

A sustainable bioenergy policy for the period after 2020

Fields marked with * are mandatory.

Introduction

EU Member States have agreed on a new policy framework for climate and energy, including EU-wide targets for the period between 2020 and 2030. The targets include reducing the Union's greenhouse gas (GHG) emissions by 40 % relative to emissions in 2005 and ensuring that at least 27 % of the EU's energy comes from renewable sources. They should help to make the EU's energy system more competitive, secure and sustainable, and help it meet its long-term (2050) GHG reductions target.

In January 2014, in its Communication on A policy framework for climate and energy in the period from 2020 to 2030,[1] the Commission stated that '[a]n 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 in the construction sector, paper and pulp industries and biochemical and energy production. This should also encompass the sustainable use of land, the sustainable management of forests in line with the EU's forest strategy and address indirect land-use effects as with biofuels'.

In 2015, in its Energy Union strategy,[2] the Commission announced that it would come forward with an updated bioenergy sustainability policy, as part of a renewable energy package for the period after 2020.

Bioenergy is the form of renewable energy used most in the EU and it is expected to continue to make up a significant part of the overall energy mix in the future. On the other hand, concerns have been raised about the sustainability impacts and competition for resources stemming from the increasing reliance on bioenergy production and use.

Currently, the Renewable Energy Directive[3] and the Fuel Quality Directive[4] provide an EU-level sustainability framework for biofuels[5] and bioliquids.[6] This includes harmonised sustainability criteria for biofuels and provisions aimed at limiting indirect land-use change,[7] which were introduced in 2015.[8]

In 2010, the Commission issued a Recommendation[9] that included non-binding sustainability criteria for solid and gaseous biomass used for electricity, heating and cooling (applicable to installations with a capacity of over 1 MW). Sustainability schemes have also been developed in a number of Member States.

The Commission is now reviewing the sustainability of all bioenergy sources and final uses for the period after 2020. Identified sustainability risks under examination include lifecycle greenhouse gas emissions from bioenergy production and use; impacts on the carbon stock of forests and other ecosystems; impacts on biodiversity, soil and water, and emissions to the air; indirect land use change impacts; as well as impacts on the competition for the use of biomass between different sectors (energy, industrial uses, food). The Commission has carried out a number of studies to examine these issues more in detail.

The development of bioenergy also needs to be seen in the wider context of a number of priorities for the Energy Union, including the ambition for the Union to become the world leader in renewable energy, to lead the fight against global warming, to ensure security of supply and integrated and efficient energy markets, as well as broader EU objectives such as reinforcing Europe's industrial base, stimulating research and innovation and promoting competitiveness and job creation, including in rural areas. The Commission also stated in its 2015 Communication on the circular economy^[10] that it will 'promote synergies with the circular economy when examining the sustainability of bioenergy under the Energy Union'. Finally, the EU and its Member States have committed themselves to meeting the 2030 Sustainable Development Goals.

[1] COM(2014) 15.

[2] COM/2015/080 final.

[3] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (OJ L 140, 5.6.2009, p. 16).

[4] Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (OJ L 350, 28.12.1998, p. 58).

[5] Used for transport.

[6] Used for electricity, heating and cooling.

[7] Biomass production can take place on land that was previously used for other forms of agricultural production, such as growing food or feed. Since such production is still necessary, it may be (partly) displaced to land not previously used for crops, e.g. grassland and forests. This process is known as indirect land use change (ILUC); see <http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels/land-use-change>.

[8] See more details on the existing sustainability framework for biofuels and bioliquids in section 5.

[9] COM/2010/0011 final.

[10] Closing the loop – an EU action plan for the circular economy (COM(2015) 614/2).

1. General information about respondents

★ 1.1. In what capacity are you completing this questionnaire?

- ☐ academic/research institution
- ☐ as an individual / private person
- ☐ civil society organisation
- ☒

- ☐ international organisation
- ☐ other
- ☐ private enterprise
- ☐ professional organisation
- ☐ public authority
- ☐ public enterprise

1.8. If replying as an individual/private person, please give your name; otherwise give the name of your organisation

200 character(s) maximum

European Plant Science Organisation (EPSO)

1.9. If your organisation is registered in the Transparency Register, please give your Register ID number.

(If your organisation/institution responds without being registered, the Commission will consider its input as that of an individual and will publish it as such.)

