EU Renewable Energy Legislation and Greenhouse Gas Methodology

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Renewable Energy Legislation in EU

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Current EU biofuels legislation

**Renewable Energy Directive 2009**

identical sustainability criteria

➤ 10% of energy used in traffic fuels must come from renewable sources by 2020 (i.e. mainly from Biofuels)

Fuel Quality Directive 2009

➤ Lifecycle greenhouse gas emissions per unit of energy from fuels need to be reduced by 6 % by end of 2020

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EU Directives: Strong focus on sustainability

Land Use Change

Traceability

Greenhouse Gas Balance

Sustainability Verification
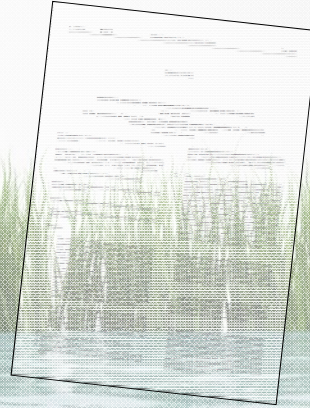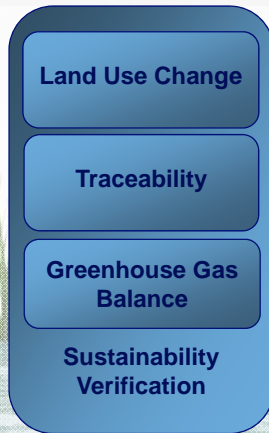
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Greenhouse gas requirement

Biofuels need to reduce greenhouse gas (GHG) emissions by 35% now, 50% from 2017, as compared with fossil fuels

GHG reductions can be reported by using legislative default values or by using actual calculated values

After April 2013, palm oil based biofuel need to show GHG reduction through actual GHG-calculated data or come from oil palm mills with **methane capturing**

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EU GHG Methodology
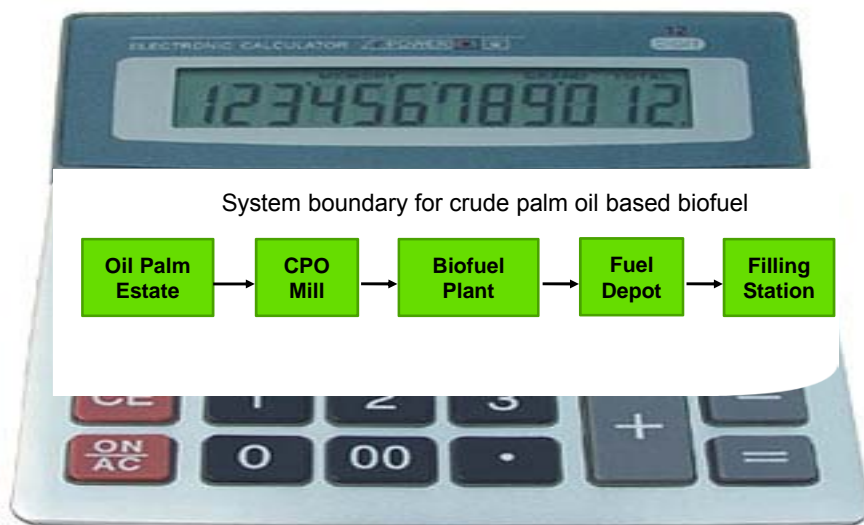
- Functional unit for the GHG assessments is one MJ of biofuel – results expressed as gCO_{2e}/MJ

- Greenhouse gases taken into account are:
  CO_2, N_2O (296) and CH_4 (23)

- Land use change emissions annualised equally over 20 years
  - Cut off date is January 2008
- Only energy allocation is allowed
- GHG emission savings $= (E_F - E_B)/E_F$
  - E_F = Fossil fuel comparator (83.8 gCO2e/MJfuel)
  - E_B = Total emissions related to biofuel production

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Example: Renewable Diesel GHG Balance from CPO

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GHG calculation assumptions

- Estates has been established before Jan 2008

- Allocation of emissions to CPO and palm kernels – roughly 90% allocated for CPO

