

IMF Working Paper

Research Department

Can International Technological Diffusion Substitute for Coordinated Global Policies to Mitigate Climate Change?

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Abstract

In short, yes. I use a multi-region integrated assessment model with fuel-specific endogenous technical change to examine the impact of Europe and China reducing emissions to zero by mid-century. Without international technological diffusion this is insufficient to avoid catastrophic climate change. But when innovation can diffuse overseas, long-run temperature increases are limited to 3 degrees. This occurs because policy not only encourages green innovations but also dissuades dirty innovations which would otherwise spread. The most effective policy package in emissions-reducing regions is a research subsidy funded by a carbon tax, driven in the short term by the direct effect of the carbon tax on the composition of energy, and later by innovation induced by research subsidies. Green production subsidies are ineffective because they undermine incentives for innovation.

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