



Fern submission to EU Consultation: “A sustainable bioenergy policy for the period after 2020”

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Views on the benefits and opportunities from bioenergy

Today, EU renewable energy policies allow for many different types of biomass to be used to meet a variety of energy demands. Projections warn us that if bioenergy would provide 20 to 50 per cent of the world's energy needs in coming decades this would require doubling or tripling of the total amount of the current global plant harvest. This is not sustainable, particularly because demand for biomass for other uses is projected to rise as well (e.g. food, fibre, feed, etc.).

Currently, wood is used to produce around 70 per cent of the bioenergy in the EU, and accounts for over 40 per cent of the renewable energy target. Between 2002 and 2012 use of biomass as a source of energy doubled. Incentives have already led to increased demand for forest biomass resources, approaching the limit of what the EU can supply domestically at sustainable levels. It has been widely acknowledged there are limits to the amount of (woody) biomass that can be supplied sustainably from domestic sources (EEA, EU Wood, et al).

Woody biomass could have a limited role to play in the renewable mix, at least in regions where there is potential for sustainable supply, at restricted levels and only as a transitional solution towards a truly low-carbon energy sector. The sustainability of biomass depends on specific characteristics of the region and biomass production process. Exceeding sustainable levels of supply, using certain high-carbon biomass feedstock, or a very intense or low efficient production process, can immediately nullify these potential benefits, because of intensification of forest management or increasing emissions.

It is therefore important that bioenergy production is restricted to levels that can be sustainably supplied and used in the most efficient way only. Generally however, the EU is advised to first reduce energy consumption (especially in heating, which demands a large proportion of biomass resources) and to develop and deploy other renewables, before considering burning biomass – which is in the end still burning carbon. The EU should also implement strict sustainability criteria, and prioritise those types of bioenergy that have co-benefits. Examples include anaerobic digestion of waste-based biomass which also allows nutrients to return to the soil, and use of biomass that is harvested for nature conservation purposes.

Risks from bioenergy production and use

Forests: intensification management, expansion intensively managed plantations, impact climate resilience; Land use conflicts, human right abuses; Barrier for efficient use of wood / circular economy.

EU policies must address and mitigate the following main risks:

- There is an urgent risk that bioenergy incentives lead to demands for biomass in excess of sustainable limits to supply. The EU Forest Strategy warned that if Member States

were to reach their National Renewable Energy Action Plan targets by 2020 this would require the total EU wood harvest of the year 2013 and reliance on imports for 15-30 per cent of total energy use. This shows that a lot of biomass is needed for a relatively small amount of energy and that there is a potential pressure on wood supply for material uses.

- The Commission website optimistically states that ‘recent projections for 2030 quantify the sustainably realisable potential of *wood for energy* from EU forests as high as 675 million cubic meters, provided intensive wood mobilisation efforts are applied.’ But this completely disregards scientific studies that project sustainable levels of wood harvest at around 590 - 620 million cubic meters *for all uses*. The European Environment Agency (EEA) has already warned energy demands for biomass will increasingly lead to intensification of forest management and trade-offs with other functions forests provide, e.g. to loss and degradation of forest habitats and species and a reduction in the ability of forests to sequester and store carbon. The EEA further warned about deforestation elsewhere in the world, due to the EU’s increasing reliance on imports. Bioenergy production can further worsen air quality.
- There are also social risks. While competition over land and biomass is increasing, bioenergy production can lead to land grabs, land right conflicts, and negatively impact on livelihoods of local communities, e.g. volatility of biomass prices and food/fiber/fuel security. This consultation has not given enough space for the latter risks to be raised and considered appropriately.
- There is also an urgent danger that energy incentives will lead to market distortion, because the energy sector pulls biomass resources away from material uses, which are more climate-friendly than burning wood. Certain sectors are already using alternative (carbon-intensive) materials or importing biomass because of a tight EU market. Increased biomass demands may thus form a barrier for an efficient use of wood and displacement effects, which may lead to indirect emissions as well.
- The EU’s current renewable policy does not ensure that bioenergy reduces emissions and is based on the flawed theory that bioenergy is carbon neutral (zero emissions from bioenergy production). Impacts on carbon stocks and indirect emissions are not taken into account. N.B. high risks of decreasing carbon stocks are not only linked just to *deforestation or direct land use change* (4.1). Risks are even bigger due to (i) time delay in the (assumed) recapture by biomass growth (decades or even centuries), and (ii) decrease in carbon stocks because of increased harvesting for energy.

