PUBP 3350 Energy Policy

This course is taught by faculty from the School of Public Policy.

Policy Content: This course examines the close coupling of policy formulations with attributes of markets and technology systems. Principles of policy analysis and theory will be introduced and illustrated throughout the course, including stakeholder assessment, market failure and externalities, and regulatory and fiscal paradigms. Methods of policy and program evaluation will be illustrated in the context of energy policies, including cost-benefit analysis and alternative cost-effectiveness tests.

Technology Content: The course reviews the basic quantitative physical relationships between energy, power, fuel consumption, generation and end-use efficiency, greenhouse gas and other emissions, and the physical principles of energy resource availability and energy use applications. This knowledge is an essential foundation for energy policy analysis and understanding.

Topics Addressed. The course focuses on policies implemented in the U.S. and abroad to promote the development and market penetration of sustainable energy options. Reflecting the need to design policies to address the market and other barriers faced by different types of technologies, the course is divides into policy-technology bundles. These include, for example, low-carbon fuel standards to promote biofuels and plug-in electric vehicles; real-time electricity pricing to promote renewable, distributed power, and a smart grid; building standards and product labeling to encourage high performance buildings; renewable electricity standards and tax credits to promote renewable technologies (solar power, wind energy, etc.); and the role of loan guarantees for nuclear, carbon capture and sequestration, and other large-scale energy projects. The concept of a cumulative greenhouse gas budget for the U.S. and the globe will be introduced and will provide a means of framing policy and technology decision-making.

Possible texts:

Energy and American Society – Thirteen Myths. B. K. Sovacool and M. A. Brown (eds.), 2007. ISBN-13; 978-1-4020-5563-8.

Climate Change and Energy Policy, M. A. Brown and B. K. Sovacool, MIT Press, 2011.

Course outline:

Energy Overview: Overview of energy; history of energy use; relation of energy and the economy, energy metrics.

Petroleum: Geopolitics of petroleum, assessment of petroleum resources, and fuel economy and renewable fuel standards.

Nuclear Energy: Principals of nuclear energy; history and status of nuclear power; technological basis and international policy for nuclear non-proliferation; and loan guarantees.

Coal, Carbon, and GHG policies: Coal and greenhouse gases; technology approaches to carbon sequestration, clean coal and the policies used to promote them. Dynamics between developing and developed nations, and the concept of cumulative greenhouse gas budgets.

Renewable Resources and Portfolio Standards: Status of renewable power technologies; tax incentives and other policies. Cost benefit analysis, levelized cost of electricity, and lifecycle assessment of renewable energy options.

State and Federal Energy Policies: Review of recent federal energy legislation and state energy initiatives, and the role of learning curves.

Energy Efficiency: Buildings, land use, & combined heat and power: High performance buildings and social marketing, codes and standards. Smart growth. Evaluation of carbon emissions of individuals, institutions, metropolitan areas, and businesses. Behavioral issues such as price elasticity of demand and the rebound effect.

The Electric Grid. Siting issues associated with electric infrastructure investment. Chronology of air quality regulations in response to changing public policy paradigms. Current trends in the restructuring and regulation of the electricity industry.

Transportation Energy Technologies and Policies: Plug-in hybrid electric vehicles and fuel cells; characterization of bioenergy resource constraints; low-carbon fuel standards.

Climate Change: Climate Change Science, Technologies to Address Climate Change, and Climate Policy: UNFCCC, and Carbon Trading.