The European Commission's science and knowledge service

Joint Research Centre

European Commission

Update on EU Renewable Energy Directive Recast to 2030

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1. The JRC and JRC Biofuels Activities
2. Transportation Biofuels in the European Union
3. RED Recast
4. RED Recast Default and Typical Values – Annex V
5. Co-processing
6. Novel transport fuels
7. Re-cap
8. Other relevant activities
9. Final (initial?) considerations

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The Joint Research Centre – JRC…

The European Commission's Science and Knowledge Service

- **Focus** on the **priorities** of the European **Commission** (80% of activities co-designed with partner DGs)
- Work **for more than 20 policy DGs** and **several project teams**
- Expertise **in a wide range of areas**, from economic and financial analysis through to energy and transport, health, environment, and nuclear safeguards

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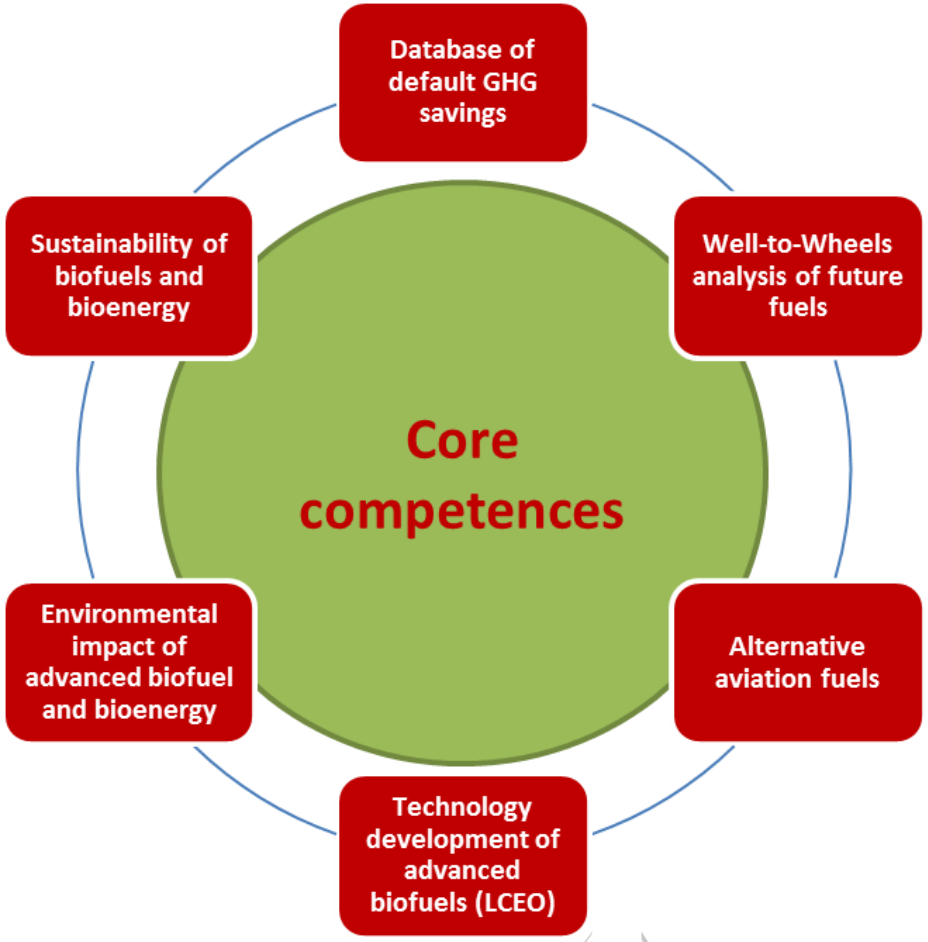
… and JRC Biofuels Activities

