

Energy transition governance in the ASEAN: current status and future prospects

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Abstract

Purpose – A study of Association of Southeast Asian Nations (ASEAN) member states' (AMS) norm entrepreneurial practices regarding the energy transition to reveal insights into its current and future governance.

Design/methodology/approach – Understanding why the notion of an energy transition has garnered support, and importantly, knowing what this means for the future requires reviewing the forces of norm entrepreneurship at play. By adopting a constructivist lens, this article undertakes a comparative analysis of the “modes of transmission” of the energy transition amongst AMS.

Findings – ASEAN nations have in many respects been at the vanguard of the energy transition. Yet the governments themselves demonstrate both norm entrepreneurial and antipreneurial characteristics. Notwithstanding this mix, there are extant opportunities for “intraconnection” – in the form of cooperation between AMS and “interconnection” – in the form of cooperation between AMS and other state and non-state actors.

Practical implications – This article underscores the importance of partnerships in the energy transition: both in enabling AMS to meet their respective nationally determined contributions (NDCs) but also crucially in catalysing action amongst a broader swathe of countries.

Originality/value – Applying the lens of norm entrepreneurship to the ASEAN context, including introducing novel conceptions of “conductive” practices that drive the energy transition and “resistive” practices that slow it down.

Keywords Governance, ASEAN, Energy transition, Net-zero, Norm entrepreneurship

Paper type Research paper

1. Introduction

Article 4(1) of the Paris Agreement enshrines a commitment to reach carbon neutrality before the end of the century. Pivotal to this commitment is the energy transition. The energy transition necessitates a shift from the fossil fuel sources that dominate the current energy system towards renewable alternatives, doing so in a just way. In parallel, global energy demand looks set to increase through mid-century and there are outstanding issues of equity to access. Striking a balance between the imperatives of energy decarbonisation and development is therefore of prime importance to the world, reaching the temperature goals of the Paris Agreement, which is to limit warming to well below 2 °C while pursuing efforts to limit the increase to 1.5 °C. Within this context, the Association of Southeast Asian Nations (ASEAN) is a key case study of the importance of coordinated and cogent energy transition. The ASEAN is a regional grouping whose members face the prospects of rapid economic growth in tandem with an attendant rise in energy demand. ASEAN's energy supply is

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presently dominated by fossil fuels, with renewable energy accounting for approximately 13.9% of its total energy supply (APEC, 2020). However, the region has significant prospects to expand its levels of renewable energy and enhance energy efficiency as part of the energy transition. Indeed, the energy transition forms a mainstay of most nationally determined contributions (NDCs) of ASEAN member states (AMS). As such, the case study of the ASEAN demonstrates the complementary nature of the energy transition as a prospective means of fuelling both low-carbon economic growth and human development. Several studies have documented the mechanics and potential for an ASEAN energy transition (Vidinopoulos, Whale, & Hutfilter, 2020; Phoumin, Kimura, & Arima, 2021; Overland *et al.*, 2021; Handayani *et al.*, 2022). To provide an additional perspective, this article adopts a constructivist methodology to assess norm development and diffusion of the energy transition as a norm within the ASEAN. Specifically, in relation to the energy transition it sets out to explore the degree to which AMS governments demonstrate attributes as norm entrepreneurs (actors who promote norms) and antipreneurs (actors who oppose them) (Bloomfield & Scott, 2017). By going beyond the technical assessments this article thus exposes the broader governance and policy landscape underpinning the energy transition in the ASEAN (Chien, Chau, & Sadiq, 2023).

This article begins in Section 2 by introducing the substance of the energy transition, both globally and in reference to AMS. This section also introduces the article's focus on the electricity sector due to its centrality to the energy transition and economic development at large. Section 3 outlines the constructivist methodology applied to assess the energy transition *in situ* amongst AMS. Section 4 examines the various "modes of transmission" of the energy transition in AMS. As part of this, the section reviews the structure of the energy market and NDC pledges amongst AMS and probes the concept of norm entrepreneurs, who act as "conductors" of the energy transition and norm entrepreneurs who act as "resistors" to such normative change. Section 5 then assesses the prospects for broader transmission of the energy transition in ASEAN. In doing so it assesses both the prospects for intra-connection amongst AMS, as well as inter-connection between AMS and other proponents of the energy transition globally. Section 6 concludes with a summary of the current and future energy transition of the ASEAN and its implications for its future normative development.

2. A primer on the energy transition and the ASEAN

The energy transition is a concept embedded into many NDCs to reach the Paris Agreement. The objective of the energy transition is to shift from non-renewable to renewable sources of energy while ensuring its security, reliability, accessibility and affordability. While at first glance this appears a straightforward ambition on a global scale, its translation to local country contexts brings with its significant complexities. This section first introduces the energy transition as a global phenomenon before examining it in the context of the ASEAN.

