

Biomass energy and forests

Finding the 'missing' emissions

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Is biomass carbon-neutral?

- Policy frameworks generally treat biomass as zero-carbon, based on two assumptions ...
- Assumption 1: carbon emitted when biomass burned is reabsorbed as part of natural forest growth cycle
- But, trees would keep on growing if not harvested
- Loss of future carbon sequestration plus higher emissions from biomass → higher net carbon levels
- Net impact depends partly on counterfactuals
- Most positive outcomes where mill or fast-decaying forest residues are used
- Most negative outcomes from harvesting whole trees, particularly from old-growth forests, displacing wood from other uses

IPCC / UNFCCC reporting and accounting rules

- Assumption 2: burning biomass does release carbon, but this is reported under greenhouse gas reporting rules in the land-use sector; for energy sector purposes, biomass emissions are zero
- This derives from IPCC reporting rules intended to avoid double-counting when biomass is (1) harvested and (2) burnt
- In effect, emissions are assumed to occur at point of harvest, not when burnt – leads to perception of carbon-neutrality amongst energy policy-makers
- But emissions are not recorded in the same way at the point of harvest: potential for ‘missing’ emissions

Three reasons for emissions to go missing (1)

- Accounting of emissions for Kyoto Protocol is not the same in the energy and in the land-use sectors
- Accounting for LULUCF not required in first commitment period (2008–12)
- Is required in second commitment period (2013–20); KP parties given choice of baselines for forest sector
- 3 chose historic baselines (as in other sectors)
 - production of biomass at the baseline level *will not be accounted for* (as long as does not change) – same as other sectors

Three reasons for emissions to go missing (2)

- 32 parties chose business-as-usual baselines – i.e. only account for changes in emissions compared to what was expected to occur when business-as-usual baseline was set
 - 21 included policies encouraging production of biomass in their baseline
 - i.e. emissions from harvesting forests for biomass in line with these projections *will not be accounted for*
 - (though impacts of post-2009 policies *are* accounted for)
 - Other 11 might also not account for biomass, but not clear

Three reasons for emissions to go missing (3)

- Emissions from imported biomass not accounted for in the importing country's accounts
 - Depends whether accounted for in exporting country
- Emissions from biomass imported from KP non-parties *will not be accounted for*
 - Note: major sources of wood pellet imports to EU all KP non-parties: US, Canada, Russia
- Paris Agreement can fix this
 - but US may withdraw

Impacts

- Potential for missing emissions from biomass
 - Building anticipated emissions into forest management accounting baselines
 - Importing biomass from non-accounting countries
- Potential for perverse incentives due to different accounting approaches in the energy and land-use sectors
 - When accounting in the land-use sector reflects fewer tonnes than it would in the energy sector, there is an incentive to increase use of forest-based biomass regardless of the ‘true’ atmospheric impacts

What's the volume of the missing emissions?

- Impossible to unravel forest management reference levels to obtain accurate estimate of a country's missing emissions from biomass energy
- Not always clear how projected harvests will be used
- Unknown source of biomass, e.g., increased harvests versus increased utilisation of residues
- Use of domestic versus imported biomass
- Conclusion: we don't know
- But total probably significant

Scale of problem

- In 2014 Annex I countries emitted 781 MtCO₂ from solid biomass combustion
 - ~ 5.6% of total economy-wide GHG emissions
 - ~ 6.0% of total energy emissions
- US ~28% total Annex I solid biomass carbon emissions
- Germany + Japan + France ~26%.
- US, Japan: no accounting for emissions from their land-use sectors under the Kyoto Protocol,
- Germany accounts against business-as-usual projection that does not explicitly include bioenergy policies
- France uses a business-as-usual projection that includes bioenergy demand from policies (not including RED)
- Woody biomass emissions from all these countries, therefore, have the potential to go unaccounted for

National case studies

- Full paper includes studies of UK, US, Finland, France
- UK, 2014 – solid biomass emissions ~16MtCO₂ (3.8% total CO₂ – about 1/2 emissions from aviation)
- UK uses BAU reference level assuming some harvest for biomass – up to 17% total harvest
- UK also imports most biomass used for electricity:
- 2015–16, ~1.5Mt pellets from Latvia and Portugal
 - Both use BAU ref levels including some harvesting for biomass
- 2015–16, ~5.5Mt pellets from US and Canada
 - Both outside KP
 - Equivalent to ~7.8Mt CO₂ (at least)
- So 16MtCO₂ UK biomass emissions counted as zero in energy sector, and bulk unaccounted in land-use sector

What would fix the problem?

- Ideally, CO₂ emissions from biomass burned for energy accounted for within the energy sector, not the land-use sector
- If this option is not followed:
- All parties to the Kyoto Protocol and Paris Agreement to include land-use sector in national accounting
- Forest management reference levels to contain detailed information on projected emissions from biomass for energy and origins of biomass
- Countries importing biomass for energy to report on whether and how country of origin accounts for biomass emissions.
- Where biomass imported from country that does not account for such emissions at all, or in baseline: emissions should be accounted for by importing country.
- Countries using domestic biomass for energy should use same baselines for energy and land-use sectors

Thank you
