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ABSTRACT

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Quantifying the costs of abating global climate change using the COMPARE model

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Abstract: The world has an important task of reducing global greenhouse gas emissions to limit the global temperature increase projected by the IPCC. Towards COP21 in Paris in December 2015 countries are in the phase of presenting their intended nationally determined contributions (INDCs) to the UNFCCC for the period 2020-2030. Using the COMPARE model at the Danish Energy Agency, we calculate for major economies the costs of achieving their submitted INDCs. Further, we find the cost-effective abatement efforts needed in 2030 to limit the global temperature increase to below 2 degrees Celsius, and the resulting costs at country level. Hence, the analyses shed light on the relative ambition of major economies in achieving the UNFCCC goal of limiting temperature increase to 2 degree Celsius by comparing cost-effective abatement efforts with submitted mitigation targets. The analyses forms part of the analytical framework internally in Denmark and is used by EU experts. The COMPARE model forms a holistic framework for analyzing different policy scenarios on the climate change issue, pooling together data on emissions and marginal reduction costs from several state-of-the-art models (including the POLES, IMAGE, TIMER, GLOBIOM and G4M models). As a carbon trading tool, it is based on marginal abatement cost curves. It covers global greenhouse gas emissions (including non-carbon gases such as CH_4 and N_2O, and emissions/removals from land-use, land-use change and forestry (LULUCF)), aggregated to 57 countries/regions and covering 18 sectors.

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