2.1 The global energy transition

The International Renewable Energy Agency (IRENA) posits that the global energy transition will occur in two key phases (IRENA, 2021). The first phase, from 2021–2030 entails the rapid phaseout of coal power and expansion of renewable energy (IRENA, 2021). The second phase, from 2031–2050 features the rapid phaseout of fossil fuels for transport and feedstock (IRENA, 2021). To determine what the first phase of the energy transition entails for a given context it is necessary to consider several aspects. Gaining a comprehensive understanding of the status quo of the energy scenario of a given country is an essential starting point in ascertaining the energy transition. This means understanding the sources of energy generation and their respective percentages of total

energy generation. Another element that it is helpful to establish at this stage is the proportion of renewable vs non-renewable energy generation and options to increase the share of the former. There are, after all, a range of different renewable energy generation options, some of which will be more appropriate than others for a specific country context. Countries' endowments of natural resources, including those that enable wind, hydro, solar and geothermal generation, can be a key determinant here. Of course, energy supply is only one half of the equation: it is equally essential to consider energy demand scenarios to ensure that energy generation and consumption are balanced. Energy efficiency measures should also be considered in tandem including understanding what energy efficiency measures are appropriate, and how these may impact future total energy demand of the country in question.

The energy transition encompasses the full range of energy supply and demand of a given country, including electricity and fuels. Due to the breadth of the energy transition at large, this examination focuses on electricity generation. The electricity sector is one the largest emitters of greenhouse gas emissions, and consequently the source of the largest source of potential emissions reductions. As part of the energy transition, electricity generation is also set to expand, especially in scenarios where warming is limited to 1.5 °C (IRENA, 2021; IRENA, 2023). Indeed, already more electricity capacity was added from renewable sources between 2013–2020 than from fossil fuels and nuclear combined (IRENA, 2021). The aspect of enhanced electrification in the energy transition is underpinned by several key developments. First, in many contexts, renewable energies are no longer just cost-competitive with their fossil fuels counterparts, they are increasingly the lowest-cost sources of added grid generation capacity (IRENA, 2021). Indeed, the International Energy Agency (IEA) predicts that by 2025 they will outstrip coal as the largest source of electricity generation (IEA, 2024a). Second, there is a wide and growing range of technological innovations that are being implemented to manage the variability of renewable energy sources (IRENA, 2021). Third, investors are aware of the transition of the electricity sector towards more renewables and are increasingly taking advantage of the attractive investment opportunities the sector renders, with clean energy investments nearly doubling those in fossil fuels (IEA, 2024b). These trends in global electrification are expected to continue to drive further global diffusion of the energy transition, as well as its translation to local contexts.

The diffusion of the energy transition from a high-level norm to local contexts can be best understood through a focus on energy supply and demand. On the supply side, electricity generation can be switched from fossil fuels to renewable sources by phasing out fossil fuels and expanding renewable energy generation and capacity. This both reduces greenhouse gas emissions from power directly as well as adds the required electrical capacity needed for a societal shift to low-carbon technologies such as electric vehicles. On the demand side, improvements in energy efficiency can help further decouple economic growth from greenhouse gas emissions. This results in less import dependency and consequently enhanced energy security without economic trade-offs. Importantly it can also reduce greenhouse gas emissions and localised air pollution and their associated health impacts. Already, the IEA notes that energy demand has started to become decoupled from carbon emissions, with the latter growing 25% slower than energy demand in 2018 (IEA, 2018). Such opportunities demonstrate the importance of the energy transition as a means of improving the global economic, social and environmental landscape.

Implementing the energy transition requires overcoming barriers to adoption whilst maximising its potential return to society. Barriers to the energy transition may include high levels of fossil fuel dependence, lack of finance, an uncertain regulatory environment for developers and technological constraints. Opportunities for an energy transition may stem from intra-regional and inter-regional partnerships. These “interconnection” opportunities

can range from financing through to technology transfer. The role of norm entrepreneurs and antipreneurs as respective stalwarts of opportunities and barriers should also not be underestimated as they directly influence the success or difficulties involved in norm diffusion, including at a regional level such as the ASEAN.

2.2 The ASEAN

The ASEAN emerged as an informal regional economic grouping on the 8th of August 1967 with the founding members of Indonesia, Malaysia, the Philippines, Singapore and Thailand. The ASEAN later grew to reach its current membership of ten members which includes Brunei Darussalam, Cambodia, Laos, Myanmar and Vietnam. In 2008, the ASEAN was formally launched as an international organisation via the ASEAN Charter. Despite large differences between AMS, members are united through their focus on two core aims and purposes: accelerating economic growth, social progress and cultural development in the region on the other hand promoting regional peace and stability. ASEAN relations are also governed by a Treaty of Amity and Cooperation (TAC) in Southeast Asia initially signed at ASEAN's first summit in 1976, and amended in 1987, 1998 and 2010- has a broad range of signatories and creates a legally binding code for inter-state relations [1]. The TAC enshrines several principles including:

- (1) Mutual respect for the independence, sovereignty, equality, territorial integrity and national identity of all nations;
- (2) The right of every state to lead its national existence free from external interference, subversion or coercion;
- (3) Non-interference in the internal affairs of one another;
- (4) Peaceful dispute resolution;
- (5) Renunciation of the threat or use of force; and
- (6) Effective cooperation.

The TAC bears a strong influence on how the ASEAN states cooperate, and energy is a key area for cooperation. Indeed, AMS have recognised that energy policy cooperation is integral to its economic development since its leaders signed the ASEAN Energy Cooperation Agreement in 1986. Recent advancements in the technological potential of renewable energy and the urgency with which electricity emissions need to be reduced have seen the energy transition become a key focus of ASEAN's energy policy more broadly. To this end, AMS have developed and released four ASEAN Plans of Action for Energy Cooperation (APAEC) since 1999. The fourth APAEC (2016–2025) is split into two phases of implementation. Phase I covered 2016–2020 and focused on “enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All” (APEAC, 2020). Phase 2 runs from 2021–2025 and has the themes of “Accelerating Energy Transition and Strengthening Energy Resilience through Greater Innovation and Cooperation”. The fourth APAEC sets an aspirational target of 23% of the total primary energy supply (TPES) being provided from renewable sources by 2025, up from 13.9% in 2018 (APEAC, 2020).

