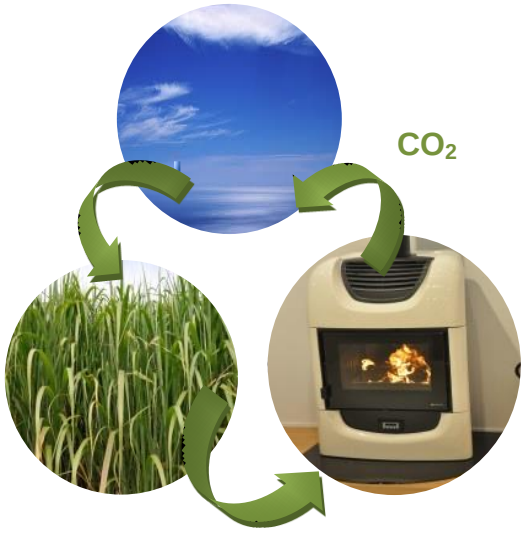
The impacts of energy crops

January 2014

The impacts related to the cultivation of energy crops are complex and depend on various factors such as the type of crop, production methods, geography, local environmental and social conditions. The full understanding of their impacts is crucial to maximize the benefits provided by these multifunctional crops and to reduce the possible risks.

ENERGY AND CLIMATE

Biomass is a renewable fuel and contributes to the reduction of greenhouse gas emissions (GHG) by replacing fossil fuels. Carbon dioxide, which is emitted during combustion, has been taken up from the atmosphere by the growing of energy crops. For this reason, biomass is a CO_2-neutral fuel. However, to assess the overall GHG performance of energy crops, the entire life cycle of the crops need to be considered and emissions emitted for the cultivation, transport and final conversion into energy need to be taken into account. Therefore, using biomass to generate heat and power can reduce GHG emissions significantly if cultivation and logistics are managed in an optimal manner. In the ■ 2 B2 -- 2 - 1/ / 8 2 2 - - requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling (COM(2010)11), typical greenhouse gas performances of solid biomass feedstock are high reaching greenhouse emission reductions of 90% in comparison with fossil fuels for most EU produced wood fuels. In this view, energy crops can play 2 ■ 2 - - and in providing security of fuel supply.



Europe's energy and climate targets

Through the Renewable Energy Directive (2009/28/EC), the European Union has set ambitious binding targets for renewable energy consumption in Europe. In 2020, at least 20% of the overall final energy consumption in Europe, and a 10% share of the final energy in the transport sector, will have to come from renewable energy sources. As bioenergy accounted for more than 8% of the final energy consumption in Europe in 2011, biomass obviously constitutes a key sector to meet the 2020 targets. Furthermore, looking beyond 2020 also reveals to be essential as the European Union puts forward an 80 to 95% greenhouse gas reduction target for 2050.

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Recommendation

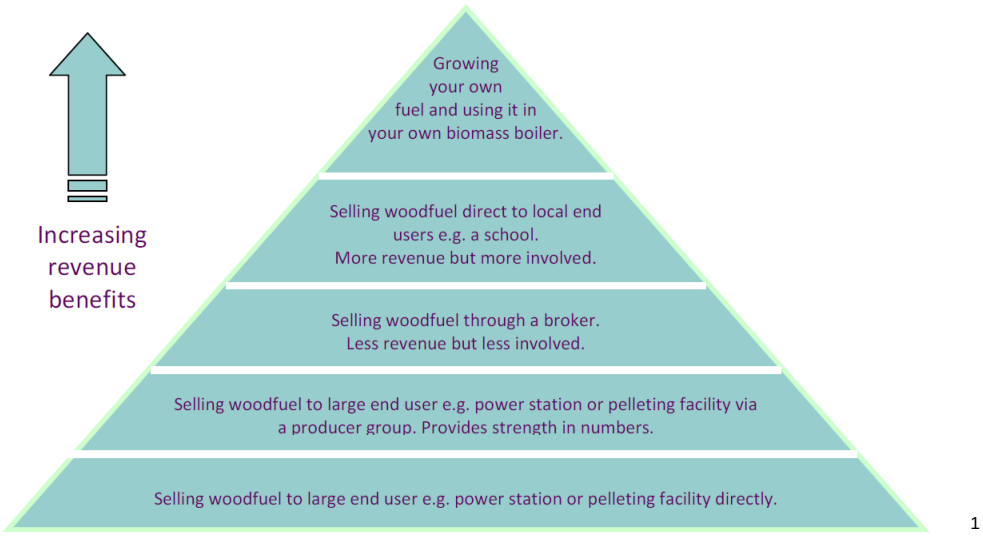
Life cycle greenhouse gas emissions of energy crops vary greatly depending on the feedstock, agricultural practices, logistics and combustion technologies used. The greenhouse gas balance needs to be adequately taken into account when developing bioenergy projects. Low agrochemical requirements, low water content at harvest and low transportation contribute to achieve an optimal greenhouse gas performance.

