

## Homework 3

Due Tuesday February 24, 2014

### Economics of Sustainability

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*You are encouraged to form study groups to work on these problems. However each student must hand in a separate assignment: the group can work together to discuss the papers and comment on drafts, but each study group member must write it up herself/himself. When emailing assignments, please include your name and the assignment number as part of the filename.*

1. What are the names of people in your study group?
2. Provide some interesting and creative examples of
  - a. Negative externalities from consumption and social policies to affect these
  - b. Negative externalities from production and social policies to affect these
  - c. Positive externalities from consumption and social policies to affect these
  - d. Positive externalities from production and social policies to affect these
3. Consider the market for a product with an output that pollutes the air. The industry's Supply curve (only including private internal costs) can be represented as  $Q_S = P_S$ . The demand can be approximated as  $Q_D = 80 - P_D$ . The industry's marginal external costs from pollution occur as  $MEC = Q$ .
  - a. What is the privately chosen equilibrium quantity and price, when neither demanders nor suppliers take account of external costs?
  - b. What is the MSC, the marginal social cost (the vertical sum of MC and MEC)?
  - c. What is the social optimum level of production of this good? What is the deadweight loss created by a lack of government action?
  - d. Suppose the government introduced a tax (per unit of output) to try to move closer to optimum. (Recall that this means that  $P_D = P_S + \text{Tax}$ .) What tax would reduce DWL the most?
  - e. If the government instead restricted the level of output through regulation, what regulation should be set?
  - f. Can you suggest any alternate policies (perhaps a tax on production over a particular level)?