

Rural electrification efforts from the perspective of ASEAN Energy Awards

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Abstract: Access to reliable and affordable electricity remains a cornerstone of sustainable development and renewable energy in the ASEAN region. While all member states strive for universal electrification, progress varies significantly, influenced by diverse national landscapes and approaches. This research sheds light on rural electrification efforts through the lens of ASEAN Energy Awards, uncovering stakeholder roles, quantifying impacts, and promoting cross-learning among member states. Through analysis of project submissions and winners from 2010 to 2023 (N = 62), the study delves into three key areas. First, there has been a shift beyond traditional government-led initiatives. While state-owned enterprises, government agencies, and international development agencies remain active, the emergence of universities, private enterprises, non-profit organisations, and even communities themselves signals the growing importance of bottom-up approaches. The analysis delves into the prevalence of technologies like solar PV (photovoltaics) and micro-hydropower, revealing trends in installed capacity and cost-effectiveness (the dominance of projects below US\$100,000). The study identifies consistent rural electrification efforts across countries like Indonesia, Malaysia, Myanmar, and Thailand, which recorded the most project submissions. Findings reveal a dynamic landscape of rural electrification efforts in ASEAN. The rising presence of non-state actors and community-driven initiatives presents opportunities for increased private sector contributions and bottom-up solutions.

Keywords: ASEAN, rural electrification, energy awards, renewable energy, private sector initiatives

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1. Introduction

Access to reliable and affordable electricity is a cornerstone of sustainable development, serving as a crucial indicator of energy accessibility and a powerful driver of socioeconomic progress. Recognising its importance, rural electrification has been a core focus of the ASEAN Plan of Action for Energy Cooperation (APAEC) since its inception. Each member state of ASEAN shares this focus, striving to achieve 100 per cent universal electricity access. However, progress varies significantly, with each country adopting unique approaches tailored to its specific landscape and challenges.

While national grids form the backbone of electrification efforts in many member states, extending them to remote and isolated rural communities often proves costly and impractical. To bridge this gap, dedicated rural electrification funds have been established in Cambodia (REF 2013), Lao PDR (World Bank 2018), the Philippines (Department of Energy Philippines 2024), and Vietnam (Gencer *et al.* 2011), channelling resources specifically towards off-grid solutions. Meanwhile, other countries like Indonesia (EBTKE 2017), Malaysia (Sabah Energy 2023, Sarawak Energy 2024), and Thailand (Provincial Electricity Authority Thailand, 2019) prioritise enhancing the quality and reliability of existing grid access for rural populations.

Despite these diverse approaches, a common challenge emerges at the regional level: a limited pool of actors willing to venture into the complex and often unprofitable task of electrifying the most vulnerable communities. Traditionally, the burden has fallen on governments, state-owned utilities, and philanthropic foundations. Corporate social responsibility initiatives from private companies also contribute but remain on a smaller scale.

Recognising the invaluable role of the private sector in advancing renewable energy (RE) and promoting sustainable development, the ASEAN Energy Awards were established in 2000 (ASEAN Centre for Energy 2024a). Among its three core categories, the ASEAN Energy Awards dedicate special attention to exemplary rural electrification projects captured under several sub-categories. This category indirectly supports the regional aspiration in RE, which has undergone several iterations. APAEC Phase II: 2021–2025 documented the latest regional target, achieving a 23 per cent RE share of total primary energy supply (TPES) by 2025 (ASEAN Centre for Energy 2024b).

This research delves into the rural electrification efforts recognised by the ASEAN Energy Awards. By analysing trends in submissions and winners over the past two decades, the aim is to illuminate three main areas: (1) uncovering stakeholder roles, (2) quantifying impact and quality of life based on the multi-tier

framework for energy access, and (3) sharing the best practices for cross-learning among member states. The award has showcased a multitude of innovative solutions initiated and driven by private players, shedding light on the potential of their involvement in tackling this critical challenge.

This paper will identify the diverse range of actors involved in rural electrification projects, including private enterprises, community groups, non-profit organisations, and government agencies. In assessing the project's impacts, the research is extended to estimate the number of households reached by exemplary rural electrification projects recognised by the awards. Several effective and innovative rural electrification practices displayed by award-winning projects across ASEAN member states are highlighted to encourage more replication.

2. Literature review: overview of electrification in ASEAN

2.1 Policy

The rural electrification policies in ASEAN vary in approach and implementation, reflecting each country's unique geographical and socio-economic contexts. Some countries, such as Singapore and Brunei Darussalam, with their urbanised and concentrated populations, have achieved nearly universal electricity access (*The ASEAN Post* 2016). Their policies emphasise sustainable and efficient energy use.

