

ECN 371 - Environmental Economics

09:00-12:00 - May 23, 2012

A1: No books except English dictionary, no other aiding tools.
This exam consists of 4 questions, for a total score of 100 points.
All questions are to be answered. You may answer in English or Norwegian.

Question 1 (20 points)

- (a) Assume that the regulator does not know the agents' marginal abatement costs, but that the marginal damages (MD or MEC) are known. Explain how the information provided from applying emission taxes and tradable permits on emissions can be used to find the optimal emission level. **(10 points)**
- (b) A common statement is that environmental policy should be less strict if regulations relate to an export oriented sector compared to a sector that mainly produces for the domestic (inland) market. Briefly discuss the validity of this statement. **(10 points)**

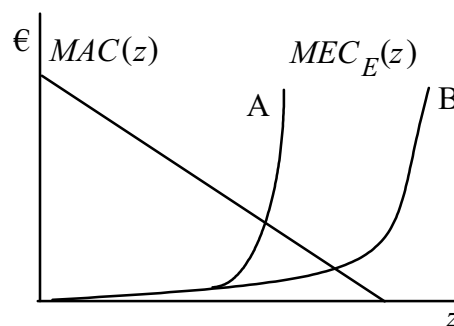
Question 2 (20 points)

- (a) Explain the terms in the basic equation for monitoring and enforcement, $p = (U_n - U_c) / S$, and show how this expression is derived. **(10 points)**
- (b) Suppose that producers have incomplete process control on their emissions. Explain how that may lead to aggregate emissions becoming lower than the aggregate emission quota under a tradable permit regime when excess emissions are penalized, and suggest how the regulator could deal with this issue. **(10 points)**

Question 3 (20 points)

Consider marginal abatement costs and marginal damages as functions of emissions, z , as illustrated in the graph to the right where:

- $MAC(z)$ are the expected marginal abatement costs that are known with reasonable certainty, and
- $MEC_E(z)$ are the expected marginal economic costs (marginal damages), where the start of the steeper segment is uncertain as displayed by the two alternatives (A and B) of the $MEC_E(z)$.



- (a) Discuss the issues you perceive as relevant for making policy recommendations in the situation depicted in the graph where marginal economic costs are uncertain. **(10 points)**
- (b) As science progresses, new environmental issues are identified. How should environmental policy incorporate this basic uncertainty while still remain predictable? Briefly justify your answer. **(10 points)**

Question 4 (40 points)

International negotiations on how to reduce emissions of climate gases are deadlocked. There are several positions in what many term the "climate game". Two of these positions are:

- (i) The "*act now*" position builds on the Stern report that suggests that net benefits are large of implementing ambitious climate policies fairly fast, and that each new report from the IPCC (the UN's climate panel) concludes with more severe estimates of damages from climate change than the previous report.
- (ii) The "*let us wait*" position builds on the perspective that technological progress is rapid, and that it would be stupid to implement policies now when cheaper solutions will be available in the near future.

You are called in as an external expert to try to break the "climate deadlock":

- (a) What do you see as the main (2-3) difficulties with each of the two positions from an economic theory perspective? Briefly justify your answer. **(10 points)**
- (b) What kind of policies are most suited to reconcile these two positions? Briefly justify your argument. **(10 points)**
- (c) These two positions are only some of several approaches to the climate issue. The difficulties of bridging all the diverging positions have led many to conclude that it is highly unlikely that there will be agreement on an international climate protocol. Therefore, it is suggested that one **instead** should pursue national policies to reduce climate gas emissions. What do you see as the main difficulties with uncoordinated national approaches to the climate issue? Briefly justify your answer. **(10 points)**
- (d) Some politicians claim that national strategies are needed while we wait for a more ambitious international climate agreement. They argue that countries that implement national policies (like unilateral cuts in own emissions) will improve their international competitiveness, and that this makes national climate policies more desirable. Briefly discuss the validity of the competitiveness argument. **(10 points)**

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