200 character(s) maximum

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1.10. Please give your country of residence/establishment

- ☐ Austria
- ☒ Belgium
- ☐ Bulgaria
- ☐ Croatia
- ☐ Cyprus
- ☐ Czech Republic
- ☐ Denmark
- ☐ Estonia
- ☐ Finland
- ☐ France
- ☐ Germany
- ☐ Greece
- ☐ Hungary
- ☐ Ireland
- ☐ Italy
- ☐ Latvia
- ☐ Lithuania
- ☐ Luxembourg
- ☐ Malta
- ☐ Netherlands
- ☐ Poland

- ☐ Portugal
- ☐ Romania
- ☐ Slovakia
- ☐ Slovenia
- ☐ Spain
- ☐ Sweden
- ☐ United Kingdom
- ☐ Other non-EU European country
- ☐ Other non-EU Asian country
- ☐ Other non-EU African country
- ☐ Other non-EU American country

★ 1.11. Please indicate your preference for the publication of your response on the Commission's website:

(Please note that regardless the option chosen, your contribution may be subject to a request for access to documents under [Regulation 1049/2001](#) on public access to European Parliament, Council and Commission documents. In this case the request will be assessed against the conditions set out in the Regulation and in accordance with applicable [data protection rules](#).)

- ☒ Under the name given: I consent to publication of all information in my contribution and I declare that none of it is subject to copyright restrictions that prevent publication.
- ☐ Anonymously: I consent to publication of all information in my contribution and I declare that none of it is subject to copyright restrictions that prevent publication.
- ☐ Please keep my contribution confidential. (it will not be published, but will be used internally within the Commission)

Perceptions of bioenergy

2.1. Role of bioenergy in the achievement of EU 2030 climate and energy objectives














































Please indicate which of the statements below best corresponds to your perception of the role of bioenergy in the renewable energy mix, in particular in view of the EU's 2030 climate and energy objectives:

- ☐ Bioenergy should continue to play a dominant role in the renewable energy mix.
- ☒ Bioenergy should continue to play an important role in the renewable energy mix, but the share of other renewable energy sources (such as solar, wind, hydro and geothermal) should increase significantly.
- ☐ Bioenergy should not play an important role in the renewable energy mix: other renewable energy sources should become dominant.

2.2. Perception of different types of bioenergy

Please indicate, for each type of bioenergy described below, which statement best corresponds to your perception of the need for public (EU, national, regional) policy intervention (tick one option in each line):

	Should be further promoted	Should be further promoted, but within limits	Should be neither promoted nor discouraged	Should be discouraged	No opinion
Biofuels from food crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Biofuels from energy crops (grass, short rotation coppice, etc.)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biofuels from waste (municipal solid waste, wood waste)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biofuels from agricultural and forest residues	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biofuels from algae	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biogas from manure	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biogas from food crops (e.g. maize)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Biogas from waste, sewage sludge, etc.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heat and power from forest biomass (except forest residues)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heat and power from forest residues (tree tops, branches, etc.)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Heat and power from agricultural biomass (energy crops, short rotation coppice)					
Heat and power from industrial residues (such as sawdust or black liquor)					
Heat and power from waste					
Large-scale electricity generation (50 MW or more) from solid biomass					
Commercial heat generation from solid biomass					
Large-scale combined heat and power generation from solid biomass					
Small-scale combined heat and power generation from solid biomass					
Heat generation from biomass in domestic (household) installations					
Bioenergy based on locally sourced feedstocks					

Bioenergy based on feedstocks sourced in the EU	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bioenergy based on feedstocks imported from non-EU countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Benefits and opportunities from bioenergy

3.1. Benefits and opportunities from bioenergy

Bioenergy (biofuel for transport, biomass and biogas for heat and power) is currently promoted as it is considered to be contributing to the EU's renewable energy and climate objectives, and also having other potential benefits to the EU economy and society.

