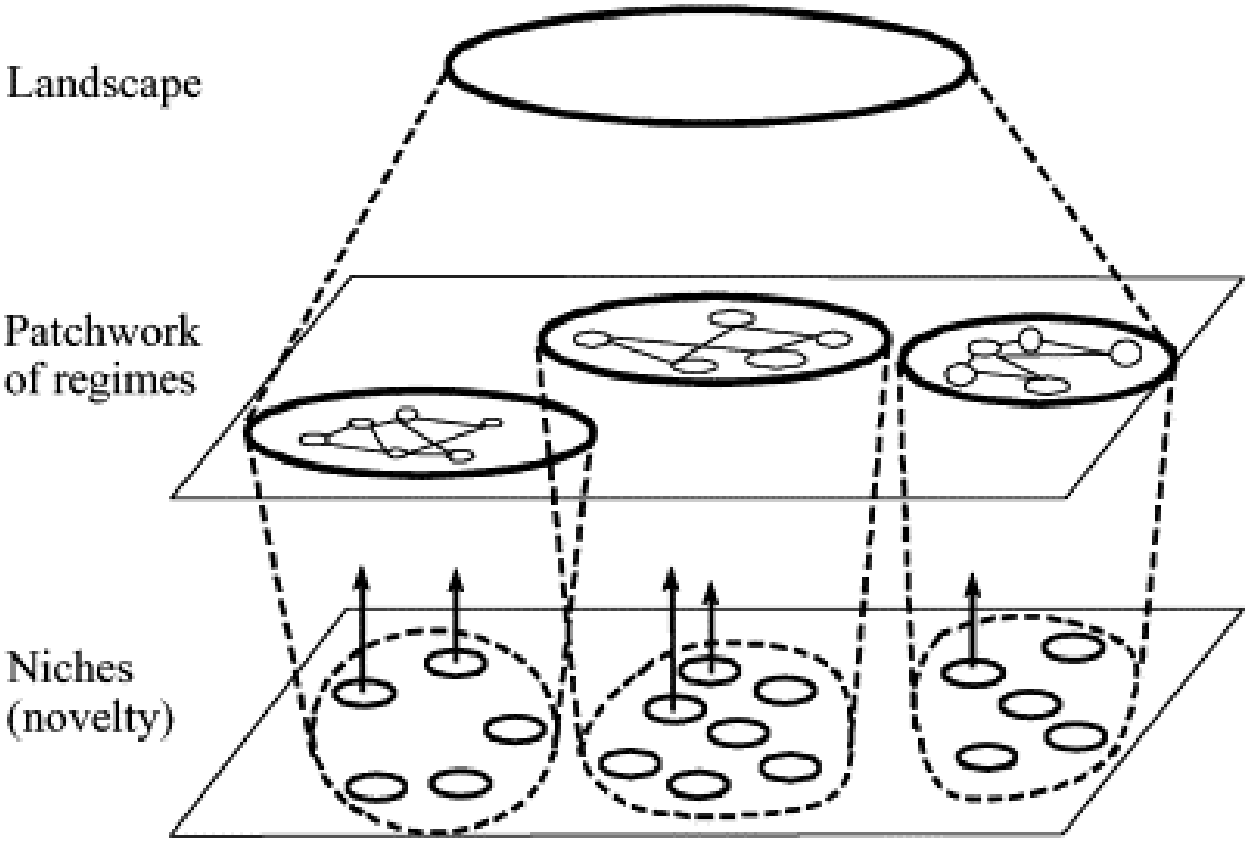
Energy developments as socio-technical transitions



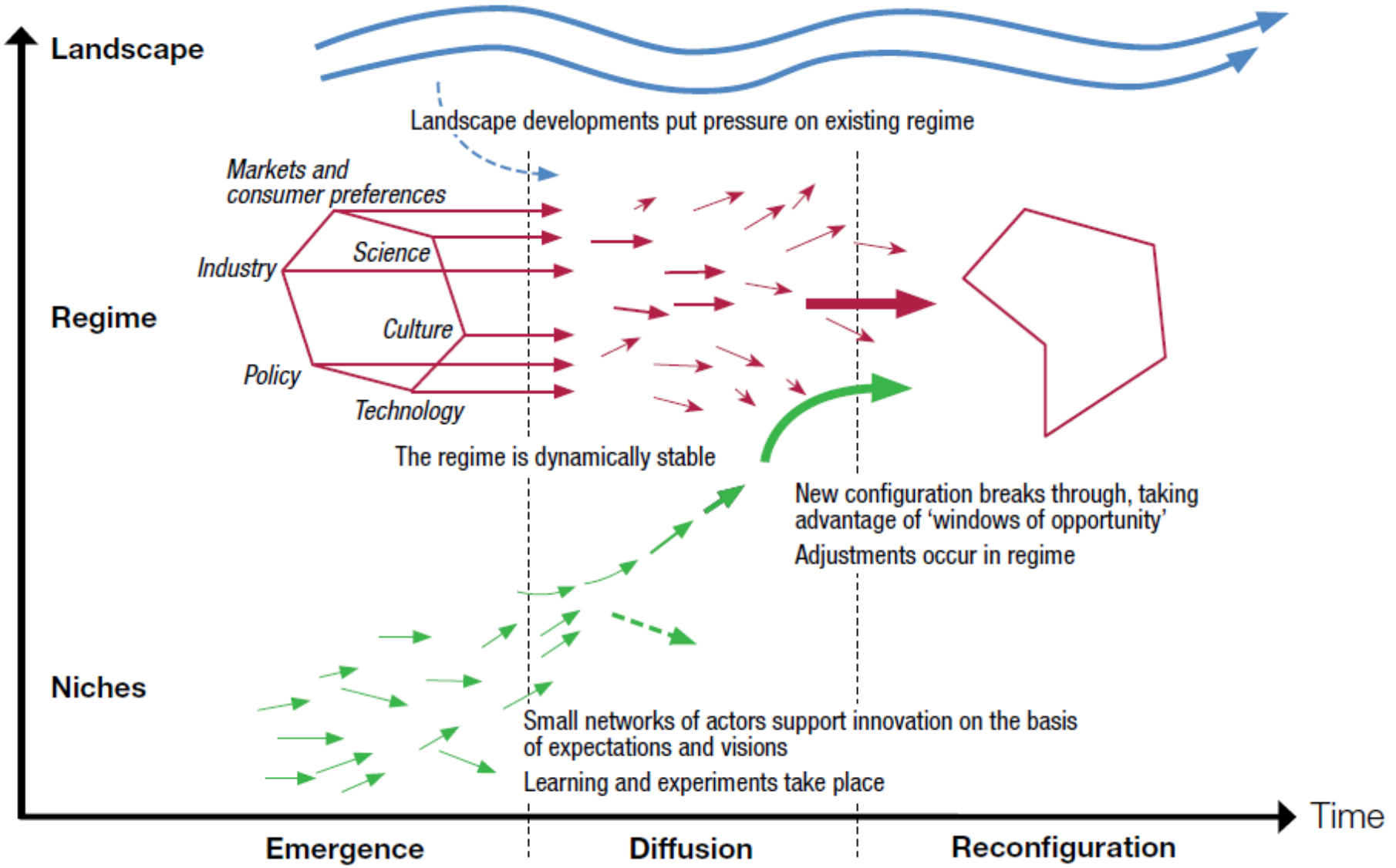
Socio-technical systems perspective

Taking a multi-level approach

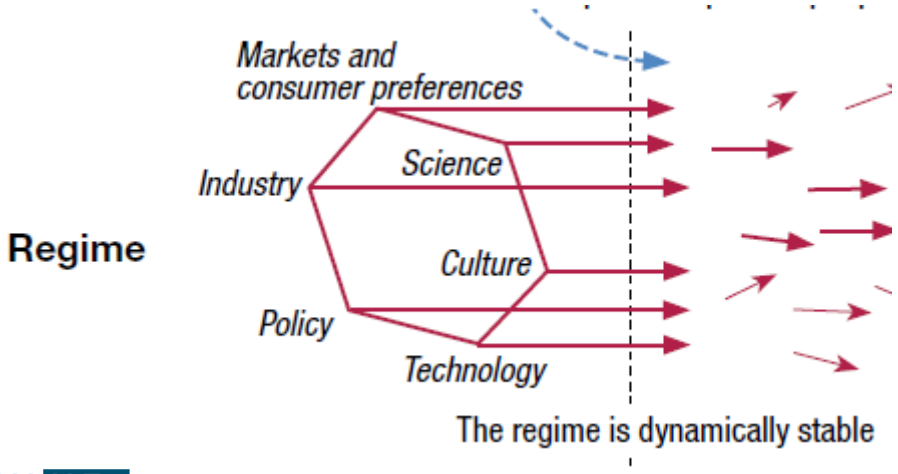
- Energy systems are connected



Conceptualising (energy) transitions with the multi-level perspective (MLP)



