

# ETIP Bioenergy 12<sup>th</sup> Stakeholder Plenary Meeting




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# Outline

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-  1. Who are we
-  2. The contribution of the sector to the energy transition - Walk the talk
-  3. MythBusters

Chapter

# 1

## Who are we

# FuelsEurope: Fuelling Europe's Future

## FuelsEurope Membership

FuelsEurope represents 40 Member Companies (≈95% of EU Refining), in the EU, UK, Switzerland and Norway



## FuelsEurope Mission

FuelsEurope represents the EU conventional and renewable fuels & industrial value chains products manufacturing industry in the policy debate with EU Institutions and other stakeholders, providing an expert opinion on the production process, distribution and use of our industry's products, in order to contribute to a regulatory framework that:

- Promotes EU excellence in technologies contributing to the energy transition towards society's climate goal;
- Boosts sustainable development through supporting a competitive EU industry;
- Establishes effective, technically feasible and sustainable requirements to protect human health and the environment.

Chapter

# 2

## The contribution of the sector to the energy transition. Walk the talk.

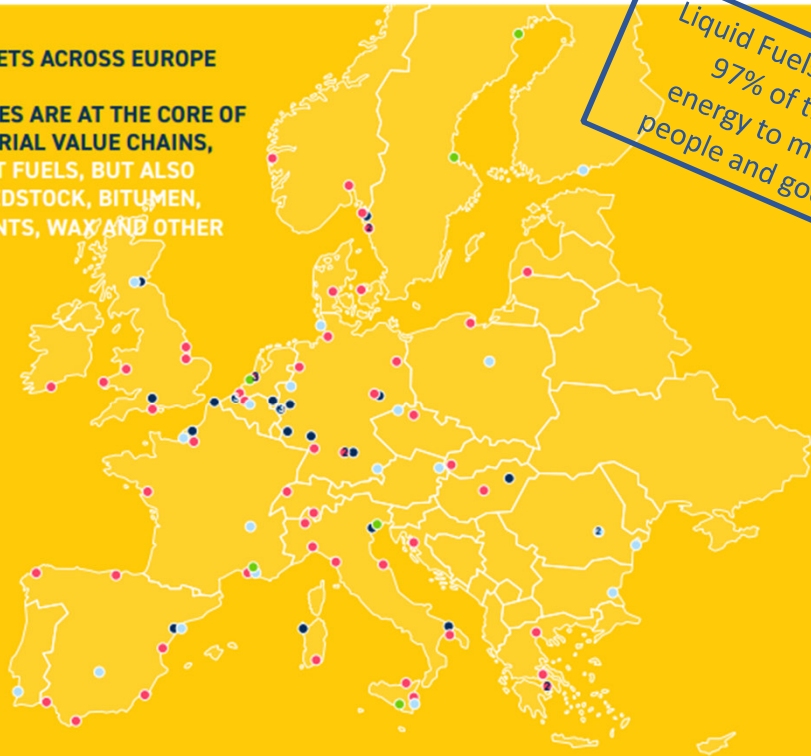
# Our sector's footprint: Industrial manufacturing assets across Europe

Liquid Fuels supply 97% of the energy to move people and goods

## OUR STRATEGIC ASSETS ACROSS EUROPE

EUROPEAN REFINERIES ARE AT THE CORE OF INTEGRATED INDUSTRIAL VALUE CHAINS, PROVIDING NOT JUST FUELS, BUT ALSO PETROCHEMICAL FEEDSTOCK, BITUMEN, LUBRICANTS, SOLVENTS, WAX AND OTHER PRODUCTS.

- Integrated refinery / Steam cracker location
- Refinery location
- Steam cracker location
- Biorefineries



12 Based on a sample of companies

NUMBER OF REFINERIES	CAPACITY KB/C/D	CAPACITY MTA
85	13653	648
MAINSTREAM REFINERIES IN OPERATION	SPECIALISED BITUMEN, LUBE OR CONDENSATE REFINERIES	BIOREFINERIES IN OPERATION
74	10	8

Source: Refineries map - Concawe

## Our sector's Transition: Low-carbon projects

Clean fuels and energy projects of FuelsEurope's Members in Europe:

### 1. GREEN HYDROGEN:

- 18** projects beyond Final Investment Decision (FID).
- 4** further projects (pre-FID) currently announced.