- GHG emissions 9 gCO2e/MJ Renewable Diesel

- Transportation and distribution includes all transportation steps:
  - FFB to Mill
  - CPO to Biofuel Plant
  - Renewable Diesel to Filling Station

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GHG calculation

System boundary for crude palm oil based biofuel

Oil Palm Estate → CPO Mill → Biofuel Plant → Fuel Depot → Filling Station

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# Total Emissions

- GHG emissions over the entire product chain are: 43 gCO2e/MJRenewable Diesel (Production in Finland)

- Equals to GHG saving of 49 %

  GHG emission savings $= (E_F - E_B)/E_F$

  - E_F = Fossil fuel comparator (83.8 gCO_2e/MJ_{fuel})
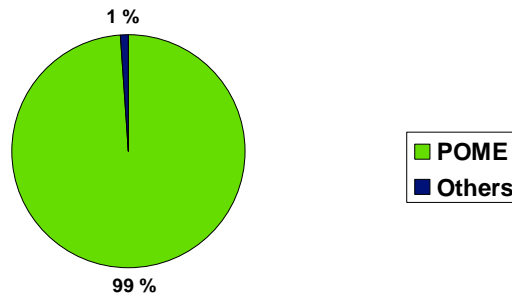 - E_B = Total emissions related to biofuel production

Total Emissions

GHG emission sources

12%

21%

23%

44%

- Cultivation
- CPO Mill
- Renewable Diesel Plant
- Transportation
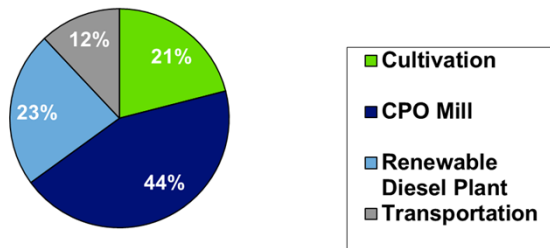
CPO Milling Emissions

GHG emission sources

1 %

- POME
- Others

99 %

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Palm Oil as a Feedstock

➤ Significant GHG savings can be achieved

➤ Methane capturing has major impact to GHG savings (Supported by EU legislation/directive)

➤ Potential competitive advantage over other vegetable oils in term of GHG performance

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Biofuel legislation modifications proposed by the European Commission (EC) on 17 October 2012
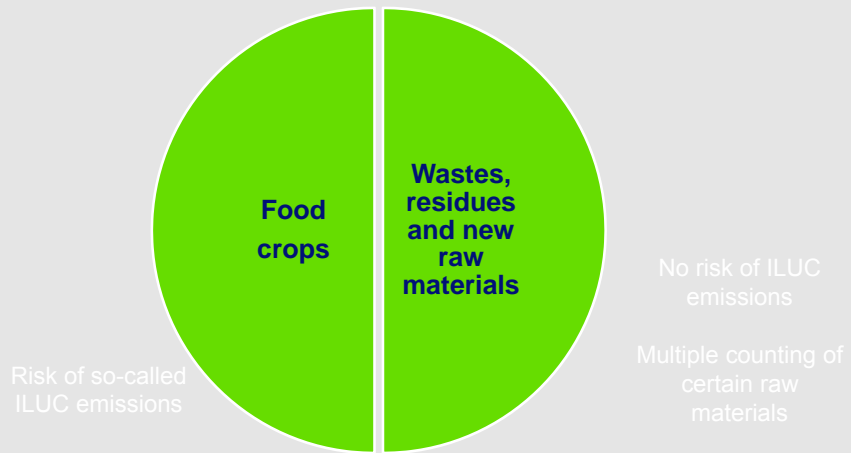
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Key points on proposal

1. 10 % renewable fuels target split:

   a) Maximum 5 % produced from "food-crops" in 2020

   b) Rest up to 10 % produced from wastes, residues, algae, and non-food ligno-cellulosic materials.

2. Multiple counting on non food crop based biofuels towards the target.

3. 60 % GHG saving requirement for installation starting operations after June 2014; For older ones 35 % until end 2017 and 50% as of 2018.

