Public Economics
Spring 2025

ASSIGNMENT #2
(due on Mar 18th)

1. Drawing on your own experience, give an example of a situation in which there is a positive externality and suggest two possible ways of internalizing it, discussing the limitations of either approach. (max. 250 words)

2. A study by Karl-Goran Maler, from the Stockholm School of Economics, estimated that replacing *uniform* reductions in pollutant emissions (for example, reductions of 30% in all European countries) by an *efficient* reduction (defined by the author) would allow European states to obtain an additional benefit of 3.6 billion German Marks (1984). The first scheme (of uniform reduction, as required by European directives) would allow by itself a total benefit of 2.7 billion German Marks.

   This study is based on the fact that due to weather phenomena, some countries are more prone to suffer the consequences of pollution from other countries. Based on a computer weather model known as EMEP, Karl-Goran Maler concluded that countries located in the east (Russia, Poland, Germany and Sweden) were the great importers of pollution due to the wind effects. Other countries, like the UK, were more protected and suffered very little from pollution created outside their borders.

   (a) One assumption of this study is that each European country had already reduced emissions to the point where the environmental damage to that country caused by an additional ton equals the cost that companies have to face in order to reduce their emissions by the same amount. In this context, how would it be possible for a uniform reduction of all countries to produce a net benefit? (max. 250 words)
   (b) In the efficient reduction scheme proposed by the author, some countries would need to reduce their emissions by 81% (UK) or 86% (Germany), while others would have to reduce them only by 2% (Russia) or 4% (Sweden). Explain the difference between these numbers. (max. 250 words)
   (c) Discuss the following statement: "The UK is almost not affected by the emissions of other states and will therefore never be better-off with the reductions imposed on emissions from those countries. On the other hand, an 81% reduction in its own emissions will certainly have a negative effect on the welfare of the country. Consequently, it is impossible to convince this country to participate in the efficient scheme proposed by the author." (max. 250 words)

3. The current price of emissions allowance traded on the European Union's Emissions Trading Scheme (ETS) is 75 euros per metric ton of CO_2.
   The EU ETS is a cap-and-trade system: the emissions cap is the limit set on the total amount of CO_2 that can be emitted by the installations and aircraft operators covered by the system. Emitters must hold one allowance for each ton of greenhouse gas they emit. Companies initially receive an equal share of allowances and may then buy and sell allowances, and this market establishes the emissions price.

   Assume that there are only 10 emitters. For 5 of them, the individual marginal benefit from emissions (Q_i) is $150-15Q_i$. For the remaining 5, the individual marginal benefit from emissions is $75-15Q_i/2$.

   a) What is the emissions cap?
   b) If authorities wanted to set a Pigouvian tax instead, what should it be? Would you recommend this possibility or the cap-and-trade system?