Please rate the contribution of bioenergy, as you see it, to the benefits listed below (one answer per line):

	of critical importance	important	neutral	negative	No opinion
Europe's energy security: safe, secure and affordable energy for European citizens	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grid balancing including through storage of biomass (in an electricity system with a high proportion of electricity from intermittent renewables)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduction of GHG emissions	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental benefits (including biodiversity)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resource efficiency and waste management	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boosting research and innovation in bio-based industries	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Competitiveness of European industry	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Growth and jobs, including in rural areas	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable development in developing countries	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.2. Any additional views on the benefits and opportunities from bioenergy? Please explain

2500 character(s) maximum

Bioenergy uniquely amongst renewables can provide storable fuels, liquid transport fuels and the most direct replacement of fossil fuels. In addition it can be carbon negative through sequestration of carbon in the soil during growth of the crop and when combined with carbon capture and storage (CCS). Bioenergy is complex in that there are many different potential feedstocks and many ways of converting them to energy, transport fuels and, in the wider bioeconomy, to other chemicals and materials we currently obtain from fossil fuels. This complexity is a strength in terms of the almost limitless possibilities as well as a weakness in terms of being able to give a clear message about the technology. This is particularly the case as there are a range of highly beneficial to less beneficial routes from biomass to energy vector/ end product. The complexity also extends to the relationship between food and energy crops which should be complementary and focused on delivering the maximum social, environmental and economic impacts in a sustainable way. For example if perennial second generation bioenergy crops are focused on the most marginal lands then there are opportunities to increase natural capital including enhanced soil carbon stocks, biodiversity and flood protection, as well as deliver fossil fuel substitution. The targeting of marginal land can also result in more diversification options to help avoid land abandonment and increase productivity including of food on other parts of the farm through reduced distraction of farming the more challenging land. Bioenergy and the wider bioeconomy also offer opportunities to connect rural and urban economies creating green jobs and growth in both sectors. This can include the repurposing of legacy industrial infrastructures for green manufacturing with bioenergy as one of it's outputs. However for Europe to obtain these benefits and opportunities, there needs to be economic incentives to get the market moving and to create an acceptable price for carbon and biomass based products.

4. Risks from bioenergy production and use

4.1. Identification of risks

A number of risks have been identified (e.g. by certain scientists, stakeholders and studies) in relation to bioenergy production and use. These may concern specific biomass resources (agriculture, forest, waste), their origin (sourced in the EU or imported) or their end-uses (heat, electricity, transport).

Please rate the relevance of each of these risks as you see it (one answer per line):

	critical	significant	not very significant	non-existent	No opinion
Change in carbon stock due to deforestation and other direct land-use change in the EU	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change in carbon stock due to deforestation and other direct land-use change in non-EU countries	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indirect land-use change impacts	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
GHG emissions from the supply chain (e.g. cultivation, processing and transport)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GHG emissions from combustion of biomass ('biogenic emissions')	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Impacts on air quality	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Impacts on water and soil	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Impacts on biodiversity	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Varying degrees of efficiency of biomass conversion to energy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Competition between different uses of biomass (energy, food, industrial uses) due to limited availability of land and feedstocks and/or subsidies for specific uses	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Internal market impact of divergent national sustainability schemes					
Other					

4.2. Any additional views on the risks from bioenergy production and use? Please explain

2500 character(s) maximum

The complexity of bioenergy means that it is possible to minimize risks identified, eliminate them, or even have positive impacts eg to build up soil carbon stocks, reduce flood risk and increase biodiversity. Energy crops should not be cultivated on prime arable land, used for food production, however, economics and policy should ensure that. The targeting of energy crops and industrial feedstocks on marginal lands therefore is unlikely to negatively impact food production (direct or indirect) and may even increase food production through either allowing farmers to concentrate on more productive farm land and by increasing the fertility and production potential of the marginal land for future food production. An example of this would be the cultivation of Miscanthus on land contaminated with black grass, or the management of rank grasslands using bioenergy to bring them back into forage production. In other words energy crops can be considered as part of a farming system and an alternative rotation on the most marginal lands. Food and energy crops and land use have the potential to be in competition with one another however they can equally be complementary and even synergistic if planned and incentivized appropriately. The use of waste streams from first generation biofuel production from cereal grains as animal feed improves the sustainability of the current process complicates the direct competition between food crops and fuel use. The risk of competition is minimized by avoiding the use of food crops and by incentivizing the use of dedicated non food crops capable of growing on marginal land and by the use of residues and waste streams. However first generation crops and processes are an important step in the journey towards more sustainable bioenergy which also delivers additional ecosystem services. Understanding of GHG emissions can help reduce the risk of emissions and is an opportunity in that bioenergy can result in GHG removal through carbon sequestration especially if targeted on carbon depleted soils.

