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**Teaching Statement**

I have enjoyed working with my colleagues at the University of Pittsburgh to strengthen our environmental, energy and development programs. I have served as the lead faculty member in establishing the Energy and Environment major at the Graduate School of Public and International Affairs and in developing our earlier Environment major. As a member of Pitt's Task Force on Sustainability, I have contributed to the design of our proposed university-wide graduate and undergraduate Certificates in Sustainability.

**ANALYTICAL METHODS FOR POLICY ANALYSIS**

My courses aim to develop students' skills in (1) economic analysis informed by an understanding of science, politics, law and administrative institutions; (2) quantitative and qualitative analysis of the effectiveness of public policy instruments and their distributional effects; (3) quantitative and qualitative analysis of the link between industrial activity and environmental impact; and (4) communication of evidence-based policy recommendations. We scrutinize study limitations that may mask underlying relationships, including the lack of sampling of informative parameters in the appropriate locations with sufficient density and frequency. Students learn research design, program evaluation, cost-effectiveness analysis and risk-benefit trade-offs within the context of specific policies. I enrich my courses with my research and field experiences. In addition to serving as a visiting professor at Arava Institute for Environmental Studies in Israel, I have worked in Mexico, Venezuela, Indonesia and Malaysia.

My graduate-level economics-based policy courses are: (1) *Global Energy Policy*, (2) *Global Environmental Policy*, (3) *Development Economics and Policy*, (4) *Global Health Policy*, and (5) *Global Economy*. I am in the process of designing two new courses: *Corporations, Environment, Energy and Development* and *Methods and Data: Environment, Energy and Development*. These courses serve students from the Schools of Public Policy, Public Health, Law, Business and Engineering and the Global Studies Certificate on Sustainability. I often teach advanced undergraduates, masters and Ph.D. students within the same course, organizing students into complementary teams. I have enjoyed involving students in my research projects. I serve as the Chair on one dissertation and as a committee member on two completed dissertations. Below are my course descriptions and excerpts of student evaluations of my teaching.

**GLOBAL ENERGY POLICY**

The Global Energy Policy course applies tools from economics, science, and policy analysis to address energy issues. First, we systematically examine various energy sources in the US/EU/developing countries including oil, gas, nuclear, hydro, biofuels, solar and wind. Specifically, we explore methods to estimate the benefits and costs (economic, environmental, and health) from various energy sources. We discuss how market forces, market failures, lobbying, and government policies influence the gaps between private and social costs of energy.

Second, we examine incentive policies for the adoption of renewable energy (e.g., cap & trade, carbon tax, renewable portfolio standards, pull-push innovation policies), barriers to their adoption (infrastructure, storage, and intermittency), and overall benefits from restructuring towards a greener economy. Third, we address incentive policies to increase energy efficiency (e.g., fuel economy standards, rebates, LEED certification). Fourth, we review the role of international trade, investment, technology transfer and climate policy in increasing energy efficiency and renewable energy worldwide. Fifth, we study the geopolitics of energy sources (e.g. US, EU/Russia, China/Africa, Central Asia & Middle East). We discuss the growing recognition that investment in energy efficiency and renewable energy can mitigate national security concerns stemming from fossil fuel dependency.

### **GLOBAL ENVIRONMENTAL POLICY**

The Global Environmental Policy course applies tools from economics, science, and policy analysis to address environmental issues. First, we address the symbiotic relationship between economic development and environmental protection. We explore methods to estimate the benefits from environmental services and the costs from environmental degradation (e.g., hedonics, integrated assessment). Second, we study the root causes of environmental problems (market failures such as externalities and public goods, informational gaps, government failures, and asymmetrical power). Third, we examine policy tools to address environmental problems (e.g. regulations, tradable permits, taxes, payment for environmental services, voluntary approaches, and information disclosure). Fourth, we examine the link between international trade and the environment (e.g., technology transfer and WTO disputes e.g. Shrimp-Turtle, Asbestos, Reformulated Gasoline) and international treaties (e.g. the Basel Convention, the Montreal Protocol, the Kyoto Protocol). Fifth, we discuss the challenges presented by climate change, including food security, water security, the spread of infectious diseases, extreme weather events and resource conflicts. We discuss efforts to address climate change adaptation and mitigation, and the recognition that climate change represents national security challenges.

### **DEVELOPMENT ECONOMICS AND POLICY**

We use basic conceptual frameworks from economics and quantitative methods to examine economic development issues. We begin by discussing Amartya Sen's concept of "development as freedom" and measures of development such as the Human Development Index. We examine when the market and government can serve as appropriate mechanisms to allocate resources within the economy. We discuss the institutions that are needed to ensure that markets function well. We study innovations, such as disclosure programs, that reduce corruption. We examine gender-sensitive pro-poor strategies, such as micro-credit programs, the granting of property rights to women, investment into girls' schooling and women's reproductive health. We study World Trade Organization provisions that assist or impede poor countries' access to drugs in combating AIDS and other public health crises. We review the rules of the WTO that attempt to balance free trade and countries' ability to protect public health and the environment. We discuss

the role of international trade (e.g., OECD subsidies for agriculture), foreign aid and debt in encouraging or impeding economic development. Case presentations by students illustrate the development challenges faced by governments, international organizations, non-governmental organizations, corporations, and members of the public.

