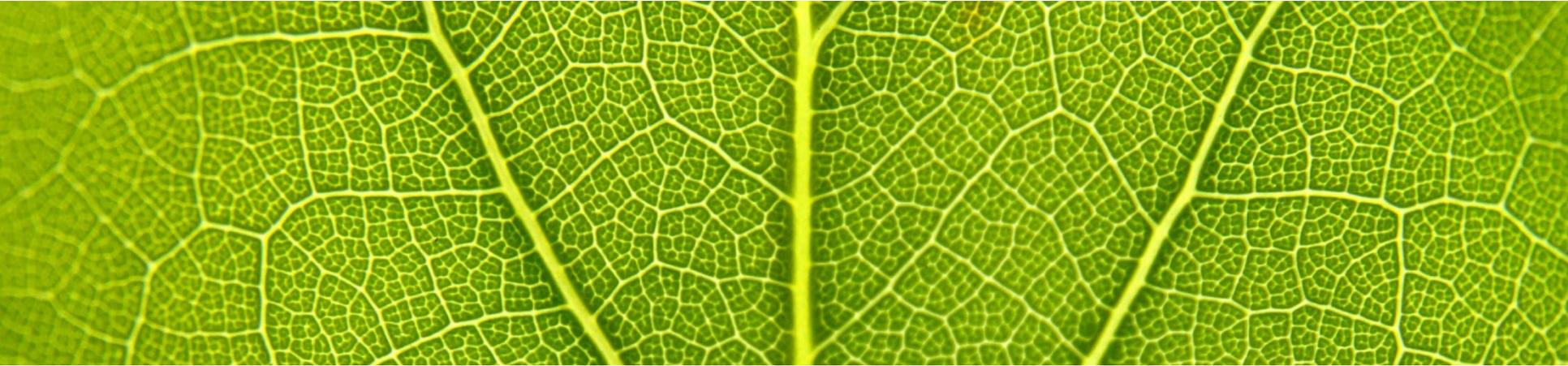




sustainable energy for everyone



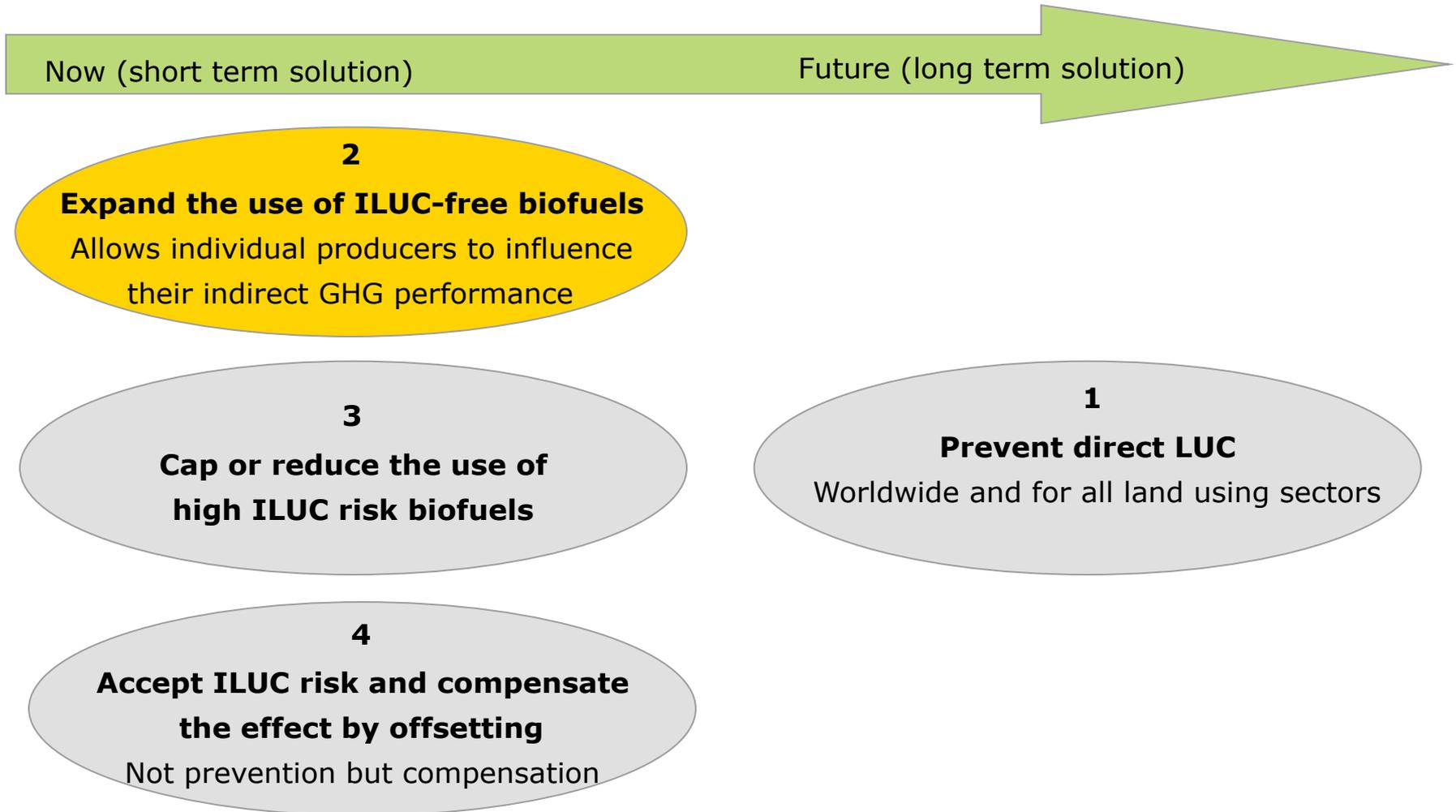
Practical ways to achieve ILUC-free biofuels

