A COMPARATIVE ANALYSIS OF PUBLIC PREFERENCES TOWARDS RENEWABLES ACROSS SOUTHEAST ASIAN COUNTRIES

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Overview

Southeast Asian countries need to transform substantially their energy mixes to realize their sustainable development and climate goals. The region is at the same time one with the fastest growing energy demand and one of the few where coal-fired generation has also been increasing the coal-fired generation capacity (IEA, 2020). Governments across the region have set ambitious goals both at national and regional level through their Nationally Determined Contributions (NDCs) and electric sector roadmaps. Furthermore, recent years have seen an outstanding increase in the number of solar energy projects approved in some countries, such as Vietnam. However, these efforts might not be enough as neither the NDCs nor the most ambitious scenarios at the ASEAN Energy Outlook 6 can fulfil the commitment included in the ASEAN State of Climate Change Report of becoming net-zero in this century (Arino and Prabhakar, 2022).

Sustainable development requires governments to balance the need for the climate change target as well as energy security and affordability. Even though the LCOE of solar and wind drops rapidly in recent years, further investment in grid and storage may greatly affect users' electricity bills. It is also widely recognized that the fast-growing electricity tariff will damage the public support towards decarbonisation and social stability according to the global experience. ASEAN countries need to be able to increase the generation capacity from all the diversity of renewable energy sources to decarbonize the electric sector while ensuring the affordability of electricity. Also, it recognized that the further penetration of certain renewable energy technology is not only decided by its cost but also its social opinion and impression. Thus, a better understanding of the preferences of and how citizens perceive renewable energy sources can bring important insights to help policymakers integrate the opinion of users into their policymaking to achieve the balanced policy target.

For that, a still relatively scarce literature is growing to investigate public preferences towards renewables, by contrasting these with non-renewables in single-country studies, such as hydropower versus coal-fired in Indonesia (Siyaranamual et al. 2020) and renewables versus coal-fired in Vietnam (Bakkensen and Schuler, 2020). Others have looked at citizens' support towards renewables through renewable energy funds (Azlina, 2018). However, there is a lack of studies that contrast different renewable energy sources. This study aims to contribute to filling this gap in the literature by investigating the differences in citizens' preferences towards various renewable energy sources, including also several cities in various countries in the region to facilitate comparability of the results.

Methods

A series of household surveys including choice experiments are conducted to calculate the willingness to pay (WTP) for different renewable energy sources. The surveys are designed following a similar structure including socio-demographic, knowledge, and attitude questions in addition to the choice experiment. In the latter, respondents were requested to select their preferable scenario among the three. Two hypothetical and one reflecting the status-quo in

their country. Each scenario included different levels of future share of renewable energy in the generation mix, the type of predominant renewable energy source, and the cost for them illustrated as an increase in their monthly electricity tariff. The levels for each attribute were expressed as a percentage for the share of renewable energy and an increase in electricity bills to facilitate comparability between the cities. However, some differences were required for the type of renewable energy due to local specifies. For example, during the pre-test it was found that respondents in Ho Chi Minh City did not differentiate between mini and large-scale hydropower; also, geothermal was only sufficiently known in Jakarta. The hypothetical alternatives were prepared with a D-optimal design and combined into choice sets. The choice sets were combined in groups to prepare blocks, ensuring the equal occurrence of all alternatives. The surveys were distributed face to face in all the cities while adapting to the local conditions in terms of the availability of sampling frames and mobility restrictions imposed due to health concerns and government recommendations related to COVID-19.

Results

The responses to the choice experiments were analysed with conditional logit models. In addition, interaction terms were also estimated to evaluate the correlation with socio-demographic characteristics. We have completed the surveys in Myanmar (Mandalay and Yangon), Thailand (Bangkok), Lao PDR (Vientiane), Vietnam (Ho Chi Minh City), and the Philippines (Manila), and are conducting the data collection in Malaysia (Terengganu) and Indonesia (Jakarta). The results show a general preference towards solar energy, with the highest WTP among all the renewable energy sources in all the cities evaluated. In contrast, biomass is the most divisive, with relatively high WTP in some cities while in others this is negative. Hydropower also shows a high difference, with higher values in countries with a large share of already installed capacity of that resource, such as in Lao PDR and Myanmar (although in this case, there were differences between Yangon and Mandalay). Wind energy is in general the second or third most favoured, although with lower values than solar.

Conclusions

The study conducts a comparative analysis of the WTP to different renewable energy sources in the urban areas across eight Southeast Asian countries. The renewable energy sources analysed are solar, wind, mini-hydro, biomass, and geothermal; although not all these were not included for every urban area due to challenges regarding lack of "realistic" available resource (i.e.geothermal outside Indonesia), little existing knowledge (i.e. wind in Malaysia) or misconceptions (i.e. hydro in Vietnam).

The results show a general highest support towards solar energy across all the cities included in the study. For the other types of renewable energy sources, the public perceptions are highly diverse. Furthermore, it was found that other environmental problems are prioritized by the respondents, particularly air pollution and flooding when presented separately from climate change. Our results also suggest the complexity of consumers' acceptance of energy technology. The understanding of public acceptance from the demand side should be emphasized in future policymaking to make a just and orderly transition in the future electricity system.

References

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