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# Are economists getting climate dynamics right and does it matter?

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## Résumé

We show that several of the most important economic models of climate change produce climate dynamics inconsistent with the current crop of models in climate science. First, most economic models exhibit far too long a delay between an impulse of CO<sub>2</sub> emissions and warming. Second, few economic models incorporate positive feedbacks in the carbon cycle, whereby carbon sinks remove less CO<sub>2</sub> from the atmosphere, the more CO<sub>2</sub> they have already removed cumulatively, and the higher is temperature. These inconsistencies affect economic prescriptions to abate CO<sub>2</sub> emissions. Controlling for how the economy is represented, different climate models result in significantly different optimal CO<sub>2</sub> emissions. A long delay between emissions and warming leads to optimal carbon prices that are too low and too much sensitivity of optimal carbon prices to the discount rate. Omitting positive carbon cycle feedbacks also leads to optimal carbon prices that are too low. We conclude it is important for policy purposes to bring economic models in line with the state of the art in climate science.

**Mots-Clés:** carbon cycle, carbon price, climate change, integrated assessment modelling, positive feedbacks, social cost of carbon

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