# Homework 1 (due Friday 8/26):

Using the paper, "In (Reluctant) Defense of Enron…" (posted on the website) as a resource, answer the following sets of questions 1-5.

1. General historical review:
    a. What two developments occurred between 1965 and 1980 that resulted in foundations for the creation of wholesale energy markets?
    b. What two provisions of the 1992 EPACT further introduced competition into the electric power industry?
    c. What did the 1996 Order 888 do towards furthering competition within the electric power industry?
    d. How did FERC Order 2000 promoted competition?
    e. Section I-B of the paper refers to a "regulatory gap." What was this?
2. California Market architecture:
    a. What was the main reason that the California Public Utilities Commission decided to move to a competitive wholesale electricity market in 1995?
    b. What two things did California require in its attempt to eliminate market power engendered by vertical integration?
    c. Was there any mechanism in place to allow utilities to hedge price volatility?
    d. Identify the wholesale energy markets conducted by the California PX:
    e. The PX conducted market transactions via a double auction procedure. What was "double" about it?
    f. What caps were placed on retail and wholesale rates, respectively?
3. Economic principles:
    a. What are the four conditions necessary for a market to be considered perfectly competitive?
    b. Why is additional capacity available to generate at a particular time period the only market mechanism available to discipline price?
    c. What two reasons is electricity not a homogeneous product?
    d. Why is electricity demand relatively inelastic?
4. Problems with California's Market:
    a. Identify the 9 defects within California's market design and implementation.
    b. Identify at least three reasons why California did not benefit from excess capacity?
    c. Why was demand not responsive to wholesale price increases?
    d. Is there any evidence that consumers would have decreased their demand if they would have been exposed to the higher prices at the retail level?
    e. What was the retail price cap, in $/MWhr, which investor-owned utilities were subjected to it, and which were not?
    f. What happened to the investor-owned utilities that were subjected to the retail price cap, and what happened to the retail rates of the utilities that were not?
    g. Name at least two reasons why during fall 2000 and winter 2001, an unusually large number of generators were taken off-line for maintenance?
    h. What is hedging?
    i. Why were California utilities unable to hedge against the volatility in the spot market?

j. How did the financial insolvency of the investor-owned utilities contribute to the power shortage of spring 2001?
k. Why did the long-term auction organized by the state, and coordinated by LADWP, in January 2001, with the purpose of increasing power availability in the state at reasonable prices, actually result in higher prices? In answering this question, it may be helpful to know that almost all of California's fossil-fired plants run on natural gas.
l. What is a monopsony, and why was California not one when it tried to heal the state's problems via the January 2001 long-term auction?
m. What were the three reasons why the state of California tried to purchase the transmission system from the three investor owner utilities?
n. What effectively stopped California from purchasing the transmission system?
o. Identify at least 3 reasons why market power is exercisable in electricity markets.
p. How many MW were off-line in April 2001 and how did this affect prices during this period?

5. <u>Antitrust laws and FERC's SMD</u>:
    a. Provide brief descriptions of the following strategies that Enron was thought to have used during the California power crisis:
        i. Load shift
        ii. Ricochet
        iii. Fat boy
    b. What was identified in the paper as the central part of the FERC SMD to provide a "prescription" against the problems leading to and resulting from the California Energy Crisis?