Indonesia, in contrast, plans to advance rural electrification through initiatives like the Super Extra Energy Saving (SEHEN) and Solar Home System (SHS) programmes (Sambodo 2015). The country's focus has been on RE in remote areas, particularly under the 2016 ministerial decree targeting underdeveloped areas with small-scale electricity projects like solar energy (*The ASEAN Post* 2018). The Energy Saving Solar Lights (LTSHE) programme, launched in 2017, exemplifies this approach, aiming to illuminate more than 2,500 villages throughout Indonesia with minimal electricity infrastructure (EBTKE 2017).

In Malaysia, the electrification rate in Peninsular Malaysia mirrors the near-100 per cent achievement seen in Singapore and Brunei. However, several initiatives have been made in rural areas in Sabah and Sarawak, such as the Sarawak Alternative Rural Electrification Scheme (SARES), and the Sabah Rural Electrification Renewable Energy (RE2) Roadmap (Sabah Energy 2023, Sarawak Energy 2024). SARES focuses on providing 24-hour electricity to remote communities, while the RE2 Roadmap in Sabah outlines a ten-year plan to deploy 206 mini-grids. Malaysia also has a rural electrification programme called the Bekalan Elektrik Luar Bandar

(BELB) Programme, which operates through grid extension and alternative methods like solar energy in remote areas. This initiative, underpinned by the Electricity Supplies Industry Trust Account, emphasises not only infrastructure development but also improvement in the consistency and availability of supply systems (Ministry of Rural and Regional Development 2010).

Thailand's Accelerated Rural Electrification Project, managed by the Provincial Electricity Authority, stands as a testament to the country's commitment to rural electrification (World Bank 2017). Thailand's strategy involves a Provincial Electricity Authority (PEA) whose objectives include expanding the distribution system to new households, particularly in rural and regional areas, thereby improving quality of life and addressing social inequality (Provincial Electricity Authority Thailand 2019). Similarly, Myanmar has also developed a National Electrification Plan that aims to achieve universal energy access by 2030 through grid extension and decentralised rural electrification via mini-grids and solar home systems (Peralta 2018). Cambodia targets also include the connection of 70 per cent of its households to the national grid by 2030 through mini-grids and renewable energy systems (ERIA 2017). The development of a special Department of Rural Electrification Fund in Cambodia helps to boost rural electrification through several initiatives, such as providing interest-free loans for grid supply, developing a Solar Home System programme, and facilitating private electricity suppliers in rural areas to access funds for investment in the expansion of the electricity supply network (REF 2013).

Lao PDR, Vietnam, and the Philippines have similar types of approaches in most of their rural electrification programmes, where most of their initiatives are funded by dedicated support. For example, Lao PDR has witnessed a rapid increase in rural electrification since 2005, largely fuelled by international support, such as the World Bank's Rural Electrification Project (JICA 2020). Vietnam also received dedicated support from World Bank in 2000, through the Rural Energy Project that helped to increased rural income under the Doi Moi reforms, rehabilitated several large power plants across the country, and enabled rapid progress in rural electrification in the subsequent period (Gencer *et al.* 2011). In the following years, Vietnam developed a comprehensive rural development programme under the state-owned utility called EVN (Vietnam Electricity) that has led to significant gains in electrification (World Bank 2015). Concurrently, the Philippines is implementing a blended grid extension with off-grid solutions as their rural electrification strategy (ITA 2022). Moreover, the Philippines has also developed the Expanded Rural Electrification (ER) Programme, which integrates the rural and missionary electrification efforts of the government in collaboration with the private sector, non-governmental organisations, and several donor-funded projects (Department of

Table 1. Categorisation of rural electrification projects.

Country	Initiative name	Category
Cambodia	Rural Electrification Fund	Government-led programme
Indonesia	SEHEN	Government-led programme
	SHS	
	LTSHE	
Malaysia	BELB Programme	Government-led programme
	SARES	
	RE2 Roadmap	
Lao PDR	Rural Electrification Project	Dedicated support
Myanmar	National Electrification Plan	Government-led programme
Vietnam	Rural Energy Project	Dedicated support
	EVN-led programmes	Government-led programme
Philippines	Expanded Rural Electrification Programme	Government-led programme
Thailand	Accelerated Rural Electrification Project	Government-led programme

Energy Philippines 2024). These diverse approaches, which are summarised in Table 1, not only demonstrate the region’s commitment to rural electrification but also highlight the innovative and adaptive strategies employed to address unique geographical and socio-economic challenges.