5. Effectiveness of existing EU sustainability scheme for biofuels and bioliquids

In 2009, the EU established a set of sustainability criteria for biofuels (used in transport) and bioliquids (used for electricity and heating). Only biofuels and bioliquids that comply with the criteria can receive government support or count towards national renewable energy targets. The main criteria are as follows:

- Biofuels produced in new installations must achieve GHG savings of at least 60 % in comparison with fossil fuels. In the case of installations that were in operation before 5 October 2015, biofuels must achieve a GHG emissions saving of at least 35 % until 31 December 2017 and at least 50 % from 1 January 2018. Lifecycle emissions taken into account when calculating GHG savings from biofuels include emissions from cultivation, processing, transport and direct land-use change;
- Biofuels cannot be grown in areas converted from land with previously (before 2008) high carbon stock, such as wetlands or forests;
- Biofuels cannot be produced from raw materials obtained from land with high biodiversity, such as primary forests or highly biodiverse grasslands.

In 2015, new rules[1] came into force that amend the EU legislation on biofuel sustainability (i.e. the Renewable Energy Directive and the Fuel Quality Directive) with a view to reducing the risk of indirect land-use change, preparing the transition to advanced biofuels and supporting renewable electricity in transport. The amendments:

- limit to 7 % the proportion of biofuels from food crops that can be counted towards the 2020 renewable energy targets;
- set an indicative 0.5 % target for advanced biofuels as a reference for national targets to be set by EU countries in 2017;
- maintain the double-counting of advanced biofuels towards the 2020 target of 10 % renewable energy in transport and lay down a harmonised EU list of eligible feedstocks; and
- introduce stronger incentives for the use of renewable electricity in transport (by counting it more towards the 2020 target of 10 % renewable energy use in transport).

[1] Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources (OJ L 239, 15.9.2015, p. 1).

5.1. Effectiveness in addressing sustainability risks of biofuels and bioliquids

In your view, how effective has the existing EU sustainability scheme for biofuels and bioliquids been in addressing the risks listed below? (one answer per line)

	effective	partly effective	neutral	counter-productive	No opinion
GHG emissions from cultivation, processing and transport	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GHG emissions from direct land-use change	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indirect land-use change	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Impacts on biodiversity	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Impact on soil, air and water	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Any additional comments?

2500 character(s) maximum

Again bioenergy can be part of the solution and not the problem. The EU sustainability scheme has tried to encourage the development of more sustainable, e.g. next generation bioenergy and biofuels, and this is to be commended as it is likely to generate win-wins through tackling climate change and helping to kick start new industries. Energy crops have been the subject of a level of scrutiny not yet applied to other forms of land use or use of natural resources. The bioenergy community has responded positively towards demonstrating more sustainable energy and transport fuel pathways, and this is likely to be of more generic benefit. However some of the negativity bioenergy has received has had the effect of delaying the implementation of technologies that could be delivering positive benefits to the environment, the creation of green jobs and growth, helping Europe to meet its renewable energy and GHG emission targets and as part of the wider global solution to tackling climate change. The recent NESAs report indicated that bioenergy is the most cost effective renewable energy technology, therefore helping to achieve the appropriate balance between tackling climate change on the one hand and meeting COP21 obligations and fuel poverty on the other.

5.2. Effectiveness in promoting advanced biofuels

In your view, how effective has the sustainability framework for biofuels, including its provisions on indirect land-use change, been in driving the development of 'advanced' biofuels, in particular biofuels produced from ligno-cellulosic material (e.g. grass or straw) or from waste material (e.g. waste vegetable oils)?

- ☐ very effective
- ☐ effective
- ☒ neutral
- ☐ counter-productive
- ☐ no opinion

What additional measures could be taken to further improve the effectiveness in promoting advanced biofuels?

2500 character(s) maximum

Large scale deployment and utilization of advanced biofuels has been slow to take off. A number of barriers still need to be overcome, and these vary from country to country but include the need for and further development of supply

chains and a guaranteed price (important when establishing long-term e.g. perennial crops with at least a 10 year lifespan), national and EU level policy incentives (or removal of disincentives) including mechanisms to pay for ecosystem services and building of natural capital, agronomy advice to farmers to reduce the risks associated with the introduction of new crops. The technological feasibility for advanced biofuels need to be combined with approaches to overcome the non-technical (policy and financial) barriers.

