Why LULUCF cannot ensure that bioenergy reduces emissions

LULUCF can neither ensure that bioenergy emissions are correctly accounted, nor that bioenergy use delivers robust and verifiable greenhouse gas savings.

Introduction

As part of work to produce a climate and energy package for 2030, the European Commission is currently reviewing the sustainability of all uses and sources of bioenergy for the period after 2020.[1] The European Commission will also propose a new policy on how to include the land use, land use change and forestry (LULUCF) sector in the EU's 2030 climate and energy framework.

EU policy currently treats bioenergy as a carbon-neutral energy source. This claim that there are net zero carbon dioxide (CO_2) emissions from bioenergy production is based on two main assumptions:

(i) CO_2 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 LULUCF sector.[2]

The European Commission's own research has shown the first assumption to be false.[3]

This briefing explains that the second assumption also comes with large caveats. Many NGOs are seeking to improve LULUCF policy,[4] but LULUCF in itself isn't a sufficient policy tool to ensure that bioenergy use delivers robust and verifiable greenhouse gas savings'.[5]

1 The Commission is preparing a bioenergy sustainability policy for the period after 2020
2 This is the reason why bioenergy emissions are not accounted for through the EU Emission Trading System and the Efforts Sharing Decision, which both account emissions from bioenergy emissions as zero.
3 See e.g. European Commission, Joint Research Center 'Carbon Accounting of Forest Bioenergy', EU (2013) and Opinion of the EEA Scientific Committee on Greenhouse Gas Accounting in Relation to Bioenergy (2011)
4 www.fern.org/LULUCFtarget
5 The European Commission specifically aims for a sustainable bioenergy policy to ensure 'robust and verifiable greenhouse gas savings'. See EC Consultation 'Preparation of a sustainable bioenergy policy for the period after 2020'.

Loopholes in the LULUCF accounting system

1 Emissions from forest bioenergy can go unaccounted

LULUCF forest management accounting rules are set up to account for emissions from forestry harvests. But it is not as simple as accruing debits if carbon stores are reducing and credits if the carbon stores are increasing. This is because of the reference level that Member States measure changes against.

As part of LULUCF accounting, Member States project their expected "business as usual" emissions levels based on the harvesting they expect to undertake, and the age of forests. This means that as long as the debits are no bigger than the Member States' projection, a Member State's forests can take up less carbon than before, and even release CO_2, without the Member State accruing debits in their carbon accounting.

This is how emissions from biomass harvests go unaccounted for. If a country's reference level has already foreseen a decline in their forest sinks due to biomass harvest for bioenergy, the emissions from the burning of this biomass effectively disappear. Of the 37 countries that submitted reference levels to use for forest management accounting in the second commitment period of the Kyoto Protocol, 21 explicitly included policies encouraging the use of biomass for energy within their emissions projections, thereby excluding them from accounting.[6]

Accounting for emissions and removals in the land sector is an imprecise science. The setting of forest management reference levels adds another layer of complication. There is also a lack of transparency about what is included and how. It is therefore hard to know the extent to which a country's bioenergy use is included in their carbon accounting. This could be improved if forest management emissions and removals were measured just like any other sector, comparing emissions with a point in time, or a period in time, i.e. net-net.

2 Lack of consistent and reliable international LULUCF accounting rules

The EU's LULUCF accounting systems does not and will not deal with emissions linked to biomass burnt in the EU but harvested outside. The EU assumes that country exporting the biomass is already reliably accounting for emissions from harvests. This is simply not the case.

Recent analysis by the European Commission's Joint Research Centre showed that only 74 out of 195 countries under the United Nations Framework Convention on Climate Change (UNFCCC) have explicitly included LULUCF in their Intended Nationally Determined Contributions (INDCs) towards the Paris Agreement.[7] The analysis also underlined the high level of uncertainty in terms of recording historical levels and projections of LULUCF emissions and removals. UNFCCC negotiations are now considering common accounting rules which will be applicable for all countries, but at present having an EU bioenergy accounting policy that fully relies on LULUCF is unreliable and inconsistent with regards to fuel imports for bioenergy.

This import loophole is particularly concerning because the EU is expected to increasingly rely on imported biomass. Further problems occur when imports come from countries where governance and capacity are low and monitoring is not precise.[8]

6 Chatham House working paper 'Forest-based biomass energy accounting under the UNFCCC: finding the 'missing' carbon emissions. Nora Greenglass, June 2015.

7 JRC Science for Policy report 'Quantifying the contribution of the Land Use sector to the Paris Agreement'. Giacomo Grassi and Frank Dentener, November 2015.

8 www.fern.org/misleadingnumbers

3 LULUCF rules leave existing forests vulnerable

LULUCF accounting includes activities such as forest management, afforestation, crop land and grazing land. This means that, even if a country receives debits from the forest management activity, these could be cancelled out by credits from an activity such as afforestation.

Afforestation is incentivised by LULUCF accounting rules because they are accounted for 'gross-net' meaning that the total carbon flux for a period is counted, but not compared to anything, such as a base year. This method of accounting is different from all other sectors. It also has the knock-on effect that afforestation credits contribute disproportionately to a Member State's LULUCF accounting. This method of accounting can obscure or even totally offset any debits a Member State has from forest management.

However, even perfect accounting rules could only safeguard carbon. They would not, in themselves, provide social or biodiversity safeguards. For example it means that a Member State could increase harvesting in old growth forests as long as they increase the number of plantations. Though the total carbon balance may be neutral, the impact on biodiversity and local communities will be large. This is the case, for example, in Ireland (see figure 1).