Daan Peters - IEA bioenergy workshop 'land use and mitigating ILUC'
Brussels 23 October 2014

Presentation content

- How can ILUC be prevented?
- ILUC prevention options and how to assess them
- LIIB methodology to identify, quantify and certify ILUC-free biofuels

Strategies to solve ILUC



Definition of ILUC-free biofuels

Biofuels that do not cause ILUC. This can either be **advanced** biofuels produced from abundantly available non land-using materials or **conventional** biofuels produced from feedstocks that do **not cause displacement** of existing agricultural production.

It's not enough to merely reduce ILUC risks. Aim should be to achieve ILUC-free biofuels

Options for ILUC-prevention

1. Using non land-using (residue) materials as biofuel feedstocks available in surplus quantities (*Included in LIIB methodology*)
 2. Using unused land (*Included in LIIB methodology*)
 3. Increasing crop yields (*Included in LIIB methodology*)
 4. Sugarcane-cattle integration (*Included in LIIB methodology*)
 5. Using fallow land as part of crop rotation
 6. Introduce multi-cropping
 7. Reduce post harvest losses
 8. Improved conversion efficiency of biofuel installations
 9. Using land historically used for biofuels
 10. Animal feed-co-product substitution (*partly an offsetting option*)
- ILUC prevention options are implemented **within the biofuel supply chain**
 - Most individual prevention options do not result in 100% ILUC-free feedstocks from a field (except unused land) but feedstock sourcing via traders can ensure 100% ILUC-free feedstock mix.

From theory to practical certification: LIIB

- Ecofys, WWF and EPFL (then hosting the RSB secretariat) developed the **Low Indirect Impact Biofuels Methodology** which sets out the methodology to identify, quantify and certify ILUC-free biofuels for 4 prevention options:
 1. Using non land-using (residue) materials as biofuel feedstocks available in surplus quantities
 2. Using unused land
 3. Increasing crop yields
 4. Sugarcane-cattle integration
- All options have been pilot tested with partners and auditors
- LIIB is not a model but a practical implementation method. It is not another voluntary certification scheme but can be used as add-on to existing schemes.
- Ecofys currently develops LIIB compliance indicators for RSB

1. Biofuels from wastes & residues

- Residues can have an ILUC risk in case materials are already used by other sectors
- Surplus quantities of residues are ILUC free
- Current system with DC positive lists is 'in or out' system. We propose to identify the available surplus per residue material and set caps on biofuel consumptions per residue feedstock.
- Caps should be set at EU level to avoid differences per voluntary scheme and can be regularly updated



2. Cultivation on unused land

- Unused land can be abandoned farmland (e.g. in Eastern Europe) or low-carbon stock, low-biodiversity land not used for agriculture before (e.g. along grasslands in Indonesia)
- Biofuel feedstocks produced on unused land is ILUC free because no existing agricultural production is displaced. Unused land certified per individual biomass producer.
 1. Farmer or developer identifies land which is not used for provisioning services during the previous three years
 2. Auditor checks ex-ante if land is currently unused and has been unused since the last three years and checks ex-post how much biofuel feedstock production took place on the land
- Sustainability requirements of the voluntary scheme used apply.