Effectiveness of existing sustainability scheme for biofuels and bioliquids

The biofuels sustainability scheme of 2009 ignored land use impacts, food security and emissions from indirect land use change (ILUC). Allowing the development and deployment of biofuels with high ILUC emissions have resulted in the support to biofuels with potentially higher GHG emissions than the fossil fuels they meant to replace. This flaw in the biofuels sustainability policy has made the policy counter-productive towards the aim of reducing emissions.

The revision of the sustainability scheme in 2015 by implementing a seven per cent cap on food based biofuels towards the renewable transport target is expected to partly address ILUC emissions and excessive land use. However this is still not effective enough because the policy (i) still allows the production of and support to land based biofuels until 2020 and even allows for a growth, as the seven per cent cap is higher than current consumption levels, (ii) does not cover all land-based crops, hence allowing for land expansion from other crops, (iii) does not effectively account for ILUC emissions, and (iv) is not expanded to the Fuel Quality Directive.

Existing sustainability criteria have been partly effective in preventing direct land use change and other negative impacts, but the criteria lack requirements on social and human rights, and the criterion on biodiversity (Art 17(3)) has been difficult to implement because of unclear or loose definitions of areas such as primary forests, high biodiversity grasslands etc.

Compliance of the sector with existing criteria cannot be claimed since the verification systems used to enforce these are often not sufficiently robust. The European Commission has failed to set strict requirements for the quality of verification systems for checking compliance with the legal sustainability criteria, which has allowed for a race to the bottom rather than the promotion of best practices regarding verification of compliance.

Lastly, the policy has failed to address the sustainability of advanced biofuels. Fern is in particular concerned with the use of ligno-cellulosic material (notably woody resources) for the production of fuels, because this can lead to trade-offs with other functions that forests provide (besides wood mobilisation), wood can be used in much more efficient applications, and because it has been shown that wood use for the production of biofuels will not lead to carbon reductions (because of the intensive production process).

Additional measures to promote advanced biofuels

The seven per cent cap on food based biofuels (as agreed in the ILUC decision of 2015) should be maintained and extended to land based biofuels after 2020. At the same time, the EU should phase out land based biofuels completely as soon as possible between 2020 and 2030.

Advanced, non-land based biofuels could play a role in the phase-out of land based biofuels but other measures to decarbonize the transport sector (e.g. reduction,

efficiency and electrification) should be prioritized. The use of wood for the production of fuels should be disincentivised, because it does not actually lead to emission reductions and wood can be used much more efficiently for the production of materials in the bioeconomy or in other energy applications (e.g. heat). Using wood to produce liquid fuel is a waste of a valuable resource.

There should be no volume / percentage target for advanced (or any other) biofuels, as such a target would risk promoting sources and uses of biofuels that harm the environment, people, other (material) sectors or the climate. Comprehensive sustainability criteria for advanced biofuels, based on the feedstock in question, should be developed.

There should be a level playing field for all forms of bioenergy, including advanced biofuels, which would apply the same sustainability requirements for all bioenergy (see response 8.2) and provide a consistent and more secure policy framework for investments.

Lessons learned from implementation of EU sustainability criteria for biofuels.

Experiences with the biofuels policy since 2009 have taught us that biofuel production can lead to significant impacts on the environment, the climate and people. In the past years civil society, the scientific community and international leaders have opposed the biofuels policy for a number of reasons, in particular the expansion of land use needed for biomass supplies as associated impacts on food security and carbon emissions.

Hence, future bioenergy policy should be approached with great caution, to avoid increasing impacts of bioenergy production from all sources and for all applications. A precautionary measure would do justice to all the scientific knowledge that warns us that the expansion of bioenergy production will require vast volumes of biomass and land, leading to severe impacts on ecosystems and communities in the EU and abroad.

The experience of the biofuels policy should be a starting point to the design of the wider bioenergy policy as well. The biofuels debate has taught us that sustainability policies need to go beyond regulating land and forest management practices, and that the concern actually lies in the negative impacts that are caused by the volumes of biomass that are required for (only a small portion) of energy production, and in a world with rapidly growing demand for land and resources for other uses. Also in the case of solid biomass for heating and electricity, increasing demands can lead to (direct and indirect) increasing emissions, environmental damage, and affects the use of land and limited available resources by people or other sectors.

