



## SUSTAINABLE BIOENERGY

An introduction to issues, IEEP work and the Way Forward

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# SUSTAINABLE BIOENERGY

*Biomass currently provides a significant proportion of Europe's renewable energy. It includes both domestic and imported biomass in a variety of forms, from woody to agricultural residues and municipal wastes. There are differing views on the longer-term role for biomass in a fully decarbonised energy system. However, sustainably sourced biomass, used as a replacement for fossil fuels, can help to reduce GHG emissions and increase energy security in Europe in the short term.*

Biomass has the practical advantage that it can be used in existing fossil fuel infrastructure. Investments in the forestry sector can provide an important contribution to the economic vitality of rural communities. With the right management in place, the sustainability and viability of managed forests can be improved alongside their contribution to carbon sequestration.

Despite these advantages, **bioenergy, like any form of renewable energy, is not sustainable by default** and requires regulatory guidance to ensure sustainability in practice.

The acceptability of using biomass for energy in the EU rests on its sustainability as a renewable and low carbon energy source and there are legitimate concerns in civil society over the potential expansion of using biomass for energy and the potential impacts this may have on carbon balances in forests and ecosystems. Sustainability, and the extent of GHG emissions reductions provided by bioenergy depends on many factors including the type and origin of biomass, its other potential uses, the counterfactuals in land and forest management, and the nature of the energy source replaced (where applicable).

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Unlike other renewable energy sources, biomass produces GHG emissions at the point of combustion for every unit of biomass used. A central issue to the carbon sustainability of bioenergy is the difference between the emissions of carbon at this point and what carbon removals in the land use, land use change and forestry (LULUCF) sectors can be legitimately used to counterbalance these emissions. This includes a consideration of any differences in timescales between the two (carbon debt period); and an understanding of what would happen if the biomass and the land associated with its production was not used for energy (the counterfactual).

The scale, nature and time horizons for carbon fluxes in forests are therefore important in relation to the contribution these sectors also make to overarching climate goals.

Delivering **environmentally responsible bioenergy** requires the consideration of a wide range of interrelated factors, including: the methods of production and harvesting; existing uses; direct and indirect land use impacts; understanding waste management and residue use; environmental, social and economic consequences; as well as trade and inter-institutional factors across a wide range of sectors.

To establish the carbon sustainability of bioenergy it is necessary to focus policy on ensuring biomass is used for energy only where it provides the greatest contribution towards overarching climate goals and improving the allocation of emissions and removals to provide better assurance of GHG savings. To achieve this, two sets of parallel initiatives are necessary.

**1)** The introduction of EU wide legislative sustainability criteria to provide a baseline and level playing field reflecting the context in which the biomass is sourced and consumed. This should include:

- Sustainable sourcing: setting out the type of feedstocks with a focus on genuine wastes residues and surplus fibre; the location from which they are sourced by avoiding sensitive and protected areas; and the management on the land in a sustainable and carbon enhancing way.
- Sustainable deployment: ensuring the level of bioenergy used to meet renewable energy targets does not undermine climate and sustainability goals;
- GHG emissions saving requirements for generating bioenergy to drive efficiency and best practice in existing and new plants.

**2)** To improve the accounting for carbon and GHG emissions to provide a more explicit framework for measuring the impact of different supply chains and policies as well as providing incentives for using more carbon beneficial pathways in both sourcing and deployment. This includes the sourcing of biomass from the LULUCF sectors; and the use of biomass in the ETS and ESR sectors.

A number of questions about the right and most appropriate approach to delivering sustainable bioenergy still remain, particularly when considering the counterfactual use of biomass.

IEEPs work on bioenergy takes a multi-disciplinary and cross sectoral approach to addressing these questions through our expertise in agriculture, forestry, economics, energy, trade and environmental policy.

Our work includes independent policy research, analysis and advice on issues such as carbon debt, cascading use and counterfactual land and resource use, as well as developing carbon accounting frameworks and the integration of resource efficiency principles into sectoral policy. We advise EU and Member State law-makers, academics, regulatory authorities, industry and NGOs.

## SELECTED REPORTS

### Conceptualising sustainability

- [The GHG Intensity of Biomass](#). This paper posed the question does bioenergy have a role in reducing Europe's GHG emissions? It sets out the literature and argumentation around the question of GHG emissions and use of forest biomass for energy (for ECF – 2012).

### Sustainable sourcing of biomass

- [Science and technology options for recycling agricultural, forestry and food wastes and residues for sustainable bioenergy and biomaterials](#) (European Parliament (STOA) – 2013)
- [Analysing the availability of land resources for bioenergy production at an EU level and in three Member States](#) (ECF - 2015)
- [The potential land availability to produce energy crops with minimal impact on the environment and existing agricultural production](#) (EU environmental NGOs 2014)

### Sustainable use of biomass

- [The resource efficient use of biomass \(ReceBio\) considering the resource and climate implications of using different biomass streams for energy](#) (DG ENV – 2016)
- [‘The optimised cascading use of woody biomass’ identifying the current barriers to and potential policy options to increase the cascading use of woody biomass in the EU](#). (DG GROWTH – 2016)
- [Policy mapping study on the cascading use of woody biomass](#) (WWF/Mondi – 2015)
- A study to define policy options for ensuring the sustainability of solid biomass used for energy (Drax-2016)
- [Establishing effective suitability criteria for the use of biomass in the production of energy in the post-2020 period](#) (ECF - 2015)

### Carbon accounting

- [Designing a LULUCF pillar that works for forests and climate. This report develops some proposals for how best to include LULUCF emissions and removals in the EU's climate target framework](#). (FERN-2015)

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