The ALFA Group at the JRC

- Support to the **implementation** of the **Renewable Energy Directive** (RED), including reporting requirements
- Support to the definition of **RED Recast 2030** (Directive EU 2018/2001):
  - Input **data** and **calculation method** defining biofuel emissions savings **default values**.
  - **Methodology definition** to determine and account for the renewable component of **fuels co-processed** in conventional oil refineries
- Support to the implementation of the **Fuel Quality Directive** (FQD) (Directive 2009/30/EC): **novel transportation fuels**
- **JEC collaboration** Well-To-Wheels Analysis of Future Automotive Fuels and Powertrains in the European Context (in partnership with EUCAR and CONCAWE)
- **Low Carbon Energy Observatory** Support to DG-RTD for the definition of research and innovation trends for advanced biofuels production technologies



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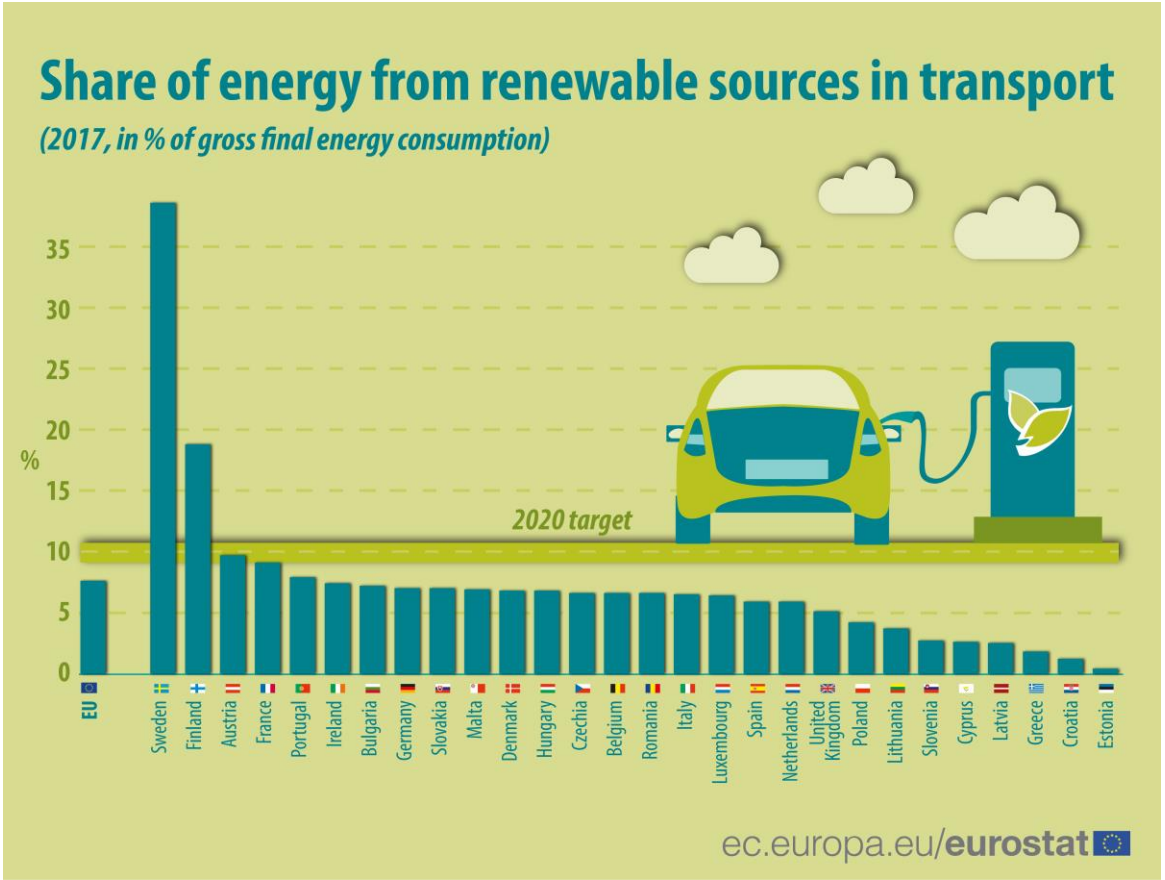
2. Transportation Biofuels in the EU

