



**PITFALLS AND POTENTIALS
THE ROLE OF BIOENERGY
IN THE EU CLIMATE
AND ENERGY POLICY
POST 2020**

NGO RECOMMENDATIONS

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SUMMARY

European Governments are increasingly relying on bioenergy as a cheap way to meet targets for renewable energy. Bioenergy represented 62% of EU's renewable energy use in 2012. But new evidence on the real climate impacts and other environmental and social impacts of bioenergy has made its use increasingly controversial.

Sustainable bioenergy has a role to play in Europe's transition to an energy system based on renewable energy and energy efficiency. However, to avoid serious negative consequences for carbon emissions, biodiversity and land conflicts, the EU should introduce four main safeguards for bioenergy use as part of the EU's 2030 climate and energy policies:

- **introduce a cap to limit the use of biomass for energy production to levels that can be sustainably supplied;**
- **ensure efficient and optimal use of biomass resources, in line with the principle of cascading use;**
- **include correct carbon accounting for biomass;**
- **introduce comprehensive binding sustainability criteria.**



INTRODUCTION

The new European Commission, led by President Jean-Claude Juncker, has made the fight against global warming one of the EU's key priorities. Two central pillars of European action on climate change are increasing the share of energy produced from renewable sources and improving energy efficiency¹. In October 2014, the European Council agreed on the EU 2030 targets: to reduce domestic greenhouse gas emissions at least 40% compared with 1990, to increase the share of renewable energy to at least 27% and to boost energy efficiency to at least 27% compared to projections. Nevertheless, these targets are not ambitious enough to keep Europe on track for its 2050 decarbonisation objective or to drive transformational change in Europe's energy system.

We urge the Commission to develop legislative proposals that will ensure that these "minimum" targets are exceeded and consider raising the targets. Reducing the demand for energy will be essential to achieve a sustainable, renewable energy system. The low renewable energy target that has been set means it is even more important that investments for renewable energy are directed towards those sustainable renewable energy sources that have been proven to deliver real carbon emission reductions. To provide context: bioenergy is already a major source of renewable energy in Europe. Member States plan to keep using bioenergy to meet over half of their EU renewable energy targets and to meet almost the entire 10% target for the transport sector²; both set for 2020. In 2020, 15% of bioenergy is expected to be consumed in the electricity sector and 65% in the heating sector. Three quarters of this biomass already come from forestry³.

Bioenergy can play a role in mitigating climate change by replacing fossil fuels, particularly in sectors where electricity produced by renewable sources such as wind and solar is difficult. But at the same time, it must be taken into account that bioenergy is a source of carbon emissions and can cause a number of other undesirable environmental and social impacts, such as biodiversity loss. Moreover, the rapidly increasing demand for biomass for energy production adds to the demand for land and forests, which are already used by other sectors such as food, materials and fibre. The European Commission has been slow to acknowledge the problematic aspects of increasing bioenergy use. However, it has recognised that "an improved biomass policy will also be necessary to maximise the resource efficient use of biomass in order to deliver robust and verifiable greenhouse gas savings and to allow for fair competition between the various uses of biomass resources"⁴ as part of the EU's 2030 Climate and Energy Framework. The Commission communication on the Energy Union further confirmed that a renewable energy package, including a bioenergy sustainability policy for both biomass and biofuels, will be proposed between 2015 and 2017⁵.

This paper outlines what the upcoming bioenergy sustainability policy should address, including biofuels, solid biomass and biogas used in the energy and transport sectors. Foremost, the policy must be embedded in EU-wide legislation, define access to financial support and specify which forms of bioenergy can be counted towards renewable energy targets. Genuinely sustainable bioenergy can be part of a strategy that leads to 100% renewable energy, but because its availability is limited the role it plays must also be limited. It is therefore of crucial importance that future EU policies promote sustainable bioenergy only, as defined in the policy recommendations of this paper, and limit the use of biomass to sustainable levels within an ambitious 2030 climate and energy package.

¹ *A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change, Political guidelines for next European Commission.*

² At the time of writing, the way to meet the 10% transport target was under legislative review, because of concerns linked with indirect land use change.

³ European Commission SWD (2014) 259 final.

⁴ European Commission (2014), *A policy framework for climate and energy in the period from 2020 to 2030*, COM (2014) 15.

⁵ http://ec.europa.eu/priorities/energy-union/docs/energyunion_en.pdf.