Unused land is often used extensively



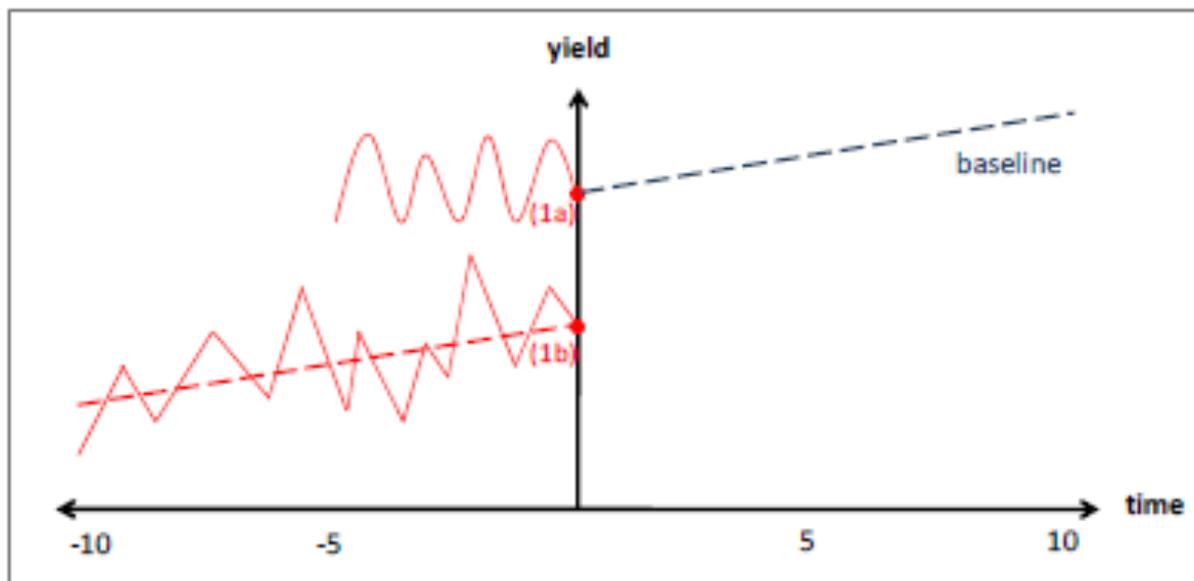
Extensively used land can be LIIB-certified if viable local alternatives exist.

3. Yield increase

- Additional biofuel feedstock produced on existing agricultural land does not displace agricultural production to elsewhere. Yield increase certified per farm.
 1. Baseline yield increase established based on historical yields at farm-level and regional figures, above baseline yield increase is ILUC-free
 2. Farmers develop measures to achieve above-baseline yield increases
 3. Auditor checks baseline and measures ex-ante and ex-post whether measures are implemented and the difference between baseline and actual yields
- Climatological impacts on actual yields can be reduced by averaging actual yields over multiple years and/or cross-checking with regional yield data
- Sustainability requirements of the voluntary scheme used apply.



Setting up the yield increase baseline



- Individual farm-level baseline: historical yield data of farmers in the region (NUTS2) compared to historical yield of farmer seeking certification.
- Future yield baseline created based on past trend.

1a is the current year yield of the LIIB applicant farmer based on the average yield during the last 5 years

1b is the expected current year yield of farmers of the same crop in the same region

Red dotted line is yield trend line of the same crop in the same region in previous 10 years

4. Sugarcane-cattle integration

- Sugar and ethanol production results in residues perfectly suitable for animal feed
- Using sugarcane residues as animal feed allows for increased density of cattle per hectare, creating more land for sugarcane without displacement effects.
- ILUC-free certification at the level of an individual sugarcane mill and its fields.
 1. Convert all sugarcane by-products to Total Digestible Nutrients (TDN).
 2. Convert TDN in a quantity of animal units (AN)
 3. Number of hectares required to produce the quantity of AN in the Brazilian Agricultural Frontier region is calculated, resulting in ILUC avoided area.
 4. Amount of ethanol the mill produces on equivalent area is ILUC-free.
 5. Audit of mill by-product production and their uses, of cattle farmer purchasing by-products, of correct application of Scint and quantification of ILUC-free biofuel

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SCint Approach



Simplified: sugarcane produced on freed-up 500 ha is ILUC free

Further ILUC prevention options

Further ILUC prevention options

- Fallow land as part of crop rotation
 - Grow cover or break crops during fallow period for ILUC free biofuel production
 - Baseline requires complete dataset of agricultural production of respective farm
- Multi-cropping
 - Increase productivity per unit area (sub-category of yield increase)
 - Additional production shall not lead to negative impacts on soil or yields of existing crop

Further ILUC prevention options

- Post-harvest losses
 - Significant amounts of biomass get lost in harvesting, processing and transport
 - >> Reduced losses are ILUC free
 - Demonstration of ILUC prevention requires well documentation of losses in supply chain
- Improved conversion efficiency
 - Ratio between feedstock input and ethanol output can be increased
 - Baseline will compare existing with improved conversion
- Land historically used for biofuel production
 - Biofuel feedstock cultivation on same land since more than 20 years could be classified as ILUC free

How much does LIIB cost

- **Investment costs** should be paid back by additional production, barriers often non-economic
- Additional **certification cost** vary:
 - Wastes and residues: check if producer uses feedstock-regions included in the positive list;
 - Yield increase baseline needs to be individually audited. Subsequent verification of actual yields data is cost-efficient;
 - Unused land does require an on-site audit with reasonable modest auditing costs;
 - Sugarcane-cattle integration audits typically cost around one day or half day if part of a sustainability certification.
 - Increased auditing costs for farmers part of group certification to ensure robustness