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1.39%	1.80%	2.45%	3.08%	3.91%	4.65%	5.22%	5.45%	5.56%	5.94%	6.52%	6.58%	7.13%	7.60%

2020 10%

The RED - Renewable Energy Directive 2009/28/EC

- Requires Member States to achieve **at least** a **10%** share of **renewable energy in transport** fuels in **2020**.
- Only **sustainable biofuels** can be counted towards the 10% target.
- **Progressively stricter minimum emission reduction thresholds**.
- **Emissions calculated over the entire life cycle** of biofuels and **include direct land use change** emissions.
- **Indirect land-use change emissions** are subject to **reporting** as of 2015 (Directive (EU) 2015/1513).



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RED Recast 2030 ~ Directive (EU) 2018/2001

- **Renewables** count towards the **32% renewable energy target** and towards the **transport sub-target of minimum 14%** of the energy consumed in the transport sector by 2030.
- **Transport sub-target**: **3.5% from advanced biofuels**
  - produced from feedstocks listed in Part A of Annex IX: 0.2% in 2022, increasing to 1% in 2025 and up to 3.5% in 2030 (e.g. agriculture and forestry residues, biowaste from households and industry, manure and sewage sludge)
  - produced from feedstocks listed in Part B of Annex IX: capped at 1.7% in 2030; double-counted towards the 14% target (animal fats cat 1 and 2, used cooking oil).
- **Advanced biofuels** will be **double-counted towards both the 3.5% target** and **towards the 14% overall transport sub-target**.
- **Sustainability criteria** for biofuels used in transport are **defined by the Directive** - as well as for solid and gaseous biomass fuels used for power, heating and cooling sectors – **determine** their **eligibility** to count towards the regulatory targets (forthcoming ILUC Delegated Act).

RED Recast 2030 ~ Directive (EU) 2018/2001

RED Recast revises **sustainability criteria** for **renewable energy use** in **transport** sector, in particular **sustainability for forestry feedstocks** and **minimum thresholds for GHG emission reductions**.

Biofuels, bioliquids and biomass fuels from agricultural biomass must not be produced from raw materials originating from:

- **High biodiversity land**
- **High carbon stock land**
- Land that was **peatland** (Reference year: 2008)

Greenhouse gas savings thresholds in RED II

Plant operation start date	Transport biofuels	Transport renewable fuels of non-biological origin	Electricity, heating and cooling
Before October 2015	50%	-	-
After October 2015	60%	-	-
After January 2021	65%	70%	70%
After January 2026	65%	70%	80%

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Typical and Default values

- RED and RED recast fix a **threshold** for minimum GHG savings for biofuels and bioliquids.

- **Methodology** to calculate GHG emissions is set in **Annex V - part C** and it has not been changed in RED recast, except for the calculation of the emissions savings from excess electricity from cogeneration (e_{ee} not in the formula)

$$E_b = e_{ec} + e_l + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{ccr}$$

Including provisions on:
- Each component of the formula
- Fossil Fuel Comparator (new)
- Allocation methodology

where

E	=	total emissions from the use of the fuel;
e_{ec}	=	emissions from the extraction or cultivation of raw materials;
e_l	=	annualised emissions from carbon stock changes caused by land-use change;
e_p	=	emissions from processing;
e_{td}	=	emissions from transport and distribution;
e_u	=	emissions from the fuel in use;
e_{sca}	=	emission savings from soil carbon accumulation via improved agricultural management;
e_{ccs}	=	emission savings from CO_2 capture and geological storage; and
e_{ccr}	=	emission savings from CO_2 capture and replacement.

Emissions from the manufacture of machinery and equipment shall not be taken into account.

