

GARP 0239-002 Seminar: Sustainable Energy (Fall 2010)

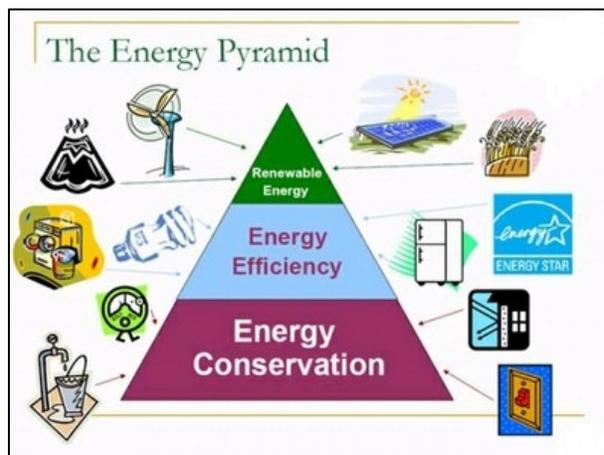
Location/Time: Wednesdays, 16:30 to 17:30 in Bates 05
Instructor: Dr. Carsten Braun, office hours MWF 12:00 to 13:00, Bates 217
cbraun@wsc.ma.edu

What is Sustainable Energy?

Sustainable energy is the supply of energy so that it meets our needs today without compromising the ability of future generations to meet their needs. A broad interpretation includes fossil fuels as transitional sources. A narrow interpretation includes only energy sources which are not expected to be depleted in a time frame relevant to humans.

Renewable (or sustainable) energy is an important piece of our energy future, but the largest opportunities are currently in energy conservation and efficiency.

(Source: <http://www.smartenergysavings.net/>).



This course explores sustainable energy as an alternative to our current fossil fuel-based energy system. Weekly readings and discussions will cover sustainable energy sources and technology, energy conservation, climate impacts, and policy choices. We will also incorporate the Stabilization Wedges Game and invite guest speakers to learn more about exciting technologies to reduce global greenhouse gas emissions. The specific topics and readings will depend on our interests.

Learning Goals and Outcomes

We have are three 'big-picture' learning goals in this course:

1. Students appreciate issues of sustainability and equity within and between generations by acquiring an understanding of sustainable energy, climate/environment/social impacts, and policy choices.
2. Students practice critical thinking and analytical skills by reading, synthesizing, and discussion of a variety of different information sources related to sustainable energy.
3. Students practice effective communication by participating in and facilitating seminar discussions.

Course Logistics

We meet once a week to discuss the assigned readings. Readings may include scientific papers, magazine articles, online book chapters, suitable websites, etc. Typically, two students will serve as discussion facilitators each week: they will provide an overview/summary of the assigned reading (typically using MS PowerPoint) and then facilitate our discussion.

We will also 'play' the excellent Stabilization Wedges Game created by the Princeton Carbon Mitigation Initiative (see link below). The Stabilization Wedges Game is a team-based exercise that teaches players about the scale of the greenhouse gas problem, plus technologies that already exist to dramatically reduce our carbon emissions and get us off the path toward dramatic and damaging climate

change. I will also try to invite suitable guest speakers to our seminar to learn more about what we all can do right now in terms of sustainable energy. I have a few ideas for guests, but any ideas would be appreciated!

Class Meetings 9/8, 9/15, 9/22, 9/29, 10/6, 10/20, 10/27, 11/3, 11/10, 11/17, 12/1, 12/8
 No class 10/13 (Wednesday = Monday schedule)
 No class 11/24 (Thanksgiving Recess)

Seminar Schedule and Topics

Our seminar is broadly-structured around three sections as summarized in the table below. Within each section we have a lot of flexibility to tailor the content and readings to our interests.

SEMINAR TOPICS	
Part 1 The Big Picture	What is Sustainability? What is Sustainable Energy? Issue of equity within and between generations Energy use, energy efficiency, and energy conservation Fossil fuels and Peak Oil <i>Anything else?</i>
Part 2 'Cool' Technologies	Carbon Sequestration and Storage Geothermal Energy Nuclear Energy = Sustainable Energy? Electricity = The Solution? Sustainable Biofuels? The car of the 21 st century <i>Anything else?</i>
Part 3 Now What?	Stabilization Wedges Game Geoengineering? Clean Coal? The Economics: Carbon Taxes, Carbon Trading, Carbon Offsets Personal Action Plan <i>Anything else?</i>

