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The potential and challenges of wastes and residues – the example of straw

Bettina Kretschmer

26 February 2013

"Advanced biofuels and ILUC: is Europe up for the challenge?" EP event organised by WWF

www.ieep.eu
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Outline

- Reviewing the EU potential of straw for bioenergy
- Beyond straw: Other, mainly wastes and residues feedstocks in the ILUC proposal – sustainability considerations

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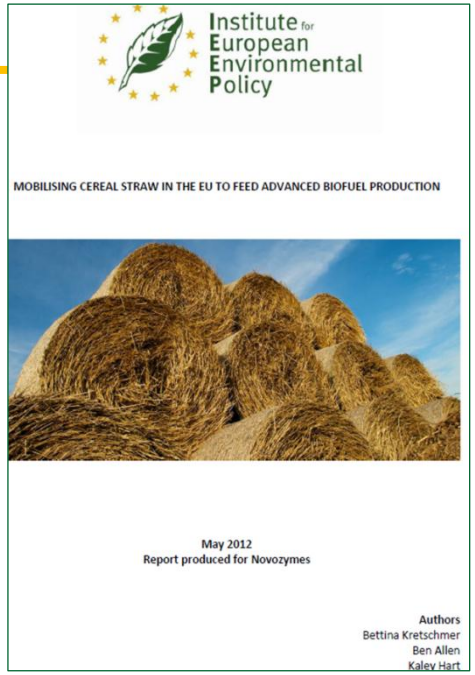
Background

- Limited uptake of advanced biofuels: 2.1 Mtoe in 2020 (27.3 Mtoe conventional)
- Commission's ILUC proposal (Oct 2012) incl list of feedstocks (mainly wastes and residues) for 2x and 4x counting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MOBILISING CEREAL STRAW IN THE EU TO FEED ADVANCED BIOFUEL PRODUCTION

May 2012
Report produced for Novozymes

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EUROPEAN COMMISSION

Brussels, 17.10.2012
COM(2012) 595 final

2012/0288 (COD)

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

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

(Text with EEA relevance)

{SWD(2012) 343 final}
{SWD(2012) 344 final}

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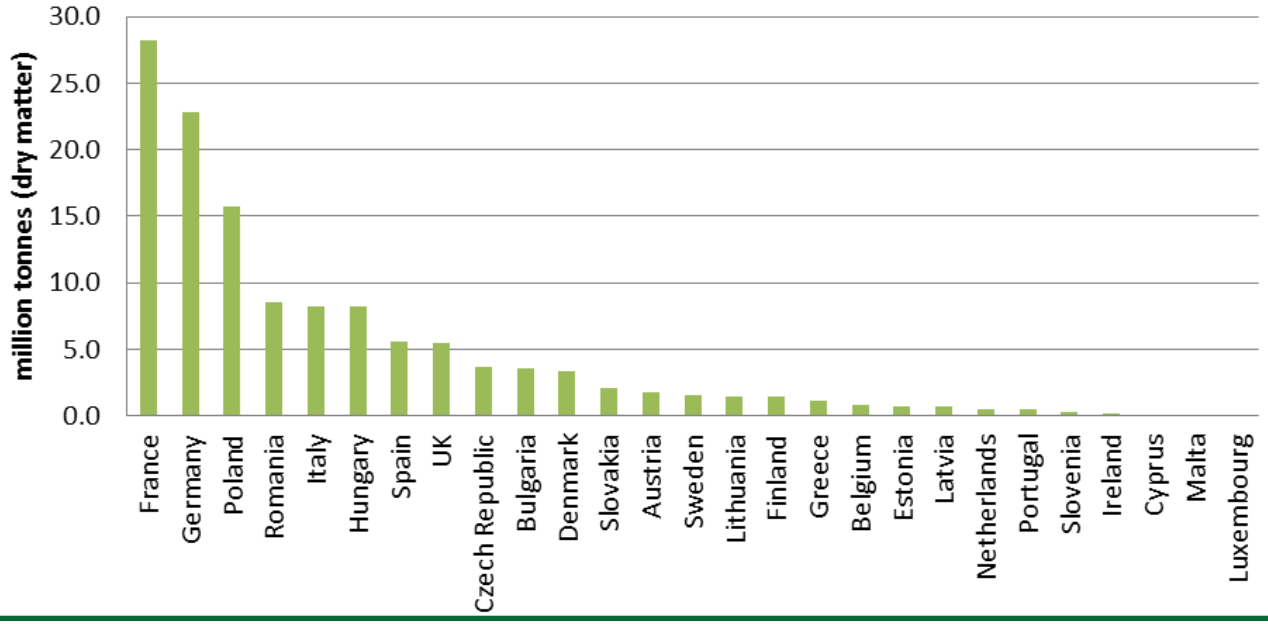
Reviewing the EU potential for straw

- Substantial EU27 potential – but high uncertainties:
  - 50 to 110 million tonnes of straw dry matter/year (DBFZ and Oeko-Institut review) to 127 million tonnes of straw dry matter in 2020 (Biomass Futures project)
- The sustainable levels for straw extraction rates are unclear



EU27 straw potential for 2020:
127 million tonnes (dry matter)

Elbersen *et al* (2012) –
www.biomassfutures.eu

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Use of straw in the EU

- By-product of cereal harvesting
- Developed a range of traditional uses, including:
  - Agriculture: bedding, soil improver, vegetable and mushroom production, composting
  - Other: thatching, building materials, as a fuel for energy (burning)
- Surplus does exist but quantifying volumes is problematic