### 2. RENEWABLE LIQUID FUELS:

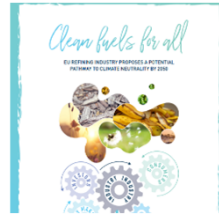
- 27** projects beyond Final Investment Decision (FID) – including some already operational.
- 10** further projects (pre-FID) currently announced.



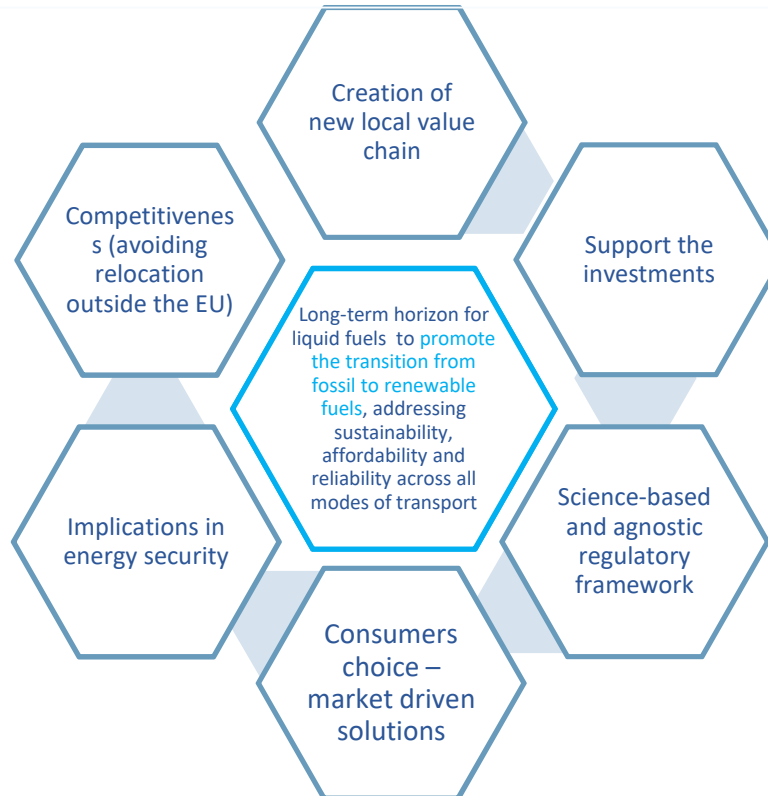
2018



2020



2024





# 3

## MythBusters

## Some myths...

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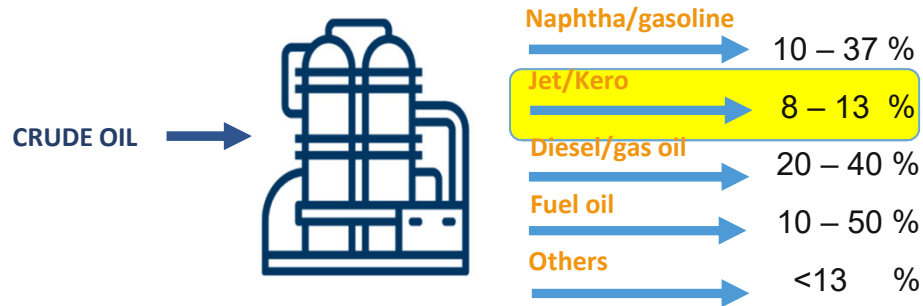
- X. Renewable fuels are only needed for Aviation and Maritime sectors as the production of these fuels is/will not be sufficient
- X. At the industrial site, select the production to have only SAF or SMF
- X. Sustainable biomass is not available in Europe
- X. Biomass production is in competition with food and land use
- X. Competition on the demand side

...to debunk

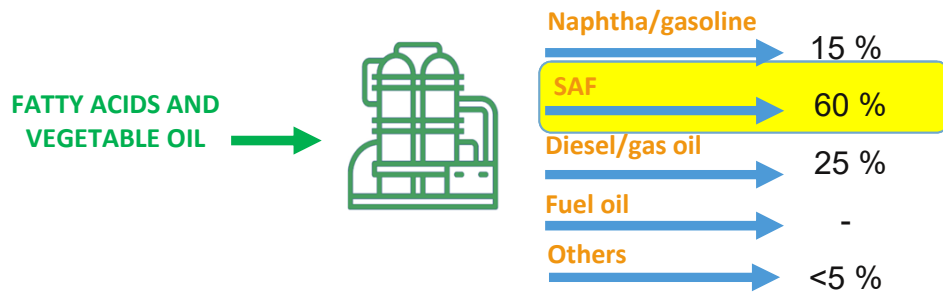
# Reality vs Myths: Renewable fuels only for aviation & maritime fuels?