Characterising energy regimes in Southeast Asia



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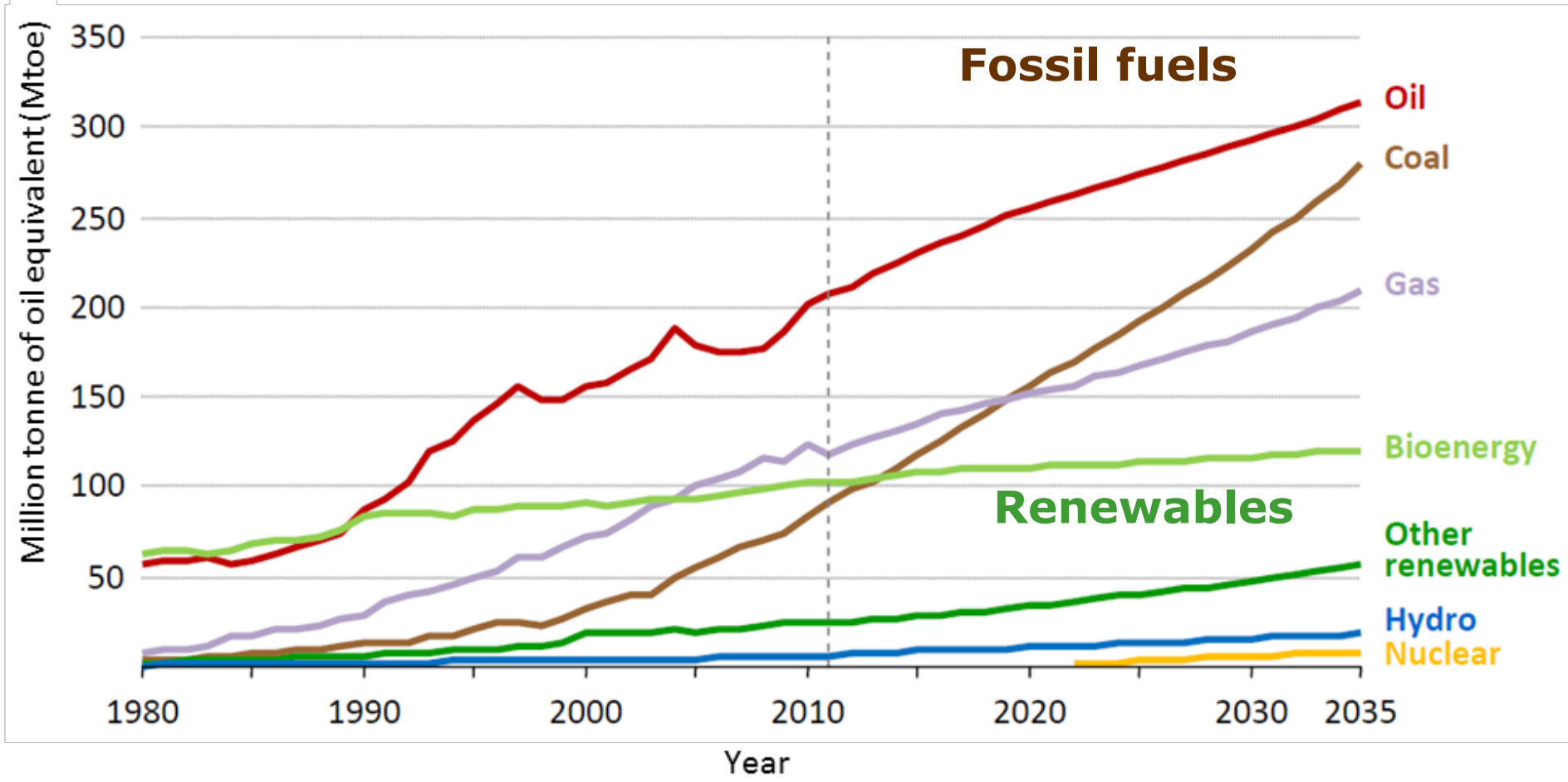
Rapid energy demand growth in Southeast Asia



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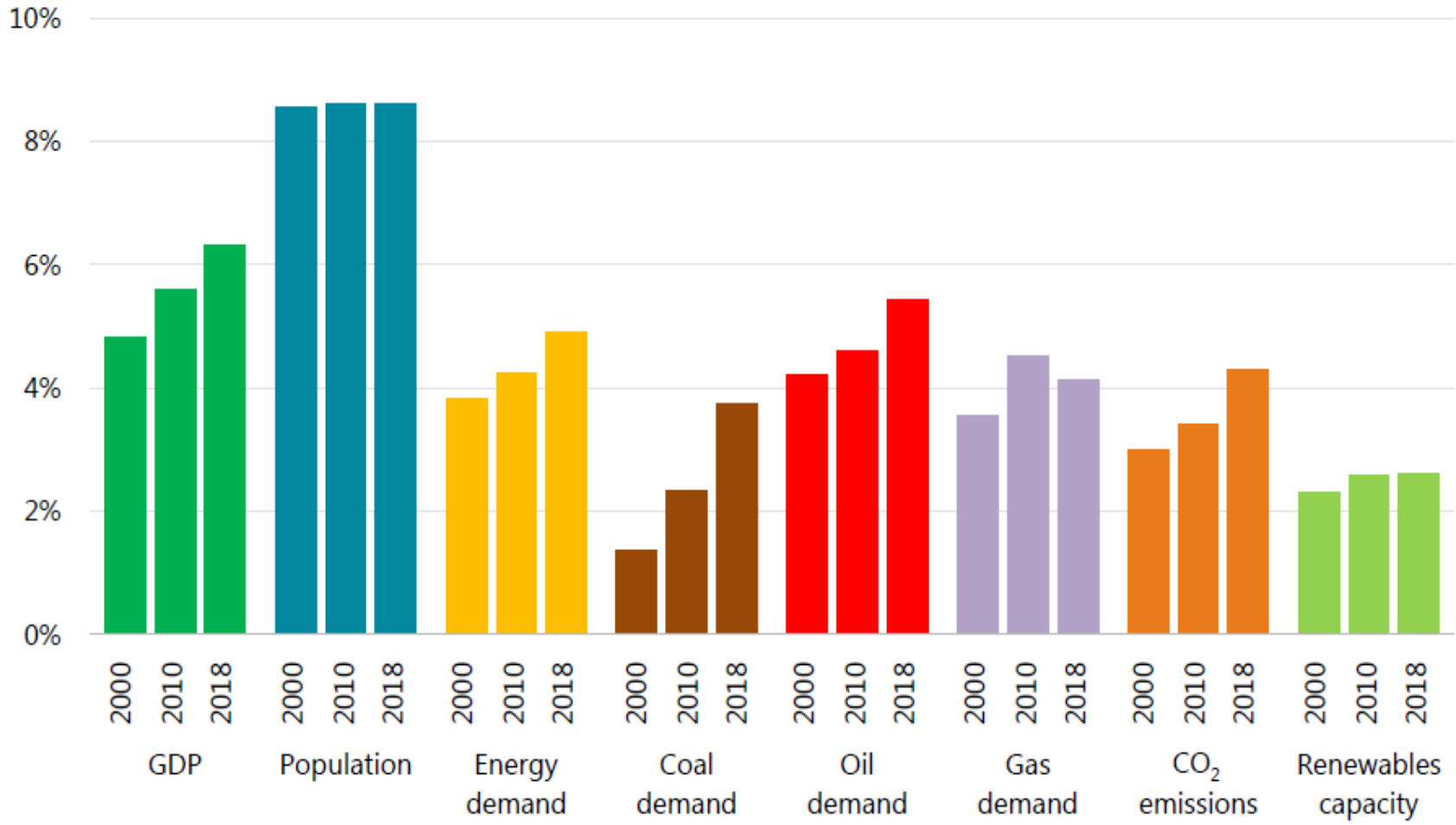
Source: IEA (2013)

Growing importance of SEA's energy in the world

Share of selected global economic and energy indicators in Southeast Asia



Note: GDP = gross domestic product ($2018, power purchasing parity [PPP]); CO_2 = carbon dioxide.