5.3. Effectiveness in minimising the administrative burden on operators

In your view, how effective has the EU biofuel sustainability policy been in reducing the administrative burden on operators placing biofuels on the internal market by harmonising sustainability requirements in the Member States (as compared with a situation where these matter would be regulated by national schemes for biofuel sustainability)?

- ☐ very effective
- ☐ effective
- ☐ not effective
- ☒ no opinion

What are the lessons to be learned from implementation of the EU sustainability criteria for biofuels? What additional measures could be taken to reduce the administrative burden further?

2500 character(s) maximum

Short term change in energy prices and also changes in environmental policies by national governments reinforces the need for European Union level environmental policies to be consistent to help provide a long view and a stable investment climate. The aim needs to be to provide assurance that a green technology is delivering positive and sustainability benefits for society and the planet and yet is not too burdensome to discourage those seeking to deploy new technologies with a range of challenges to develop the technology and get it to market.

5.4. Deployment of innovative technologies

In your view, what is needed to facilitate faster development and deployment of innovative technologies in the area of bioenergy? What are the lessons to be learned from the existing support mechanisms for innovative low-carbon technologies relating to bioenergy?

2500 character(s) maximum

There needs to be the right policy environment for farmers to make the long term commitment to planting and growing sustainable energy crops. This includes providing incentives (or reducing disincentives) to farmers especially in more marginal areas where energy crops can deliver multiple benefits, i.e. reduce GHG emissions and deliver additional ecosystem services. In other words location selection is a key to ensure that any negative effects are avoided and positive benefits are maximized. There then needs to be a

mature enough supply chain to ensure that biomass gets from the field and farm to the energy end user and all those in the chain are sufficiently rewarded to ensure the chain stays viable. End users need to be rewarded for fossil carbon substitution and encouraged to invest early in the technology to allow continued improvements. Policy support is needed to encourage adoption rapidly enough to ensure that the benefits of bioenergy are realized in a timeframe which is meaningful for tackling climate change. Further the incentives need to be clearly signaled and made quick to encourage investment in the ramp up which will require some time but only financially possible with the right policy signals. The tackling of climate change and meeting the 2 degree celsius target is probably already impossible without GHG removal. Bioenergy is one of the most cost effective solutions at delivering GHG removal through carbon sequestration especially when deployed on degraded soils and when combined with carbon capture and storage which could include conversion to and incorporation of biochar. To maximize benefits bioenergy crops and their conversion need to be approached in a systemic way - in the sense of a cyclic process, in which (a) nutrient fluxes are developed in a path from agricultural production to conversion and back to agricultural system (including a regionalization concept for logistic and cost-efficiency reasons), (b) in which the use of resources that cannot be contained in a controlled cycle (e.g. water, which will be cycled through the atmospheric compartment) should be minimized and developed for the lowest impact on the natural compartments that are essential for recycling of the resource and (c) in which an optimization approach is developed and implemented, which searches for the most holistic process to simultaneously achieve energy gain, resource use efficiency and economic benefit.

6. Effectiveness of existing EU policies in addressing solid and gaseous biomass sustainability issues

6.1. In addition to the non-binding criteria proposed by the Commission in 2010, a number of other EU policies can contribute to the sustainability of solid and gaseous bioenergy in the EU. These include measures in the areas of energy, climate, environment and agriculture.

In your view, how effective are current EU policies in addressing the following risks of negative environmental impacts associated with solid and gaseous biomass used for heat and power? (one answer per line)

	effective	partly effective	neutral	counter-productive	No opinion
Change in carbon stock due to deforestation, forest degradation and other direct land-use change in the EU					

Change in carbon stock due to deforestation, forest degradation and other direct land-use change in non-EU countries					
Indirect land-use change impacts					
GHG emissions from supply chain, e.g. cultivation, processing and transport					
GHG emissions from combustion of biomass ('biogenic emissions')					
Air quality					
Water and soil quality					
Biodiversity impacts					
Varying degrees of efficiency of biomass conversion to energy					
Competition between different uses of biomass (energy, food, industrial uses) due to limited availability of land and feedstocks					
Other					

6.2. Any additional views on the effectiveness of existing EU policies on solid and gaseous biomass?
Please explain

2500 character(s) maximum

A number of policies are partly effective because it depends on what energy crop and how it is being converted. Bioenergy is subject to many more policy constraints compared to other forms of agriculture, and concerns about excessive uptake have, in part, contributed to a climate in which there has been very little uptake. The limited incentives for being an early adopter with the economic risk in an uncertain market environment have slowed down take-up of new technologies through the value chain. Consequently, the many benefits of sustainable bioenergy production, including climate change

mitigation though both enhanced soil carbon sequestration and fossil carbon substitution, as well as delivering other ecosystem benefits, are not being realized. The EU has tried to distinguish between bioenergy types and it is still important to make the clear distinction between bioenergy types to avoid all bioenergy types (from highly sustainable to unsustainable) being lumped together.

