

Technological Change: Exploring its Implication for the Economics of Atmospheric Stabilisation: Lessons from a Modelling Comparison Exercise

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This study summarises the main finding of the Innovation Modelling Comparison Project (IMCP). IMCP aims at comparing different models with the special focus on induced technological change. This paper evaluates the economics of atmospheric stabilisation with and without the inclusion of endogenous technological change. Modelling endogenous technological change has been heralded as the key to improve the assessment of mitigation costs of climate policy. This paper compares and analyses results from a broad range of energy-economy-environment models paying especial attention to the following questions: What are the impacts of induced technological change on discounted macroeconomic costs under different stabilisation scenarios in different regions? More specifically, what are the contributions of different carbon mitigation options in achieving an overall climate protection target?

Preliminary results suggest that in some models mainly energy consumption and gross world product are reduced while we find that in other models the reduction of carbon-intensity is predominant. Here, the introduction of backstop-technologies, and the transformation of the fuel mix in general are major drivers of the reduction of carbon-intensity. The paper investigates the economic dynamics of induced technological change in some detail.