It follows from this analysis that a volume limit should be extended to bioenergy in general, forest and agricultural biomass for all applications. Plus, a robust, coherent and binding

sustainability policy for all forms of bioenergy (biofuels, solid and gaseous bioenergy) is needed at the EU level to ensure truly low-carbon and sustainable use of bioenergy across the EU, and to harmonise rules that would support investment security and the internal market. Such a policy should include strict sustainability criteria that ensure greenhouse gas reductions over the entire life cycle of bioenergy production (taking into account indirect emissions and carbon debt), avoid market distortion and increasing competition of biomass resources and further negative impacts on environment and people.

The EU should further adopt more specific and strict requirements for the different verification systems for checking compliance with the sustainability policy that support a promotion of best practices rather than a race to the bottom.

What is needed to facilitate faster development and deployment of innovative technologies in area of bioenergy? Lessons learned existing support mechanisms

In the context of forest biomass, it should be acknowledged that burning wood is not – to say the least – an innovative practice, and innovation potential here is limited.

At the moment, policies allow for many different types of biomass to be used to meet a variety of energy demands. This triggers two subsequent questions that are fundamental for designing a future sustainability policy for bioenergy: (i) what bioenergy practices support the aims of a renewable energy policy and are also sustainable?, and (ii) which of these practices are expected to still rely on public support post 2020? These questions should be answered taking into account the existing capacity of the developed bioenergy utilities in the year 2020, to assess whether there is still room for expansion of (sustainable) biomass use.

We have seen that on solid biomass, the Commission has already indicated that the EU will reach sustainable levels of supply before 2020. This means that there is a specific challenge of redirecting limited availability of biomass towards the most innovative and resource-efficient applications, between and within the material and energy sector. Taking into account EU objectives on emission reductions, biodiversity protection, resource efficiency, and reducing global deforestation, it is key that only the sustainable sources and most efficient and climate-friendly uses are allowed.

This effectively means that also in the context of a bioenergy policy, environmentally harmful subsidies should be avoided at all cost. In this context, we have already recommended to limit bioenergy use post 2020 to levels that can be sustainably supplied. However, the EU should also ensure that bioenergy use is genuinely leading to carbon reductions and not leading to severe negative environmental and social impacts at the same time. Therefore, such a restriction should be combined with strict sustainability requirements to ensure emission reductions and resource efficiency, and to avoid impacts on the environment and people.

The potential for innovation in solid biomass applications, and also more effective towards mitigating climate change, lies mainly in efforts towards reducing energy demand, such as energy efficiency activities – e.g. insulation of houses or efficiency of energy systems (while most solid biomass is used in heating). In the context of sustainability criteria the EU should direct the limited amount of available sustainable biomass to those applications with the highest conversion efficiency or when there is no alternative renewable option. Heating is the most energy efficient application for biomass, especially when used in district heating systems and when a conversion to efficient heat pumps and solar thermal is not feasible. In that light it would be recommended to limit the use of wood for the production of electricity-only or of liquids, as these are very inefficient uses of a valuable biomass feedstock.

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

Social impacts, e.g. land tenure rights, human rights and food security; potential indirect emissions by displacement of wood by more carbon-intensive materials/fuels; efficient use of limited resource; forest resilience.

There are no sustainability criteria for solid biomass, which has become the dominant renewable energy source and led to increased demand for wood from EU sources and third countries. This has led to increasing pressure on forests in and outside Europe, impacts on resource efficiency and climate impacts. These impacts have not been mitigated effectively:

- **Environmental impacts:** The European Environment Agency warns that increasing biomass demands are putting a growing pressure on European forests, and forests elsewhere. Biodiversity levels in EU forests are still abominable, despite EU objectives in this regard. Reports from NGOs working in the United States (US), the main provider of biomass to the EU, show severe impacts on high-carbon stock and high-biodiversity forests in the South-East of the US. Bioenergy is harming air quality by wood pellet production and biomass burning.
- **Impacts on resource efficiency:** The use of wood for energy already has a negative impact on a resource efficient use of wood. Since the implementation of the Renewable Energy Directive (RED), a larger share of the total wood harvest has been allocated to energy purposes and several wood-based industries in the EU and beyond have complained about market distortion. Scientific reports have also warned of the danger of displacement of wood use with other materials by sectors or local communities. This may lead to increasing indirect emissions. A recent report by Mondi/WWF confirms market distortion in several Member States already and indicates that growing energy demands could lead to a deficit of supply in the coming decade and that bioenergy subsidies form a barrier for a more resource-efficient use of wood.
- **Climate impacts:** Current EU policies completely ignore that forest harvests for bioenergy negatively impact forest carbon stocks and sinks. The bioenergy policy is in

