

University of Cambridge, Department of Land Economy

EP02: Fundamentals of the Economics of Climate Change

Course description

The course aims to provide MPhil students coming from different backgrounds with the knowledge necessary to make informed decisions and robust analysis when thinking about the economy-environment nexus with application to climate change. Alternative approaches available in the literature on the economics of the climate will be put forward. The emphasis will be on comparing and contrasting different approaches to the economics of climate change, such as traditional economics with its sub-discipline of environmental economics, ecological economics, and elements shaping a new economics trans-disciplinary approach with corresponding policy implications. Traditional economics of climate change tends to take a fragmented view of the economy-environment nexus and is mainly concerned with the economy's insertion into the environment through anthropogenic greenhouse gas emissions. Alternative and new economics of climate change, on the contrary, adopts a whole systems integrated approach and regards energy-environment-economy linkages as foundational, core to our understanding and managing the climate and economics of our world. The course will cover fundamental concepts and key methods and tools employed in discourses on the economics of climate change. Regulatory instruments in dealing with climate change mitigation with a focus on institutional issues, taxes and tradable pollution permits will be discussed. The course will consist of eight lectures.

Course outline

Lecture 1: Introduction to the course and an overview of the economics of climate change

Serban Scriciu

The first lecture will introduce students to the aim of the course, contents, literature, logistics and others. It will then continue by providing an overview of the economics of climate change by comparing and contrasting different approaches to climate change economics, for instance neoclassical traditional economics with its sub-discipline of environmental economics versus ecological economics or other alternative approaches.

Core Readings:

- Stern, N. (2007) *The Economics of Climate Change*, Cambridge University Press (Executive Summary)
- Hanley, N. and A.D. Owen (2007) *The Economics of Climate Change*, Routledge
- Michael Common and Sigrid Stagl (2005) *Ecological Economics: An Introduction*, Cambridge University Press
- Herman E. Daly and Joshua Farley (2004) *Ecological Economics: Principles and Application*, Island Press, Washington DC

Additional Readings:

- Söderbaum, P, 2000 "Ecological Economics. A political economics approach to environment and development", Earthscan, London
- Barker, T and others (2007) "Climate Change 2007: Mitigation of Climate Change", Summary for Policymakers, IPCC Working Group III, IPCC Fourth Assessment Report, Intergovernmental Panel on Climate Change (<http://www.ipcc.ch/SPM040507.pdf>)
- Kolstad, C.D.: *Environmental Economics*. Oxford University Press, 2000 (Chapters 1, 2, and 3)
- Pearce, David, W. (2002) "An Intellectual History of Environmental Economics", *Annual Review of Energy and the Environment*, 27: 57-81 (on intranet).

Lecture 2: The treatment of values in the economics of climate change

Serban Scriciu

This lecture will focus on how traditional neoclassical/environmental economics and alternative approaches (ecological economics, new economics) deal with the problem of values when evaluating climate change damages and benefits. It will present the debates surrounding social choice, individual vs social benefits, welfare and wellbeing, preferences, the valuation of natural and social "assets", and the strengths and limitations of the corresponding tools created to address the treatment of values. Concepts covered will include the double dividend, competitiveness issues, carbon leakage and co-benefits. The lecture will also refer to ethical and social justice issues surrounding the topic. Several references and application will be made to the issue of climate change.

Core Readings:

- Michael Common and Sigrid Stagl (2005) *Ecological Economics: An Introduction*, Cambridge University Press
- Barker, T (2008) 'The economics of avoiding dangerous climate change', *Climatic Change* 89(3-4): 173-194
- Hanley, N. and A.D. Owen (2007) *The Economics of Climate Change*, Routledge
- Herman E. Daly and Joshua Farley (2004) *Ecological Economics: Principles and Application*, Island Press, Washington DC
- Broome, J. Counting the cost of climate change

Additional Readings:

- Stern, N. (2007) *The Economics of Climate Change*, CUP.
- Barker, T., Scriciu, S.S. and D. Taylor (2008) "Climate change, social justice and development", *Development* special issue **51**(3): 317-324
- Kolstad, C.D.: *Environmental Economics*. Oxford University Press, 2000 (Chapters 1, 2, and 3)
- Söderbaum, P. 2001 "Neoclassical economics, institutional theory and democracy. CBA and its alternatives", *Economic and Political Weekly* 36 (21), 1846-1854 (Mumbai-India)

Lecture 3: The treatment of spatial and temporal effects applied to climate economics

Serban Scriciu

A further major differentiation between ecological and neoclassical environmental economics is the treatment of spatial and temporal effects. This lecture will discuss how environmental impacts across (geographical) space are dealt with in the two approaches which are of particular relevance to environmental problems. This lecture will also present the main environmental challenges and their characteristics facing today's society.

Core Readings

- Barker, T., Scriciu, S.S. and D. Taylor (2008) "Climate change, social justice and development", *Development* special issue **51**(3): 317-324
- Michael Common and Sigrid Stagl (2005) *Ecological Economics: An Introduction*, Cambridge University Press
- Hanley, N. and A.D. Owen (2007) *The Economics of Climate Change*, Routledge

Additional Readings:

- Barker, T (2008) 'The economics of avoiding dangerous climate change', *Climatic Change* 89(3-4): 173-194

Lecture 4: Climate change mitigation potentials and costs

Serban Scriciu / Terry Barker (?)