The energy transition of the ASEAN anticipated by the APAEC creates opportunities and barriers for the region at present. The high proportion of fossil fuels in the ASEAN energy mix presents an opportunity in terms of the energy transition as a norm. Yet the reliance on a mix of fossil fuels such as coal, gas and oil means that a higher degree of transition is required. But a large-scale transition is feasible. The predicted TPES needed in 2040 under

ASEAN's target scenario is 52,293 petajoules of energy generation and the total technical potential that exists amongst solar, wind, hydro and geothermal potential of 216,451 petajoules (World Bank, 2022). This illustrates that it is indeed technically possible for ASEAN to source 100% of its TPES from renewable energy sources (World Bank, 2022). However, adequate financing is crucial to make this transition. This conclusion is echoed in a policy brief of the ASEAN Centre for Energy which identifies financial constraints as the primary barrier to the energy transition in the region (IRENA, 2021).

However, a large-scale energy transition could also create significant opportunities for the region. ASEAN has abundant natural resources for renewable energy development (Phoumin, 2021, p. 5). Development of this potential could not only deliver direct economic benefits in terms of employment, they also equally reduce the many direct and indirect health impacts suffered by those subjected to high levels of particulate pollution from fossil fuel use. While the benefits of the energy transition to AMS are clear, consideration of the individual energy transitions of AMS requires an understanding of the disparity between their economic and energy systems at present. Table 1 provides an overview of economic and energy comparators pertinent to examining the energy transition in the context of the ASEAN:

As Table 1 demonstrates the Human Development Index (HDI) scores of AMS span categorisations from Very High to High and Medium. Similarly, while the populations of some AMS enjoy full electricity coverage, in others, connectivity rates are much lower. For this reason, access to and the affordability of energy is understandably a core concern of several AMS. The electricity systems of AMS also demonstrate differing carbon intensities of the electricity end product with Brunei's being over 3x the carbon intensity than Lao.

To bring the energy transition into fruition from this baseline it is necessary to consider the different modes of transmission available to AMS. The need for a broad-based energy transition in the ASEAN is reflected in the rapid rate of economic development the region is set to experience (IRENA, 2021). However, given the high prevalence of fossil fuels in the overall energy mix of the ASEAN, a concerted effort amongst all member states is needed for a successful energy transition. Resolving this requires AMS to balance the "energy trilemma of energy security, energy equity and environmental sustainability" (APEAC, 2020; Overland *et al.*, 2021; Phoumin *et al.*, 2021).

ASEAN member state (AMS)	Human development index rank (2022)	Human development index value (2022)	Electricity access as a % of total population (2022) (%)	Grams of CO ₂ equivalents per kilowatt-hour (2022)
Singapore	9	0.949	100	474
Brunei Darussalam	55	0.823	100	894
Malaysia	63	0.807	100	606
Thailand	66	0.803	99.9	561
Indonesia	112	0.713	100	676
Philippines	113	0.710	94.8	601
Vietnam	107	0.726	100	410
Lao PDR	139	0.62	100	266
Cambodia	148	0.6	92.3	418
Myanmar	144	0.608	73.7	606

Source(s): World Bank (2024) and Our World in Data (2024)

Table 1.
Economic and energy comparators of AMS

3. Methodology

[Section 2](#) outlined how the energy transition is a norm with both global reach and highly localised application to the ASEAN. To investigate its impact in this regard, this paper adopts a constructivist perspective utilising the concepts of the “community of practice” and “norm diffusion” and adapting them to elucidate insights into the energy transition. This section outlines the methodology used to elucidate the community of practice as well as the “modes of transmission” of the energy transition adopted by AMS.

3.1 Norm development

Understanding norm development involves gaining an appreciation of its community of practice. Classically, a community of practice is understood to be composed of both norm entrepreneurs and epistemic communities ([Brunnée & Toope, 2010](#)). Norm entrepreneurs are actors who help orchestrate a shift to a new norm. Norm entrepreneurs do this through a range of mechanisms making their commitment to change, coalition building, demonstrating that non-compliance with existing norms is less costly or making compliance with new norms seem to be more beneficial ([Sunstein, 1996](#)). Such norm entrepreneurs are, in turn, supported by epistemic communities who help generate the necessary knowledge concerning the scope and practice of a given norm. The contribution of epistemic communities also furthers the legitimacy of new norms by grounding them in expert discourse. Communities of practice are bound together by shared understandings of a norm with epistemic communities shaping norms and norm entrepreneurs putting them into practice. Applied to the context of the energy transition, norm entrepreneurs can come from both state and non-state domains. In some countries, governments have been pioneers of the energy transition, and in others private companies. This paper proposes a specific conception of norm entrepreneurs in the context of the energy transition as “conductors”. These conductors may directly or indirectly promote renewable energy infrastructure, for example by creating a more stable regulatory regime for its development or directly funding or facilitating construction and operation of such infrastructure. They may also work to phase out fossil-intensive energy infrastructure, including disbanding fossil-fuel-enabling policy and financial frameworks such as subsidy regimes.