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Use of straw in the EU

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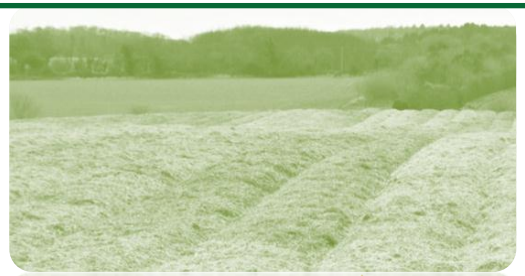
- Emissions from cultivation
  - Agricultural residues (incl straw) are not currently included in the GHG accounting framework under the RED
  - Residues considered zero emission until collection
- Soil carbon content could therefore have a significant impact on total GHG savings





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Building straw supply chains

Limited uptake of straw for biofuels: *Which barriers explain the lack of development?*

- Underdeveloped markets and lack of market information
- Competing existing uses of straw
- Lack of guidance on the optimal use of straw as a soil improver
- Lack of infrastructure (eg machinery for bailing)
- Variable availability of straw

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Beyond straw

Other, mainly wastes and residues in the ILUC proposal

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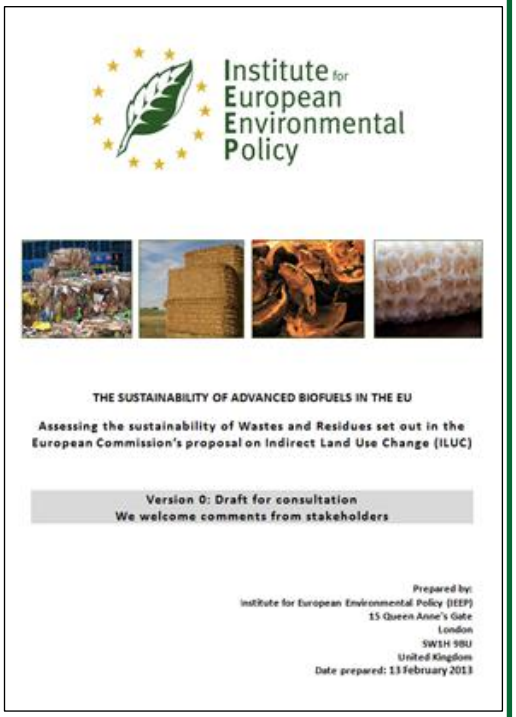
Method

- Initial screening exercise of proposed list
- No consideration of volumes available and costs of mobilising wastes and residues
- Limited consideration of how sustainability risks are affected by volumes of mobilised wastes and residues
- Limited consideration of priority uses for wastes and residues, ie should feedstocks be used for biofuels, heat & electricity, other (non-energy) economic uses?
- **PRELIMINARY RESULTS presented**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THE SUSTAINABILITY OF ADVANCED BIOFUELS IN THE EU

Assessing the sustainability of Wastes and Residues set out in the European Commission's proposal on Indirect Land Use Change (ILUC)

Version 0: Draft for consultation
We welcome comments from stakeholders

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Date prepared: 13 February 2013

Example I: Bark, branches, leaves, saw dust and cutter shavings

Existing uses
Wood pellets and briquettes; fibreboard and paper production; composting, mulch and soil protector; combustion for heat and electricity. Pharmaceutical applications for bark etc

Risk of diversion of existing uses
Loss of fallen deadwood/higher extraction of residues: impacts on soil organic carbon and biodiversity in forests.
Diverting existing uses that maintain wood as a solid component (ie fibreboard): risks to impact negatively overall carbon balances.

Is the feedstock imported?
Unlikely. Primary import would be for high quality timber or pellets.

Environmental safeguards?
- Ensure that sustainable extraction rates of bark, branches and leaves.
- Ensure suitable alternatives are available for compost industry and soil mulch processing.
- Ensure that paper pulp industry is not deprived of feedstock resulting in demand for higher-grade wood with consequential diversion from other industries.

Conclusion: sustainable alternative? *Potentially unsustainable if based on diverting current uses but may be further resource available if cost barriers removed (but depends on safeguards)*

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Summary of sustainability assessment

Sustainability assessment	Feedstock
Likely sustainable	Tall oil pitch (4x)
	Nut shells (4x)
Potentially sustainable (contingent on safeguards)	Algae (4x)
	Biomass fraction of mixed municipal waste (4x)
	Biomass fraction of industrial waste (4x)
	Straw (4x)
	Animal manure and sewage sludge (4x)
	Palm oil mill effluent and empty palm fruit bunches (4x)
	Bagasse (4x)
	Grape marc and wine lees (4x)
	Husks (4x)
	Cobs (4x)
	Used cooking oil (2x)
	Animal fats (Category 1 and 2) (2x)
Potentially unsustainable (but depends on safeguards)	Bark, branches, leaves, saw dust and cutter shavings (4x)
	Non-food cellulosic material (2x)
	Ligno-cellulosic material except saw logs and veneer logs (2x)
Unclear	Crude Glycerine (4x)

Key messages I – straw

- There is a significant potential for straw to feed advanced biofuel production in the EU
- Policy can help to ensure the sustainable use of straw through:

CAP

1. Strengthening environmental safeguards through cross compliance in the form of specific requirements on soil organic matter
2. Providing advice and support to farmers on the sustainable use of straw

RED

3. Including soil carbon in GHG accounting framework

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Key messages II – wastes and residues

General environmental safeguards needed:

- Clear definitions are needed
- Adherence to waste hierarchy
- Respect for environmentally, socially and/or economically more favourable existing uses
- Consider the complete lifecycle GHG emissions that arise from wastes and residues

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IEEP's Biofuel ExChange project:

www.ieep.eu/minisites/pursuing-change-in-biofuels-policy-developing-alternatives/

The full straw report is available at:

http://www.ieep.eu/publications/2012/05/mobilising-cereal-straw-in-the-eu-to-feed-advanced-biofuel-production

Contact: bkretschmer@ieep.eu