4. Indicative Indirect emissions (ILUC) to be used in reporting of biofuels GHG performance.

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1. Split of the 10% biofuel target and a cap of 5 % on the use of food crops in 2020

Food crops

Risk of so-called ILUC emissions

Wastes, residues and new raw materials

No risk of ILUC emissions

Multiple counting of certain raw materials

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2. GHG reduction requirement of biofuels will go up to 60% in July 2014, existing installations "grandfathered"

%

- Existing installations
- New installations
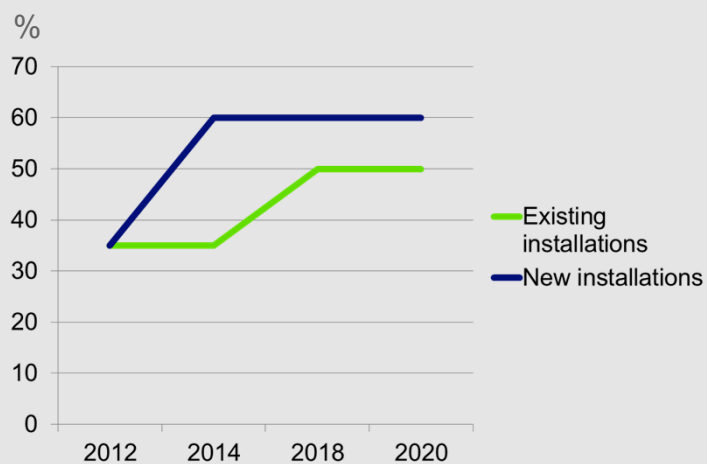
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Direct Land Use Change

Estimated Palm oil LUC emissions calculated according to the Commission's guidelines:

- Degraded land to oil palm: -50 gCO2e/MJ
- Grassland to oil palm: -25 gCO2e/MJ
- Scrubland to oil palm: 10 gCO2e/MJ
- Forest to oil palm: 10 gCO2e/MJ
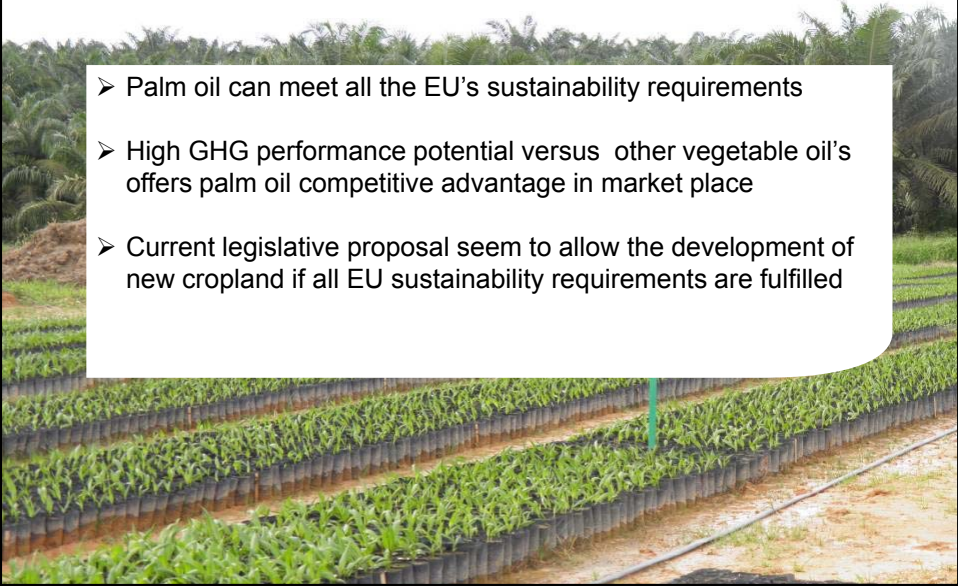 (10-30% canopy cover)

Proposed ILUC for oil crops: 55 gCO2e/MJ

Preliminary results

Source: Calculated based on methodology from EC guidelines 2010 for the calculation of land carbon stocks Directive 2009/28/EC

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Palm oil's regulatory suitability to EU's biofuels market

- ➤ Palm oil can meet all the EU's sustainability requirements

- ➤ High GHG performance potential versus other vegetable oil's offers palm oil competitive advantage in market place

- ➤ Current legislative proposal seem to allow the development of new cropland if all EU sustainability requirements are fulfilled

Thank you for your attention

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