2.2 Status of electrification rate

As of 2020, the electrification landscape in ASEAN exhibited varying degrees of success. Based on data from *The ASEAN Energy Outlook 7* (ASEAN Centre for Energy 2022), which are shown in Table 2, Cambodia (81.1 per cent), Indonesia (99.2 per cent), Lao PDR (95 per cent), Myanmar (51.6 per cent), and the Philippines (97.2 per cent) had not yet achieved complete electrification, in contrast with their counterparts like Thailand, Singapore, Vietnam, Brunei Darussalam, and Malaysia, which reported full electrification (ASEAN Centre for Energy 2022). Indonesia was close to its target, aiming to close the gap by 2022. Myanmar, with just over half of its population electrified, faces a significant challenge in bridging this disparity. The focus is not only on achieving universal physical connections but also on ensuring the quality, affordability, and sustainability of electricity supply for inclusive access to energy across the region.

2.3 Non-governmental drivers

The efficacy of rural electrification programmes in the ASEAN region is predominantly influenced by governmental policies and social acceptance from local communities. Vietnam’s rural electrification success exemplifies the impact

Table 2. Electrification rate for ASEAN member states.

<i>Country</i>	<i>Electrification rate (2020)</i>
Lao PDR	95%
Myanmar	51.6%
Thailand	100%
Cambodia	81.1%
Singapore	100%
Vietnam	100%
Philippines	97.2%
Brunei Darussalam	100%
Malaysia	100%
Indonesia	99.2%

of consistent governmental commitment and effective collaboration across various administrative levels, from central to local authorities (Gencer *et al.* 2011, Hidayah & Rarasati 2020). However, beyond governmental initiatives, the role of the private sector in financing these programmes is crucial.

Some countries in the ASEAN region, such as Indonesia, are still struggling with several barriers in terms of attracting private investors for rural electrification projects, which can be caused by the government's predominant focus on large-scale RE projects, the lack of dedicated rural electrification financing schemes, and centralised energy development with PLN (Perusahaan Listrik Negara) as the main player in electricity off-take, supply, and distribution (UNDP 2018). However, countries like Vietnam and the Philippines have developed several new approaches to attract and promote investment for rural electrification. The existence of EVN allowed Vietnam to overcome the profitability issue that most private investors and private sector operators worried about by providing substantial support for electrification (ADB 2011). In the case of the Philippines, the government launched the Expanded Rural Electrification Programme that allowed the participation of non-governmental and non-utility agencies in electricity provision and resource generation by involving qualified third parties (QTPs) (Bhattacharyya 2013).

An emerging dimension in the financing of rural electrification is the utilisation of Corporate Social Responsibility (CSR) funds. This approach allows private entities to contribute to high-impact socio-economic initiatives, aligned with Sustainable Development Goals (SDGs), particularly SDG 7 (Affordable and Clean Energy). The integration of CSR funds into rural electrification projects presents a valuable opportunity for private sector participation, offering a dual benefit of community development and fulfilment of corporate social commitments. Evidence of successful CSR-funded rural electrification initiatives is showcased in the ASEAN Energy Awards, reflecting the private sector's growing role in

advancing rural electrification in the region. The ASEAN Energy Awards also serve as a platform to catalyse private sector involvement in renewable energy by showcasing innovative solutions and commitments, thereby inspiring further investment in rural electrification.

3. Methodology

This study employed a comprehensive methodology to analyse rural electrification efforts through the lens of the ASEAN Energy Awards. The dataset was sourced from the publicly available applicants' database of the ASEAN Energy Awards spanning the years 2010 to 2023. This database provides detailed information about submitted projects, including project descriptions, technology type, investment value, business model, and socio-economic benefits. The procedure involved three main steps: (1) data collection and shortlisting, (2) trend analysis and stakeholder mapping, and (3) impact evaluation.

The shortlisting stage was based on sub-category selection and project objective filtering. Given the research focus on rural electrification, the initial dataset was shortlisted to applications categorised under the on-grid (local) and off-grid (power) sub-categories. These sub-categories specifically target projects aimed at electrifying remote and underserved communities. Further refining the data, the study focused on projects explicitly targeting rural community electrification rather than those targeted on companies' own benefit or commercial use, such as electricity saving or decarbonising their remote facilities. This targeted subset ensures that the analysis directly addresses the core research question.

From the final shortlisted data, the study extracted and analysed key trends to understand the evolving landscape of rural electrification in ASEAN. This included examining the geographical origin of projects, the predominant renewable energy technologies employed, the associated investment costs, and the year of project commissioning. The organisational type of each applicant was carefully assessed to illuminate the diverse actors driving rural electrification initiatives. This analysis categorised applicants into groups, such as private enterprises, community organisations, non-profit organisations, and government agencies.

