

C&RP 720: INTRODUCTION TO ANALYSIS OF ENERGY FACTORS IN CITY AND  
REGIONAL PLANNING

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Call No.: 05127-6  
Meeting Time: Tuesday and Thursday, 6:30- 9:18 pm, Brown 274  
Credit: 3 hours  
Instructor: Jean-Michel Guldmann  
Office: 281 Brown Hall  
Office Hours: By appointment (email: Guldmann.1@osu.edu, tel.: 292-2257)

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### INTRODUCTION

This course is designed as an introduction to the role of energy as a factor and constraint at various levels of city and regional planning and policy. The resource, technological, environmental, economic, and institutional dimensions of various critical energy issues are analyzed. The emphasis is set on basic facts finding, definition of the problems, search for possible solutions, and evaluation of their associated costs and benefits. An overview of the international and U.S. energy scenes is first presented, and then the following specific subjects are discussed: coal resources, production, conversion, and utilization; natural gas production, transmission, distribution, consumption, and regulation; electricity production, transmission, consumption, and pricing; the potential and problems of new energy sources and technologies such as solar, geothermal, wind, biomass, hydrogen; assessment of various energy/environment interactions (air pollution, heat release, climate modification); energy consumption in cities, energy conserving land-use patterns, and urban development policy.

The course is non-quantitative, and no prior knowledge about energy is required. Several sound filmstrips will be presented, complementing the instructor's class presentations.

### COURSE OBJECTIVES

Upon completion of the course, a student should be able to:

- 1) understand the existing patterns of energy supplies, the institutional arrangements that govern their availability, and their associated economic costs and environmental impacts;
- 2) understand the various energy consumption patterns (residential, commercial, industrial, transportation), their determinants, costs and environmental impacts;
- 3) discuss the critical issues confronting the development of regional, state and local energy plans and policies.

## COURSE METHOD

Course material is presented through both lectures and sound filmstrips. These two information sources are to complement and enrich one another. A final exam will assess each student's understanding and knowledge of the issues discussed in class.

## EVALUATION

The final grade for the course is determined as follows:

Class participation	20%
Final exam	80%

## OFFICE HOURS

Appointments can be made to meet with the course instructor by contacting him at 292-2257 or by sending an E-mail to: Guldman.1@osu.edu.

## COURSE OUTLINE

1. Overview of the international and U.S. energy scenes: worldwide primary production, flows and reserves of crude oil, natural gas, coal, hydro electric and nuclear power; U.S. energy production, consumption, and imports/exports; general recent trends.
2. The coal issue: geography of resources and current production; mining technologies (underground and strip-mining); coal processing and conversion (in particular, liquefaction and gasification); environmental impacts of production and conversion, in particular on water resources, land, and landscapes.
3. The natural gas issue: general pattern of production, transmission, and consumption in the U.S.; regulatory framework of the natural gas system and current deregulation trends; gas distribution planning; weather-related variability of gas demand and role of gas storage.
4. The electricity issue: generation technologies and environmental impacts; patterns of consumption; regulation of electric utilities and pricing policies; deregulation trends; impacts of the Clean Air Act Amendments of 1990 on the electric utility industry.
5. New energy technologies issues: solar, geothermal, wind, tidal, and biomass energy sources; the possible future for hydrogen; technological and environmental characteristics of these sources, and the economic and institutional barriers to their development. The emphasis will be set on solar and geothermal energy.
6. Energy/Environment interactions issues: review of the environmental impacts related to

waste heat release, air pollution emissions due to fuel combustion, water usage, and solid wastes; analysis of air pollution control approaches, and of solid wastes recovery for energy production.

7. Energy, land-use planning, and urban policy issues: analysis of the various interrelationships between energy production and consumption and urban spatial structure and development; analysis of the potential for energy conservation in the transportation and residential sectors; district heating; site planning and climatic design.