

## **Opportunities and dilemmas of a bio-based economy**

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**Blog on Food versus Fuel**

With more sophisticated technology, it is now easier than ever to turn plants, trees, crops, and residual animal waste into useful biomass. The ensuing products may replace products based on non-renewable materials. Today, most of such bio-based production is directed towards traditional products like fuel, but the percentage of entirely new products – for example pharmaceuticals and bio-plastics – is growing.

Much of the demand for biomass results from an incentive policy intended to promote renewable energy. As mentioned by Dougal, the US Renewable Fuels Standard and, in Europe, the Renewable Energy Directive (RED) play key roles. Both impose quantitative targets and allow national governments to introduce tax measures. This implies the creation of an artificial market for biomass intended for energy purposes, largely through energy crops.

The concerns about the ecological and social impacts of such crops are increasing. Encouraging the demand for biomass may increase pressure on farmland, which in turn can have a negative impact on global food production and biodiversity. In addition, biomass cultivation can lead to social problems, for example poor working conditions on the plantation or land use without the original users' consent.

A few years ago, the reduction of greenhouse gas (GHG) emissions was cited as one of the most important reasons for using "green" raw materials. At the moment, however, it appears that – when assessed across the entire supply chain – bio-based energy products have far fewer GHG benefits than originally anticipated. This is especially the case if these products are the result of large-scale cultivation, and if the indirect effects, for example of indirect land use change (ILUC), are taken into account. In the case of many crops, the GHG balance is in fact negative when compared with fossil fuels.

The sustainable use of biomass is far from certain, both in quantitative and qualitative terms. This is no reason to disqualify biomass entirely, but we must encourage the most rational use of it. This implies, for example, the development of high-value chemical and material products, rather than placing the emphasis on bulk products like fuel. Such an approach needs to be accompanied by voluntary standards at national and international levels to avoid unfair competition and unsustainable use of biofuels.

In December 2010 the Dutch Social and Economic Council, one of the highest policy advisory bodies of the Dutch government, adopted the report "More chemistry between green and growth". It formulates a strategy to introduce biomass into economic processes in a sustainable and competitive manner by introducing a responsible incentive policy for renewable energy; by taking a comprehensive approach to sustainable resource supply chains; and by supporting energy and food production in developing countries.

([http://www.ser.nl/en/sitecore/content/Internet/en/Publications/Publications/2010/2010\\_05.aspx](http://www.ser.nl/en/sitecore/content/Internet/en/Publications/Publications/2010/2010_05.aspx))

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