### **GLOBAL HEALTH POLICY**

The Millennium Development Goals prioritize investment in health for human welfare. We examine underlying economic problems and policy proposals to address major diseases such as AIDS, TB, malaria, diarrhea and respiratory illnesses. We study policy incentives, including public-private partnerships, pull mechanisms (e.g., advanced purchase commitments) and push mechanisms (e.g., research grants) to enhance R&D for vaccines, antibiotics and medicines for neglected diseases. We study how TRIP provisions attempt to strike a balance between two competing goals: first, incentivizing R&D by protecting intellectual property, and second, enabling poorer countries to access medicines by allowing compulsory licensing. We discuss how TRIP-plus provisions in US/EU bilateral trade agreements with developing countries impede the latter's access to drugs. We examine WTO cases in which countries differ on their risk assessments (e.g., the Beef Hormone and GMO cases). We evaluate the adverse health impacts of agriculture policies (e.g., the use of antibiotics in animal husbandry). We discuss how health co-benefits can provide the impetus for countries to transition towards a lower carbon economy (e.g., reduced air pollution from the switch away from cars to public transit and the switch away from coal-fired power-plants). Student presentations examine cases of successful global health interventions (e.g., small pox eradication and arresting AIDS in Thailand) and new challenges (e.g., Ebola, SARS, avian flu, and health-related impacts of climate change).

### **GLOBAL ECONOMY**

This course on the global economy is organized into three sections. The first section reviews the quantitative evidence on economic policies that can contribute to equitable and sustainable economic progress (e.g. investment in human capital, technology and institutions). The second section examines economic interdependence among countries. These linkages are through international trade (e.g. food and energy security), labor movements (e.g., migration) and global public goods (e.g. the global environment and global public health). The third section focuses on fiscal policies (e.g. to create jobs and counteract recessions) and policies in the financial sector (e.g. the need for regulation to correct market failures).

### **METHODS AND DATA: ENVIRONMENT, ENERGY AND DEVELOPMENT**

Policy analysts working in policy think-tanks, consulting firms, or government agencies need to be proficient in assessing research papers and in conducting primary research. We discuss key concepts in energy, environment, health, and development policies. We study (1) methods used in policy research, particularly program evaluation, valuation of public goods, regulatory impact analyses, and environmental impact assessments, and; (2) how disparate data sources can be creatively combined to address policy questions. As we read research papers, we discuss their research methods, data sources, results, and importantly, limitations. Students, working in teams,

will (1) review a research paper in their area of interest; and (2) write one focused research proposal. The research proposal identifies a sharp question, describes the data that can be used to address the question, and outlines the qualitative or quantitative methods. Each team presents their research proposal in an oral briefing.

### **CORPORATIONS, ENVIRONMENT, ENERGY AND DEVELOPMENT**

Corporations contribute to economic progress, by providing employment, goods and services, and by spurring innovations. At the same time, public policies are needed to align firms' profit-maximizing decisions with socially optimal decisions. First, we discuss firms' financial interests in undertaking health and environmental protection. Poor performance by one firm can lead to the entire industry facing losses to their stock market value or at the extreme, losing public support for their continued operations (e.g. the Fukushima and Bhopal accidents). The Security and Exchange Commission has required publicly traded firms to report their environmental liability. These reports are scrutinized by investors who consider the risks and rewards of allocating their investments to competing firms. Second, we examine the role of regulations, industry self-regulation, mandatory disclosure programs, and voluntary standards to incentivize firms to reduce their health and environmental risks. We discuss cases of regulatory capture (e.g. the relationship between the Minerals and Management Service with oil companies prior to the Deepwater Horizon disaster) and strategies to ensure the independence of regulatory agencies. Third, we examine the role of courts in developed countries in holding firms responsible for polluting actions in developing countries. The Dutch court has fined the Swiss firm Trafigura, which dumped toxic waste in the Ivory Coast, for violating EU law on waste exports. However, the US Supreme Court has ruled in *Kiobel vs. Royal Dutch Petroleum* (RDP) that the Alien Tort Statute cannot be used by foreign victims to hold firms' responsible in US courts for human rights violations abroad. The plaintiffs had accused RDP of compelling its Nigerian subsidiary to collude with the Nigerian government to violently suppress environmental activists in the Niger Delta. Fourth, we discuss information collection and disclosure in developed countries that allow the public in developed and developing countries to scrutinize the actions of firms and their relationship with governments in developing countries. The US Dodd Frank Act and the EU Transparency and Accounting Directive require firms to report payments above \$100,000 and €100,000, respectively, on every individual extraction project they operate. Therefore, local communities and civic organizations, armed with information on funds generated by extractive activities, can press governments to invest part of these funds into local development projects. Fifth, we discuss investor demand for socially responsible investment (SRI). We examine research evidence on whether investment funds marketed as SRI allocate their investment portfolios in manner consistent with this stated aim.