1035-91-1516   **Roy Radner*** (`rradner@stern.nyu.edu`), Stern School, NYU, KMC 8-87, 44 West 4th St., New York, NY 10012, and **Prajit K. Dutta**, Economics Dept., Columbia University, New York, NY. *Self-Enforcing Climate-Change Treaties.*

In the absence of world government, a treaty to control the emissions of greenhouse gases should be self-enforcing. A self-enforcing treaty (SET) has the property that, if a country expects other countries to abide by the treaty, then it will be in its self-interest to abide by the treaty, too. (One objection to the Kyoto Protocol is that is does not appear to lay the groundwork for a SET.) A SET can be modeled as a Nash equilibrium of a suitably defined dynamic game. The game analyzed here represents the strategic interactions among a large number of sovereign countries of diverse sizes and economic capabilities. We describe a methodology for identifying the equilibria of such a game (typically there are many), as well as the global-Pareto-optimal trajectories (GPOs). We identify one of the equilibria, "Business as Usual" (BAU), with the current situation. The multiplicity of equilibria provides an opportunity to move from the inefficient BAU to one or more equilibria that are Pareto superior. Using a calibrated model with 184 countries, we give numerical illustrations of BAU and GPO trajectories, and estimate the potential welfare gains from a SET. We also describe the mathematical and computational difficulties in extending the model to be more realistic. (Received September 20, 2007)

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