effect an 'offsetting scheme' which allows current emissions from biomass combustion (sometimes higher than burning fossils), on the presumption that these will be compensated by future growth. Science has shown us that emissions from wood-based bioenergy can be significant, and can even cancel out emission savings from the deployment of other renewables. Current EU climate and energy policies do not ensure GHG reductions from bioenergy production and also not account for bioenergy emissions correctly.

In the absence of sustainability criteria for solid and gaseous biomass, most Member States have relied upon existing domestic policies on sustainable forest management (SFM), agriculture (CAP, rural development) or waste management. However, such policies do not address the 'scalability of bioenergy', and lack any rules to ensure reduction of greenhouse gas emissions or resource efficiency – issues that cannot be tackled through SFM. Plus, policies that aim to address sustainable *sourcing* of biomass are insufficient: across the EU SFM rules and practices are diverging, and effective enforcement of rules can also be a challenge.

Policy objectives for a post -2020 bioenergy sustainability policy

Avoid increasing land use and negative impacts on food security and land conflicts; ensure land tenure rights and human rights.

EU policy currently treats bioenergy as a carbon-neutral energy source, meaning net zero emissions from bioenergy production. It justifies this due to two main assumptions: (i) CO₂ emissions from bioenergy combustion will be fully compensated by future growth of biomass; and (ii) emissions from biomass harvest are fully accounted for in the land use sector (LULUCF).

Research has already shown that the first assumption – that emissions from bioenergy production will be compensated for by future biomass growth – cannot 'a priori' be relied upon, in particular when harvesting for bioenergy decreases the amount of carbon stored in plants and soils, or reduces ongoing carbon sequestration.

The second assumption on LULUCF accounting also comes with large caveats. LULUCF policy – regardless of its improvements - will not ensure that bioenergy use delivers 'robust and verifiable greenhouse gas savings' because of three main loopholes:

- Countries can include harvests for bioenergy in their projections for decreasing forest carbon stocks in their Forest Management Reference Level, meaning that bioenergy emissions can be counted for as credits and the atmosphere is seeing more emissions than are being accounted for;
- Since LULUCF is the net result of several activities, any debits that countries may incur in the forest management category due to high bioenergy production, while being hidden in the Forest Management Reference Level, can be cancelled out by credits from

afforestation, which is generously credited. This leaves existing forests vulnerable as this means they can be 'traded' for newly planted forests;

- Emissions from harvests for EU bioenergy production occurring in third countries are often neither covered in those countries nor in EU carbon accounting systems.

LULUCF rules for forests serve very specific purposes and are unsuitable for more general application as calculation methods for assessing the GHG emissions associated for forest bioenergy.

Currently energy producers benefit from the zero carbon rating of bioenergy via credits in carbon markets and bioenergy subsidies, while the burden of proof (to account for emissions via biomass harvest) lies solely with the land sector, who accrue debits (unless they are included in the projected reference level set by Member States).

To ensure that bioenergy production is reducing emissions, bioenergy sustainability criteria are required that ensure only wood that makes large GHG savings should be burnt, e.g. waste and residues. The EU Emission Trading Scheme (ETS) and LULUCF rules should be aligned with such as sustainability policy. In addition, to ensure emissions from bioenergy are accurately measured, the onus should be on those benefiting from the zero carbon rating i.e. on the energy sector rather than on the land sector. This is even more important since bioenergy is increasingly becoming a traded commodity and exported, meaning it is not burnt in the same country as it is harvested, further removing the burden of proof and traceability of emissions.

What should an EU policy framework on sustainability of bioenergy include?

Fern advises the EU to halt subsidies for bioenergy from 'forest biomass', resources directly sourced from the forest. Ending subsidies for the use of forest biomass for energy would reduce the pressure on forests because currently these subsidies are driving excessive biomass demands. It would also level the playing field with other sectors reliant on wood, such as the construction industry and the developing bioeconomy.