There is also the concurrent phenomenon of norm antipreneurs, who actively work to contravene a potentially emergent new norm ([Bloomfield & Scott, 2017](#)). Bloomfield and Scott outline five categories of norm antipreneurial behaviour, such as direct opposition to a norm, those who creatively reject it by interest capture and those who strongly support the status quo ([Bloomfield & Scott, 2017](#)). In the context of the energy transition, governments and private companies may act as norm antipreneurs. Such stakeholders may act as “resistors” to such change by making a more complex policy framework for renewable energy development or failing to divest from or even in some cases upgrading existing fossil fuel-intensive infrastructure. In this way, the efforts of norm antipreneurs to thwart an emergent norm can be considerably more nuanced than that of a norm entrepreneur. Of course, the same actor may exhibit a full range of norm entrepreneurial and antipreneurial behaviours and modify behaviour as the context dictates. As a result, considering both norm entrepreneurship and antipreneurship can help provide more textured insights into norm diffusion.

The heterogeneity of norm development underscored by the extant literature helps set the scene for the role played by norm entrepreneurship and antipreneurship in norm diffusion. Yet, regime building also depends very much on norm diffusion.

3.2 Norm diffusion

A community of practice – including norm entrepreneurs and norm antipreneurs – plays a key role in the broader process of norm diffusion. A useful framework in considering the role

norm entrepreneurs play in this regard is Finnemore and Skikkink's notion of a "norm lifecycle" (Finnemore & Sikkink, 1998). A complete "norm lifecycle" involves three key stages: emergence, cascade and internationalisation. While not every norm will complete or even advance beyond the norm emergence phase, Finnemore and Skikkink's framework helps underscore norm building as a continual process (Finnemore & Sikkink, 1998). The norm lifecycle begins with norm "emergence" where norm entrepreneurs seek to persuade other network participants of the value of a norm. From here norms may reach the stage of "cascade", where through socialisation, states and other actors see norm adoption as a means of enhancing their legitimacy (Finnemore & Sikkink, 1998). If norms have reached the tipping point of cascade, they may become internalised within the system. It is at the stage of "internationalisation" where conformity with norms is sought and is reflected in a number of professional and bureaucratic settings including law and policy (Finnemore & Sikkink, 1998). There is a range of factors individual to the setting of a norm that can affect the success of norm diffusion and adaptation to local contexts in the latter two stages of the norm lifecycle. It is also vital to acknowledge that completion of the norm lifecycle "is not inevitable" (Finnemore & Sikkink, 1998). In fact, Finnemore and Skikkink recognise that "many . . . norms fail to reach a tipping point" from emergence to cascade (Finnemore & Sikkink, 1998). Equally, only appreciating the role of norm entrepreneurs in the norm lifecycle can present an overly optimistic picture of norm diffusion. Hence the importance of positioning norm entrepreneurial and antipreneurial behaviour within a given community of practice before ascertaining the extent of norm diffusion *in situ*.

4. Norm development: modes of transmission

The initial composition of AMS energy systems informs the baseline for the energy transition and equally affords insights as to future opportunities to further spur the transition. The section below introduces each AMS before assessing the extent to which they reveal behaviour characteristic of norm development.

4.1 Generally

Other studies demonstrate that ASEAN has a high potential to shift to renewable energy (Vidinopoulous *et al.*, 2020; IRENA, 2021). Yet, of course, the specific type of renewable energy prospects that specific type of opportunity each has is highly context dependent as Table 2 reveals the following information:

Brunei	Cambodia	Indonesia	Lao PDR	Malaysia
1. Solar	1. Solar	1. Solar	1. Solar	1. Solar
2. Hydro	2. Wind	2. Hydro	2. Hydro	2. Hydro
3. Wind	3. Hydro	3. Wind	3. Wind	3. Wind
		4. Biomass	4. Biomass	4. Biomass
		5. Geothermal	5. Geothermal	
Myanmar	Philippines	Singapore	Thailand	Vietnam
1. Solar	1. Solar	1. Solar	1. Solar	1. Solar
2. Wind	2. Wind	2. Wind	2. Wind	2. Wind
3. Hydro	3. Hydro		3. Hydro	3. Hydro
4. Biomass	4. Geothermal		4. Biomass	4. Biomass
	Bio			5. Geothermal

Source(s): The author's construction based on Table 2 of Handayani *et al.* (2022)

Table 2.
Availability of
renewable energy
resources within AMS

Given this potential, it is necessary to consider the current energy mix and the unique role played by AMS as both norm entrepreneurs and norm antipreneurs of the energy transition. [Table 3](#) below presents an overview of several key indicators of the energy transition, to which the lenses of norm entrepreneurship and antipreneurship can help tease out the status of norm diffusion in the ASEAN.

[Table 3](#) reveals a highly heterogenous pattern of norm diffusion across AMS. On the one hand, it highlights that norm entrepreneurial developments in terms of the energy transition have been seen across all contexts. On the other, it reveals that similarly, no state has wholly embraced it and that there is the parallel presence of norm antipreneurial practices as well.

