

The determinants of science-based green patents

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The extent to which science contributes to the relevance and quality of innovations in climate change mitigation technologies has emerged as a crucial question among scholars and policymakers. To address the issue, this paper proposes a measure of the importance of innovations based on the distance from a paper-patent boundary, which represents the scientific frontier. Relying on an original dataset combining green patents and their cited publications, our study demonstrates that green patents grounded in science are essential in their own right and occupy a central position within the citation network. We investigate the factors that contribute to the scientific basis of green patents and find that the percentage of citations to other green patents is a crucial determinant of the scientific basis of innovations, which underscores the need to prioritize "pure green" innovations over "brown" innovations to develop science-based innovations. Furthermore, the technological domain, the country of origin and the type of institutions are also essential factors in determining the scientific content of patents.