(IEA, Southeast Asia Energy Outlook 2019)

Dominance of fossil fuels

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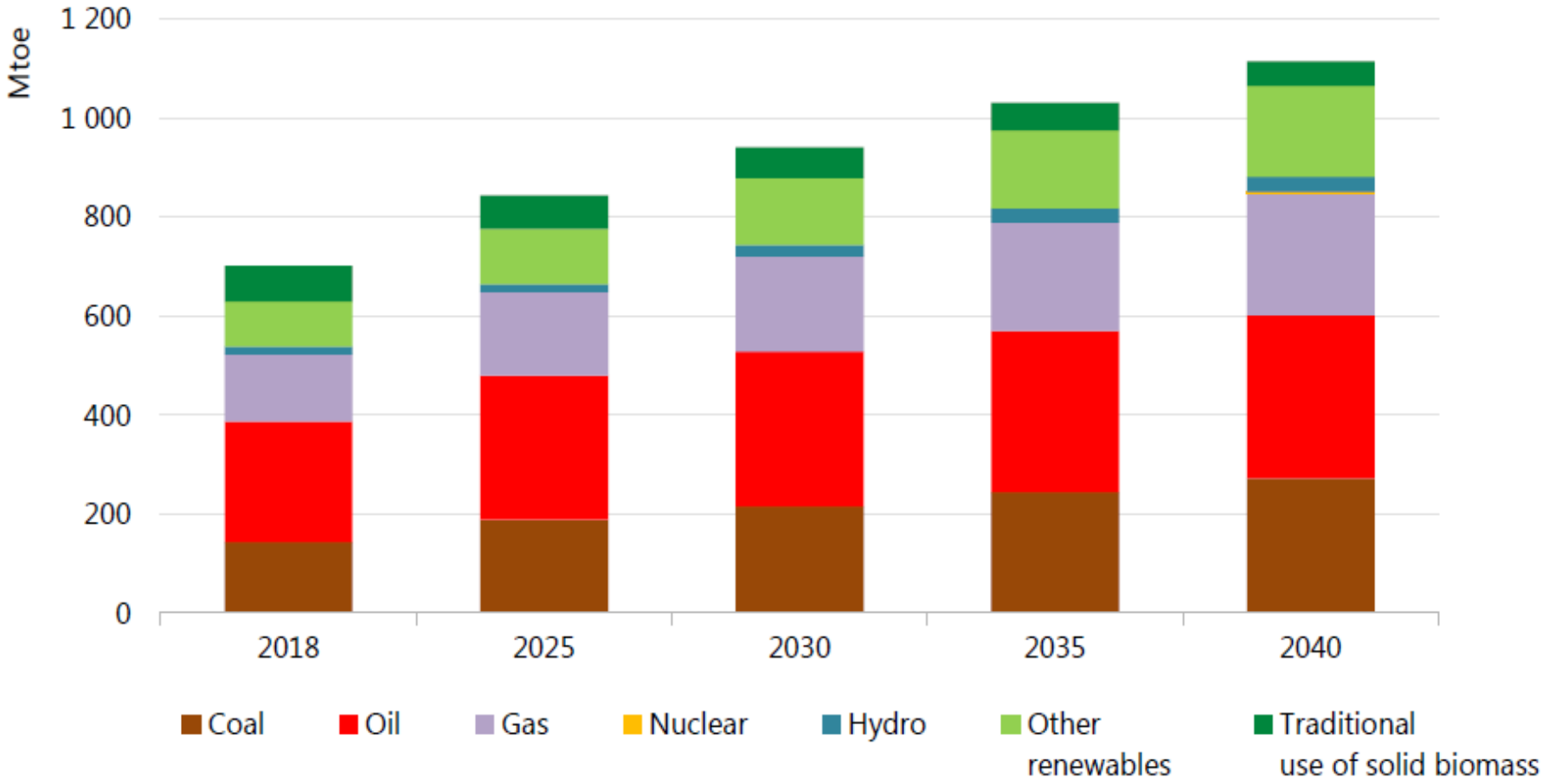
Dominance of fossil fuels (2)

Primary energy demand in Southeast Asia in the Stated Policies Scenario

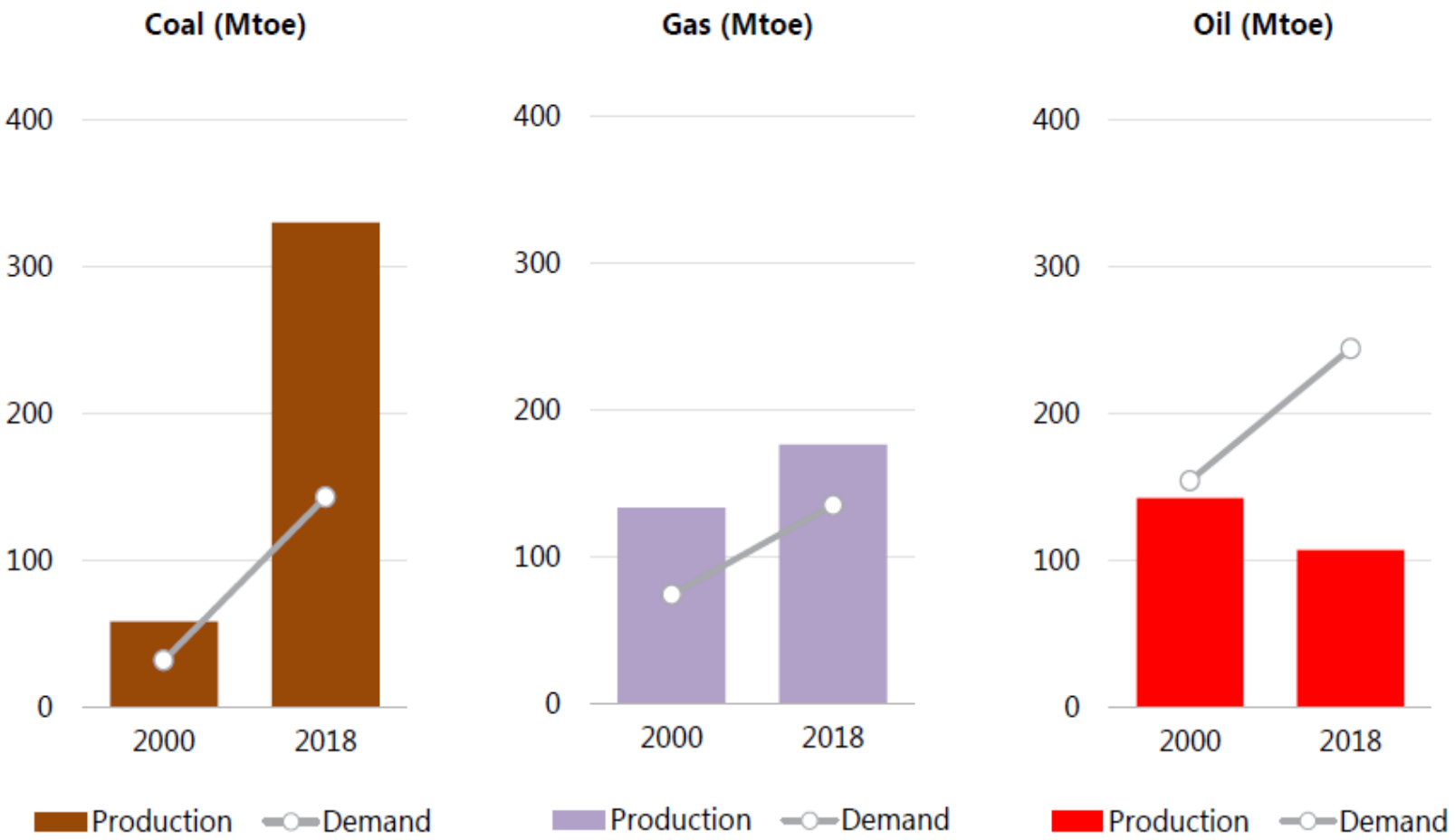


(IEA, Southeast Asia Energy Outlook 2019)

Notes: Mtoe = million tonnes of oil equivalent. Other renewables include solar PV, wind, geothermal and modern use of bioenergy.