4.2 Norm entrepreneurial behaviour

Energy infrastructure in the majority of AMS depends principally on governments. Even where there is a mixed public and private energy market structure, governments still retain an important role in their governance. As [Table 3](#) highlights, there are many examples of norm entrepreneurs within AMS. Indeed, many of the norm entrepreneurial attributes amongst AMS demonstrate the hallmarks of more general entrepreneurship approaches: direction setting and raising capital. [Table 3](#) demonstrates that nearly all AMS have set net zero targets, enhanced goals for the uptake of renewable energy and the phasing down of fossil fuels. The recent wave of Net-Zero commitments by a range of AMS indicates the importance of direction setting. As [Table 3](#) further exemplifies a significant proportion of AMS set both unconditional and conditional targets within their NDCs and continue to revise them. While this indicates enhanced ambition on their part, it also highlights the material challenges some AMS face in funding the energy transition. Analogous to entrepreneurs in the business world, long-term plans to scale renewable energy require detailed evidence and a documented pathway. To this end, several AMS governments have issued long-term strategies under the Paris Agreement, which reiterate their renewable energy pledges made in their NDC as well as their overall commitment to net-zero ([UNFCCC, 2024](#)). The existence of fossil fuel subsidies in the region also presents a mixed picture. Most AMS are indeed phasing out fossil fuels, and where they exist, these subsidies principally focus on the end-use electricity market to provide citizens with the necessary funds to meet their basic energy access needs. However, even states that retain a significant amount of fossil fuels recognise the need to alter this – such as joining the informal Friends of Fossil Fuel Subsidy Reform working group at the World Trade Organisation. A case in point of this is Indonesia which has gone further by highlighting in its updated NDC how phasing down fossil fuel subsidies has freed up fiscal space to work towards other aspects of its NDC ([Government of Indonesia, 2021](#)). It is also significant that the majority of AMS have made progress in expanding their renewable energy generation capabilities. A prime example of this in action is the Cambodian Government which in a successful collaboration with the Asia Development Bank, opened for tenders on a Solar Park. Receptivity to engage with epistemic actors is also shown on the part of Thailand which showed a strong willingness to engage with the IEA and IRENA on matters related to transforming the energy market, including via the advent of carbon pricing ([IEA, 2021](#)). In these ways, AMS continue to show interest in the energy transition and – to varying degrees – act as norm entrepreneurs in its realisation.

4.3 Norm antipreneurial behaviour

All AMS presently have the capacity to also act as norm antipreneurs of the energy transition. While there are many demonstrations of behaviour where AMS are promoting the energy transition as a norm, concurrently there remain examples of norm antipreneurial behaviours. A primary mechanism that this occurs is in competing directives being given to government departments tasked with overseeing the energy transition. The DES in Brunei

ASEAN member state	Net-zero target (Year set)	2030 NDC target and relevant energy transition plan	Major Fuel sources of electricity generation (2022)	Sources of renewable energy supply (2022)	Target for renewable energy	Fossil fuel subsidies trend and amount (millions of USD)	Actors within its community of practice: Energy transition
Brunei Darussalam	2050 (2021)	Unconditional Brunei reduction in GHG emissions by 20% relative to BAU levels by 2030. Energy reductions achieved through renewable energy	Gas – 77.6%; Coal – 21.6%; Oil – 1%	Solar (2 GWh)	Brunei has set a target of 35% share of renewable energy in power generation by 2035	Fossil fuel subsidies were decreasing in 2020. Petroleum subsidised: \$62 Million	Government: Department of Electrical Services (DES); SOE: Berakas Power Company (BPC)
Cambodia	2050 (2022)	Unconditional 41.7 % emissions reduction compared with the BAU levels by 2030. Energy emissions reductions achieved through investment renewable energy and energy efficiency measures.	Hydro – 57.9%; Coal – 32.3%; Solar – 6.8%; Oil – 2.9%	Hydropower (4025 GWh)	In 2020 Cambodia approved a Power Development Plan that aims to implement 1.8 GW of solar in Cambodia by 2030	Fossil fuel subsidies were decreasing in 2020. End-use Electricity – \$26 Million	Public/Private: Electricité du Cambodge (EDC), Independent Power Producers (IPPs)
Indonesia	2060 (2021)	Unconditional 26% reduction in GHG emissions below BAU. Conditional potential for an enhanced reduction of 41% below BAU. Energy emissions reductions achieved through new renewable capacity	Coal – 66%; Gas – 13.6%; Renewable Energy – 7.3%	Hydropower (21185 GWh); Geothermal (14,100 GWh); Wind (484 GWh) and solar (118 GWh)	Indonesia scaled up its renewable energy generation target to 51.6% of added capacity in its 2021–2030 electricity plan	Fossil fuel subsidies were increasing in 2020. Coal – \$4038 Million; End-use Electricity – \$3500 Million; Natural gas – \$1678 Million; Petroleum – \$7496 Million	Public Dominated: Perusahaan Listrik Negara (PLN); Limited IPPs (ERIA, 2017, p. 4)

(continued)

Table 3.

