LCS abstract

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This paper addresses three fundamental issues related to technological innovation and climate stabilisation objectives: i) Can innovation policies be effective in stabilizing greenhouse gas concentrations? ii) To what extent can innovation policies complement carbon pricing (taxes or permit trading) and improve the economic efficiency of a mitigation policy package? Iii) what is the optimal policy instrument mix, accounting for second best imperfections such as economic distortions, quality of institutions, etc.

To answer these questions, we provide a complete assessment of both ex ante and ex post analysis of the role of innovation in climate stabilization. We provide insights of empirical investigations of the bidirectional link between environmental policy and the pace and direction of technical change. We also use results from integrated assessment model with an endogenous representation of technical progress in the energy sector and with multiple externalities. We evaluate a range of innovation policies, both as a standalone instrument and in combination with other mitigation policies.

Our analysis indicate that even under fairly optimistic assumptions about the funding available for, and the returns to R&D, innovation policies alone cannot stabilize global concentration and temperature. However, we show that combining innovation and carbon pricing policies can provide economic efficiency gains, though these are not dramatic. However, we also show that such gains are reduced when more plausible (sub-optimal) global innovation policy arrangements are considered.