Brief Overview of ILUC work in Europe

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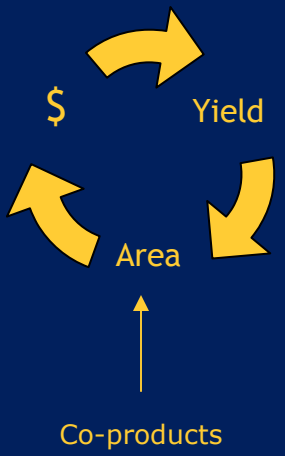
Looked at three types of ILUC-work

1. How large is ILUC and the associated GHG-impacts?
   - Agro-Economic / Biophysical models
   - Spreadsheets
2. Practical solutions for companies to minimise the risk of ILUC
3. Monitoring of biofuel induced (I)LUC

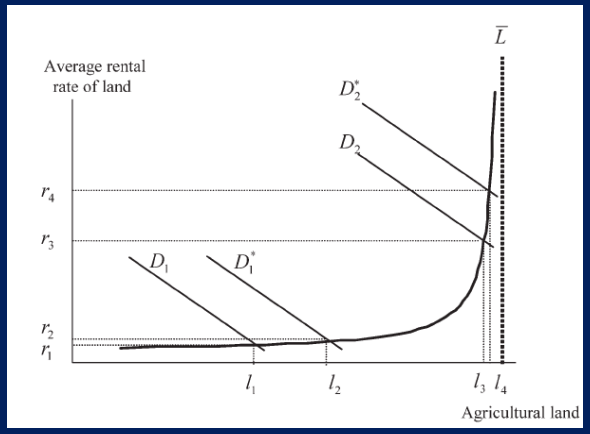
I. European work on ‘sizing the problem’

GHG-effects from ILUC: 4 questions

Biofuel Mandates	1. Market response?	2. Types of LUC?	3. Carbon stocks?	4. Time / allocation?
		  	C-stocks	g CO_2/MJ

LEITAP

- CGE used to asses impacts of biofuels on global agri markets
  - Possible translation to GHG-impacts - link with IMAGE
- LEITAP model based on GTAP with key modifications
  - Land supply curve (IMAGE-based)
  - Land allocation tree
  - New structure petroleum sector



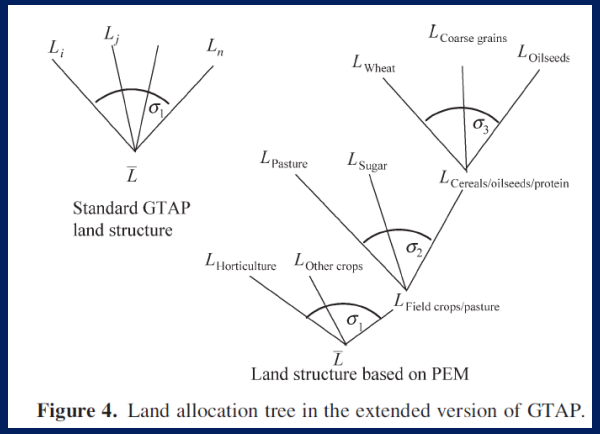


Figure 4. Land allocation tree in the extended version of GTAP.

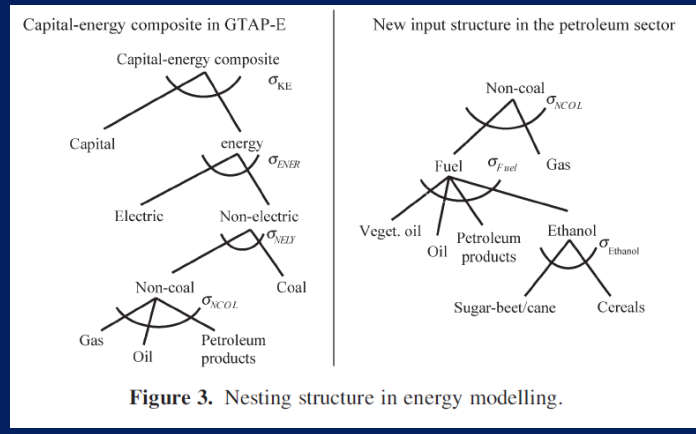


Figure 3. Nesting structure in energy modelling.

LEITAP

- Other key characteristics
  - Yield price-response
    - 80% Adjusted historic trends (assumed to decline)
      - Informed by IMAGE
    - 20% Price response
  - Co-products not modeled in detail
  - Sustainability policy
    - Protected forest excluded from land supply curve
    - No other sustainability to prevent deforestation etc.

