



1 Robust Options for Decarbonisation: The Role of Renewable Energies

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Meeting the EU 2° C climate policy target with more than 50% certainty implies that the CO₂-equivalent concentration is to be stabilized at 450ppm. In order to achieve this goal, global greenhouse gas emissions must decline significantly over the coming decades. On the other hand, recent scenarios for the 21st century show that the demand for energy will grow substantially – especially in the developing countries and emerging markets.

In order to achieve deep emissions reductions consistent with the aforementioned climate policy goal (i.e., more than 50% by 2050 compared to 2000), energy efficiency improvement and fuel switching measures unfortunately will not suffice. Capturing carbon from fossil fuels and storing it underground does imply higher costs but it can play an important role, at least as a transitional bridging technology. In addition, the potential of energy conversion technologies that do not emit carbon dioxide (using renewable or nuclear energy) suffices to meet even the highest projections of the global energy demand projected for 2100.

The contribution reviews the available potential and investigates the role renewable energies should play within a least-cost portfolio of robust options intended to achieve low CO₂ concentration stabilization targets (e.g., 450 ppm). In addition, the problem

of intermittent supply and suitable support schemes to facilitate the rapid diffusion of innovative technologies are discussed.