Using wood to replace carbon-intensive materials (such as plastic, steel and concrete), rather than burning it, would be a more effective way of mitigating climate change. Renewable technologies such as wind, solar and geothermal power must develop more quickly to create a shift to a low-carbon economy and they could make good use of the incentives freed up by bioenergy.

Instead of increasingly relying on bioenergy, the EU should focus on reducing energy demand to mitigate CO₂ emissions, by measures such as increasing energy efficiency, as no energy is produced without greenhouse gas emissions. For example, it would be more effective to promote the insulation of buildings or improve the efficiency of energy systems than to support the increased use of wood for heating, which still leads to CO₂ emissions.

For the limited extent that bioenergy could play a role in towards 2030 renewable energy targets, the an EU sustainable bioenergy policy should cover four main safeguards:

- A volume cap to limit the use of biomass for energy production to levels that can be sustainably supplied from domestic sources. Member States should be required to assess the availability of biomass for energy generation from regional sources at sustainable levels, while taking into account demands for material use/production and potential for a more resource efficient use of biomass, and adapt their renewable energy plans accordingly;
- Verifiable greenhouse gas savings; EU climate and energy policies should further ensure correct carbon accounting for biomass, as LULUCF accounting is not sufficient;
- An efficient and optimal use of biomass resources, in line with the principle of cascading use;
- Comprehensive binding sustainability criteria to mitigate other negative impacts on the environment or people.

More concretely, the policy should result in exclusion of the kinds of biomass sources that have the highest risk of negative impacts on the climate, the environment, people and resource efficiency. Since the introduction of the current renewable energy policy, it has become clear that the biggest impacts have taken place because of the expansion of agricultural and forest resources. Increased land use for agricultural crops has led to emissions from indirect land use change and indirect deforestation, and impacts on food security. Increased forest biomass had led to emissions from decreasing forest carbon stocks and sinks, higher atmospheric emissions and further pressure on forests, notably in the EU itself.

To mitigate risks, the EU is advised to as a principle not allow biomass extraction for energy purposes from areas designated for nature protection, or from lands with high biodiversity value or high carbon stock. It should also not allow biomass harvests from converted forest lands.

In both the agricultural and forest area, science supports the identification of high-risk feedstocks. On the agricultural side, it is advised that bioenergy from land-based crops is capped and phased out completely by 2030. On the forest side, it is important to exclude the use of stem wood for energy purposes, and limit the use of harvest residues to sustainable levels. Such a feedstock-based approach does not only serve the aim of ensuring carbon reductions from bioenergy production, but could also benefit resource efficiency and protect forest ecosystems.

To further promote an efficient use of wood as a limited resource, a future sustainability policy should not only include a volume cap on the use of wood for energy generation and exclude high-risk feedstocks, but also provide that biomass can only be used in the most efficient installations, e.g. by implementing a minimum threshold for conversion efficiency. This means, in principle, that electricity-only production with biomass or the use of wood for the production of liquids should not be allowed under a future policy. A future bioenergy policy should focus

on the use of waste and residues, but also provide strict limits and sustainability criteria, such as respecting the principles of the waste hierarchy.

A few Member States have already developed criteria to ensure bioenergy production does not increase emissions, affects resource efficiency or puts a specific pressure on forest ecosystems. Examples are Finland, the Netherlands, Hungary and Belgium – countries that have applied a ‘feedstock-based approach’ to limit impacts on market distortion, the climate and forests, by limiting or disincentivising the use of roundwood. Other countries have applied a minimum threshold for conversion efficiency, to make sure wood is used only in the most efficient functions. All these examples go beyond criteria for the sourcing of the material, and put the burden of proof for constituting sustainability of bioenergy production on the energy producer itself. After six years of experience under the current policy, that is highly needed.

‘Social criteria’ need to ensure (i) respect for tenure and usage rights of individuals and communities to land, water and forests, and Free Prior and Informed Consent (FPIC), (ii) food security, and (iii) respect for basic human and labour rights. Social criteria need to cover indigenous people’s rights, but also other communities that could be affected by bioenergy production.

The EU should further adopt more specific and strict requirements for the different verification systems for checking compliance with the sustainability policy that support a promotion of best practices rather than a race to the bottom.