Assessment

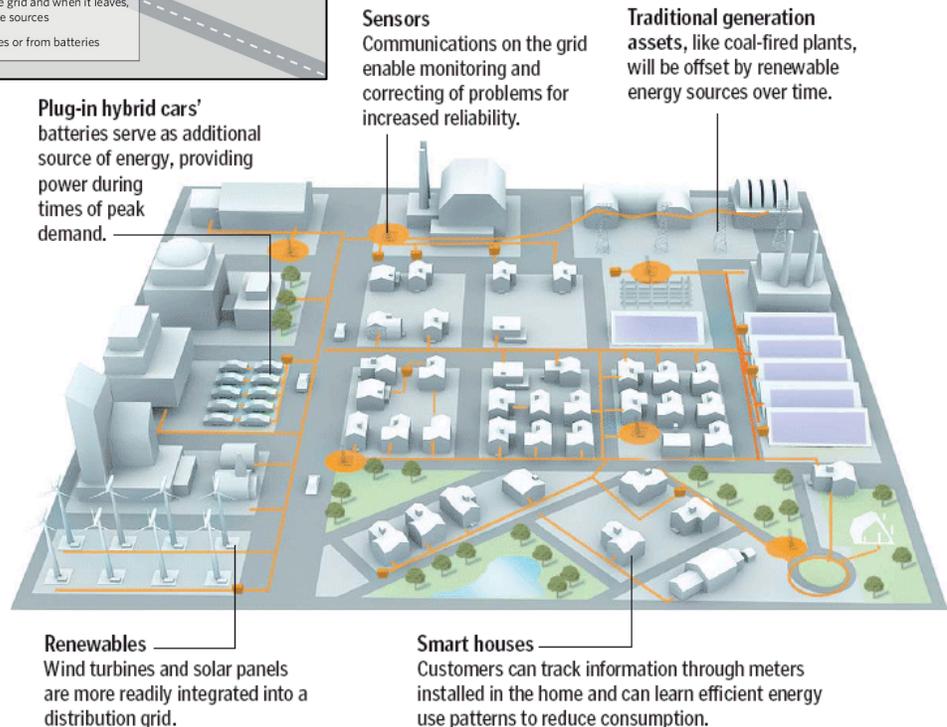
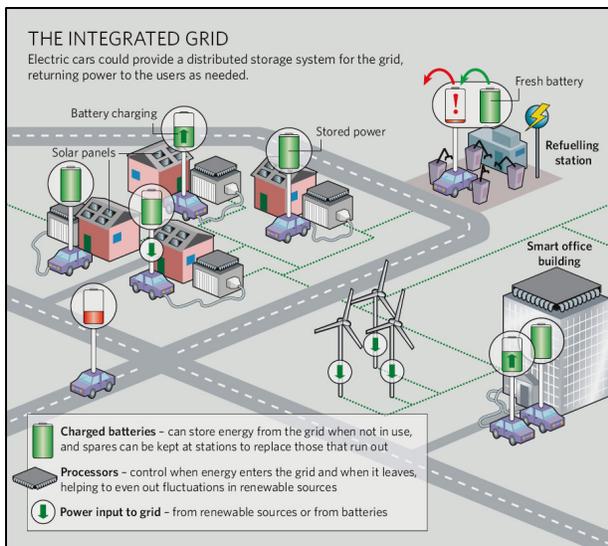
Attendance/Preparation/Participation	200 points
Resource Portfolio	100 points
Discussion Facilitator	100 points
Personal Action Plan	100 points

It's really pretty simple: Attendance is mandatory and you will lose 20 points each time you miss class. Preparation and participation are crucial; otherwise our discussions will be boring and lack substance. The resource portfolio is a compilation of useful resources, figures, papers, websites, etc. = essence a folder, binder, or document with reliable and organized information about sustainable energy. Each person will serve once as discussion facilitator and we will all develop personal action plans for ourselves.

More details will be provided!

Course Resources

- <http://www.withouthotair.com/>
This is the free online version of David MacKay's excellent textbook. The material gets a bit technical at times, but provides a solid foundation of sustainable energy sources.
- <http://needtoknow.nas.edu/>
This is an excellent website about energy from the National Academies – advisers to the nation on science, engineering, and medicine.
- <http://cmi.princeton.edu/>
Princeton's Carbon Mitigation Initiative – great resources, including the famous Stabilization Wedges Concept and Game.
- <http://www.ucsusa.org/>
This is the website of the Union of Concerned Scientist with great information and resources about clean vehicles, clean energy, and other related topics.



SOURCE: National Grid

JAVIER ZARRACINA/GLOBE STAFF