

How High Could CO₂ Go?

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The growth of carbon dioxide emissions from the burning of coal, oil, and natural gas has been more or less exponential since the start of the 20th century, with an average rate of increase of 2.7% per year. At this point the observed increase of atmospheric CO₂ has been entirely due to our own activities. Substantial further increases depend mostly on three factors: the total earth resources of coal and hydrocarbons, the pace we can achieve in de-carbonizing our energy system, and the response of the natural system to climate change itself. Climate change as an unintended byproduct of our activities poses a major challenge to our economic system, especially to our expectations of growth, to our long-term goals, and measures of success.

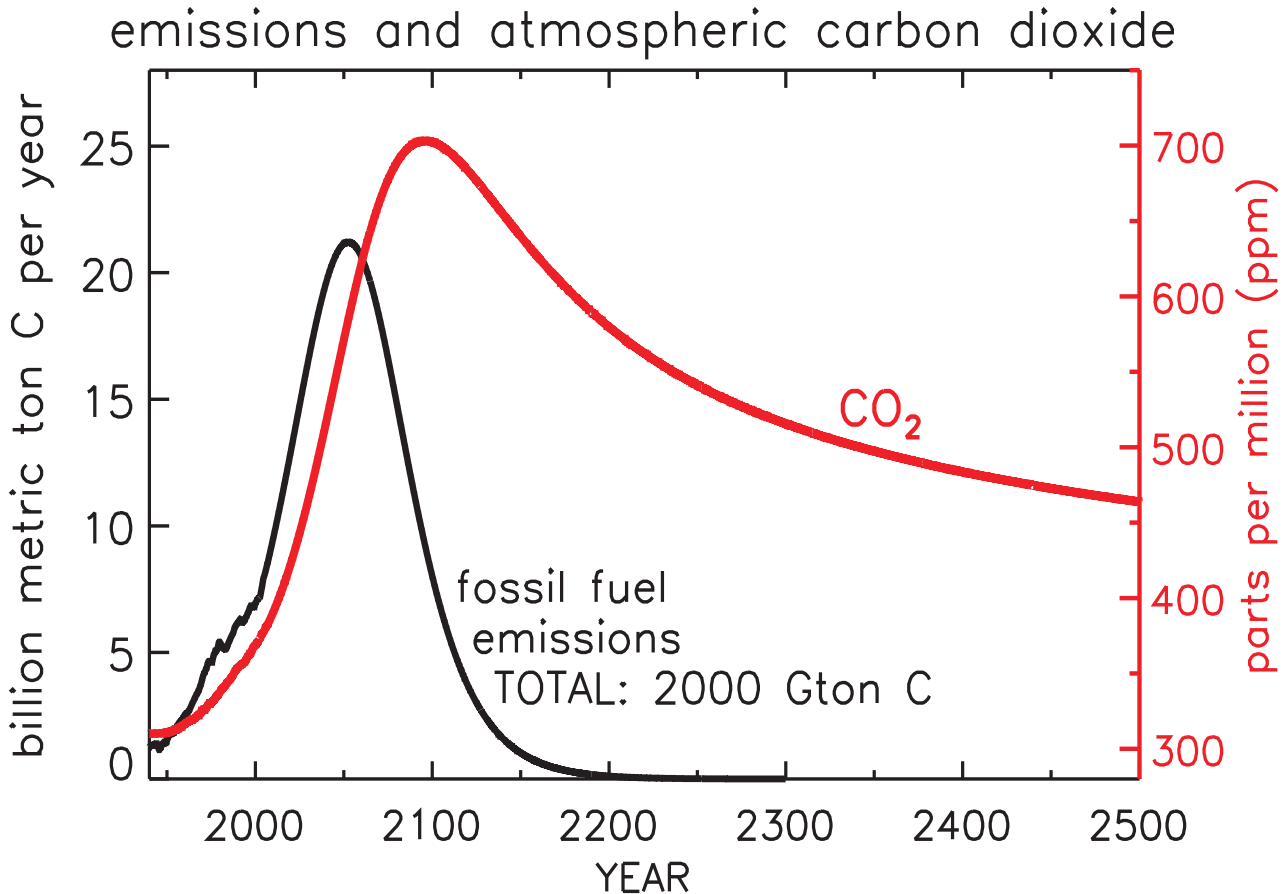


Figure 1. Black curve: Emissions from the burning of fossil fuels according to a logistics function, if all global reserves are consumed. Growth is initially exponential, slowing after the largest and most easily accessible deposits are consumed, peaking as the halfway point is reached, and then steadily declining until exhaustion. Emissions through 2006 are historical. The projected growth rate in 2007-2013 was chosen to equal the 2000-2006 pace. Red curve: The atmospheric CO₂ level that would result from such an emissions trajectory.