Energy reserve dynamics: Integrating renewable energy for energy security and sustainability in lesser-developed economies

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Abstract

The current global energy system dominated by fossil fuels exposes countries to wide-ranging risks including environmental and energy security. Lesser-developed economies are very vulnerable to these risks, as their low income makes the energy transition difficult to finance and fossil fuels unaffordable, especially during global price fluctuations upward. However, investing in the energy transition may prove to be a successful strategy to achieve both decarbonisation and energy security. We hypothesize that this can be the case also in lesser-developed economies, despite their wide-ranging limitations at the technical, financial, and regulatory levels. With a sample of 31 lesser-developed economies, we test this hypothesis by using a probit regression model to analyse the relation between changes in energy reserves as a proxy of energy security in the face of different levels of renewables in the energy mix, among other variables. The results show that, as the countries increase the share of renewable energy in their energy mix, they also tend to decrease their levels of reserves of fossil fuels, which indicates a perception of lower exposure to security of supply risks. This suggests that decarbonisation and energy security can be reconciled, also in lesser-developed economies, if decarbonisation is not merely addressed to phasing out fossil fuels but to increase the overall energy supply through additional renewable energy capacity.

Keywords: Renewable energy development, Energy Security, Energy stock changes, Lesser-developed economies

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