

Directed Technological Change and General Purpose Technologies: Can AI Accelerate Clean Energy Innovation?

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Abstract

Transitioning away from dirty and towards clean technologies is critical to reducing carbon emissions, but the race between clean and dirty technologies is taking place against the backdrop of improvements in general-purpose technologies (GPT) such as information and communication technologies (ICT) and artificial intelligence (AI).

We show how, in theory, a GPT can affect the direction of technological change and, in particular, the competition between clean and dirty technologies. Second, we use patent data to show that clean technologies absorb more spillovers from AI and ICT than dirty technologies and that energy patenting firms with higher AI knowledge stocks are more likely to absorb AI spillovers for their energy inventions. We conclude that ICT and AI have the potential to accelerate clean energy innovation.