LESSONS FROM CURRENT POLICY AND SCIENCE

Many industrial sectors, such as pulp and paper, construction, furniture and chemicals, compete with the energy sector for the limited pool of sustainable wood and land that is available. The policy driven growth in bioenergy use comes on top of existing pressure from other sectors. Studies show that the wood and land resources available in the EU will not be enough to meet the agreed targets for renewable energy by 2030, in addition to the needs of the other sectors, in an environmentally sustainable way, without setting new limitations on bioenergy use⁶. **It is therefore crucial to make resource efficiency and cascading use of limited biomass resources a priority.**

Scientific evidence increasingly demonstrates that the carbon neutrality of bioenergy cannot be assumed per se, yet all EU efforts to mitigate climate change, including energy policies and modelling are still based on this false assumption⁷. The EU will not be able to guarantee effective carbon emission reductions unless the full carbon footprint of bioenergy use⁸ is taken into account.

In the case of woody biomass, carbon emission levels can vary from negligible to very significant – indeed some woody biomass feedstocks like dedicated harvesting of stemwood for energy use have even been shown to result in higher carbon emissions than fossil fuel energy sources⁹. This is because increasing use of forest biomass for energy production requires more logging which results in reduction in carbon stocks as well as reduced carbon sequestration. Even if the carbon stocks of the forest are allowed to fully recover, there is a time delay between the release of CO₂ into the atmosphere and the re-growth of the forest necessary to reabsorb released carbon, creating “carbon debt”.

There is also strong evidence that growing crops on arable land for biofuel production is linked to displacement of food production and emissions from indirect land use change¹⁰. Biodiesel produced from crops has a carbon footprint that is worse or not much better than fossil fuels, when accounting for the emissions that arise from direct and indirect land use change¹¹.

Growth in bioenergy use without setting necessary safeguards comes with serious risk of socio-environmental impacts¹²; this can already be seen and felt today both in the EU and elsewhere. Negative environmental impacts include biodiversity loss, land use change, and impacts on water, soil and air quality linked to unsustainable intensification of agriculture and forestry practices. Social impacts include land rights conflicts, “land grabbing”, and degradation of the livelihoods of local communities and indigenous peoples. Competition between sectors for land is also contributing to high food price volatility and undermining food security globally, especially for the poor.

⁶ See for example: IINAS, *European Forest Institute and Joanneum Research* (2014), IEEP (2014), Mantau et al. (2010).

⁷ See for example *Joint Research Centre* (2013), Matthews et al. (2014), *Manomet Center for Conservation Sciences* (2010).

⁸ Including all five pools of carbon: aboveground biomass, belowground biomass, soil disturbance, dead wood and litter.

⁹ Matthews, R. et al (2014) *Review of literature on biogenic carbon and life cycle assessment of forest bioenergy* Final Task 1 report, DG ENER project *Carbon impacts of biomass consumed in the EU*.

¹⁰ Biofuel feedstocks cultivated on existing agricultural land may displace other crop production some of which ultimately may lead to conversion of land into agricultural land. Through this route, the extra biofuel demand can lead indirectly to land-use change, from which the term indirect land-use change is derived. *Commission report on ILUC* (2010).

¹¹ European Commission (2012), *Impact Assessment accompanying the ILUC proposal*.

¹² See for example German et al. (2011).



For example, biofuel mandates of the EU have led to additional pressure on deforestation and drainage of peatlands in Malaysia and Indonesia¹³ and have contributed to land-grabbing in these countries¹⁴. From an environmental perspective, wood pellet exports from the south-eastern United States to the EU are driving increased logging in biodiversity rich bottomland forests¹⁵. In Germany, high nature value grasslands and drained peat areas have been converted to maize cultivation to produce biogas¹⁶ causing greenhouse gas emissions many times higher than those resulting from fossil energy sources¹⁷.

Sustainability criteria for biofuels and bio-liquids in the 2009 Renewable Energy Directive have been inadequate. Worse still, no EU-wide sustainability criteria have been applied to biomass for electricity and heating/cooling at all. The result is that all biomass, no matter the source or environmental impacts, qualifies for state subsidies and can be counted towards national renewable energy targets in the majority of Member States.

Within the Emission Trading System, biomass is also erroneously considered a carbon neutral energy source¹⁸. This means that energy companies which use biomass unsustainably are not required to purchase greenhouse gas allowances for its combustion, creating additional incentives for unsustainable biomass production¹⁹.

The energy transition towards a 100% renewable energy based system will require investment in a new kind of energy system, grid development, demand management and decentralised energy. EU policy must recognise the need to move towards an increasingly decentralised energy system and also support smaller scale, local energy projects that have beneficial impacts for local communities and rural development. Increases in large scale industrial use of biomass through co-firing with coal or by converting old coal power plants to burn biomass is a very inefficient use of biomass resources. By contrast, community managed district heating systems that use locally sourced sustainable biomass, saving energy costs and empowering local communities²⁰, so are a much more promising example of appropriate use.

In consideration of these lessons learned we urge the EU institutions to take into account the following policy recommendations.

¹³ See for example: Fargione et al. (2008), *Friends of the Earth* (2010), Gibbs et al. (2008).