To gauge the impact of shortlisted projects, the study estimated the electricity generation capacity for each project based on the specified technology and installed capacity. This provided a quantitative measure of the potential energy production associated with each initiative. Assuming tier-3 electricity access as the standard (Myanmar Multi-Tier Framework 2022), the study estimated the number of households benefiting from each project based on the calculated generation capacity and

average per-household electricity consumption. This metric allows for a tangible assessment of the impact of these projects on improving the lives of rural communities.

The analysis utilised quantitative methods. These quantitative techniques comprised: (1) descriptive statistics employed to identify trends, and (2) impact assessments involving calculations based on project data and assumptions about household’s tier-3 electricity access. This study acknowledges the limitations of relying on self-reported data from project applicants. Potential biases in project descriptions and the possibility of missing projects not submitted for awards were carefully considered. Furthermore, ethical considerations regarding data privacy and confidentiality were strictly adhered to throughout the research process.

4. Trend analysis and discussion

4.1 Data filtering

The general upward trend in the number of submissions over the years suggests that rural electrification efforts are gaining traction in ASEAN countries. Figure 1(a) indicates that the number of submissions in each sub-category fluctuates year-to-year. However, there is a general trend of increasing submissions in the ‘off-grid’ and ‘special submission’ categories, while submissions in the ‘on-grid’ category have remained relatively stable. Figure 1(b) further shows that the number of projects submitted for rural electrification purposes is double the number of

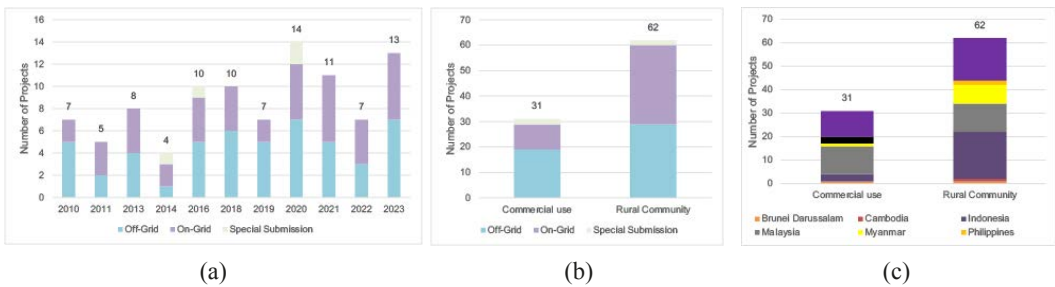


Figure 1. Submissions of rural electrification projects from 2010 to 2023: (a) trends over the year by sub-category of the award, (b) filtering criteria by project objectives, (c) country of origin.

applicants for commercial use which are also from the on-grid and off-grid sub-categories. Figure 1(c) points out that most of the rural electrification projects with the objective of serving the community originated from Indonesia, Malaysia, Myanmar, and Thailand. From now on, the data analysis is based on the 62 rural electrification projects with specific objectives to serve local communities.

4.2 Technology

Across the trend of rural electrification in ASEAN reflected in the awards programme, the choice of technologies for powering rural areas is also assessed in Figure 2. These technologies comprise solar PV (photovoltaics), small-scale hydropower projects, biomass, biogas, as well as the combination of two or more of the aforementioned technologies—in addition to other energy sources, such as battery and diesel. Amongst the technologies used for rural electrification in ASEAN, solar PV and micro-hydroelectric plants dominate the submission population against the other types of technologies. Solar PV projects are relatively small in scale, with the installed capacity size ranging up to 0.5 MW. One submission stood out with an enormous installed capacity of around 3 MW, namely the Sarawak Alternative Rural Electrification Scheme (SARES). The popularity of using solar PV in the context of empowering rural areas can be attributed to its affordability due to its relatively low cost compared to other technologies or energy sources (Feron 2016).