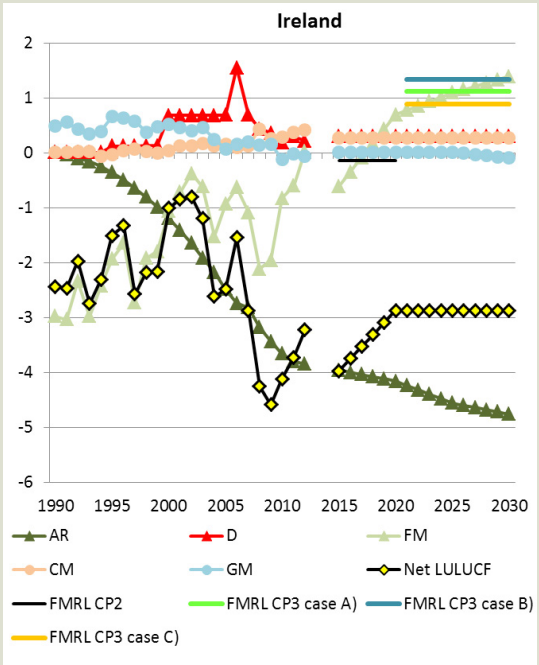

Figure 1: *Ireland projects it will significantly increase harvesting in existing forests (see light green line). Although this is decreasing the forest carbon sink to the point that it may be a net source of emissions, the high level of afforestation (see dark green line) means that the total balance is positive (see yellow and black line).*[9]

9 See LULUCF projections on p.8-16 of Fern briefing available at www.fern.org/LULUCFtarget

Other loopholes that arise from relying on LULUCF to regulate bioenergy emissions

1 Driving increasing demand without requiring proof of emission reductions

Currently we rely on LULUCF to account for bioenergy emissions at the moment of harvest. It assumes that this will sufficiently incentivise the re-growth of enough biomass to compensate for smokestack emissions in the energy sector. In reality, biomass crops, particularly those planted on drained or degraded peatlands, cause peatland oxidisation and elevated emissions which are often overlooked. Energy producers then benefit from a zero carbon rating for bioenergy while the land sector has to account for emissions when biomass is harvested. The zero rating means that bioenergy producers get carbon market credits and subsidies without having to provide proof of actual emission reductions.

2 Emissions not reduced but shifted between sectors and Member States

Emissions and emission reductions are accounted for and incentivised differently in the land and energy sectors. This may create an imbalance, or a tension between the two sectors and between Member States. If accounting rules or emission reduction targets in the land sector are too lax, this may incentivise the shifting of efforts to reduce emissions from the energy to the land sector. This does nothing to reduce emissions overall.

The European Environment Agency has estimated that in 2012 the EU's renewable energy policies resulted in 326 megatonnes (Mt) of saved CO_2 (assuming emissions from all bioenergy were zero).[10] At the same time, the UK Forest Research[11] estimated that 'business as usual' use of bioenergy in the EU will lead to 520 Mt of CO_2 emissions annually. These emissions mostly happen in the land sector and are currently unaccounted for. This indicates that emissions are merely shifted from the energy sector to the land sector (where they are often unaccounted), but no emissions are actually reduced.

10 http://www.eea.europa.eu/publications/renewable-energy-in-europe-approximated
11 DG ENER/C1/427 Carbon impacts of biomass consumed in the EU, 2015

Conclusion

Most sectors in the EU are subject to emission reduction targets as a result of the EU Emissions Trading System (ETS) and the Effort Sharing Decision (ESD). On top of this, many sectors have additional policy measures to help ensure emission reductions are achieved in the most effective way. For example, the transport sector is part of the ESD, but is also required to increase vehicle efficiency and decrease the carbon intensity of fuels.

The land sector is a huge source of emissions and is the only sector that also has the possibility of removing emissions. Despite this, LULUCF rules are not yet strong enough to ensure efforts to keep carbon in the forest are effective. LULUCF rules could account for emissions from harvesting if done in the EU, but are not sufficient to ensure that bioenergy production achieves significant greenhouse gas savings, an express aim of the EU's bioenergy policy. The bioenergy sector should introduce additional requirements to ensure that it is effectively reducing greenhouse gas emissions.

LULUCF is the wrong tool to account for bioenergy emissions.

Key recommendations

A robust LULUCF policy and improved accounting rules for the sector are urgently needed. However, this will not automatically ensure that bioenergy production reduces greenhouse gas emissions, and additional rules in a sustainable bioenergy policy are strongly needed for that purpose. Below we provide some recommendations on both policies, from the perspective of ensuring real emission savings from bioenergy.

A post 2020 bioenergy sustainability policy should include:

- **The introduction of an EU wide cap on the amount of bioenergy that can be counted towards the EU 2030 renewable energy and climate targets.** This would limit the overall amount of biomass extracted from ecosystems for energy purposes. It would also ensure biomass extraction does not exceed sustainable supply, lead to a decline in carbon sinks or further deplete EU carbon stocks.

- **The exclusion of high risk biomass sources** such as crops from agricultural land (particularly from those planted on peatlands), roundwood, stumps and feedstocks that could be used to replace other carbon intensive materials. This will exclude sources of biomass that are most likely to produce net emissions through reduction in carbon stocks or through indirect land use change and sources that have other, more sustainable uses.

- **A minimum threshold for the efficiency of energy production systems.** This will direct limited biomass resources towards the most efficient energy applications.

A post 2020 LULUCF policy should:

- **Measure forest management emissions transparently, simply and efficiently.** Emissions from forest management are real, and should be mandatorily included in accounting systems. All LULUCF sectors should be accounted for 'net-net', rather than according to a future reference level

- **Set a separate target on LULUCF** to incentivise increased carbon removals in the forestry and land sector without watering down emission reduction targets in other sectors.[12]

12 For more information see www.fern.org/LULUCFtarget