7. Policy objectives for a post-2020 bioenergy sustainability policy

7.1. In your view, what should be the key objectives of an improved EU bioenergy sustainability policy post-2020? Please rank the following objectives in order of importance: most important first; least important 9th/10th (you can rank fewer than 9/10 objectives):

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Contribute to climate change objectives	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoid environmental impacts (biodiversity, air and water quality)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigate the impacts of indirect land-use change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Promote efficient use of the biomass resource, including efficient energy conversion	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote free trade and competition in										

the EU among all end-users of the biomass resource										
Ensure long-term legal certainty for operators										
Minimise administrative burden for operators										
Promote energy security										
Promote EU industrial competitiveness, growth and jobs										
Other										

7.2. Any other views? Please specify

2500 character(s) maximum

The main priorities have to be maximizing GHG removal through fossil fuel replacement (ideally coupled with carbon capture) and also carbon sequestration from long term planting with perennial energy crops. The biomass should be used in appropriate and efficient pathways to maximize the unique role of biomass to provide a storable energy source (e.g. as pellets or biogas) and its ability to produce transport fuels (especially for aviation, haulage and marine where electrification is unlikely), chemicals and materials otherwise sourced from fossil fuels. Bioenergy also has the potential to create economic growth and jobs through it's role in the wider bioeconomy. Given it is a "green technology" the environmental benefits should significantly out way any disbenefits and negative consequences of indirect land use change. However these risks can be significantly minimised by the appropriate selection of crop, land and conversion technology to deliver multiple environmental and economic wins.

8. EU action on sustainability of bioenergy

8.1. In your view, is there a need for additional EU policy on bioenergy sustainability?

- ☐ No: the current policy framework (including the sustainability scheme for biofuels and bioliquids, and other EU and national policies covering solid and gaseous biomass) is sufficient.
- ☐ Yes: additional policy is needed for solid and gaseous biomass, but for biofuels and bioliquids the existing scheme is sufficient.
- ☐ Yes: additional policy is needed on biofuels and bioliquids, but for solid and gaseous biomass existing EU and national policies are sufficient.
- ☒ Yes: a new policy is needed covering all types of bioenergy.

8.2. In your view, and given your answers to the previous questions, what should the EU policy framework on the sustainability of bioenergy include? Please be specific

5000 character(s) maximum

The EU policy needs to ensure that the significant opportunities of bioenergy including to tackle climate change at an affordable price are realized. If the policy framework is not structured appropriately sustainable bioenergy may not be realized because of concerns which apply to unsustainable bioenergy. Sustainable bioenergy can increase biodiversity, decrease flooding risk, increase soil carbon, increase food production as well as increasing incomes and supporting communities in rural areas. The use of wastes, crop residues and (waste or contaminated i.e.) marginal land for the growth of energy crops will deliver significant and sustainable bioenergy at scale. Action is needed to ensure that the opportunities from bioenergy done well are seized and in particular the opportunities needed for GHG removal are not lost.

9. Additional contribution

Do you have other specific views that could not be expressed in the context of your replies to the above questions?

5000 character(s) maximum

The first priority in Europe for land use should be given to Food and Nutritional Security. Energy security in this respect is secondary. However the environmental view is that we have already gone beyond the point that we can achieve a 2 degrees increase in temperature. This will seriously impact all forms of agricultural production and negatively impact future food production. We therefore urgently need greenhouse gas removal strategies and biomass is one of the technologies that can help deliver this including through carbon sequestration and additionally if coupled with carbon capture and storage. Other renewables can not do this which is why biomass is still considered in many future energy scenarios as an important part of the energy mix

The questionnaire has been completed by the EPSO Working Group on Plant Research for Biorefineries.

Finally, you may upload here any relevant documents, e.g. position papers, that you would like the European Commission to be aware of.

Thank you for participation to the consultation!

Contact

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