Actual, default and disaggregated values

- Operators can use **default values** listed in Annex V (only if Land Use change emissions = 0) to facilitate economic operators

- …or declare their **actual values**

- **Default values** include a "safety" factor of **40% increase** in emissions from processing compared to typical values

- **Disaggregated** default values are also specified in Annex V: a combination of default for some production steps + actual for others can be used

- **Disaggregated** values include: cultivation emissions (with or without N_20); processing emissions; transport and distribution emissions (only of the final product is included), total emissions

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How “default” values are defined

- Default values must be **representative of average supply to EU market**
- **Database of input data** for biofuels/bioliquids (and solid/gaseous biomass) is **calculated** independently **by JRC**
  - **Continuously updated**
  - Updates come from:
    - Improved data from JRC
    - Suggestions from stakeholders or national experts
  - Many bilateral **contacts and discussions**
  - Stakeholder and expert **public consultations** (2011, 2013, 2016)

The new update for the default values

"Definition of input data to assess GHG default emissions from biofuels in EU legislation"

published in July 2017 and

revised in May 2019

http://data.jrc.ec.europa.eu/collection/alf-bio

This page links to:

1) Liquid biofuels pathways:
   - Report with input data and explanations (2017 and 2019 versions)
   - Appendix with stakeholders' comments and replies (2017)
   - Database in excel (2017 and 2019 versions)
2) Bioenergy pathways (2017)

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Co-processing

Article 28 (5):

By 31 December 2021, the Commission shall adopt delegated acts …by specifying the **methodology** to determine the share of biofuel, and biogas for transport, **resulting from biomass being processed with fossil fuels in a common process**,

On-going work at JRC on co-processing:

Screening of different methods used/proposed in EU or outside EU

Initial methodology in discussion with policy services

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Novel transport fuels

Article 28 (5):

By 31 December 2021, the Commission shall adopt delegated acts …by specifying the **methodology** for assessing greenhouse gas emissions savings from **renewable liquid and gaseous transport fuels of non-biological origin and from recycled carbon fuels**, which shall **ensure that credit for avoided emissions** is **not given** for CO2 the capture of **which has already received an emission credit** under other provisions of law.

The delegated act will determine **minimum greenhouse gas emission savings** required for these fuels

On-going work at JRC

The methodology will be generally consistent with the principles established in the document

'*Data requirements and principles for calculating the life cycle GHG intensity of novel transport fuels and invitation to submit data*'

published in DG-CLIMA website in September 2016
https://ec.europa.eu/clima/sites/clima/files/transport/fuel/docs/novel_transport_fuels_default_values_en.pdf

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Re-cap

- RED 2009 has triggered biofuels in transport and the industry supplying those, defining an original process:
  - Mandatory sustainability criteria (determining fuels' eligibility in the EU regulatory scheme).
  - Flexible approach on the "how-to's": default vs actual values supported by sustainability certification schemes.
  - Incremental stringency requirements in terms of minimum GHG emissions reduction thresholds triggering investment in innovative technological options.
  - On-going (learning) process: indirect effects eventually regulated in 2015 (ILUC Directive EC/2015/1513).
- Learning process continues: RED Recast scrutiny by 2023.

Re-cap

- RED Recast strengthens the EU policy approach:
  - Accounting for ILUC effects by progressively discouraging food/feed- and land-competing feedstocks (Article 26: 7% cap progressively decreasing to 0% unless 'low-ILUC' certified)
  - Impulsing investment in advanced technologies (multiplier for advanced biofuels).
  - Accruing the interest of fuel producers to supply non-road transport modes (multipliers for biofuels used in the aviation and maritime sectors).
  - Tempering competition peaks across transportation modes by fostering the uptake of alternatives to liquid fuels (renewable electricity multipliers for the road and rail sectors).

