

Climate Risks and Carbon Prices: Revising the Social Cost of Carbon

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Researchers at the Potsdam Institute for Climate Change Research (PIK) in Germany, compared scenarios from five models that stabilize carbon dioxide concentrations at 400 ppm by 2100.¹⁵ Because carbon dioxide remains in the atmosphere for decades or centuries, and we are already at 390 ppm, these scenarios have to achieve negative net global emissions before 2100... In general, the 400 ppm scenarios strain the limits of plausible rates of technological and socioeconomic change. Their carbon prices reach \$150-\$500 per ton of CO₂ by 2050, with an average of \$260 per ton.

A similar, though slightly more pessimistic, scenario from the International Energy Agency (IEA), stabilizes the atmosphere at 450 ppm of CO₂. This scenario - IEA's "BLUE Map" - is meant to represent the maximum feasible pace of abatement. The marginal abatement cost in 2050 is between \$175 and \$500 per ton of CO₂ (IEA 2008; 2010).

A more optimistic [scenario], from McKinsey & Company, projects rapid abatement leading to eventual stabilization at 400 ppm CO₂-equivalent; atmospheric concentration peaks at 480 ppm CO₂-e in the 2060s before declining. McKinsey estimates the marginal abatement cost of this scenario at \$90-\$150 per ton of CO₂-e in 2030 (McKinsey & Company 2009).

The British government assigns values to carbon emissions for use in long-term policy appraisals.. Their estimated carbon value for 2050 is £200 + £100 per ton of CO₂e (U.K. Department of Energy & Climate Change 2009) - equivalent to about \$165-\$495.

Comparing these abatement cost estimates to our SCC calculations, the 400 ppm model scenarios compared by PIK, the IEA BLUE Map, and the UK government carbon values all imply abatement costs of roughly \$150 to \$500 per ton by 2050...

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