

Modul 23: External Costs of Energy and Climate Change

Studiengang/course:	M.Eng. Energie- und Umweltmanagement / M.Eng. Energy and Environmental Management
Modulbezeichnung / module name:	External Costs of Energy and Climate Change
ggf. Kürzel / abbreviation	ECE
ggf. Untertitel / subtitle	-
ggf. Lehrveranstaltungen / seminar:	<ul style="list-style-type: none"> • Analysis of external costs of energy – methodology and major studies • Impacts and external costs of climate change
Semester / semester:	Autumn term
Modulverantwortliche(r) / person in charge of module:	Prof. Dr. Olav Hohmeyer
Dozent(in) / person teaching the seminar:	Prof. Dr. Olav Hohmeyer
Sprache / language:	Englisch
Zuordnung zum Curriculum / attribution to courses:	M.Eng. Energie- und Umweltmanagement / M.Eng. Energy and Environmental Management for ‚Industrial Countries‘ and ‚Developing Countries‘ Core Elective Course
Lehrform / SWS / form of seminar / teaching hours per week:	Seminar / 3 SWS
Arbeitsaufwand / student workload:	45 hours of teaching and 105 hours of student work
Kreditpunkte / credit points:	5 ECTS
Voraussetzungen / preconditions:	none
Lernziele / Kompetenzen / aims of the module / competencies:	<p>Students will learn different methodologies to analyse external costs. Students will be able to analyse major international studies of external costs of energy (ExternE and USDOE/RFF/Oak Ridge National Lab) and understand the specific differences of the competing approaches. Students will understand the major impacts of climate change and the possibilities and difficulties of deriving the external costs of these impacts.</p> <p>Competencies covered:</p> <ul style="list-style-type: none"> • analytical thinking • life long learning • specific knowledge in external cost analysis • interdisciplinary knowledge • economic competence • ecologic competence • methodological competence • social and ethical responsibility • self organisation and teamwork • project organising skills • conflict solving skills • interdisciplinary communication
Inhalt / subjects covered:	<p>The following topics will be covered in the module:</p> <ul style="list-style-type: none"> • The basic concept of external and social costs

	<ul style="list-style-type: none"> • Internalisation of external costs versus policies securing strong sustainability • Damage costs versus control cost approach • Marginal versus average costs • Impact pathway approach and marginal costing • Valuation approaches <ul style="list-style-type: none"> ○ Market prices and cost measures of value ○ Travel cost method ○ Hedonic pricing ○ Contingent valuation method ○ Discrete choice methods • Major external international studies of external costs of energy • Impacts of man-made climate change <ul style="list-style-type: none"> ○ The Fifth IPCC Assessment Report ○ Mitigation, adaptation and impacts ○ Impacts on hydrology and water resources ○ Impacts on ecosystems ○ Impacts on human settlements, energy and industry ○ Impacts on insurance and finance ○ Impacts on human health ○ Impacts on the different regions of the world • Possibilities and problems of monetization of external costs of climate change • Internalization of external costs in the context of sustainable development
Studien- Prüfungsleistungen / form of examination:	Oral presentation (approx. 15 min. per student) of the results of the different teams in the seminar and a final written report (approx. 15 pages per student) by each team
Medienformen / media used:	Group work and lectures with beamer based presentations
Literatur / basic literature for the module:	<p>Bickel, Peter and Rainer Friedrich (2005): ExternE – Externalities of Energy. Methodology 2005 Update. EUR 21951. Luxemburg</p> <p>Cline, William R. (1992): The Economics of Global Warming. Institute for International Economics, Washington D.C.</p> <p>European Commission (1995): ExternE – Externalities of Energy. Volume 1 – 9. Office for Official Publications of the European Commission, Luxemburg</p> <p>Garrod, Guy and Kenneth G. Willis (1999): Economic Valuation of the Environment – Methods and Case Studies. Edward Elgar, Cheltenham</p> <p>Hohmeyer, Olav (1988): Social Costs of Energy. Springer, Berlin</p>

	<p>Hohmeyer, Olav (2015): The Benefit of Climate Change Mitigation. Why the 5th Progress Report of the IPCC falls short. Flensburg</p> <p>Koomey, Jonathan and Florentin Krause (1997): Introduction to Environmental Externality Costing. In: CRC Handbook on Energy Efficiency. Boca Raton, FL, USA</p> <p>IPCC (2014): Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge UK</p> <p>Markandya, Anil et. Al (eds.) (2010): The Social Costs of Energy. Scenarios and Policy Implications. Chaltenham, UK</p> <p>National Research Council (USA) (2010): Hidden Costs of Energy – Unpriced Consequences of Energy Production and Use. Washington, D.C.</p> <p>Nestle, Ingrid (2010): The Costs of Climate Change in the Agricultural Sector – A Comparison of Two Calculation Approaches. Dissertation. Flensburg</p> <p>Office of Technology Assessment (OTA) (1994): Studies of the Environmental Cost of Electricity. OTA-BP-ETI-134, Washington, D.C.</p> <p>Ottinger, Richard et al. (1990) : Environmental Costs of Electricity. Oceana Publications, Dobbs Ferry N.Y.</p> <p>Oak Ridge National Laboratory and Resources for the Future (1994): External Costs and Benefits of Fuel Cycles – A Study by the U.S. Department of Energy and the Commission of the European Communities. Utility Data Institute, no place</p> <p>Umweltbundesamt (2012): Methodenkonvention 2.0 zur Schätzung von Umweltkosten - Ökonomische Bewertung von Umweltschäden. Berlin</p>
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