Dominance of fossil fuels (3)

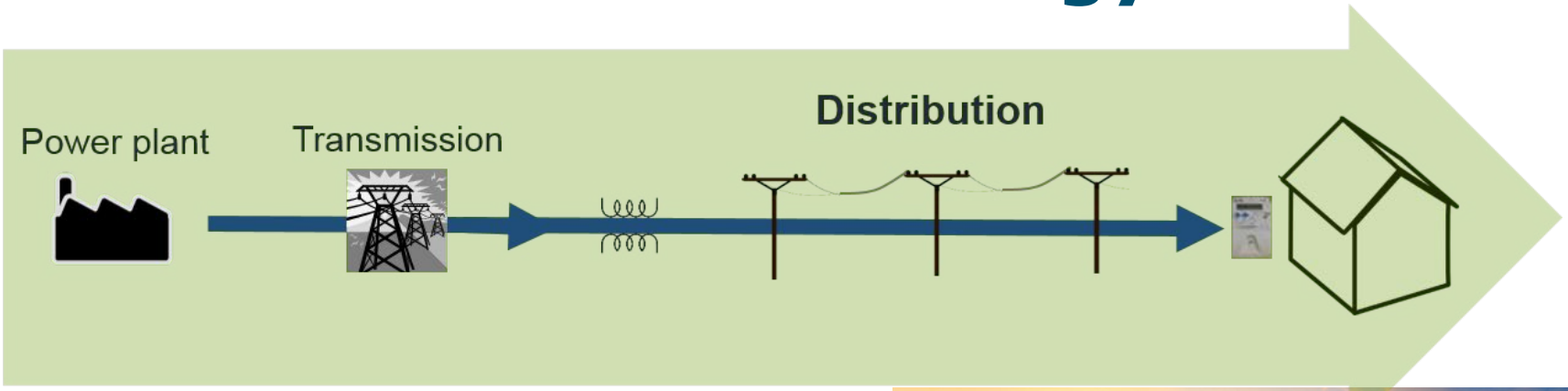
Change in fossil fuel supply and demand in Southeast Asia, 2000-18



Note: Mtoe = million tonnes of oil equivalent.

(IEA, Southeast Asia Energy Outlook 2019)

Focus on centralised energy solutions



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Regional power grids

(IEA, Southeast Asia Energy Outlook 2019)

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Strong role of state (planning)

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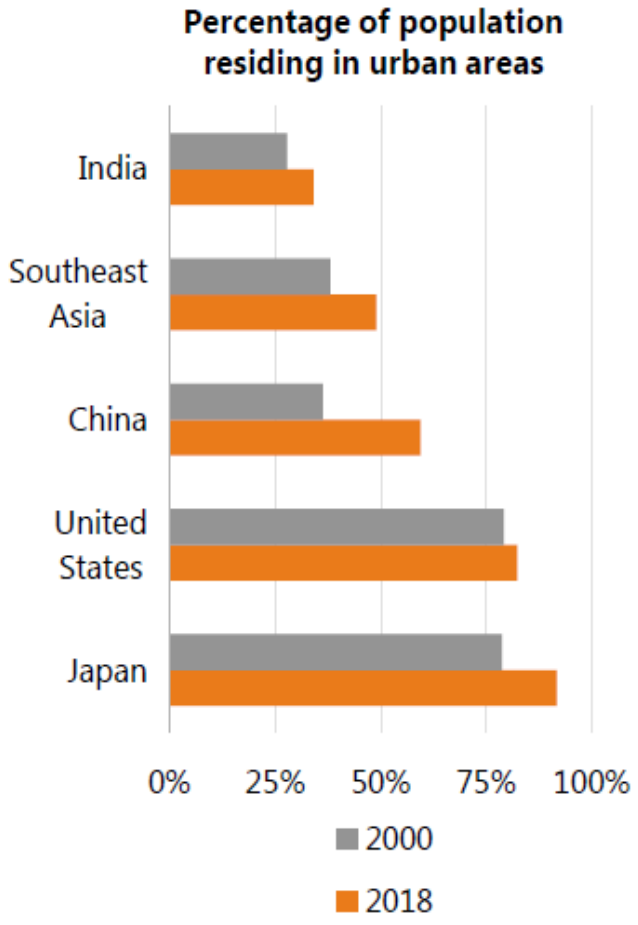
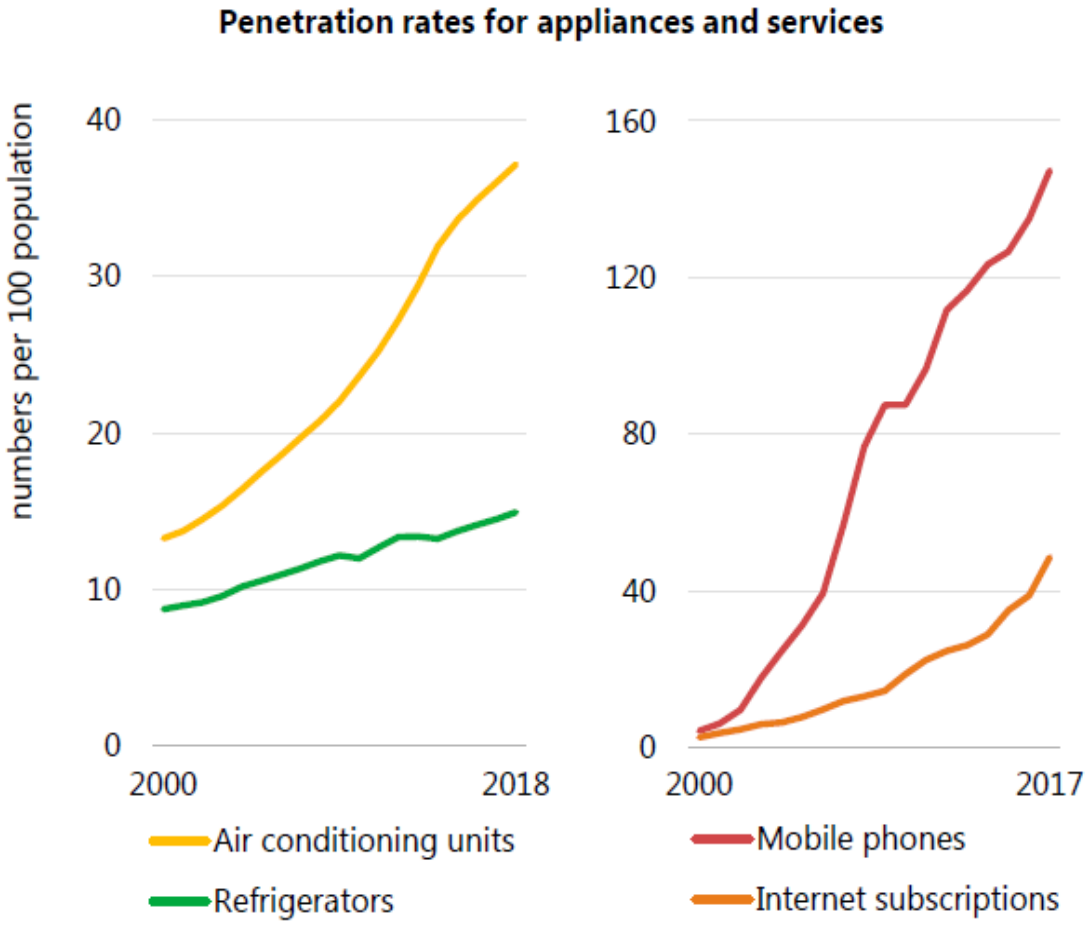
https://www.adb.org/news/infographics/southeast-asia-and-economics-global-climate-stabilization

Focus on (large) urban areas

Urbanisation and increase in appliance and air conditioning use

Share of population in urban areas and ownership rates of selected devices in Southeast Asia





Sources: The ASEAN Secretariat (2018); IEA analysis.

