

The energy transition in the global south

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Overview

The green transformation has profound implications for the global economy and, hence, for the prospects for latecomer development. In this paper we review the insights derived from case studies of developing countries' green technology experience. We conduct a systematic literature review covering seven key technologies. This allows us to examine whether the green economy offers new opportunities for latecomer development and their ability to seize these opportunities. To understand how developing countries' capacities to exploit these opportunities differ across cases, we focus on sectoral systems and, particularly, on (a) preconditions allowing exploitation of these opportunities, and (b) strategic responses of public and private actors in this respect. We identify four different scenarios: (1) effective opportunity exploitation; (2) missed opportunities; (3) active approach; and (4) distant opportunities.

Methods

The paper is based on a thoroughly review of the existing literature and on an extensive analysis of case studies in several renewable energy industries and in countries at different level of development as well as on detailed analysis of descriptive statistics about the different industries under investigation.

Results

Our empirical analysis provides three main findings that extend our knowledge about GWOs. The analytical framework presented in Section 2 is based on the rather successful catch-up experience of China in renewable industries, discussed in Lema et al. (2020).

First, the analysis of many countries and sectors, overall confirms the specificities of windows of opportunity in the green economy. The existence of different national strategies and policy frameworks across countries and green industries, supports the finding of the significant economic opportunities arising from domestic institutional changes, driven by efforts to mitigate climate change, transform energy production and consumption, electrify rural communities, and increase energy security. In addition, the international dimension and global pressure to speed up the green transformation, are facilitating the diffusion of green investments and establishment of promising new markets in many and diverse countries. The evidence confirms the complexity involved in policy design and coordination, and how different priorities, instruments and timings of interventions can have a major impact on industrialization outcomes.

Second, we stress that the capacity to exploit opportunities depends on national preconditions and the actions of public and private actors in the relevant production and innovation sectoral systems. At a general level, this is self-evident, but on a case level, it is far from trivial and not straightforward. There is evidence that the introduction of policies aimed at developing domestic markets has not been supported by appropriate incentives and measures aimed at building the sectoral system, which has allowed foreign investors to take advantage of favorable natural conditions (e.g., intense sunlight and low-cost energy production) in many countries in the global South. In the context of appropriate responses, the pattern varies according to both sectoral characteristics, such as technology maturity and tradability of products and services and domestic market size, industrial structure, pre-existing firm capabilities, etc.

Third, sectoral characteristics determine differences in the depth and speed of latecomer development trajectories. For example, in green energy, mature sectors with significant market creation, such as biomass or solar PV, readily available technologies can provide a relatively fast way to boost economic activity. In these industries, satisfying domestic market demand by employing new-to-the country technologies tends to be the norm. Newer technologies, such as green hydrogen, CSP and electric vehicles are more demanding in terms of technological capabilities and require significant investment in innovation system development.

Conclusions

This paper is based on the idea that the global transformation towards sustainability could open important GWOs for latecomer development, across countries and sectors in low- and middle-income countries. However, opportunities differ and require active exploitation. In the concluding section, we make some proposals for policy to allow the emergence of and exploitation of GWOs in developing countries. Such policy interventions require government action, at the national and local levels and involvement of a range of public and private stakeholders.

Moreover, our findings suggest several directions for future research, related to some of the limitations of this research and to explore new issues.

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