- Future work
  - Detailed co-product modeling
  - Detailed agricultural and forestry residue modeling
  - Detailed technology development in biofuel conversion technology

IIASA Science for Global Insight

- Combining PE with biophysical models
  - Bottom-up approach
  - Geographic explicit

- Used to analyse effects biofuel policies, deforestation policies, etc. on prices, land use, GHG-emission, etc
- Key characteristics
  - Detailed modeling of other land-intensive sectors
    - forestry sector
    - livestock sector
  - Detailed modeling of co-products
    - Including agricultural residues
  - Land availability dependent on scenarios
    - E.g. avoided deforestation policies, land set-aside for nature conservation
  - Results include GHG-emissions from (i)LUC and agri-practices

- Results analysis EU 10% biofuel target
  - If not constrained (e.g. REDD) important deforestation occurs
  - EU mandates put pressure on deforestation elsewhere even without trade – iLUC
  - Trade in biofuels lowers deforestation and the iLUC effect
  - Avoiding deforestation further increases the effect of biofuels on crop prices

EEA/JRC with support from OECD

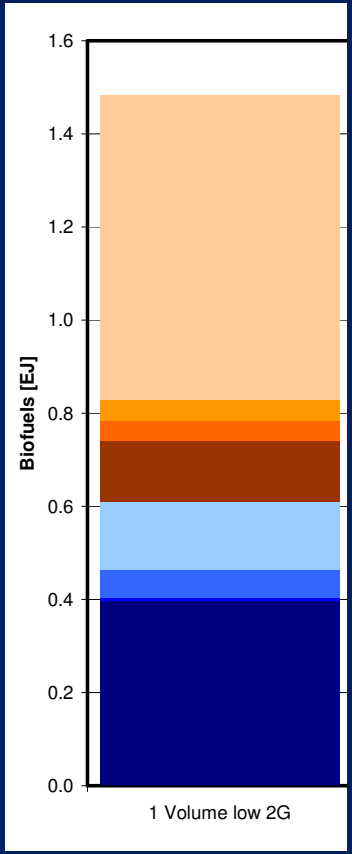
- Bringing together work on ILUC
  - OECD/EEA workshop in June 2008
  - OECD/EEA/JRC workshop in Jan 2009

- Key items identified (selection)
  - Co-products
  - Availability (marginal) land
  - Yield developments
  - Sustainability policies
  - Monitoring of LU & LUC to calibrate/validate models

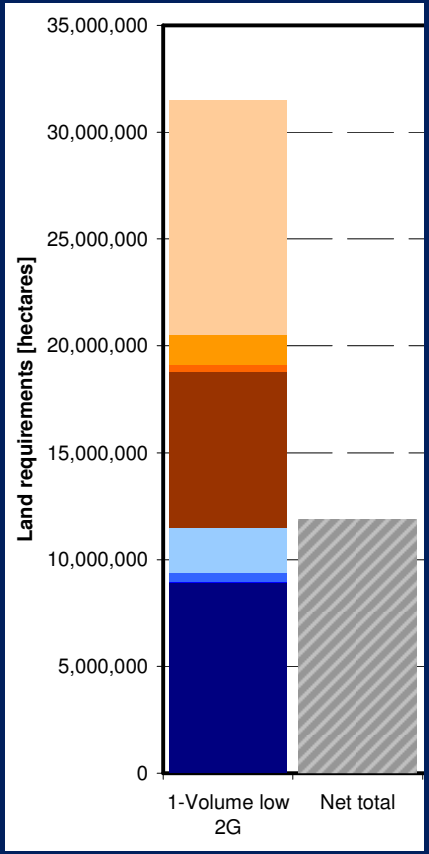
- Future aims
  - Compare models on technical level
  - Agree common scenarios, run in different models, compare results

UK –Gallagher review + follow-up

1. Biofuel Volume



2. Gross -> Nett land requirements



3. LU -> LUC

DG-AGRI

ESIM results

Biofuel feedstock comes from:

Imports: 23%

EU Set-aside: 31%

EU Area not taken out of production: 17%

EU Displaced exports: 29%

"yields do not vary strongly with price because farmers maximise profit, not yield"

4. Conclusions

Biofuels *can* lead to large (i)LUC

Uncertainties due to

- Feedstock choice
- Second generation from residues
- Co-products
- Yield biofuel crops
- Yield substituted crops

Other models ……..

- CGE
  - GTAP-E
  - DART – focus on climate change policies
  - ……..
- PE
  - EUFASOM – focus on EU
  - ESIM – focus on EU
  - CAPRI – focus on EU
  - AGMEMOD – focus on EU
  - AGLINK (OECD)
  - FAPRI – focus on US
  - IMPACT – IFPRI
  - RAUMIS – focus on Germany
  - …….
- Biophysical models
  - IMAGE (PBL)
  - IIASA
  - …….