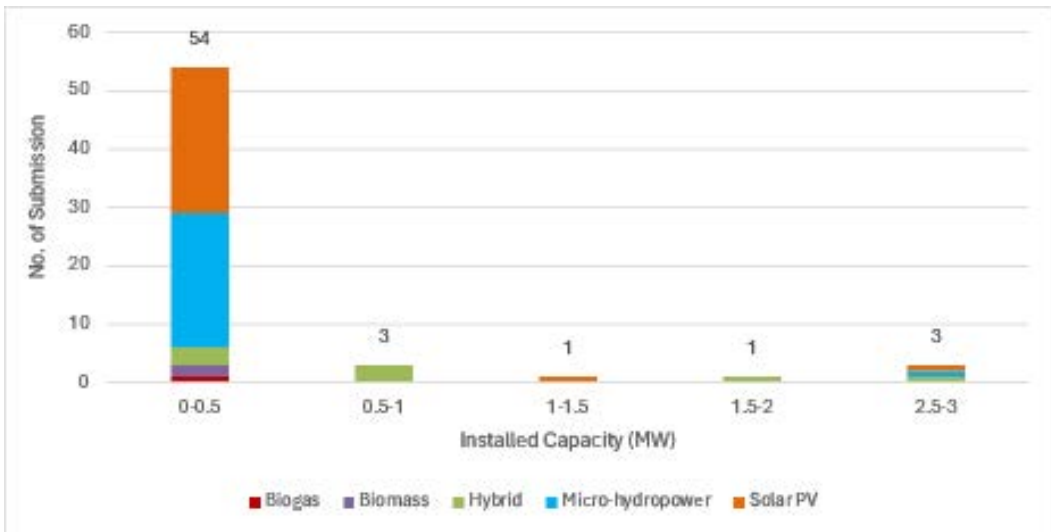


Figure 2. Technology trend of shortlisted rural electrification projects.

4.3 Country

The trend of rural electrification programmes is dominated by small-scale projects, with their installed capacity size in the range of 0.5 MW and under, as reflected in Figure 3. Within the thirteen-year period of the implementation of the ASEAN Energy Awards, submitted projects were compiled from seven out of ten ASEAN member states—Indonesia, Thailand, Malaysia, Myanmar, Brunei Darussalam, Cambodia, and the Philippines. Out of the total of 62 submissions that qualified as rural electrification programmes, Indonesia, Malaysia, Myanmar, and Thailand submitted the greatest number of projects. Malaysia had seven submitted projects and Myanmar had eight programmes, with Brunei Darussalam, Cambodia, and the Philippines each submitting one project. From the overview of technology options, the submissions from Indonesia are dominated by solar PV with the prevalence of micro-hydropower. Malaysia presents a rather balanced option of technologies, with relatively equal submission of projects leveraging mini-hydropower and solar PV, as well as hybrid sources.

4.4 Commissioning date

Commercial Operation Date (COD) signifies the year the project started its operation. Figure 4 shows the ways in which micro-hydropower plants have emerged as the technology of choice for rural electrification in ASEAN, with the earliest recorded COD among the submissions, a project that started operation in 1993. Assessed from the overall submissions with COD across three decades,

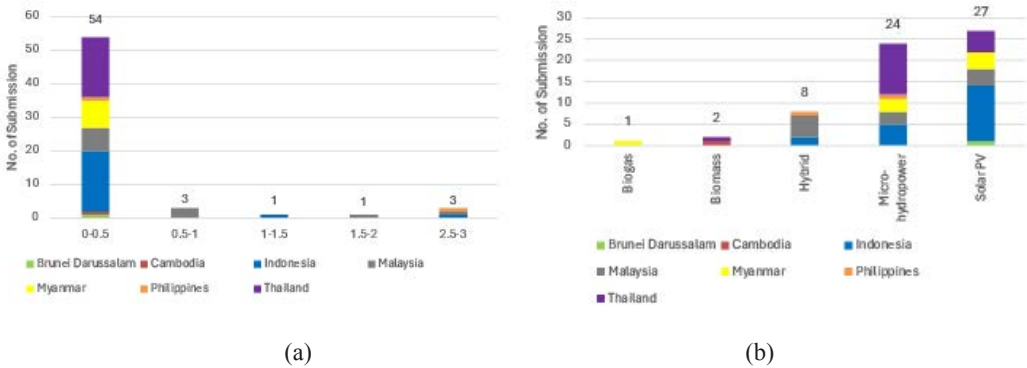


Figure 3. Overview by shortlisted rural electrification projects: (a) by project size, (b) by technology from different countries.

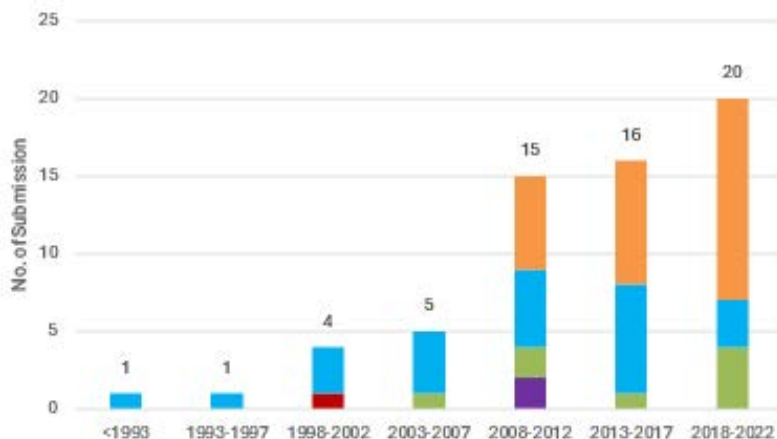


Figure 4. Typical operational age of shortlisted rural electrification projects.

micro-hydropower has enjoyed steady popularity as a technology option for pursuing rural electrification in the region. From the ASEAN Energy Awards submissions, the dominant technology for rural electrification, which is solar PV, only arrived as a technological option to be pursued during the 2008–12 period. Since then, the rate of solar PV deployment has increased over time. The same period also saw the rise of rural electrification programmes in ASEAN that leveraged hybrid technologies, such as a combination of solar PV and/or micro-hydroelectric plants with battery, diesel, and other technologies. For projects that solely deploy biogas as well as biomass, the submissions showed that there have been no recently operationalised facilities powered by those sources in the last ten years.