Conclusion

JRC is a trusted partner at the crossroads with:

policy debate,

regulatory development,

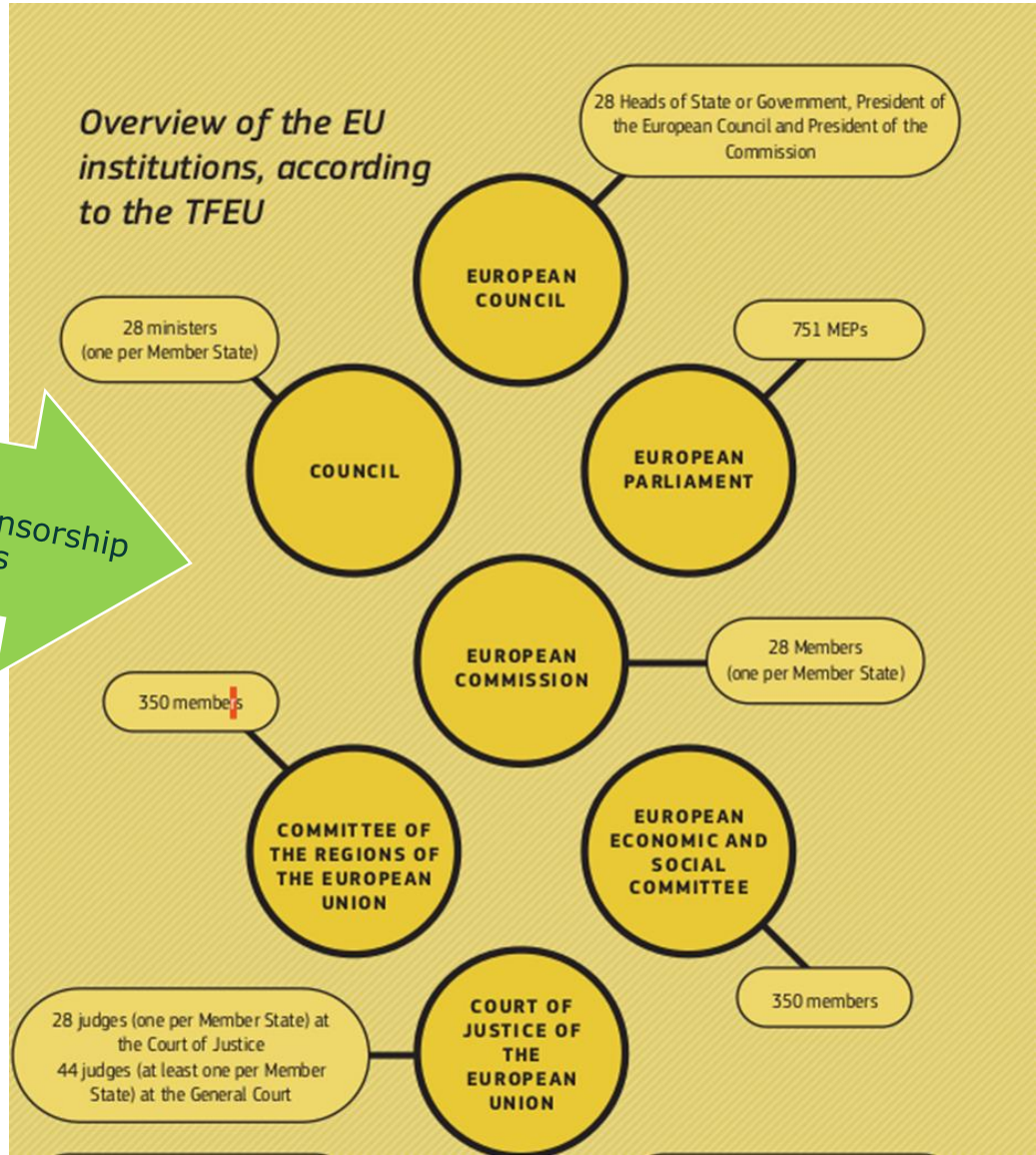
industry innovation

no embedded interests

no funding/sponsorship needs

JRC provides science advice to EU regulators on input data and calculation methods, defining the emissions profiles of alternative transportation fuels