ASEAN member state	Net-zero target (Year set)	2030 NDC target and relevant energy transition plan	Major Fuel sources of electricity generation (2022)	Sources of renewable energy supply (2022)	Target for renewable energy	Fossil fuel subsidies trend and amount (millions of USD)	Actors within its community of practice: Energy transition
Laos	2050 (2022)	Unconditional NDC: 34% reduction compared to baseline scenario achieved in 2020 target by 2030. Energy reductions achieved through renewable energy and energy efficiency	Renewable Energy – 75.9%; Coal – 23.9%	19,739 GWh in 2019 in comparison to its only other renewable source – solar – which produced 41 GWh	30% renewable energy share of total energy consumption by 2025	Fossil fuel subsidies were increasing in 2020. End-use Electricity \$82 Million	Private/public: SOE Electricite du Laos (EDL); IPPs.)
Malaysia	2050 (2021)	Unconditional target to cut carbon intensity against GDP by 45% by 2030 compared to 2005 levels. No mention of specific energy directives in NDC	Coal – 46.8%; Gas – 34.3%; Renewables –16.6%	Hydropower (26,666 GWh); Solar (943 GWh)	Installed capacity target for renewable energy of 18,000 MW by 2035	Fossil fuel subsidies were decreasing in 2020. Petroleum – \$99 Million	Public/private: Peninsular Malaysia and the states of Sabah and Sarawak each have their own regional monopolies generation companies- Tenaga Nasional Berhad, Sabah Electricity Sdn. Bhd and Syarikat SESCO Berhad (SESCO); IPPs

(continued)

ASEAN member state	Net-zero target (Year set)	2030 NDC target and relevant energy transition plan	Major Fuel sources of electricity generation (2022)	Sources of renewable energy supply (2022)	Target for renewable energy	Fossil fuel subsidies trend and amount (millions of USD)	Actors within its community of practice: Energy transition
Myanmar	No Net Zero Target	No quantified GHG emissions reduction in NDC. Energy emissions reductions achieved through investment renewable energy and energy efficiency measures	Gas – 54.8%; Hydro – 43.4%	Hydropower (10,518 GWh); Solar (45 GWh)	12% of all electricity generated in Myanmar be renewable by 2025	Fossil fuel subsidies were decreasing in 2020. End-use Electricity – \$603 Million	State Dominated: The Ministry of Electric Power No. 1 governs the development of hydroelectricity and electric power plants; Ministry of Electric Power No. 2 covers the construction and operation of thermal power plants and regulates the transmission, distribution and retail of electricity. Myanmar Electric Power Enterprise (MEPE) is the sole energy purchaser in Myanmar and there are two state owned enterprises governing distribution: the Yangon Electricity Supply Board (YESB) and the Electricity Supply Board (ESB); Limited IPPs
<i>(continued)</i>							

Table 3.

ASEAN member state	Net-zero target (Year set)	2030 NDC target and relevant energy transition plan	Major Fuel sources of electricity generation (2022)	Sources of renewable energy supply (2022)	Target for renewable energy	Fossil fuel subsidies trend and amount (millions of USD)	Actors within its community of practice: Energy transition
Philippines	No Net Zero Target	GHG emissions reduction and avoidance of 75% by 2030 of which 2.71% is unconditional and 72.29% is conditional. Emissions reductions from energy to be achieved through investment in sustainable energy systems	Coal – 59.6%; Gas – 16%; Geothermal – 9.3%; Hydro – 9.0%; Oil – 2.3%	Geothermal (10,691 GWh), Hydropower (8025 GWh), Wind (1042 GWh); Solar (1246 GWh)	National Renewable Energy Program (NREP) 2020–2040. has a target of 35% share of renewable energy in the power mix by 2030 and 50% by 2040	Fossil fuel subsidies were increasing in 2020. Natural Gas – \$34 Million	Private/Public – The National Power Corporation (NPC) now authorises IPPs who are the primary developers of new electricity
Singapore	2050 (2022)	Reduce Emissions Intensity by 36% from 2005 levels by 2030. Emissions reductions from energy to be achieved through investment in sustainable energy systems	Gas – 91.6%; Waste – 2.6%; Oil – 2.6%	Solar (622 GWh)	Plans to import 4GW of low-carbon electricity by 2035, to ensure that 30% is renewable	Fossil fuel subsidies were increasing in 2020. End-use Electricity – \$8395 Million	Private dominated: IPPs apply directly to the government for licences to develop electrical capacity

(continued)

ASEAN member state	Net-zero target (Year set)	2030 NDC target and relevant energy transition plan	Major Fuel sources of electricity generation (2022)	Sources of renewable energy supply (2022)	Target for renewable energy	Fossil fuel subsidies trend and amount (millions of USD)	Actors within its community of practice: Energy transition
Thailand	2050 (2021)	Unconditional 20% emissions reductions by 2030 BAU up to 25% conditional. No mention of energy in NDC	Gas – 56.4%; Coal – 19.6%; Biofuels – 9.8%; Oil – 5.7%	Hydropower (6446 GWh); Solar (5146 GWh); Wind (3670 GWh); Geothermal (1 GWh)	Thailand's Power Development Plan aims to achieve total renewable energy capacity in Thailand could increase to 37% by 2036	Fossil fuel subsidies were decreasing in 2020. Coal – \$20 Million; Petroleum – \$396 Million	Public/private mix: Government EGAT, SOEs Provincial Electricity Authority (PEA) and Metropolitan Electricity Authority (MEA).; IPPs and small power producers (SPPs)
Viet Nam	2050 (2021)	Unconditional 9% reduction from BAU emissions by 2030, a 27% additional conditional commitment. Emissions reductions from energy to be achieved through investment in sustainable energy systems	Coal – 40.2%; Hydropower – 34.7%; Gas – 10.6%; Solar – 10.3%	Hydropower (66,117 GWh); Solar (4818 GWh); Wind (722 GWh)	32% of total primary supply and electricity generation by 2030 (to be updated by PDP 8)	Fossil fuel subsidies were decreasing in 2020. Coal – \$271 Million	State dominated: SOE of Vietnam Electricity (EVN), some IPPs and SPPs

