UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Term paper in: **ECON4925 – Resource economics**

Handed out: Friday, October 14, 2005

To be delivered by: Wednesday, October 26, 2005 **before 2 p.m.**

Place of delivery: Reception office, 12th floor

Further instructions:

- This term paper is **compulsory**. Candidates who have passed the compulsory term paper in a previous semester, does not have the right to hand in the term paper again. This is so, even if the candidate did not pass the exam.
- You must use a printed front page, which will be found at http://www.oekonomi.uio.no/info/EMNER/Forside_obl_eng.doc
- It is of importance that the term paper is delivered by the deadline (see above). Term papers delivered after the deadline, **will not be corrected**.*)
- All term papers must be delivered to the place given above. You must not deliver your term paper to the course teacher or send it by e-mail.
- If the term paper is not accepted, you will be given a new attempt. If you still not succeed, you will not be permitted to take the exam in this course. You will then be withdrawn from the exam, so that this will not be an attempt.

*) If a student believes that she or he has a good cause not to meet the deadline (e.g. illness) she or he should discuss the matter with the course teacher and seek a formal extension. Normally extension will only be granted when there is a good reason backed by supporting evidence (e.g. medical certificate).

Term paper ECON 4925

1. Consider an aggregated hydropower system with a reservoir constraint and multiple time periods
    a) Set up the social planner's optimization problem.
    b) Discuss the nature of the optimal solution either inspecting the first-order conditions or by use of figures.
    c) Discuss reasons for variation in the social price of hydro electricity.
    d) Try to explain what kind of price variations you expect in a country like Norway during a one year weather cycle.

2. Consider a given deposit of a non-renewable resource.
    a) Define the concept "choke price" for the resource and discuss reasons for the existence of a finite choke price. What is the relationship with this concept and the concept of "backstop technology"?
    b) Assume variable extraction costs for the resource. Discuss other variables that may influence extraction costs in addition to the amount extracted
    c) Derive the Hotelling rule for the development of the gross price (price the consumers face) over time in the case of i) no extraction costs ii) extraction costs
    d) Discuss effects of change in the rate of discount, amount of resource in the ground and the extraction cost function

    Use either discrete or continuous time and give reasons for your choice.