- Biofuels
- Novel fuels
- Co-processing

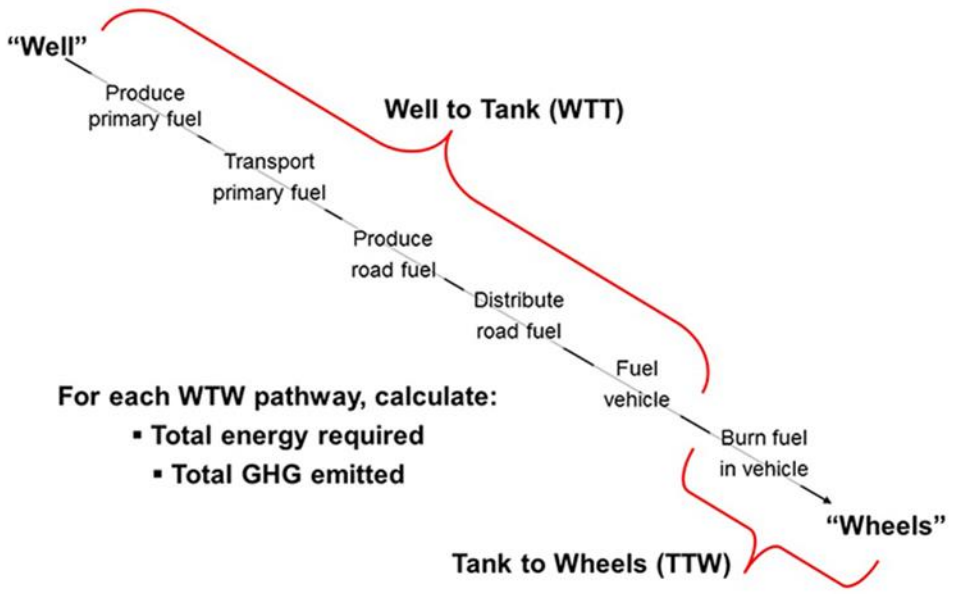


Other activities…

The JEC Collaboration

JEC (**J**RC-**E**UCAR-**C**oncawe) is a long-standing collaboration between:

- the European Commission's **J**oint **R**esearch **C**entre,
- **E**UCAR,
- **C**ONCAWE.



Establish in a **transparent and robust** manner a consensual **well-to-wheels analysis** of **energy use** and **GHG emissions assessment** of a wide range of **automotive fuels and powertrains** relevant to **Europe at** a given **time horizon.**

***

Have **outcomes accepted** as a **reference** by all relevant stakeholders.

concawe

eucar
EUROPEAN COUNCIL FOR AUTOMOTIVE R&D

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The WTW report

- The reference work of JEC collaboration is the **Well-to-Wheels study**, assessing the **energy use** and **GHG emissions** of **road** fuel and powertrain configurations in **Europe** today and in **2030**.

All the material can be freely downloaded from the **website**:

https://ec.europa.eu/jrc/en/jec

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The JEC study – **Version 5**

- Version 5 of the **JEC study** is **almost ready** to be released.

- The **main outcomes** of the new version are going to be **presented** at the next

European Sustainable

Energy Week

19 June 2019 – Bruxelles

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Alternative Aviation Fuels

- At **international level** the Carbon Offsetting and Reduction Scheme for International Aviation (**CORSIA**) will start with a pilot and voluntary phase in 2021, is expected to become compulsory from 2027, and to be finalised in 2035.

The European Commission approved legislation

- **extending the current intra-European scope of the EU ETS for aviation** (flights in the European Economic Area) **beyond 2017**,
- and **provide for a new review** once there will be **more clarity on CORSIA rules and implementation by non-EU countries**.
- The **derogation for extra-EEA flights will be prolonged until 31 December 2023**, when the first phase of **CORSIA will begin**.