4.5 Capital expenditure

Capital Expenditure (CAPEX) refers to the expenditure generated in the initial stage of the development of rural electrification projects. The trend of CAPEX shown by the submissions is characterised by the dominance of projects that were constructed with initial expenditure in the range of US\$100,000 and under. The prevalence of such a range of CAPEX is fairly steady over the years, and projects with CAPEX under US\$100,000 typically occupied half of the submissions per year with the exception of 2022. This trend further shows that rural electrification projects in ASEAN are dominated by small-scale facilities, which correlates with the typically sparse population in rural areas as well as the need to extend energy access in addition to fulfilling the electrification target. From a country perspective, projects with CAPEX of US\$100,000 and under were submitted by almost all submitting-ASEAN countries apart from Cambodia. However, for projects with a

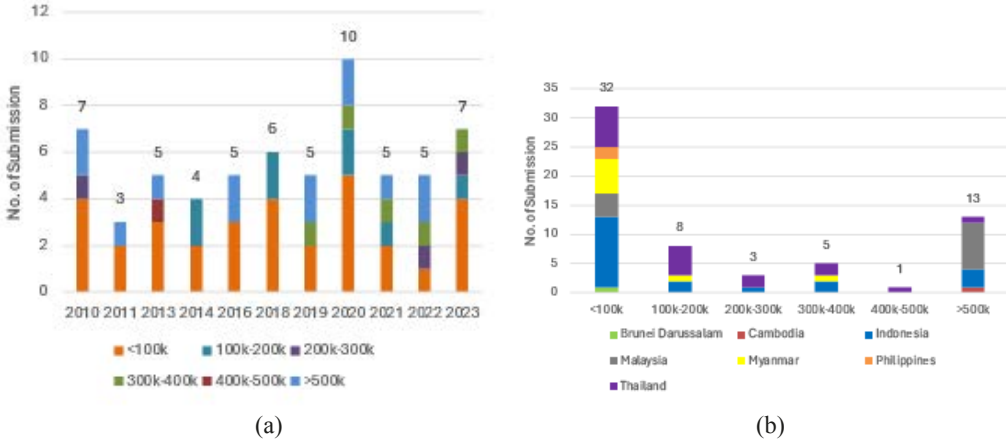


Figure 5. Projects' CAPEX by submission year and country: (a) by submission year, (b) by country.

CAPEX value of US\$500,000 and over, Malaysia dominated the trend with eight submissions.

4.6 Stakeholders/drivers

The direct link between benefits from extending electrification to the rural population and the alleviation of geographical inequality and poverty—as well as the pitfalls associated with the lack thereof—has driven rural electrification into the territory of state intervention policies. While resources and supportive policy measures are instrumental in increasing the rate of electrification, especially in countries where 100 per cent electrification has yet to be reached, non-state actors are increasingly contributing to rural electrification efforts. From the submissions of projects that qualify as rural electrification programme in the ASEAN Energy Awards, stakeholders from state-associated actors, such state-owned enterprises, government, and international development agencies, are identified. However, the submissions also witness the emergence of non-state stakeholders, such as universities, private enterprises, as well as non-profit organisations. Aside from top-down intervention from state actors, communities and cooperatives have also been proactively involved in driving up electrification initiatives within their areas.

Throughout the thirteen-year period of ASEAN Energy Awards submissions, the role of private enterprises has been consistently present in the representation of



Figure 6. Main stakeholders driving the rural electrification project.

rural electrification projects, except in 2011. Figure 6 also highlights the prominent role of government-initiated projects in driving rural electrification in ASEAN during the period 2011–19. However, the subsequent four years are characterised by the absence of government as the main stakeholder in rural electrification projects. Interestingly, the period 2019 to 2023 is marked by the active roles of community in driving rural electrification in the region, as shown by the data of ASEAN Energy Awards submissions. The prevalence of non-state actors in driving up rural electrification, as shown by the active participation of private enterprises and communities, presents opportunities for drawing a higher contribution from bottom-up initiatives. Despite active participation from non-state stakeholders, the state still has the responsibility for designating a policy environment conducive for expanding rural electrification. Drawing bottom-up initiatives from private enterprises can serve as a broader means to alleviate energy poverty. Meanwhile, encouraging active participation from communities can facilitate better-tailored electrification projects which reflect the needs of the communities themselves.