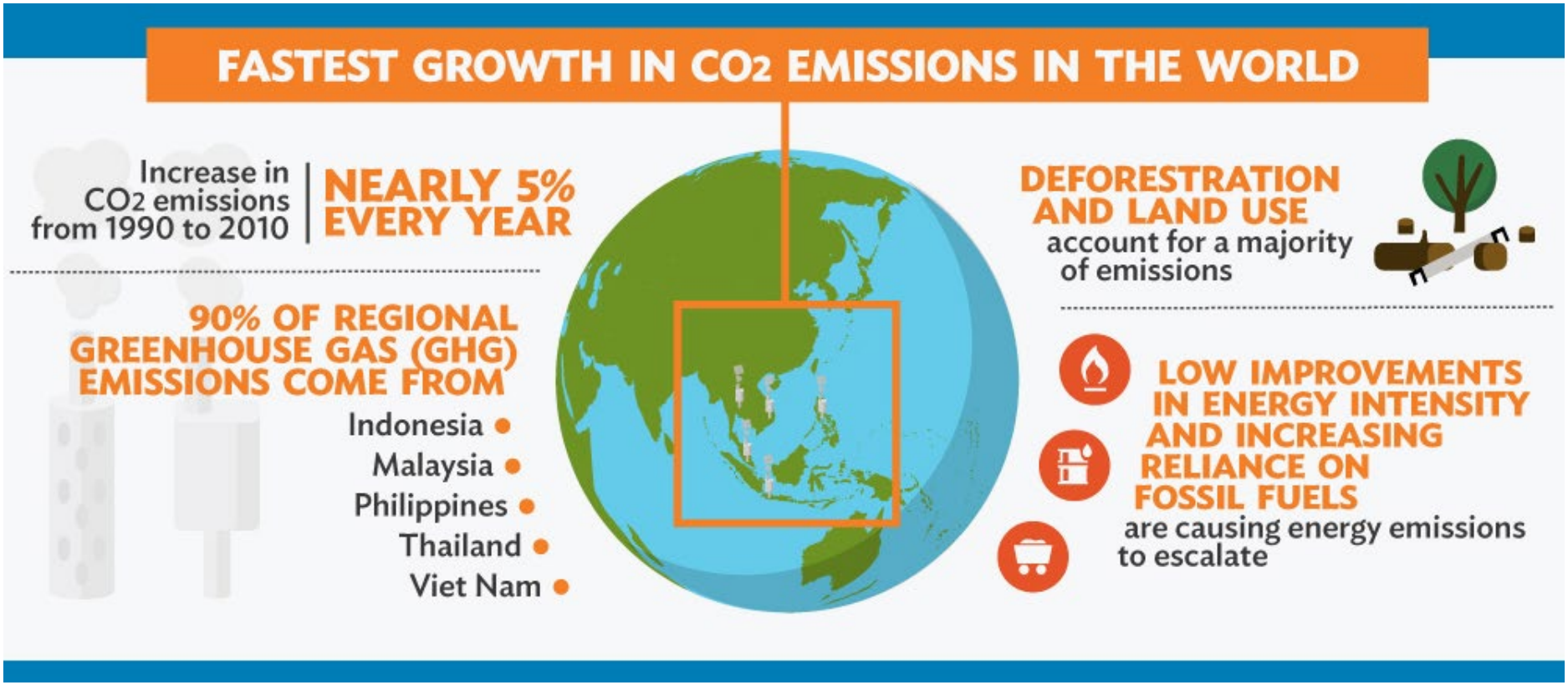
(IEA, Southeast Asia Energy Outlook 2019)

Summarising characteristics of dominant energy regime(s) in SE Asia

- Still predominantly fossil-fuel based
- Focus on centralized solutions
- Strong belief in regional integration through large-scale infrastructure
- Biased towards urban metropolitan areas
- Tradition of strong state planning and control

Problems related to dominant energy regimes in SE Asia

Greenhouse gas emissions in Southeast Asia



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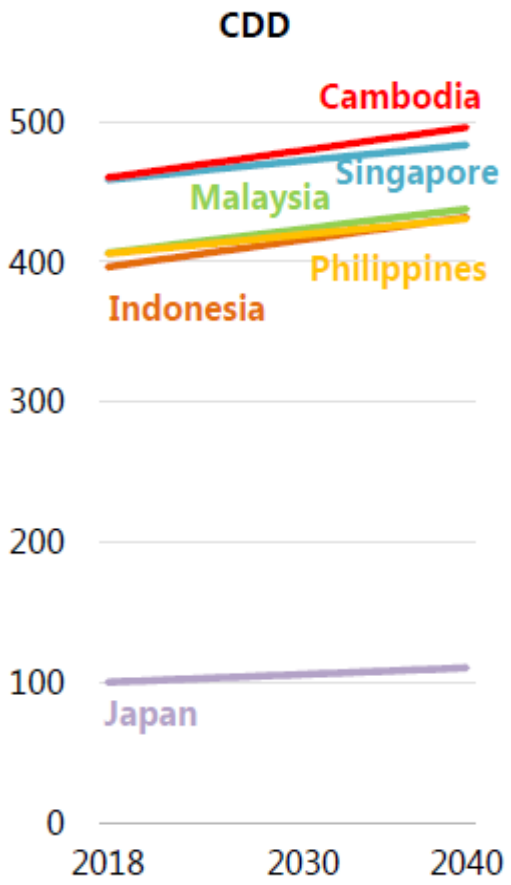
https://www.adb.org/news/infographics/southeast-asia-and-economics-global-climate-stabilization

Local climate change impacts



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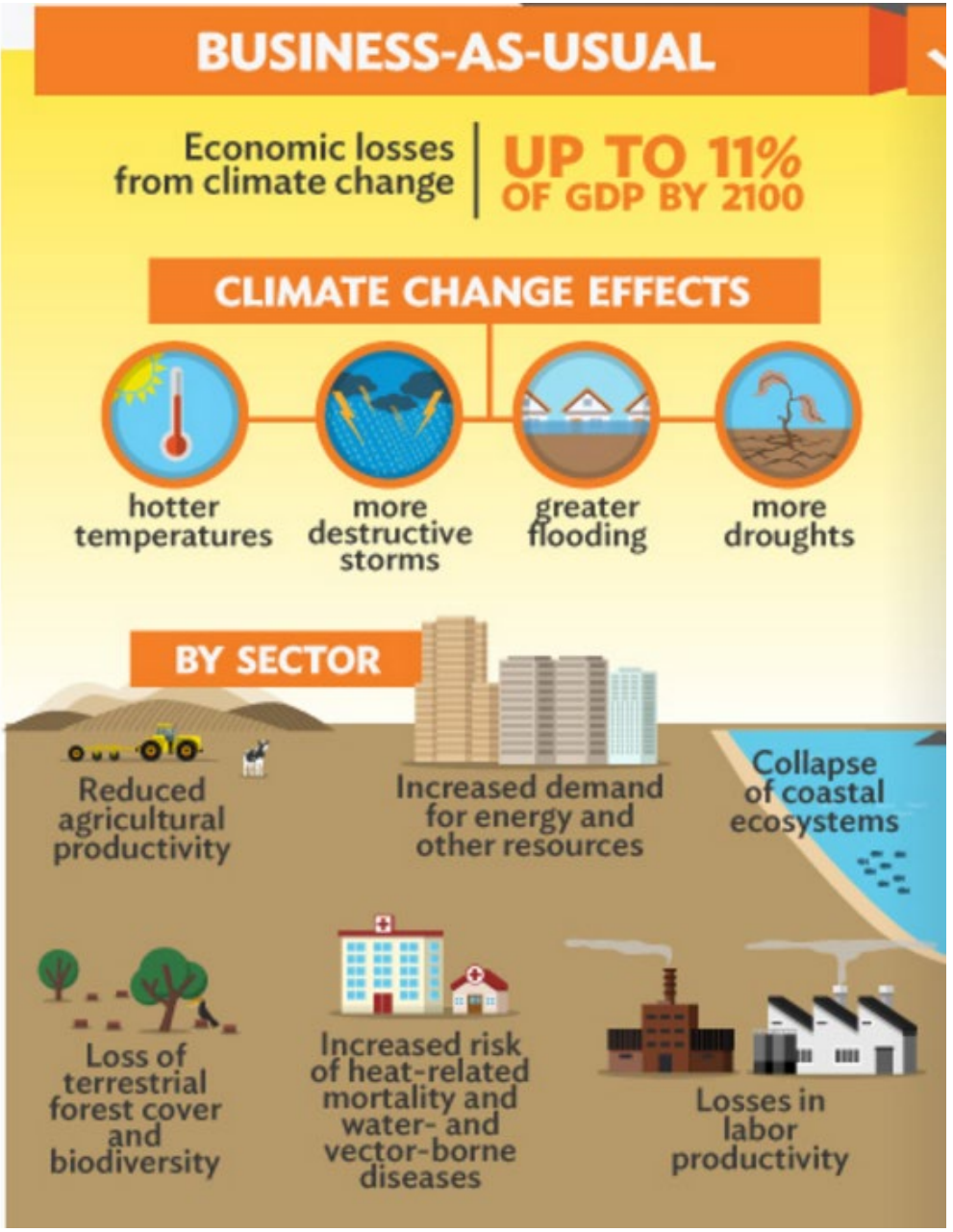

https://www.adb.org/news/infographics/southeast-asia-and-economics-global-climate-stabilization

