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The effects of industrial policymaking on the economics of low-emission technologies: the TRANSid model

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Abstract-

Basic materials such as steel, cement, aluminium, and (petro)chemicals are the building blocks of industrialised societies. However, their production is extremely energy and emission intensive. Hence, these industries need to decarbonise over the next decades to keep global warming at least below 2°C. However, low-emission industrial-scale production processes are not commercially available for any of these basic materials and require policy support to ensure their large-scale diffusion over the upcoming decades. Hence, the novel TRANSid (Transition to industry decarbonisation) model analyses the framework conditions that enable large-scale investment decisions in climate-friendly basic material options. We present a simplified case study of the cement sector to demonstrate the process by which the model optimises investment and operational costs in carbon capture technology by 2050. Furthermore, we demonstrate that extending the model to other sectors allows for the analysis of industry- and sector-specific policy options.

Index Terms- Deep decarbonisation; Industrial policy; Basic material sector; Industry transition; Emission pricing; Carbon capture

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