

A review of cross-sector decarbonisation potentials in the European energy intensive industry

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Abstract— The energy intensive industry (EII) is responsible for two-thirds of industrial carbon dioxide emissions in the EU. It has been recognised by both public and private stakeholders that a far-reaching transformation of these industries is required to comply with the overall emission reduction goals stated by the European Union for 2050. Contrasting innovations discussed in pathway and roadmap publications for the different industries, it can be concluded that there is little consensus on how deep decarbonisation of the EII will be achieved. In this paper, a review of pathway and roadmap publications and scientific literature is presented. This permits to identify key areas for emission abatement across all subsectors. Results show significant discrepancies in the literature regarding the expected emission reductions achievable, but permit us to identify areas that are key for the transition towards a low-emission EII: the decarbonisation of low temperature heat by cross-sector technologies, use of membranes in the (petro)-chemical industry, carbon neutral steelmaking, alternative feedstock for the cement production and carbon capture & storage (CCS).

Index Terms— CO₂ emissions; energy intensive industry; end-use efficiency; process heat; CCS;

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