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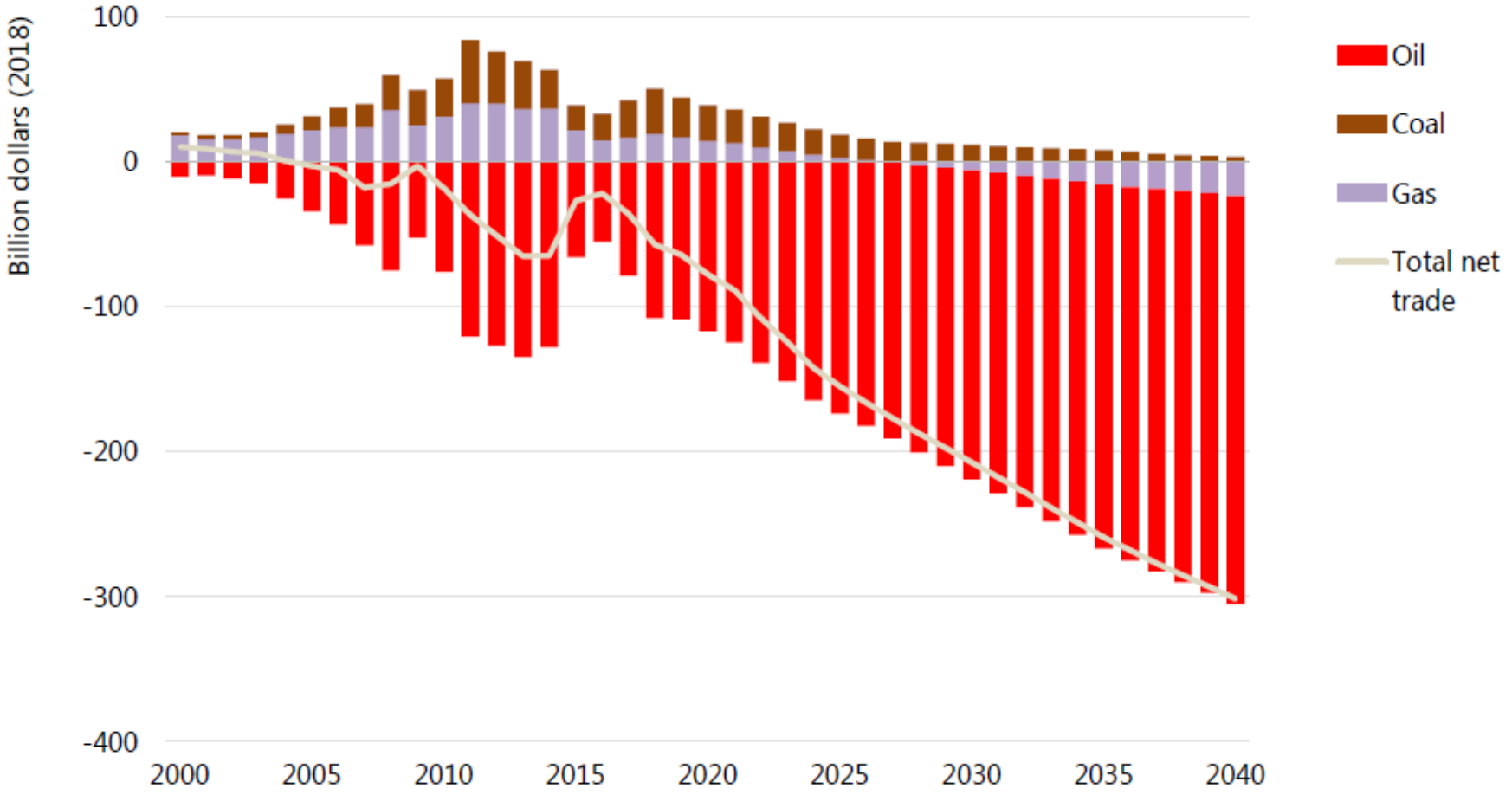
Negative trade balance

Fossil fuel trade balance in Southeast Asia in the Stated Policies Scenario

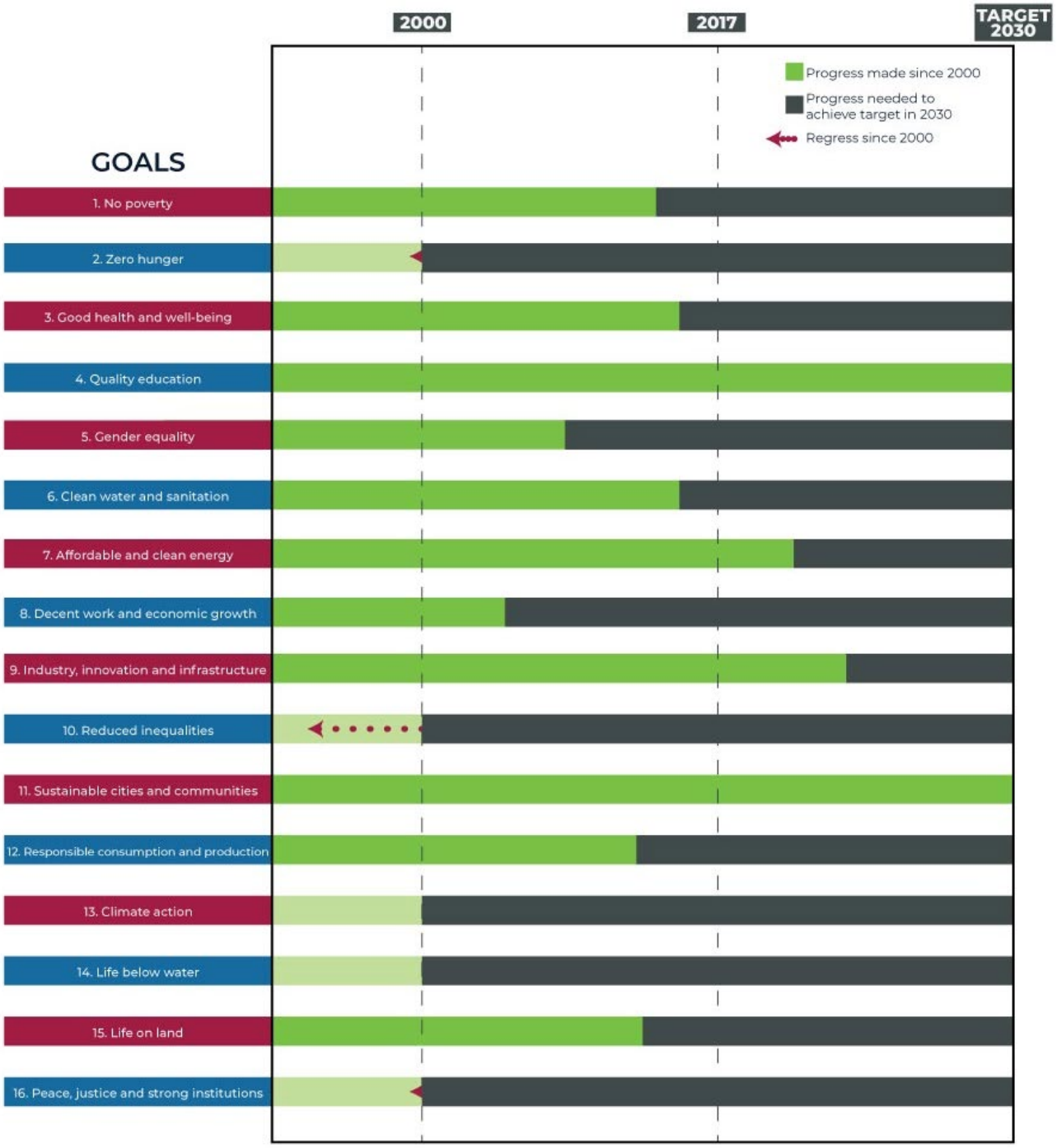


(IEA, Southeast Asia Energy Outlook 2019)

