



Energy Transition in the global South – Editorial for the International Journal of Sustainable Energy Planning and Management Vol 35

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ABSTRACT

This 35th volume of the International Journal of Sustainable Energy Planning and Management includes work investigating different biomass resource utilisation scenarios for Mexico as well as scenarios for the transition of Thailand. The latter finds significant photo voltaic requirements when factoring in the transition to green hydrogen for transportation. Transportation is also the focal point in a study of Indonesia, finding that cost and emission optimisation are pushing optimum in different directions. Continuing with Indonesia, the country is seeing a rapidly growing electricity demand, and Siregar investigates social, environmental, technical, and economic criteria for the development of the system towards a more sustainable electricity supply. The scenario analyses are largely based on larger societal transitions, but Appiah makes a more concerted effort to investigate the actual investments in renewable energy sources. Lastly, an article focuses on the industrial sector and how energy efficiency may be affected by policies.

Keywords

Transition scenarios Thailand
Renewable investment Ghana
Biomass scenarios for Mexico
Transport transition scenarios
Energy efficiency

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1. Energy transition in the Global South

A new study led by Breyer [1] has synthesized much of the work on 100% renewable energy systems finding that there is consensus in the scientific community that 100% renewable energy systems are indeed technically and economically feasible. One thing that was also identified in the study is a lack of studies on the Global South. This is also exemplified by another recent study which while finding some application of the EnergyPLAN [2] model in, e.g., Latin America, there is very little application in Africa and South East Asia [3]. In this issue of the International Journal of Sustainable Energy Planning and Management, the articles address different angles of the energy transition in different countries of the Global South and thus help fill this gap.

Hernandez-Escalante et al. [4] use a SWOT methodology to assess and prioritise different biomass-based power generation scenarios for Baja California Sur in Mexico, finding prospects for a 61% share in

2032. In a previous study, Hernandez-Hurtado and Martin-del-Campo [5] developed sustainability indicators for Mexican power system planning.

Using the AIM/Enduse model, Pradhan et al. [6] investigate scenarios for the decarbonisation of Thailand, finding that 64 GW of wind power and 40 GW of photo voltaics would be required. If the transport sector is to transition to RES-based hydrogen, an additional 200 GW photo voltaics is needed. In addition comes carbon sequestration from land-use changes.

Kwakwa et al. [7] previously analysed fossil fuel consumption in Ghana, identifying a need for increasing the energy efficiency of the energy system, and Momodu [8] investigated transition pathways for the West African Power Pool, finding, in addition to a need for renewable energy investments, also a need for energy efficiency improvements.

Using Indonesia as a case, Siregar [9] develop a multi-criteria decision analysis approach to assess the

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sustainability of a variety of electricity generation methods. In Indonesia, electricity demand has tripled since the year 2000, and the vast majority has been in the form of fossil fuel-based power generation. This calls for an immediate focus on other expansion options as well as options for transitioning the current system to renewable energy. In the assessment, Siregar investigates social, environmental, technical, and economic criteria – and several relevant subcategories such as job creation and public acceptance within these general categories of criteria. Interestingly, among the stakeholders involved in the research from government, fossil fuel industry, renewable industry, university-think tank, civil society international organisation, all rank solar alternatives highest – while even stakeholders from the fossil industry give low priority to coal and oil.

Al Hasibi and Pramono Hadi [10] focus on the transportation sector and how to transition the energy demands and supply to renewable energy sources. Analysing three different scenarios using a mixed integer linear programming model, they optimise according to greenhouse gas emissions and costs for the Province of Yogyakarta, Indonesia. They find, that compared to the business-as-usual scenario and a renewable energy scenario, the renewable energy with storage scenario has the lowest emission levels albeit at the highest costs. Al Hasibi together with Setiartiti [11] has previously investigated low-carbon transportation strategies in an Indonesian context for this journal.

Appiah [12] looks into how the investment in renewable energy sources can be facilitated in Ghana. Using Resources Based View (RBV) and Porter's Five Forces, Appiah develops an “*approach to analysing investments in renewable energy sources*”, finding that “*entrepreneurial competency, financial resource, marketing capability and technological usage significantly relate to investment in renewable energy*”.

Barkhordar [13] addresses the cost and potential rebound effects of energy efficiency measures in the energy-intensive industry of Iran. Using both a top-down and a bottom-up simulation approach, Barkhordar seeks to simulate the effect of different policy measures, showing how they can contribute to energy efficiency improvements and the realisation of Iran's carbon dioxide emission reduction goal. In this journal, Godarzi and Maleki [14,15] previously analysed policies to increase the RES share of the power production of Iran, Noorollahi and co-authors [16] analysed the transition of the Iranian heating system and Caldera et al. analysed

prospects for RES-based desalination in Iran. The integration of desalination into RES-based energy systems is an emerging issue with studies in this journal for Chile [17] and Jordan [18].

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