MASSACHUSETTS INSTITUTE OF TECHNOLOGY SPRING 2007

5.92 Energy Environment and Society
(a Project Based First Year Subject supported by the d'Arbeloff Program)

Session 1.5. Energy Basics (continued)

1. Climate (Guest lecturer, Prof. Peter Stone, Department of Earth Atmospheric and Planetary Sciences)

Readings and Assignments

G. Stix, "Climate Repair Manual", Scientific American, Sept. 2006, pp. 46 – 49

J. Hansen *et al.*, "Global temperature change", Proc. National Academy U.S. **103**, 14288 – 14293 (Sept. 26, 2006)

Questions for discussion

(1) Why (how) would the Gulf Stream be disrupted by Global Warming?

(2) Why would poison ivy get worse as a result of Global Warming?

(3) How is the concentration of CO_2 in the atmosphere measured? What are the other components of the Earth's atmosphere?

(4) It is claimed that the concentration of atmospheric CO_2 is higher than at any time in the past 650,000 years – how do we know that?

(5) What is the basic mechanism of the „Greenhouse Effect"? What are the principal greenhouse gases besides CO_2?

(6) Stix claims that "Almost all of the 20 hottest years on record have occurred since the 1980's". How is global average temperature measured?

(7) What is the basis for the statement, „Climate change compels massive restructuring of the world energy economy"?

(8) The US, with less than 5% of the Earth's population, accounts for ~ 25% of the carbon emissions. What is it about the U.S. (us) that accounts for this disparity?

(9) What is the Kyoto Protocol and why do we talk about it?

(10) Which states are parties to the Northeast Regional Greenhouse Gas Initiative? Is Massachusetts? Why or why not?

(11) Stix states that „If we wait for an ice cap to vanish, it will simply be too late". Why will it be too late? When do we need to take action?