4.7 Quality of electrification

Electricity is an indispensable aspect in enhancing the positive quality of human lives. This critical feature of electricity is encapsulated within Sustainable Development Goal (SDG) number 7, which asserts the need to ‘ensure access to affordable, reliable, sustainable and modern energy for all’. With access to electricity being one of the targets in the SDGs, the provision of modern energy in accelerating development has received universal acknowledgement. Advancing access to electricity towards all populations is instrumental in ensuring just and sustainable

development for all. However, access to the kind of energy possessing the qualities outlined in SDG 7 has not been extended to certain populations. The communities most susceptible to deprivation of electricity access are those living in remote areas, challenged by long distances to city areas or constrained by extreme geographical features. Thus, rural electrification efforts are salient in the trajectory for reaching universal energy access.

With its recognised importance in driving the electrification rate and extending access to populations barred from electricity, rural electrifications programmes also provide room for further scrutiny with regard to the quality of the electrification itself. A study by the World Bank (Tenenbaum *et al.* 2014) brought up an instance of policy error in which the parameter of electrification was defined solely as physical connection to the grid. As a result of this loose parameter, a village can be characterised as electrified if a grid connection is established even if the supply is limited to powering a single appliance (Tenenbaum *et al.* 2014). The application of such a standard in assessing rural electrification can lead to fatal policy ramifications, especially when the qualification as an ‘electrified village’ restrains further upgrading of poor conditions.

To avoid this problem, this study applied the ‘Multi-Tier Framework for Measuring Household Electricity Access’ (Tenenbaum *et al.* 2014) to assess the quality of electricity access of the rural electrification projects submitted under the ASEAN Energy Awards. As the current data gathering system under this award has not collected information on the number of supplied households, the application of this framework presents an important opportunity to examine the quality of the electrification from the projects.

Table 3. Appliances used in ‘tier-3’ and their indicative wattages.

<i>Appliances</i>	<i>Indicative wattage</i>
Radio	1
Task lighting	1
Phone charging	1
General lighting	18
Air circulation	15
Television	20
Computing	70
Printing	45
Air cooling	240
Food processing	200
Rice cooking	400
Washing machine	500

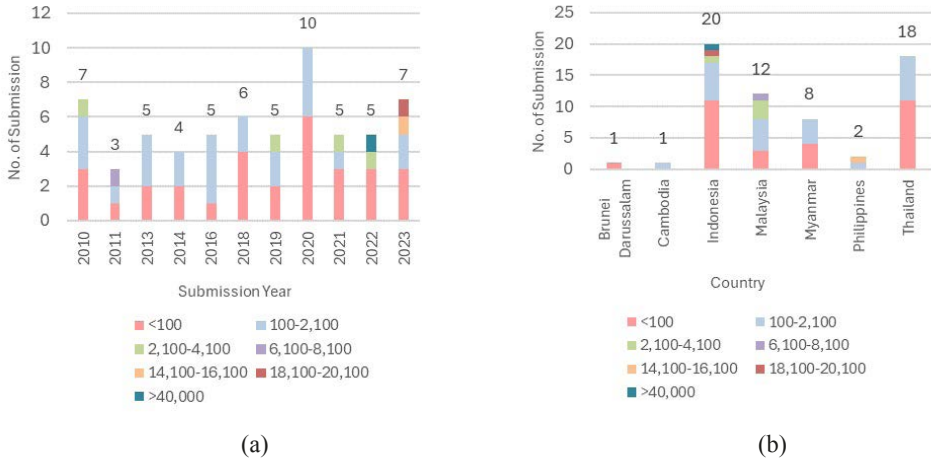


Figure 7. Indicative supplied households: (a) by submission year, (b) by country.

The framework consisted of five tiers of electricity access, from which its quality was attributed through the household appliances that could be employed as a result of the supply. This study assumed ‘tier 3’ of the framework as a standard for an ideal electrified quality for a household. Electricity access qualified as ‘tier 3’ allows members of the household to perform basic domestic activities with electrified appliances, such as cooking and washing, in addition to enjoying television and access to air-cooling. In deriving the results, this study multiplied the indicative wattages of appliances as shown in Table 3 with the assumed hourly usage per day, within a period of a year.

