

# Course Syllabus

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Planning for Urban Energy

PLA 4010

GSAPP Columbia University

Spring 2017

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## Introduction

Urbanization has been associated with increasing energy use and GHG emissions. Yet, urban energy systems have almost been a taken-for-granted infrastructure system, out of the realm of urban planning. Due to climate change as well as threats of “peak energy use” however, these systems are coming under increasingly intense scrutiny. Understanding and planning for urban energy may be one of the most important tasks for planners in the future. This class explores urban energy systems, their components and related planning issues.

## Course description and learning objectives

This class explores planning for urban energy systems and is divided into four sections. The first section examines the concept of “urban sustainability”. What does this concept entail, how it is used, does it apply to urban energy use? The second part of the semester focuses on energy use and infrastructure generally. We examine the electric grid, primary energy supply, end uses and policies. The third section examines these aspects at the urban scale. In this section we cover issues of urban energy first and second low-carbon urban planning and policies.

The learning objectives for the course include:

- Identification of the general dynamics and components of energy systems
- Identification of the urban aspects of energy systems
- Explanation of shifts in urban energy planning and policy over the last two decades
- Synthesis and prediction of major future challenges for urban energy systems

## Course methods

During the semester we will focus on several texts and a number of articles. For each class, reading requirements are provided in the syllabus and posted in CourseWorks. During the beginning of the semester the course is run a lecture, but quickly moves into seminar format. The seminars are run by students and all will be expected to contribute and/or present thoughts, information and experiences. Presentations and participation are a major contribution to the success of the class.

## Student evaluations

Evaluations are based upon:

- Class attendance and participation. Participation in class discussion is vital for learning. As mentioned, a significant portion of class time is devoted to discussion of readings and class lectures;
- The completion of three further assignments.
  1. First students are required to run a seminar and perhaps more than one, depending on the size of the class. These student seminars can be given by groups of students.
  2. Second, students will prepare a paper based upon, or related to any topic directly covered during the seminar (planning for urban energy systems). The paper is due at the end of the semester. The final paper should be approximately 2500-4000 words including bibliography, tables and charts.
  3. Finally, students will present a group project on one aspect of planning for the urban energy system of New York City. This project could focus on planning for energy supply, energy transformation infrastructure, vulnerabilities or mitigation measures.

Percent of

| <u>Class activity</u> | <u>final grade</u> | <u>Due date</u> |
|-----------------------|--------------------|-----------------|
|-----------------------|--------------------|-----------------|

|                     |     |            |
|---------------------|-----|------------|
| Class participation | 10% | Throughout |
|---------------------|-----|------------|

|                                   |     |           |
|-----------------------------------|-----|-----------|
| Assignment 1 – Leading a seminar  | 20% |           |
| Assignment 2 – Paper              | 50% | 4 May     |
| Assignment 3 – Group presentation | 20% | Last week |

### Class policies

There are no incompletes given for the course, with the exception of proof of a medical emergency. Late papers will be marked down.

### Course readings

- Worldwatch Institute, 2016. *Can a City Be Sustainable?* Washington, DC: Island Press
- William L. Thompson, 2016. *Living on the Grid, The Fundamentals of the North American Electric Grids in Simple Language*, Bloomington, IN; iUniverse
- L. Danny Harvey, 2010. *Energy and the New Reality 1: Energy Efficiency and the Demand for Energy Services*, London: Earthscan
- [Arnulf Grubler](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=Arnulf+Grubler&search-alias=books&field-author=Arnulf+Grubler&sort=relevancerank) ([http://www.amazon.com/s/ref=dp\\_byline\\_sr\\_book\\_1?ie=UTF8&text=Arnulf+Grubler&search-alias=books&field-author=Arnulf+Grubler&sort=relevancerank](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=Arnulf+Grubler&search-alias=books&field-author=Arnulf+Grubler&sort=relevancerank)) and David Fisk (Eds.), 2012. *Energizing Sustainable Cities: Assessing Urban Energy 1st Edition*, London, Routledge
- Harriet Bulkeley, Vanesa Castán Broto, Mike Hodson, Simon Marvin (Eds.), 2010. *Cities and Low Carbon Transitions*, London, Routledge

These books are in the Columbia University Bookstore

### Office hours and classroom policies

I am available for discussion most Thursdays. I do not, however, have an office here on campus, so we will meet in common spaces at Columbia. Note that while I respond to email as promptly as possible, if you send me an email late on Friday I may not respond until Monday.

During class time, please turn off your phones and do not bring/use earphones.

### Academic integrity

Columbia University regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The University is committed to enforcing its Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Academic Integrity Procedures. Plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished to the full extent allowed according to Columbia University College regulations.

### Tentative semester schedule

|             |                                                                            |
|-------------|----------------------------------------------------------------------------|
| 19 January  | Introduction                                                               |
| 26 January  | Can a City be Sustainable?: Part 1, WRI (2016)                             |
| 2 February  | Can a City be Sustainable?: Part 2, WRI (2016)                             |
| 9 February  | Living on the Grid: Thompson (2016)                                        |
| 16 February | Energy Efficiency and the Demand for Energy Services: Part 1 Harvey (2010) |
| 23 February | Energy Efficiency and the Demand for Energy Services: Part 2 Harvey (2010) |
| 2 March     | Energy Efficiency and the Demand for Energy Services: Part 3 Harvey (2010) |
| 9 March     | Energy Efficiency and the Demand for Energy Services: Part 4 Harvey (2010) |
| 16 March    | Spring Recess: No class                                                    |
| 23 March    | Energy Efficiency and the Demand for Energy Services: Part 5 Harvey (2010) |
| 30 March    | Energizing Sustainable Cities: Part 1, Grubler and Fisk (2012)             |
| 6 April     | Energizing Sustainable Cities: Part 2, Grubler and Fisk (2012)             |
| 13 April    | Cities and low Carbon Transitions: Part 1, Bulkeley et al (2010)           |
| 20 April    | Cities and low Carbon Transitions: Part 2, Bulkeley et al (2010)           |

27 April Student group presentations

## Course Summary:

| Date | Details |
|------|---------|
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