(1) Do question #2 on the undergraduate homework #4 (http://www.geo.arizona.edu/geo4xx/geos478/GC10.UGHmwk4.pdf), taking care to explicitly include, in your written answer, the relative values of the total CO2 emissions, the CO2 emission per capita, and the energy intensity of the economy for each of the countries considered there, for current day emissions.

Now, consider the recently published Davis et al (2010) paper, and the associated commentary by Hoffert (2010) about the world's energy infrastructure and associated CO2 emissions. Davis et al., drawing on the long-recognized concept of "committed warming," which quantifies the inertia in the climate system, attempt to quantify technological inertia of global economic systems with the concept of "committed emissions." Consider each of the following questions, answering concisely in a few complete sentences (or, if necessary, in a concise essay), with all text for answering questions 2-5 amounting to no more than 4 double-spaced pages.

(2) Describe the general approach taken in Davis et al. How reasonable or unreasonable do you think it is, in the context of strategies that might be considered for mitigating global warming, to take their approach of assuming that all existing CO2 emitting devices will live out their normal lifetimes? Are there ways might this approach might over- or underestimate the "committed" emissions burden? (Answer in a few sentences, no more than ½ page).

(3) What two countries have the greatest committed emissions, and what is the size (in Gt CO2) of their emissions commitments? Despite the comparable rates of emissions of these top two in the present day, the committed emissions of the top country is several times that of the second place country over time. What do Davis et al suggest is the reason for this disparity?

(4) Davis et al. also consider emissions commitments per capita, noting that "Despite its much larger population, emissions commitment per capita in China (136 tCO2 per person) is remarkably similar to that in Japan and Europe (152 and 150 t CO2 per person, respectively), but still considerably less than the commitment of 241 t CO2 per person in the United States." (p. 1333) They say that these numbers underscore the global importance of future emissions policy in China, but also that this "ignores the legacy of historical emissions as well as the role of consumption in developed countries in driving Chinese emissions. (24)" What do you think Davis et al mean by this comment? Answer this question in a short essay (1 to 1.5 pages), drawing also on the reference cited therein (# 24), and any others you think relevant.

(5) The Hoffert (2010) commentary suggests that Davis et al, together with updated "business as usual" scenarios, imply that mitigating global warming will be a much greater challenge than the "7 wedges" advertised by the Pacala & Socolow (2004) reading we read for the class lecture on energy. Between Pacala & Socolow (2004) and Hoffert (2010), who do you think has the more compelling case, and why? (short essay of 1 to 1.5 pages)

REFERENCES