Non-economic barriers for the Adoption of Technologies for Energy Transition in Latin America and the Caribbean

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OVERVIEW

This work discusses the technical barriers that exist for the viability and adoption of key technologies for a clean energy supply in Latin America and the Caribbean (LAC), taking into account motivations, constraints and differences between different countries.
The region has great potential in natural resources for the generation of clean power, which will allow it to reduce dependence on fossil fuels and mitigate greenhouse gas emissions. It also faces barriers that act as pervasive incentives affecting investment, such as lack of sufficient economic resources, lack of infrastructure, outdated regulatory frameworks, which were largely formulated in the '90s, as well as the lack of definition regarding key public policies that encourage the adoption of clean technologies for electric production.
In this context, our contribution to the design of public policies aimed at accelerating the process of modernization of the energy sector and the incorporation of new models of sector planning begins by identifying non -economic barriers that limit the adoption of clean technologies to boost the energy transition process.
Variable renewable energy sources (VRE) began to scale-up recently in the energy mix of many countries in the region. A significant share of wind and solar power generation projects started to operate less than a decade ago, and experienced an accelerated growth that was in some cases ralentized or halted by a series of technical and economic barriers.
Other relevant energy sources such as hydroelectricity, geothermal or biofuels have a long tradition and have achieved increasingly relevant shares in the regions power generation mix, but also found obstacles to continue their expansion.
Finally, new technologies such as hydrogen or electricity storage are still in an embryonic stage of research and development, subordinated to the results that the main scientific and technology centers in the world are obtaining for their commercial application and cooperation promoted by institutions such as multilateral development banks to encourage research in the region.

METHODS

We start providing an overview of the main non-economic barriers that should be considered, categorized as: a) technological; b) existing assets that block other alternatives (lock-in effect); c) Institutional, which have to do with regulatory aspects, planning or mechanisms for the elaboration of public policies, and d) social, individual or collective behaviors. A matrix of barriers is developed to be used in the analysis by technology, subregion and in some cases by country.
In the second section we characterize the selected technologies and analyze their evolution across LAC's countries and subregions, through a five-year period (2016-2021). This time frame is

relevant for this research because of the emergence of certain technologies, particularly solar and wind, which showed remarkably low development in terms of installed capacity with an incipient penetration in the power generation mix before the analyzed period, which accelerated towards almost exponential growth.
Finally, we analyzed a set of success cases overcoming the existing barriers, such as in the cases of solar photovoltaic power generation in Brazil and wind energy in Uruguay, extracting lessons learned from that set of case studies

CONCLUSIONS

In the conclusions we highlight the existence of available information about common problems that can be treated in a similar way in different countries to overcome barriers that arise in the energy transition and in this way enhance regional cooperation and energy integration optimizing the use of existing resources to accelerate the transition away from fossil fuels

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