

# Biomass energy and forests

## Finding the 'missing' emissions

Duncan Brack (Associate Fellow, Chatham House)

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## Is biomass carbon-neutral?

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- 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

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- 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)

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- 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)

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- 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)

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- 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

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- 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?

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- 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

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- In 2014 Annex I countries emitted 781 MtCO<sub>2</sub> 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

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- Full paper includes studies of UK, US, Finland, France
- UK, 2014 – solid biomass emissions ~16MtCO<sub>2</sub> (3.8% total CO<sub>2</sub> – 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 CO<sub>2</sub> (at least)
- So 16MtCO<sub>2</sub> UK biomass emissions counted as zero in energy sector, and bulk unaccounted in land-use sector

## What would fix the problem?

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- Ideally, CO<sub>2</sub> 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

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