PUBPOL 830.08

DEVELOPMENTS IN STATE CLIMATE CHANGE POLICY

SPRING 2020
Tuesday, Thursday 11:45-1:00 PM
February 25 — April 16, 2020
Sanford Rm 102

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COURSE DESCRIPTION AND OBJECTIVES

Reliable, affordable electric power is an essential component of modern daily life in developed economies, as well as a key to economic progress in developing economies. Electric power generation has traditionally been a carbon intensive process. Recognition of the risks associated with climate change have given rise to extensive public policy proposals to reduce carbon emissions in the electric power system. International efforts have focused on the United Nations Framework on Climate Change. Recent policy efforts in the United States have focused on implementation of the federal EPA Clean Power Plan of 2015. With the Trump Administration's withdrawal from both of these efforts and the alarming predictions from the scientific community concerning increased risks associated with climate change, many US states and localities are pursuing their own carbon reduction policies. This module will explore state level policies to reduce carbon emissions in the electric power system. It will also explore the potential for carbon reductions through the electrification of transportation. Course presentation materials will include:

1. climate change science, including historic and forecast carbon levels and global temperatures;
2. overview of the US electric power system with particular focus on the carbon intensity of various power generation technologies;
3. evolution of the regulatory framework that governs the electric power system; and
4. trends and issues associated with various state policies to reduce carbon emissions in the electric power systems.

Specific course objectives are:

1. To understand the electric power system and how cost of service regulation works, including investor-owned utility incentives associated with various carbon reduction strategies.

2. To analyze and evaluate state carbon reduction policy options in light of electric power technology, regulation and economics.

3. To enhance analytical, communication and collaboration skills through class discussion, presentation and project work.

TEAM PRESENATION

Each student will be assigned to a team to prepare a twenty minute presentation on the role various available electric generation and smart grid technologies can play in state policies to reduce carbon emissions in the electric power sector. These teams will focus on nuclear power, renewables (wind and solar), natural gas, and energy efficiency.

ELECTRIC TRANSPORTATION EXPLORATION

Each student will be assigned an electric transportation topic to research and present. Topics will be developed by the class in a collaborative exercise on April 2 identifying key questions to be explored for the growth of electric transportation in the US. Topic research will be presented in ten minute report outs in class on April 7.

STUDENT PROJECTS

Each student will prepare present an individual project. The project should analyze one or more viable state level carbon reduction policies. A 15-20 page, double spaced project report is due when the project is presented. A one-page project proposal is due in class on March 31.

CLASS GUIDELINES AND RULES

This module is a seminar. Students are expected to attend class on time, have completed the assigned reading materials and participate in class discussion. Unexcused absences will affect your grade. Honesty is basic

to what we do at the university and in this course. Your individual student project must be your own work. Your are expected to conform strictly to the standards for honesty and integrity in the Duke and Sanford School Honor Code. Use of electronic devices in class for anything other than class work is prohibited.

GRADES

Team Presentation	20%
Electric Transportation Research Report out	20%
Individual Project	60%

SYLLABUS

CLASS 1 (2/25) COURSE OVERVIEW, INTRODUCTIONS
United States Climate Alliance, **usclimatealliance.org**

CLASS 2 (2/27) THE CLIMATE CHANGE CHALLENGE
Guest Speaker: Drew Shindell, Professor of Climate Sciences, Nicholas School of the Environment

CLASS 3 (3/3) OVERVIEW OF THE US ELECTRIC POWER SYSTEM
MIT, The Future of the Electric Grid (2011)
Appendix A: A Brief History of the U.S. Grid (pp. 235-40)
Appendix B: Electric Power System Basics (pp. 243-259) (skim)

CLASS 4 (3/5) RETAIL ELECTRIC UTILITY REGULATION
McDermott, Cost of Service Regulation in the Investor-Owned Electric Utility Industry: A History of Adaptation (2012)

CLASS 5 (3/17) WHOLESALE ELECTRIC POWER MARKETS
Adair, Sarah K. and Litz, Frank T., 2017 "Understanding the Interaction between Regional Electricity Markets and State Policies." NI Primer 17-01. Durham, NC: Duke University, http://nicholasinstitute.duke.edu/publications

CLASS 6 (3/19) INDUSTRY STRATEGY TRENDS

Electric Power Research Institute (EPRI), "Developing a Framework for Integrated Energy Network Planning." (2018)

Guest Speaker: Randy McAdams, Partner, ScottMadden, Consultants

CLASS 7 (3/24) TEAM PRESENTATIONS

Nuclear Power
Natural Gas

CLASS 8 (3/26) TEAM PRESENTATIONS

Renewables —Wind and Solar
Energy Efficiency

CLASS 9 (3/31) CALIFORNIA POLICY DEVELOPMENTS

Guest Speaker: Caroline Choi, Senior Vice President, Corporate Affairs, Edison International and Southern California Edison

CLASS 10 (4/2) NORTH CAROLINA POLICY DEVELOPMENTS

NC Clean Energy Plan (October 2019)

Guest Speaker: Michael Regan, Secretary, North Carolina Department of Environmental Quality (or designee)

CLASS 11 (4/7) ELECTRIC TRANSPORTATION

Team Research Reports on class-developed questions

CLASSES 12, 13, 14 (4/9, 4/14, 4/16) STUDENT PROJECTS REPORTS