

Mitigation costs of concessional financing for renewable power in developing countries

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Extended Abstract

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Abstract Summary

Meeting climate and development goals will require a rapid scale up of investment and deployment of clean energy technologies in emerging market and developing economies (EMDEs), but their deployment is in large part constrained by high costs of capital that are at least twice levels in advanced economies. To accelerate clean energy deployment in EMDEs, grants and finance provided at below-market rates (concessional finance) will need to rapidly expand over the next decade. However, despite the need for the limited pool of development funding for concessional finance to be prioritised for projects that deliver the largest abatement potential at the lowest cost, there has been limited assessments of the mitigation effectiveness of support provided to date.

Combining a geospatial technoeconomic model for solar and wind power with retail electricity prices, grid carbon intensity trajectories and estimates for the cost of capital for 2026 at a high spatial, temporal and technology granularity, this paper investigates the influence of national costs of capital on the levelised cost of solar PV, onshore wind and offshore wind at over 96,000 locations. It explores the extent to which high costs of capital are holding back the harnessing of high quality renewable potential in locations with high grid carbon intensities and a pipeline of planned fossil power projects, showing that the marginal abatement cost from concessional financing for renewables in these locations is below USD 50 / tCO₂ across the majority of the world. The most cost-effective regions are Central Asia, North Africa and the Middle East, reaching as low as USD 10 / tCO₂ in countries such as South Africa, Burundi, and Senegal, nearly orders of magnitude below carbon pricing schemes and marginal abatement costs for advanced economies.

Presenting Author Biography

Luke Hatton is a PhD researcher at Imperial College London, working in the field of energy economics on the Grantham Institute's Science and Solutions for a Changing Planet PhD programme. His research is focused on estimating and projecting the cost of capital for energy projects and assessing the implications for of high costs of capital on mitigation pathways in developing countries. He works part time in the Energy Investment Unit at the International Energy Agency, co-leading on their Cost of Capital Observatory and sources of financing modelling amongst other projects.