RURAL DEVELOPMENT AND EMPLOYMENT

Growing energy crops has a great potential of enhancing rural development and stimulating the regional economy. The development of the energy crops sector creates local energy markets which insulate end users from future fossil fuel price increases and ensure security of supply. Heating with local energy crops can contribute to energy poverty mitigation. A thriving energy crops sector generates jobs in both the production and utilization of biomass, and provides new markets and sources of income for farmers.

Recommendation

The best return rates are reached when the grower uses the fuel in self consumption or through a local heat end user. By replacing heating oil with energy crop derived fuel, farmers benefit of a stable gross return and are insulated against future fossil fuel price increases.



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ENVIRONMENT AND ECOLOGY

[1] Source: Why we need energy crops in the South West, Kevin Lindegaard, Crops for Energy, June 2012

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Most types of agricultural biomass involve relatively low environmental risks, though much depends on the agricultural practices followed. It is therefore crucial to take ecological considerations into account to minimize risks related to large-scale agricultural production. As long as best-practice management guidelines are followed, perennial energy crops are multifunctional crops that can help improve water quality, enhance biodiversity, prevent erosion and reduce the use of pesticides in comparison with traditional annual crops.

Water quality improvement and flood prevention

Some energy crops could be strategically grown to help improve water quality and provide a low cost form of flood prevention. Energy crops can provide barrier strips which intercept sediment and absorb nitrates from the water. The coppice nature of energy crops provides hydraulic roughness which enhances sediment retention and slows down the flow of flood water.

Increasing the biodiversity on the farm land

Energy crops in general and Short Rotation Coppice (SRC) in particular can significantly increase biodiversity on farms. SRC plantations can benefit the phytodiversity of agricultural landscapes; as an additional structural landscape element, SRCs provide habitats with species compositions which differ from those of the surrounding land uses. SRCs are three-times richer in plant species than arable lands (and also than coniferous forests and mixed-forests in Germany). Species diversity can thus be increased, especially in areas dominated by arable lands and coniferous forests. The overall effect on the biodiversity will depend to a large extent on the surrounding landscape and land use previously in place.

Recommendation

Due to the current lack of a clear legislative framework for biomass used in the heating and cooling sector, it is recommended to ensure sustainability of energy crops based on existing agriculture best-practice guidelines and voluntary certification schemes. Moreover, the use of EU grown biomass enables the minimization of environmental risks related to energy crop cultivation as in Europe, current agricultural and forestry management practices are generally regarded as environmentally sound.

LAND USE AND FOOD PRODUCTION

The use of arable land for the production of non-food crops has been accused of competition with global food production and blamed for the rising grain prices in 2008. Fluctuation in food prices is a complex issue which needs to be put into its right context to fully take into account all relevant factors. Cropland used in Europe for energy production is currently rather small, and to judge the impact of energy crops on global nutrition and food prices, it is crucial to adopt a holistic approach. While any use of arable land can influence prices for agricultural products, many factors - both structural and cyclical - can have a substantial impact on food prices, including:

Weather conditions
Oil price

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Growing demand from emerging economies
Low investment in agricultural research
Export/import policy
Speculative investment

Land use change related to bioenergy - both direct and indirect is currently at the center of policy discussions. Indirect land-use effects occur when the production of biomass feedstock displaces certain activities to other areas, with potentially negative impacts on carbon stocks and biodiversity. At present, there is no consensus regarding the possible indirect land use change impact of energy crops and its importance in terms of carbon impact. Direct land use change needs to be carefully considered and managed to ensure that the cultivation of energy crops does not cause negative land use changes such as deforestation.

Recommendation

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