Source(s): World Bank (2022), U.S. Department of International Trade (2021), Reuters (2021a), ERIA (2017), Malaysian Investment Development Authority (2021), Philippines' Government (2021), Reuters (2021b), S&P Global Commodity Insights (2021), Smart-Energy (2020), Government of Indonesia (2021), IEA (2021, 2024c)

provides a primary example of this as it has conflicting objectives of growing and diversifying Brunei's downstream oil and gas sector whilst also strengthening sustainable energy efforts (U.S. Department of International Trade, 2021). In addition to conflicting duties, another issue is where there is a direct conflict of interest. Illustrative of this dynamic is a situation where state-owned enterprises are entrusted with enacting policies contrary to their economic position, for instance, Indonesia's PLN is tasked with stimulating renewable energy developments, whilst also exploring its fossil fuel reserves (Kearney, 2022). Similarly, far from the recognised need to phasedown coal as part of the Glasgow Climate Pact (UNFCCC, 2021, [20]) and to phase out fossil fuels at COP28 (UNFCCC, 2023, [28(d)]), some AMS remain increasingly wedded to fossil fuel integration as part of the energy transition. This is for instance demonstrated by Indonesia's NDC, which includes minimum targets of coal and natural gas can be seen as a backward slide (Government of Indonesia, 2021). Similar concerns over the role of fossil fuels, and their relative priority in comparison to renewable energy were also expressed in relation to Vietnam's Eighth Power Development Plan (Energy Tracker, 2021). The impact of such norm antipreneurial practices still largely remains to be seen. Nonetheless, it is recognised that it has a detrimental effect on further implementing the energy transition; in particular by limiting options to address financial and technical barriers.

4.4 Role of states as norm entrepreneurs

AMS governments demonstrate both norm entrepreneurial and antipreneurial qualities in the context of the energy transition. By examining the role played by each AMS within the community of practice one gains an appreciation of their important role in shaping the ultimate success of the energy transition. It is, for instance, clear that interactions with the broader community of practice remain key as the successful examples of partnership with epistemic agencies on the part of Cambodia and Thailand (see Table 3). Similarly, conducive behaviour is demonstrated by strong leadership in NDC target setting and positioning the energy transition within the broader trend towards low carbon development. Equally, too much co-option or distraction from advancing energy transition – such as by backsliding on renewable energy targets – in turn, reveals resistive behaviour that slows down the adoption of a potential norm. Indeed recent assessments show that the energy transition, although apparent is progressing slowly in the ASEAN, with countries having attracted no more than US \$8 billion between 2016–2021 (Chien *et al.*, 2023).

5. Norm diffusion

As has been revealed by examining the role of AMS governments within the community of practice, electricity generation and distribution is only half of the energy transition equation: the other is the opportunities for “intraconnection” between ASEAN and “interconnection” with the rest of the world. These opportunities both strengthen the size, speed and resiliency of the energy transition's norm diffusion and importantly help mitigate barriers to its realisation.

5.1 Intra-connection

ASEAN energy ministers have long indicated interconnection to be a priority for the region. Since the first APAEC in 1998 the integration of the ASEAN Power Grid (APC) has been a core driver. The APC is the first of seven focus areas of the current APAEC. At present, the APC comprises a variety of interconnected national grids. Energy transfer agreements between these national grids in the ASEAN are primarily bilateral in nature. Currently, Lao PDR, rich in its hydropower capabilities, is the largest ASEAN electricity exporter.

Concurrently, Laos PDR's neighbour, Thailand, is currently the largest ASEAN's electricity importer. ASEAN ministers plan on enhancing the APC in order to build a fully functional regional grid whereby energy generated in one can be seamlessly integrated to meet energy demand elsewhere (APEAC, 2020).

The plan to upgrade and better integrate the APC lists a total of 13 interconnection projects as of April 2020 occurring between Peninsular Malaysia-Singapore; Thailand-Peninsular Malaysia; Sarawak-Peninsular Malaysia; Batam-Singapore; Philippines-Sabah; Sarawak-Sabah-Brunei; Thailand-Lao PDR; Lao PDR-Vietnam; Thailand-Myanmar; Vietnam-Cambodia and Lao PDR-Cambodia (APEAC, 2020). Phase I of the current APAEC saw the conclusion of the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project – the first multilateral power trade project in the ASEAN (APEAC, 2020). Such a project enhances the resiliency of the ASEAN energy supply, whilst further integrating renewable energy supply into the power grid. Phase II in turn will continue to follow similar objectives, in an expanded manner including (APEAC, 2020):

- (1) Accelerating the progress of APG projects and initiating the expansion of multilateral electricity trading
- (2) Developing the institutional framework and regulatory capacity as minimum requirements to advance multilateral electricity trading
- (3) Developing and harmonising the minimum technical requirements to advance multilateral electricity trading
- (4) Exploring and integrating renewable energy and other digital developments into the ASEAN Power Grid

Notwithstanding the political will that exists amongst AMS to improve the inter-connection of the APC, there remains significant technological and financial constraints in doing so. For this reason, it is necessary to consider the complementary opportunities for inter-connection that exist between ASEAN and the rest of the world.