Threat to energy security

Equity problems

https://theaseanpost.com/article/southeast-asias-widening-inequalities



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Contesting the dominant regime

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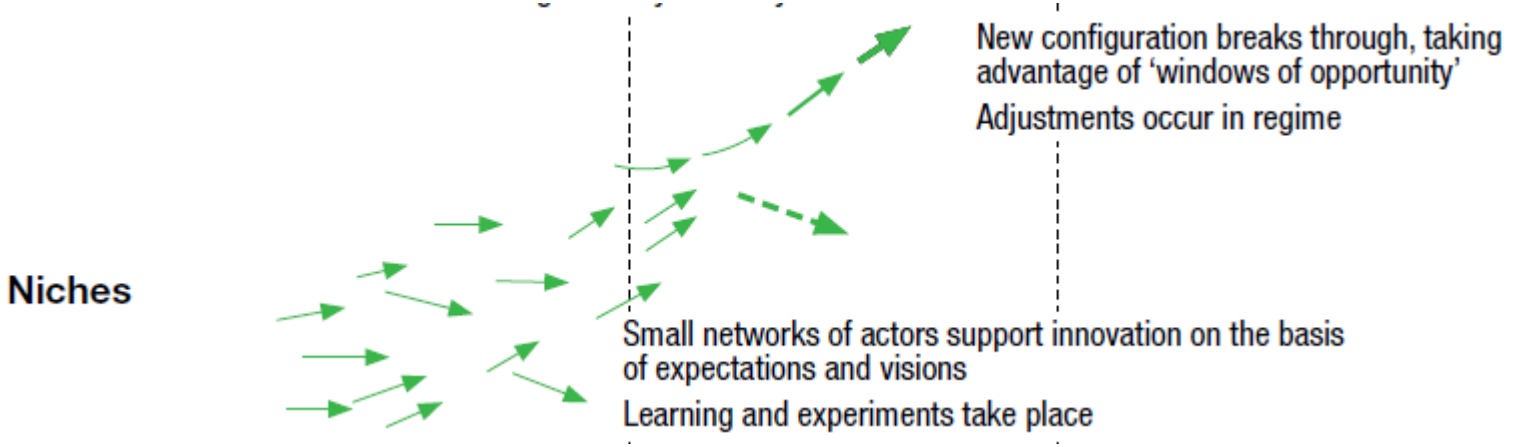
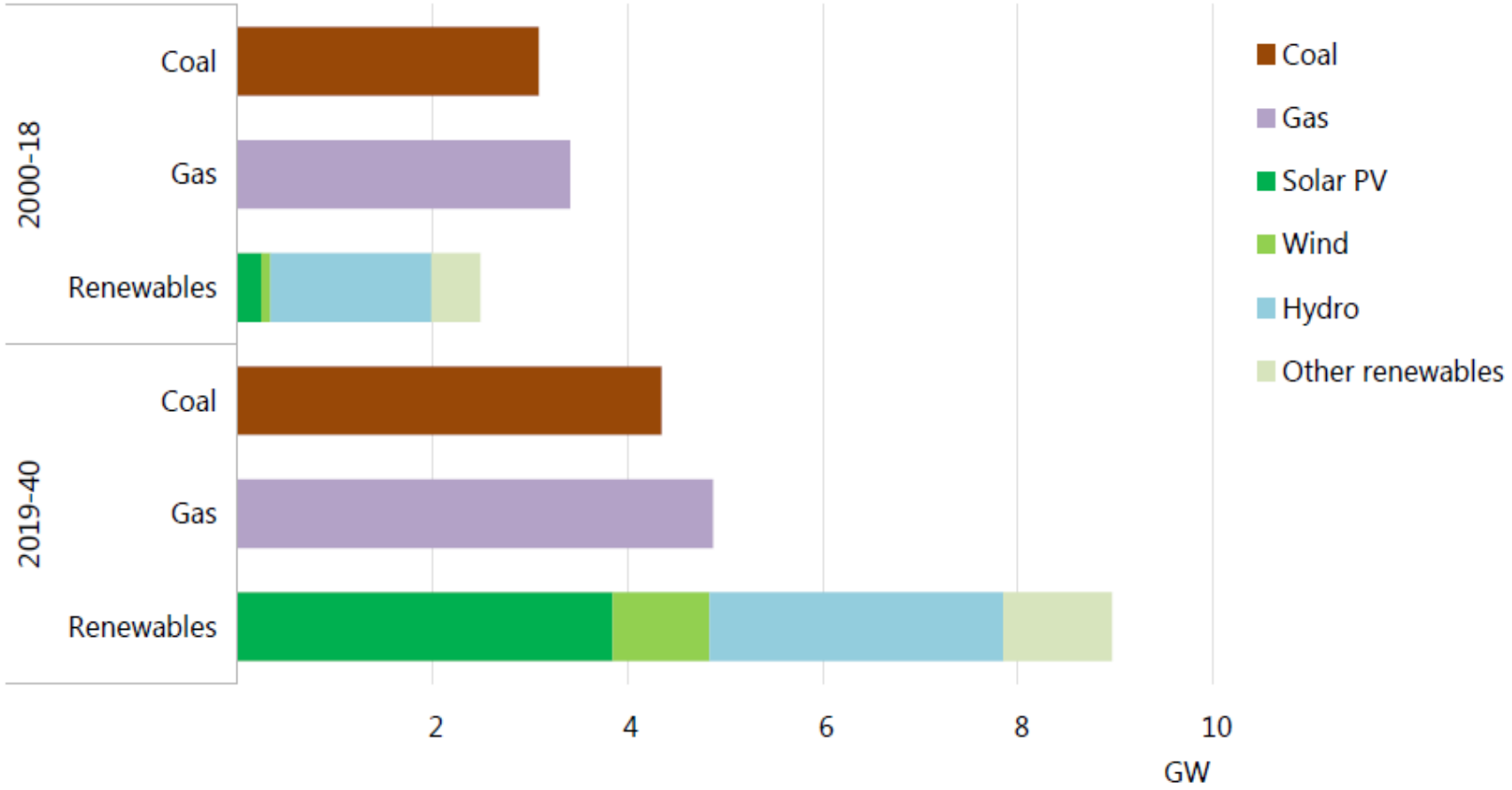
Emerging niches and 'cracks' in the regime



More and more renewable energy technologies

Increase in RE capacity

Southeast Asia's average annual capacity additions by type in the Stated Policies Scenario