The Mitigation section from the IPCC Fourth Assessment Report introduces new definitions of the economic potential for mitigation policies and presents estimates of these potentials at different costs. The lecture will explain the concepts and provide a guide to the Report and the global, regional and sectoral estimates, both from top-down and bottom-up modelling and analyses. It will also summarise the different approaches (e.g. neoclassical versus new economics) to the economics of mitigation. Issues related to ancillary environmental benefits and co-benefits of climate change mitigation are also explored.

Core Readings

- Barker, T and others (2007) "Climate Change 2007: Mitigation of Climate Change", Summary for Policymakers, IPCC Working Group III, IPCC Fourth Assessment Report, Intergovernmental Panel on Climate Change (<http://www.ipcc.ch/SPM040507.pdf>)
- Stern, N. (2007) *The Economics of Climate Change*, CUP.

Additional Readings:

- IPCC WG3 Climate Change 2007: Mitigation, CUP.
- Barker, T., M. S. Qureshi and J. Köhler, 2006: The Costs of Greenhouse Gas Mitigation with Induced Technological Change: A Meta-Analysis of Estimates in the Literature. UK Tyndall Centre Working Paper 89.

Lecture 5: Institutional setup for climate policies

Annala Anger-Kraavi

This lecture will address the institutional settings surrounding the climate change problem needed for an effective, efficient and equitable climate policy. It will discuss the formal and informal institutional framework, top-down and bottom-up approaches in harnessing market based instruments to address climate change mitigation. The lecture will also cover the institutional aspects / architecture of the Kyoto Protocol, command-and-control policy measures, and the issue of property rights (including the Coase Theorem).

Core Readings

- Stern, N. (2007) *The Economics of Climate Change*, CUP
- Yamin, F. and J. Depledge (2004). *The International Climate Change Regime. A Guide to Rules, Institutions and Procedures*. Cambridge University Press

Additional Readings

- Kolstad, C.D.: *Environmental Economics*. Oxford University Press, 2000 (Chapter 6)
- Coase, Ronald H.: The Problem of Social Cost, *The Journal of Law and Economics*, Vol.3, October 1960, pp.1-44
- Ellickson, Robert C.: The Case for Coase and against "Coaseanism", *The Yale Law Journal*, Vol. 99, No. 3, 1989, pp. 611-630.

Lecture 6: Carbon taxes

Annala Anger-Kraavi

The lecture will discuss environmental taxes applied to climate change. The Pigouvian approach is discussed, its limitations highlighted and there will be some analysis of other regulatory or market based approaches.

Core Readings:

- Ekins, Paul and Terry Barker: Carbon taxes and carbon emissions trading, *Journal of Economic Surveys*, Vol 15, No. 3, July 2001, (Special Issue on Issues in Environmental Economics eds Nick Hanley and Colin Roberts) pp. 325 -376.
- Nordhaus reference?

Additional Readings

- Kolstad, C.D.: *Environmental Economics*. Oxford University Press, 2000 (Chapters 7,8,9 and10)
- Herber, Bernard P. and Jose T. Raga: An International Carbon Tax to Combat Global Warming: An Economic and Political Analysis of the European Union Proposal, *American Journal of Economics and Sociology*, Vol. 54, No.3, July 1995, pp. 257-267.

Lecture 7: Tradable carbon permits

Annala Anger-Kraav

This lecture will discuss carbon permit trading as an alternative or complementary market based instruments to address climate change. The Kyoto flexible mechanisms will be discussed.

Core Readings

- Ekins, Paul and Terry Barker: Carbon taxes and carbon emissions trading, *Journal of Economic Surveys*, Vol 15, No. 3, July 2001, (Special Issue on Issues in Environmental Economics eds Nick Hanley and Colin Roberts) pp. 325 –376.
- Hansjürgens, Bernd: Introduction, in B. Hansjürgens (ed.), *Emissions Trading for Climate Policy: US and European Perspectives*, Cambridge, Cambridge University Press, 2005, pp.1-14.

Additional readings

- Kolstad, C.D.: *Environmental Economics*. Oxford University Press, 2000(Chapters 9 and10)
- Tietenberg, Tom (2002) *The Tradable Permits Approach to Protecting the Commons: What Have we Learned?* FEEM Working Paper 36, 2002.
- Kyoto Protocol (1997) *Kyoto Protocol to the United Nations Framework Convention on Climate Chang*

Lecture 8: System dynamics of the energy-environment-economy nexus applied to climate change

Serban Scriciu / Terry Barker (?)

Human-induced climate change is a systemic problem spanning space and time. This lecture will discuss the complexities and uncertainties surrounding the economics of the climate change debate from a whole systems approach and evolutionary perspective. Central elements of the discussion will be technological change and uncertainties. Current research attempts to shape a new economics approach more suitable for analyzing the climate issue are put forward.

Core Readings

- Barker, T (2008) 'The economics of avoiding dangerous climate change', *Climatic Change* 89(3-4): 173-194
- Beinhocker, E. (2007) *Origins of Wealth: Evolution, Complexity and the Radical Remaking of Economics*, Random House Business Books
- Barker, T., Scriciu, S.S. and D. Taylor (2008) "Climate change, social justice and development", *Development* special issue **51**(3): 317-324

Course assessment

To be developed