

CGE Analysis of Environmental and Energy Policies

EAERE-FEEM-VIU Summer School

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LECTURE 1: *Decomposing the Integrated Assessment of Climate Change*

This lecture deals with integrated assessment of climate policy measures, i.e. models in which both economic and climate mechanisms are incorporated to provide a framework for cost-benefit assessment of climate policy. In this lecture, I go through a decomposition approach for integrated models which is based on a linear approximation of the climate system. In our formulation the economic and natural science components are processed independently on different time scales. Turnpike properties of the Ramsey growth model can be exploited to provide a precise representation of post-terminal emissions and to reduce the economic horizon required to accurately approximate transition paths. Germaine to the economic assessment of climate policies, our decomposition accommodates formulation of the economic model in a complementarity format and thereby provides a means of incorporating second-best effects that are not easily represented in an optimization model.

The paper which provides the basis for this lecture can be downloaded from:

<http://www.mpsge.org/iamdecomp.pdf>.

Related computer programs (in GAMS) are available from:

<http://www.mpsge.org/mainpage/dicemodel.zip>.

LECTURE 2: *Stochastic Programming in a Complementarity Format: Programming Tools and an Application to Climate Policy Design*

This lecture introduces a new set of programming tools for representing stochastic equilibrium problems in GAMS. I outline the logic of stochastic optimization with recourse and show how these ideas are extended to complementarity programming. I illustrate this problem class through a model which explores the trade-off between technology subsidies and carbon taxes in climate policy.

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<http://www.mpsge.org>