Subsequently, the generated capacity (MWh/year) data for each project that were submitted by the applicants were divided by the annual assumed appliance usage of a ‘tier-3’ household. However, it is important to note that, due to data limitations, the results of this method are only indicative of the number of households that can potentially be supplied, as opposed to reflecting the real-life conditions. As presented in Figure 7(a), the results lead to the finding that rural electrification project submissions to the ASEAN Energy Awards are dominated by small-scale projects with ‘tier-3’ electricity provision capacity for 2,000 households or fewer. Projects that can provide ‘tier-3’ electricity access to fewer than a hundred households make up the majority of the submissions data, with thirty rural electrification projects.

4.8 Situating rural electrification projects within the just transition framework

Rural electrification is a fundamentally transformative process, which through its enactment can bring about significant and holistic improvements to the lives of a population previously made vulnerable by the lack of access to electricity. This paper has attempted to critically examine the provision of rural electrification beyond the question of extending accessibility to electricity to rural communities, by also evaluating the quality of the electricity access provided. Today, ensuring the universal deliverance of electricity is driven by the objective to achieve better living conditions at the critical juncture of the ever-accelerating climate crisis while simultaneously alleviating energy poverty.

Within this context, addressing energy poverty is one among many aspects emanating from the rural electrification process, as it intertwines with questions of sustainability, affordability, and the quality of the electricity service. It is imperative to situate rural electrification efforts not only within the limited framework of electrification, without a meaningful assessment of its quality or the concrete existence of socio-economic empowerment that it provides to community members, but to look at the potential negative ramifications that it causes.

Energy justice as a discourse and framework arises from the critical need to go beyond the narrow technocratic view of energy practice, emphasising the importance of seeing energy from the ‘temporal, economic, socio-political, geographic, and its technological aspects’ (Sovacool & Dworkin 2015). Just transition, on the other hand, is an emerging framework that focuses on the elements of equity and inclusivity in the search for or transition towards more environmentally sustainable alternative methods of energy practice (Heffron 2021). The catchphrase ‘no one is left behind’ is at the heart of just transition’s operation as a framework (Heffron 2021). This consequently means that just transition implies embracing people from every socio-economic background—race, gender, and income or class (Velicu & Barca 2020).

This work has assessed the ability of the electrification provided by rural electrification efforts to transcend the pragmatism of ‘already-electrified’ status, which is sometimes devoid of further inquiries into the actual benefits derived from electrification. It has also touched upon the ways in which rural electrification practices have the potential to eradicate inequality and empower communities through the various activities that it enables. Regardless, the assessment has focused solely on the numbers of households enabled to enjoy ‘tier-3’ electrification quality—without an advanced investigation of the class or economic status, gender, religion, and ethnicity of the receivers themselves. This is a pitfall that needs to be addressed in the next round of the ASEAN Energy Awards through which data on the receiving populations’ socioeconomic background also need to also be collected, in order to

meaningfully situate the rural electrification projects from this database in the just transition framework.

5. Conclusions

Access to reliable and affordable electricity for all is instrumental in achieving and actualising sustainable development. Its provision is an indispensable component propelling socio-economic advancement. This study tracked the current electrification progress within the landscape of ASEAN and found that five member states have not reached universal electrification. The unelectrified portion is usually attributed to a rural population to which access to electricity has not been extended. By means of tracking policies that address this challenge of achieving universal electrification, this study finds that rural electrification has dedicated policy measures in eight ASEAN member states—with Thailand, Philippines, and Vietnam achieving 100 per cent electrification as of 2023. Aside from identifying specific policies that tackle rural electrification challenges, this study also aimed to identify the various actors that are involved in driving rural electrification progress in ASEAN. Electrification efforts, especially in rural areas characterised by distance from urban centres or challenging geographical features, tend to be costly and effort-intensive; hence these tasks are considered to be the domain of state actors, such as the government itself or state-owned corporations.

The database of ASEAN Energy Awards through its renewable energy category provides an avenue to map out the main stakeholders involved in driving rural electrification across the ASEAN region. From this study, non-state actors, such as private enterprises, university bodies, cooperatives, and the communities themselves, are identified in galvanising electrification among populations deprived of energy access. The study also finds that the involvement of non-state actors in driving rural electrification is present across the submission years. In addition to the identification of stakeholders, this study also assessed the electrification quality of the submitted rural electrification projects in the ASEAN Energy Awards by the means of ‘Multi-Tier Framework for Measuring Household Electricity Access’. Through applying the standard of ‘tier-3’ in examining the projects, the study found that the majority of the projects were able to power under a hundred households. However, the study also recognises the pitfalls of this method as it does not reflect in-field reality due to data limitations. Therefore, further comprehensive data collection through ASEAN Energy Awards submission that draws information on the quantifiable impact of the projects will be crucial to enriching the contemporary literature landscape on rural electrification in ASEAN.

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