5.2 Inter-connection

Overcoming financial and technological constraints is a major factor in developing inter-connection opportunities. This is evidenced by financial conditionality being attached to the energy transition under the NDCs of most ASEAN members. Financial constraints can be best met through two principal sources: investment by International Financial Institutions (IFIs), including Multilateral Development Banks. Epistemic agencies focussed on energy continue to be a valuable source of information to overcome technological constraints. In this regard, agencies such as the International Energy Agency (IEA) and the International Renewable Energy Agency (IRENA) further furnish AMS with technical information regarding aspects such as grid capacity, renewable energy options and energy demand and supply forecasting. International Financial Institutions (IFIs) and Development Banks have been long-standing sources of funding for energy projects in the ASEAN. Over the last decade, they have also become prime sources of funding for the energy transition. This trend has been strengthened as part of the economic recovery from COVID-19 pandemic. An emphasis on the opportunity to “green” this recovery can be seen in IFIs such as the World Bank and the International Monetary Fund. In November 2020 the major public investment banks of the world also launched a declaration in support of aligning post-pandemic investment flows with the Paris Agreement in November 2020 (Finance in Common Summit, 2020).

The past decade has also seen increasingly fruitful offers of external partnership on offer to assist with energy transitions. One particularly relevant one for ASEAN is

China's Belt and Road Initiative (BRI). The BRI aims to improve the connectivity of trade, capital and people across Asia ([LSE, 2018](#)). Since 2014 the BRI has been undertaking investments, funded by a consortium of mostly Chinese lenders. While transport comprises most of BRI lending (over \$330bn USD) since 2013, energy investment forms a close second at \$266bn USD ([LSE, 2018](#)). The BRI does not possess environmental conditionality nor have it as a focus. This is a major point of difference between it and the competing B3W partnership that was launched at the G7's Carbis Bay summit in June 2021. The B3W, like the BRI, is packaged as a program to aid in investment in core infrastructure. Unlike the BRI, the B3W explicitly seeks to apply a climate lens to projects. Given the nascence of the latter, concrete details of B3W's timeline for rollout, coverage and conditionality remain lacking. Nevertheless, the presence of two major, competing infrastructure projects, could be a significant development for the ASEAN region. To make the most of this phenomenon AMS should focus on the project development related to renewable energy which, in principle, could be funded by either the BRI or B3W. There also remains an increasing number of energy transition partnerships, such as those between the UK and the ASEAN or between partners and specific AMS such as Indonesia, Philippines and Malaysia ([HM Government, 2021a](#); [Asian Development Bank, 2021](#); [HM Government, 2021b](#)).

Adequate finance alone does not result in successful infrastructure projects unless it is combined with technical expertise that ensures the project can deliver the expected end results. The epistemic community related to global energy issues has both generalist agencies (such as IEA and IRENA) and specialist agencies (such as the International Atomic Agency or the International Hydropower Association). Actors such as the IEA and IRENA are also increasingly forging their own direct alliances with AMS. For instance, the IEA notes that Indonesia and Thailand became IEA Association Countries in 2015, followed by Singapore in 2016. In 2019, ASEAN described how the IEA had become a strategic partner. Such developments all help further solidify the engagement between the IEA's technocrats and ASEAN country partners, with examples such as the IEA's Clean Energy Transition Programme ([CETR, 2024](#)). The IEA received a support request in 2020 from then-ASEAN Chair Vietnam on the issue of how to attract private-sector investment in regional transmission. In parallel IRENA also continues to provide invaluable insights as to the technical potential of renewable energy generation and distribution in the region ([IRENA, 2021](#)). Therefore, while the above insights demonstrate that the energy transition is a domestic journey for AMS, they further highlight how the journey is one of partnership or "inter-connection".

6. Conclusion

ASEAN is a regional grouping that will play a significant role in the energy transition globally. AMS not only demonstrate high potential for the energy transition but at the same time, are a group whose energy demand is set to grow significantly in decades to come. ASEAN membership is also highly varied and comprises countries with a vast range of populations, incomes and natural resource endowments. For this reason, it provides an important context to assess the varied pathways for energy transition that are available both to individual states and the AMS as a whole. This paper has identified the key "modes of transmission" for norm transmission in the ASEAN; by doing so it highlighted how AMS are capable of both norm entrepreneurial and antipreneurial behaviours. In revealing this, the article has highlighted how the energy transition is not a given but rather is the result of an ongoing contest between "conductors" and "resistors" of the energy transition. Importantly also, the energy transitions of AMS do not solely remain within their individual borders. ASEAN seeks to continue interconnection of electricity systems through work on the APC.

This project and other work involved in shifting electricity generation from its non-renewable base to a more renewable one relies on AMS overcoming a number of financial and technological constraints. Aiding in this pursuit is a range of public and private investment opportunities, in addition to support from epistemic agencies with necessary technical expertise. By examining these opportunities for interconnection, it is suggested that investments related to the energy transition will continue to dominate infrastructure investments made across the ASEAN. Consequently, the individual and combined success of the energy transition is intrinsically linked with prospects for sustainable economic, social and environmental development of AMS at large.

Note

1. 51 as of July 2023.

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