Spreadsheet models

- Advantages
  - Relatively simple and transparent
  - Can provide quick rough estimates for policymakers
- Disadvantages
  - Many simplifications needed which may hurt accuracy

- Examples
  - ILUC-factor (Oko)
    - Determine most likely types/region of ILUC based on trade
    - Low (25%,), Medium (50%), high (75%) ILUC-scenario
    - Co-products allocation based on energy content
  - Ensus
    - Focus on co-products substitution
  - Ecometrica
  - FotE

II. Work on practical solutions for companies

Responsible Cultivation Areas

- International consortium led by Ecofys
  - NGO's (e.g. CI, WWF)
  - Private sector (e.g. Neste Oil, Shell)
- Aim:
  - Define measurable feedstock production conditions with low ILUC risk
  - Develop methodology to identify concrete opportunities
- Two principle solutions
  - Bioenergy-induced additional productivity increase
  - Cultivation in areas without existing provisioning services
    - (idle/marginal/degraded/abandoned/underutilised land)
- Would not be necessary with effective global, multi-sector conservation of carbon/biodiversity/etc (may take some time ….)

RCA-pilots in Borneo and Brazil

4-step process

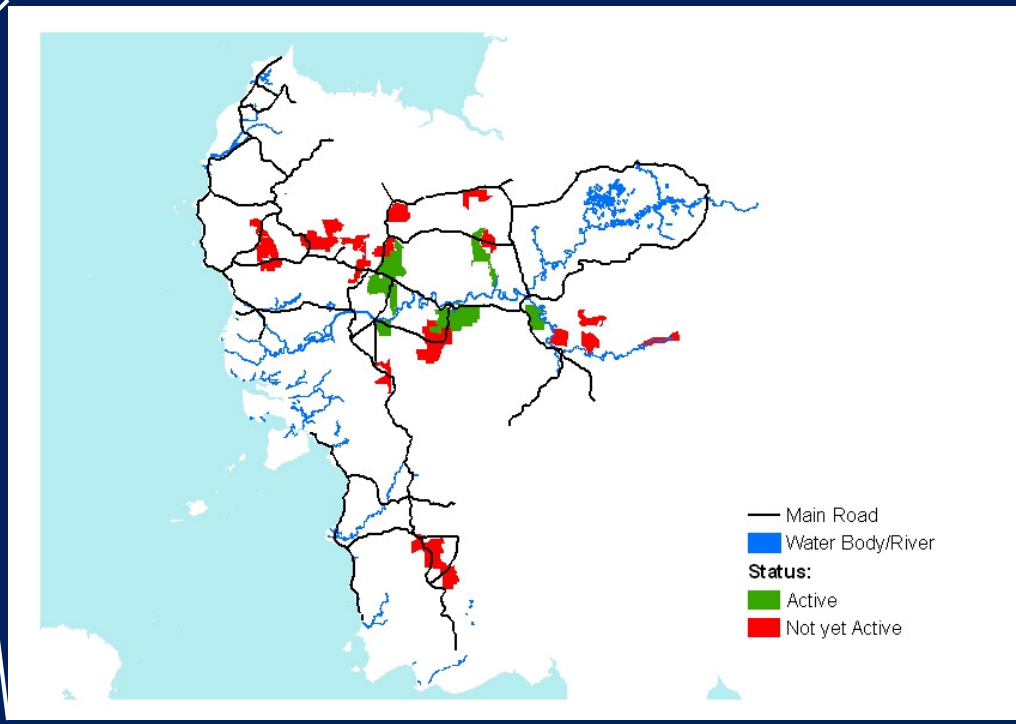
1. Site Pre-Selection
Identify promising areas
HCV | Carbon stocks | Land rights | Displacement effects | Suitability

2. Desk-Based Site Assessment
Evaluate suitability based on existing data
Define information needs field work
HCV | Carbon stocks | Land rights | Displacement effects | Suitability

3. On-Site Assessment
Ground Truth Earlier Findings
Fill in Knowledge Gaps
HCV | Carbon stocks | Land rights | Displacement effects | Suitability

4. Evaluation
Evaluate whether site qualifies as RCA
HCV | Carbon stocks | Land rights | Displacement effects | Suitability

Near existing infrastructure



III. Monitoring of bioenergy induced (I)LUC

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Final thoughts

- Many different models, different assumptions and different datasets
  - Complex and not very transparent -> challenge for policy makers

- Key modeling aspects include
  - Land availability
  - Interaction with other land-intensive sectors (fff)
  - Yield developments and price-responses
  - Co-products
  - Effectiveness sustainability policies

- Potential role GBEP
  - Models
    - Increase transparency different models
    - Improve availability open-source data
    - North-South dialogue
  - Disseminate work on practical solutions
  - Global monitoring?

Thank you for your attention

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