¹⁴ The Land Matrix Partnership (2012), *Transnational Land Deals for Agriculture in the Global South*.

¹⁵ Southern Environmental Law Center, National Wildlife Federation (2013), *Forestry Bioenergy in the Southeast United States: Implications for Wildlife Habitat and Biodiversity*.

¹⁶ NABU-Bundesverband (2012), *Defizitanalyse Natura 2000 Situation von artenreichem Grünland im süddeutschen Raum*.

¹⁷ Wichtmann & Wichmann (2011), *Environmental, Social and Economic Aspects of a Sustainable, Biomass Production*.

¹⁸ EEA Scientific Committee (2011), *Opinion of the EEA Scientific Committee on Greenhouse Gas Accounting in Relation to Bioenergy*.

¹⁹ Transport & Environment, BirdLife Europe and European Environmental Bureau (2015), *Study: Reasons to change the zero-rated criteria for biomass in the EU ETS*.

²⁰ See for example inspiring stories from Italy, Slovakia and Greece of community owned projects using local biomass and waste resources.



POLICY RECOMMENDATIONS

Four main safeguards must be included in the EU's 2030 Climate and Energy Policy Framework to ensure that bioenergy makes a sustainable contribution after 2020.

Introduce a cap to limit the use of biomass for energy to levels that can be sustainably supplied

The amount of bioenergy that is allowed to contribute to 2030 targets should be capped to sustainable levels. This cap should be fixed on the basis of the EU's maximum sustainable potential of domestic biomass supply and take into consideration competing uses in other sectors. The EU is already moving towards such a cap in transport, but not yet elsewhere. The methodology to identify an appropriate EU-wide cap for all bioenergy should be defined according to what is available in Europe domestic a strict, comprehensive sustainability criteria. The cap, which should cover both domestic and imported biomass, will not aim to prevent imports but try to ensure that the footprint of EU bioenergy use is sustainable.

Ensure efficient and optimal use of biomass resources, in line with the principle of cascading use

Prioritising energy savings has multiple benefits, including reducing the need for biomass in the energy sector. The EU's biomass policy should specifically encourage resource demand reduction and ensure that biomass is used with greater efficiency while applying the principle of "cascading use".

This means that biomass should be used to create materials and products first, and the energy content only recovered later, while respecting the waste hierarchy²¹ that requires a product first to be reused and/or recycled. Where sectors compete for the same limited sustainable biomass resource, priority should be given to uses which have limited or non-existent sustainable alternatives. The limited amount of sustainable biomass that is available for energy use should then only be used in the most energy efficient applications, within minimum efficiency thresholds.

Include correct carbon accounting for biomass

All biomass that receives support and subsidies under EU law should be subject to comprehensive accounting of carbon emissions and minimum requirements for the delivery of real emission savings. This accounting should include a full carbon footprint of bioenergy use²² including fossil fuel substitution, carbon debt, indirect land use change, foregone carbon sequestration, and displacement of other uses of biomass. Emissions from all aspects of biomass cultivation, processing, transport and combustion should also be accounted for.

The European Commission and European Parliament have already called for the inclusion of indirect land use change in the carbon accounting for biofuels from 2021 onwards. It is imperative that carbon debt (i.e., changes to biogenic carbon stocks over time), which is particularly relevant for forest biomass, is also taken into account. The use of bioenergy must result in real cuts in carbon emissions in policy relevant timeframes to keep global warming below a two degrees Celsius (2° C) rise.

Introduce comprehensive and binding sustainability criteria

In order to ensure that only sustainable forms of bioenergy are promoted, robust safeguards that cover environmental and social impacts are needed. In particular, biomass production

²¹ The rules are established in the EU Waste Framework Directive (2008/98/EC).

²² Including all five pools of carbon: aboveground biomass, belowground biomass, soil disturbance, dead wood and litter.



must not cause direct or indirect destruction or degradation of forests or other ecosystems with high biodiversity and/or carbon storage value. Only bioenergy practices that fully meet robust sustainability criteria should be counted towards renewable energy targets or be eligible for any type of financial support.

Biomass sustainability criteria must help ensure that land management practices contribute to biodiversity and environmental objectives and prevent further negative environmental impacts including carbon stock decreases in soils and ecosystems, biodiversity loss, soil erosion, depletion of water resources and loss of soil health due to increased use of synthetic fertilizers, pesticides and herbicides. Social criteria must include protection of labour and human rights, gender impacts, maintenance of local communities' and indigenous peoples' landuse and tenure rights. The efficient sustainable use of small-scale bioenergy in rural communities, carried out in a way that enhances biodiversity and resilience, should be supported.

Complementary policies should also be pursued to help reduce pressure on biomass resources as bioenergy expands, such as reuse and recycling of biomass resources, reduced demand for energy, improvements in agricultural yield, and investment in integrated food energy systems (IFES).



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