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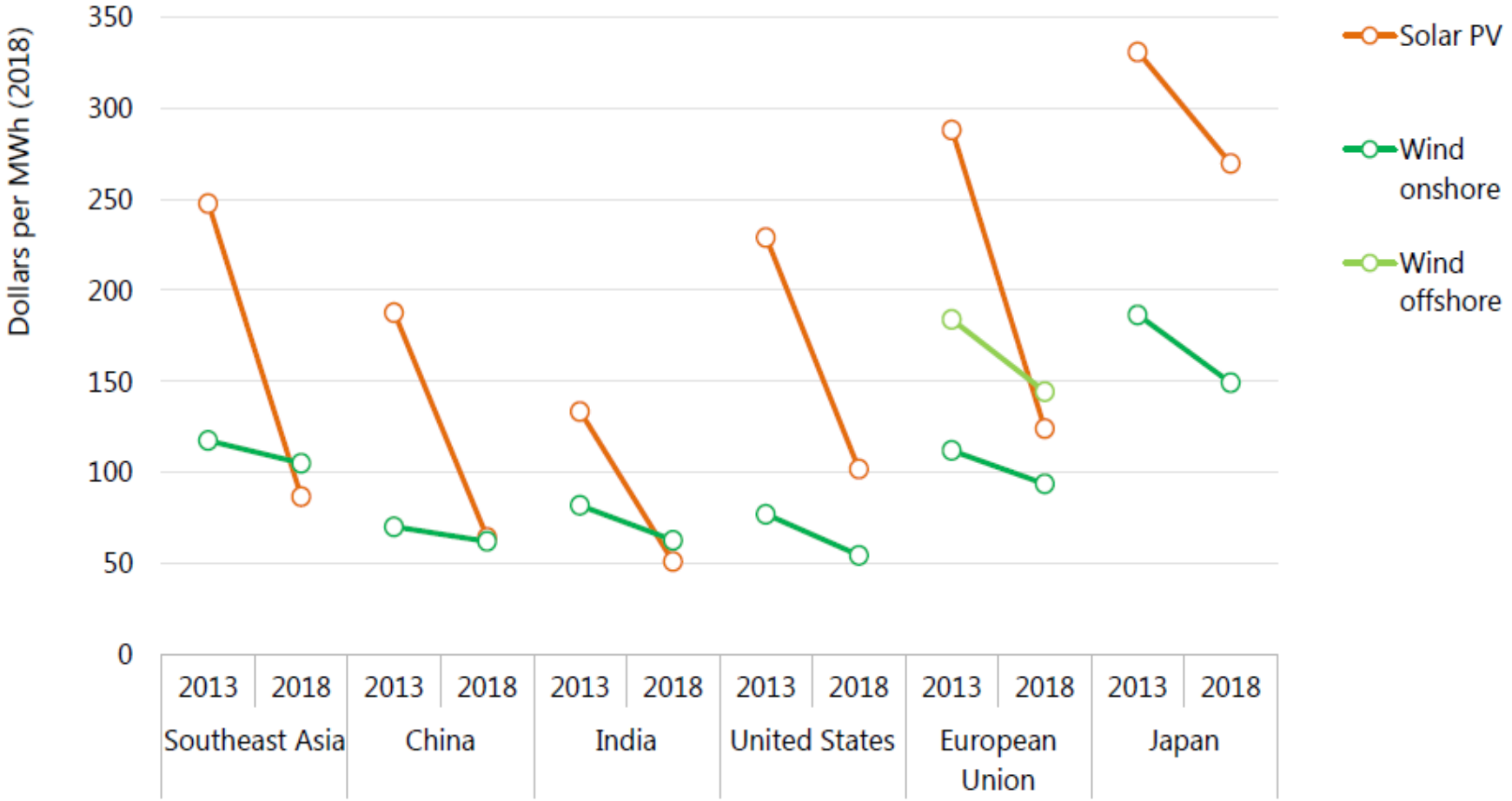
(IEA, Southeast Asia Energy Outlook 2019)

Falling costs of renewable energy

Levelised cost of electricity in selected regions and countries, 2013-18



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(IEA, Southeast Asia Energy Outlook 2019)

Emerging decentralised energy solutions

Connecting to rural areas and needs (going beyond technical solutions)

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Towards universal access?

Table 5.3 ▷ **Number of people without access to modern energy services in Southeast Asia, 2013**

	Without access to electricity		Traditional use of biomass for cooking*	
	Population (Million)	Share of population	Population (Million)	Share of population
Brunei Darussalam	0	0%	0	0%
Cambodia	10	66%	13	88%
Indonesia	49	20%	98	39%
Lao PDR	1	13%	4	65%
Malaysia	0	1%	0	0%
Myanmar	36	68%	49	93%
Philippines	21	21%	53	54%
Singapore	0	0%	0	0%
Thailand	1	1%	15	23%
Viet Nam	3	3%	42	47%
Total Southeast Asia	**120**	**19%**	**276**	**45%**

Sub-conclusion energy transitions

- Energy transitions (as socio-technical systems) and their direction are not a given
- Influencing/changing regimes is very hard and involves a large number of variables and stakeholders
- Dominant regimes tend to reproduce themselves (similar strategies/solutions/knowledge)
- Yet, there are new solutions/niches out there
- Higher education should not focus on reproducing the current energy regime, but rather sensitise students to think about alternative futures

Implications of/for higher education

Needs assessment (MEEE proposal)

1. There are **no established renewable energy programmes** or energy trainings facilities
2. Knowledge on renewable energy is **traditional, outdated, or inaccurate**
3. There is **little emphasis on field (practical) training** and linkages to relevant energy stakeholders including both public and private entities
4. Existing renewable energy **curricula are very technical** with very little environmental, social, political, economic or cultural aspects of energy

Needs assessment (MEEE proposal)

5. **University departments are segregated**; energy courses are not streamlined
6. Curricula **change is slow** due to rigidity of Myanmar education system
7. Renewable energy is **mostly taught at postgraduate level**
8. **Universities need permission** to collaborate with international partners

MEEE's potential contribution (proposal)

1. **Streamline existing renewable energy courses** at Myanmar universities into one course, or one established energy education programme (at undergraduate and postgraduate level).
2. **Organise crossovers to different departments** through seminars, tours, guest lectures, (elective) course flyers, and the like.
3. **Strengthen the collaboration between renewable energy education and renewable energy companies** through guest lectures, practicals, tutorials, workshops, tours and day visits, thesis guidance, and the like.

MEEE's contribution (proposal, con't)

4. **Organise internship meetings and seminars** discussing the option to work with a renewable energy institutes (e.g. company, civil society group, ministry).
5. **Survey renewable energy companies** on skills needed, in order to create competency based renewable energy curricula

Thank you!

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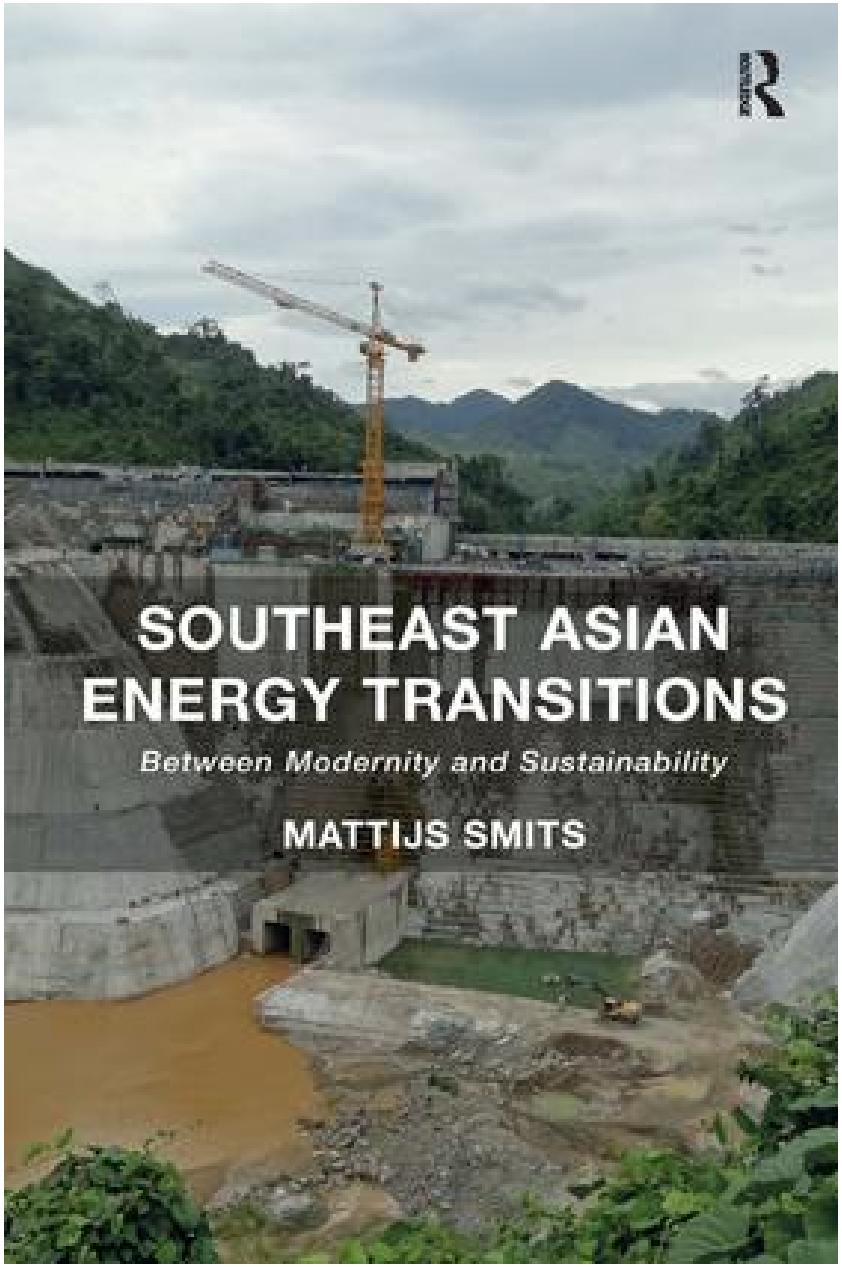
Book: Southeast Asian Energy Transitions

Published with Ashgate/Routledge (2015)



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