

**CELLULOSIC ETHANOL: ECONOMIC AND GREENHOUSE GAS IMPACTS – A  
CASE STUDY**

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**Abstract**

The political support for biofuels in the EU is predicated on their ability to reduce greenhouse gas (GHG) emissions. But calculating the savings that may be attributed to biofuels is problematic because biomass production systems are inherently complex and the use of lifecycle assessment methods to quantify emissions savings is subjective. Differing approaches and interpretations have fuelled an active debate about the environmental merit of biofuels, and consequently about the level of policy support that can be justified.

This lecture reviews estimates and compares emissions from plausible supply-chains for lignocellulosic ethanol production. The common elements that give rise to the greatest GHG emissions are identified and the sensitivity of total supply-chain emissions to variations in these elements is described. The implications of different allocation methods and indirect land use change are also discussed.

A case studies is developed that summarises the development of lignocellulosic ethanol technology in Sweden, it outlines the structure of the Swedish forest industry sector and describes detailed marginal cost and GHG emission curves for feedstock supply in a coastal area of Northern Sweden. The results of this case-study indicate that feedstock limitations dictate a relatively small capacity plant. Consequently, the option most likely to provide cost reductions and provide a practical way forward is the integration of ethanol production with facilities such as CHP and district heating.