Additional contribution

Promoting the use of wood for energy at the current scale is not sustainable and conflicts with EU objectives to protect biodiversity, reduce deforestation and forest degradation, decrease carbon emissions, and create a circular economy and a sustainable bioeconomy. Neglecting any of these policy objectives can easily lead to discrediting of the future sustainability policy.

Growing demands for energy will further harm forest biodiversity, water and soil quality, and the ability of forests to sequester and store carbon. It hampers the replacement of carbon-intensive materials in other sectors, where there are fewer alternatives, and slows down the development of real renewable energy solutions such as wind and solar power. Further imports will also lead to an increase in deforestation globally, and the loss of agricultural land needed for food production.

Burning biomass increases carbon emissions in the atmosphere, an effect that is bigger if harvesting the biomass decreases the amount of carbon stored in plants and soils, or reduces ongoing carbon sequestration of forests. In fact, emissions from biomass burning could ultimately be higher than burning fossil fuels. It has been widely acknowledged by the scientific community that only ‘additional’ biomass can potentially reduce emissions, without displacing other ecosystem services. Lowest emissions are associated with scenarios that have the lowest

share of bioenergy, i.e. scaling down after 2020 peak. Highest emissions are associated with the highest share of imported forest biomass.

Sustainable Forest Management (SFM) doesn't ensure that biomass for energy is sustainable in the light of all EU objectives mentioned above. SFM objectives, requirements and verification methods differ widely across the EU, while forest management is regulated at national level with little scope for the EU to intervene. More importantly, focusing on SFM disregards the problem of increased demand and limited supply (scalability). Nor do SFM criteria necessarily address bioenergy-specific issues such as greenhouse gas impact, land use effects, resource efficiency or imported biomass. Currently, aggressive incentives from EU renewable energy policies to rely more heavily on biomass are in direct tension with the soft law measures to promote SFM.

Beyond 2020, we need to ensure that bioenergy use contributes to climate change mitigation, the circular economy and resource efficiency without negative impacts on the environment or on land use and human rights. Since 2009 the EU has provided the energy sector with a 'carte blanche' regarding the use of forest biomass, and now it is high time that tide is turned. The burden of proof for proving sustainable production of bioenergy needs to be on the energy and fuel producer.

With regard to sustainability, we reiterate it is important to look both at quantity and quality of bioenergy production. Studies have shown that the EU is already starting to reach the limits of biomass that forests and agricultural land can sustainably supply, and this should be a red flag considering growing demands from both the energy and material uses. The EU should carefully take into account the sustainable potential of domestic biomass supply for energy use, also respecting competing (material) uses, EU nature objectives – and adopt a volume cap to the use of biomass for energy accordingly.

In designing a post 2020 sustainable bioenergy policy, the EU therefore needs to look beyond sustainable sourcing of biomass, and acknowledge that biomass is a limited resource. Most importantly, the EU should ensure that it does not produce a bioenergy policy that will lead to increasing demands for land and biomass resources, or negatively impact the environment and people. Biomass should only be used for energy when not negatively impacting resource-efficiency and only where it has the greatest climate benefits.

Concrete recommendations that Fern has brought forward towards those aims, are:

- End subsidies for burning woody biomass that is directly harvested from forests, and restrict the amount of biomass that EU Member States can use towards their renewable energy targets to levels that can be sustainably supplied.
- Only allow bioenergy to count towards renewable energy targets when robust greenhouse gas emissions savings have been proven, and make sure bioenergy emissions are correctly accounted for in the EU accounting framework.

- Ensure that wood is not burned for energy when it can still serve other purposes, hence ensuring the policy doesn't counter objectives of a 'circular economy'.
- Implement strict and binding sustainability criteria to avoid impacts on the environment and people, while making sure the burden of proof lies with the energy operator to show compliance with criteria can be verified for specific production chains.
- On woody biomass, Fern further concretely recommends excluding the use of stem wood and stumps for energy purposes, and limit the use of residues to sustainable levels. This would not only be a way of excluding feedstocks that have the highest risk of increasing carbon emissions, but would also benefit resource efficiency and nature objectives. In addition, Fern recommends to only allow woody biomass to be used in the most efficient applications by adopting a minimum threshold for conversion efficiency.

Relevant documents

- Fern [Burning Matter](#) report
- Fern Case study report, [Up in flames](#)
- Fern [Briefing note 1: the limited availability of wood for energy](#)
- Fern LULUCF briefing