CORSIA

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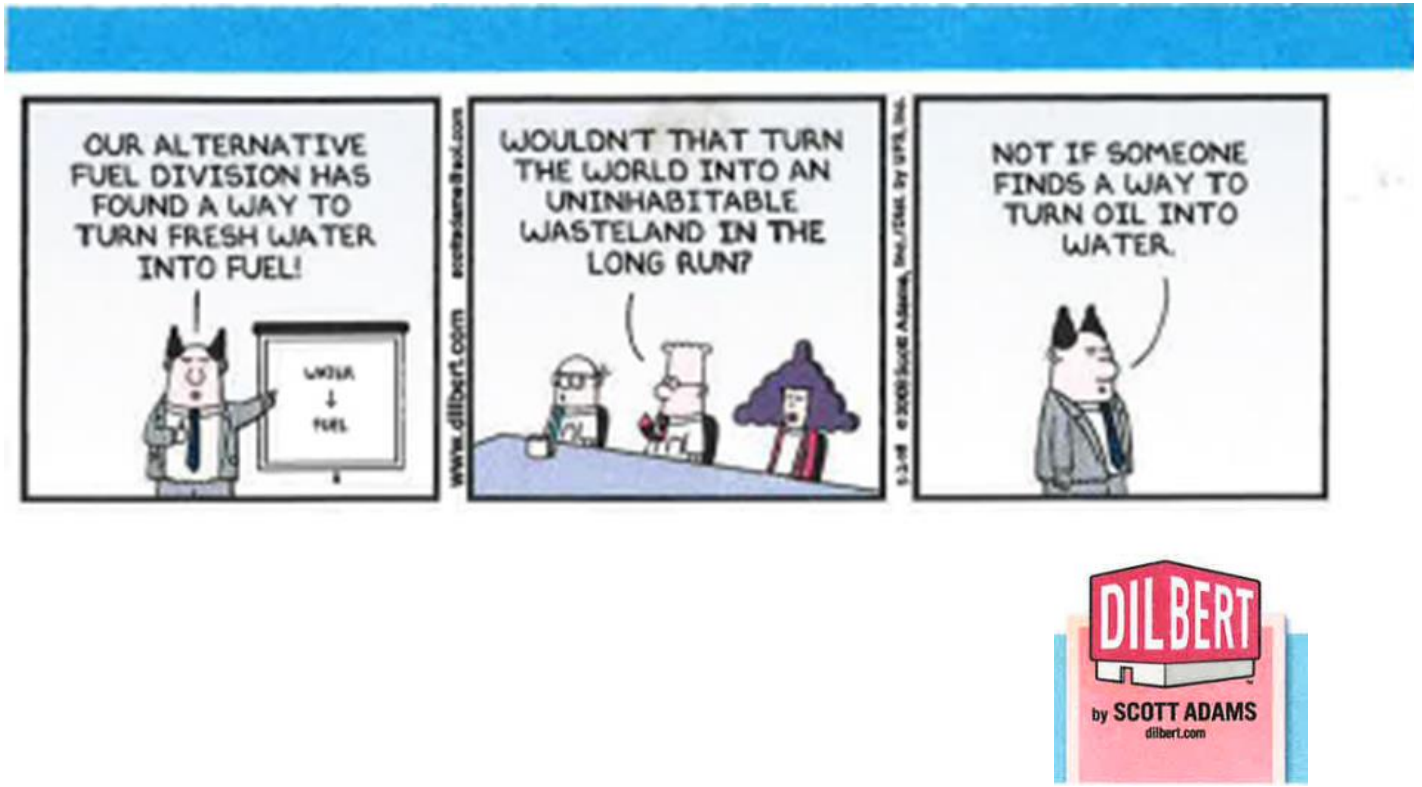
Sustainability



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…Sustainability Criteria?

Alternative Fuels are interesting for mitigating GHGs if they are **sustainable** but…

…sustainability criteria are not unequivocally defined

	Sustainability criteria
EU RED(s)	• GHGs saving (progressive emissions thresholds) • Land use change - carbon stock • Biodiversity • Social and economic sustainability criteria: not mandatory but reported on (impact of increased demand for biofuels on food prices, the respect of land-use rights and main producer countries' have ratification of international labour conventions. Corrective actions can be proposed.
CORSIA	• GHGs saving • Carbon stock

Any questions?

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https://ec.europa.eu/jrc/en/alfa

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