## a. Aviation Fuels

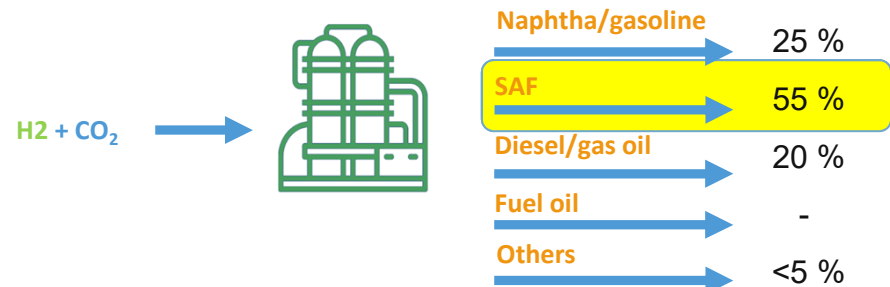
Conventional refinery\*



Bio-refinery (bio-SAF via HEFA) \*in max Jet mode

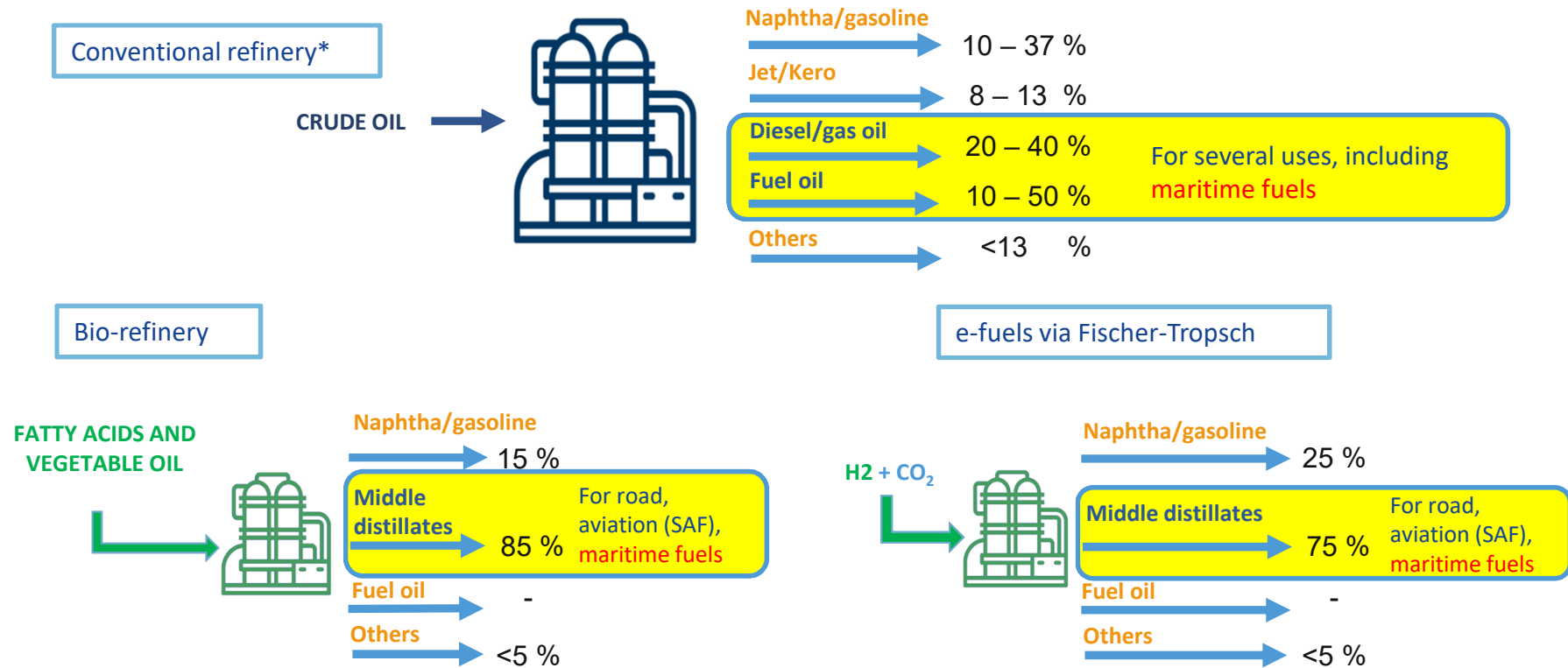


e-SAF via Fischer-Tropsch \*in max Jet mode



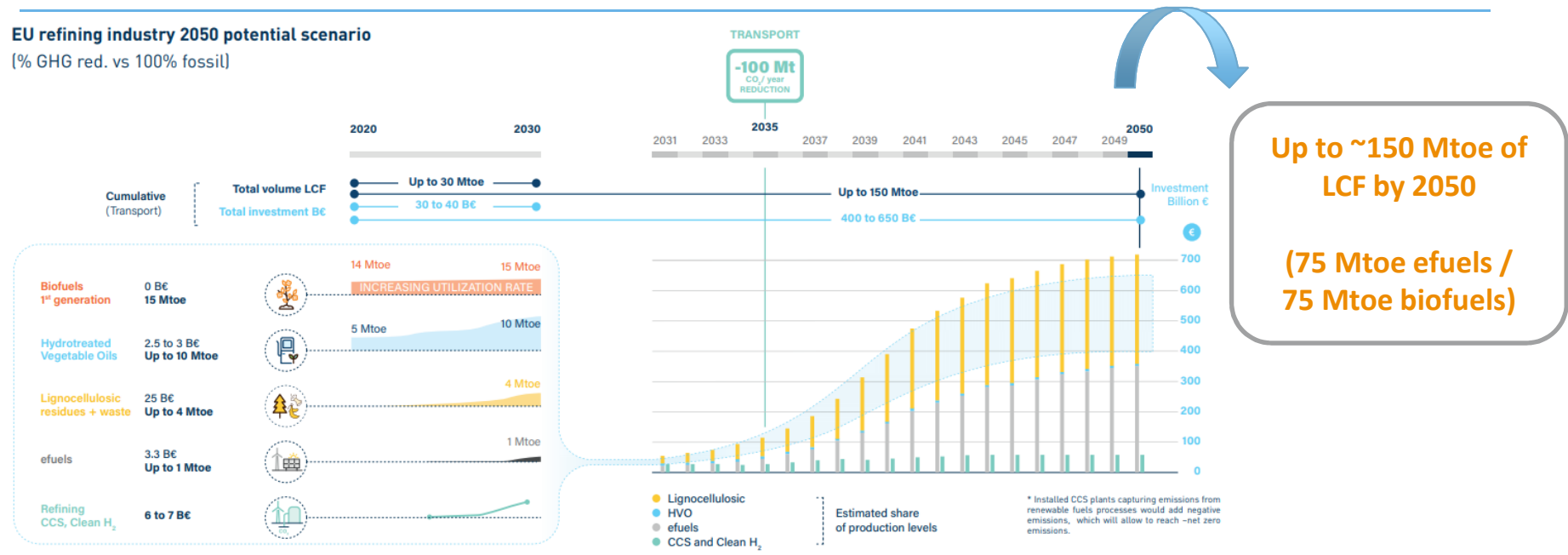
# Reality vs Myths: Renewable fuels only for aviation & maritime fuels?

## b. maritime fuels



# Combination of technologies

**EU refining industry 2050 potential scenario**  
 (% GHG red. vs 100% fossil)



One of the key questions regarding the role of bio-feedstocks in transport sector is the **potential availability of sustainable biomass** (included in Annex IX A and B of RED II) in EU and **under which conditions and assumptions biomass availability can be improved** and the biomass potential can be sustainably maximised by 2050 **within safe boundaries and without causing negative impacts** (e.g. preserving high nature value areas, maintaining and improving biodiversity, not compromising the use of arable land).

# The Biomass Availability

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Link to the report:

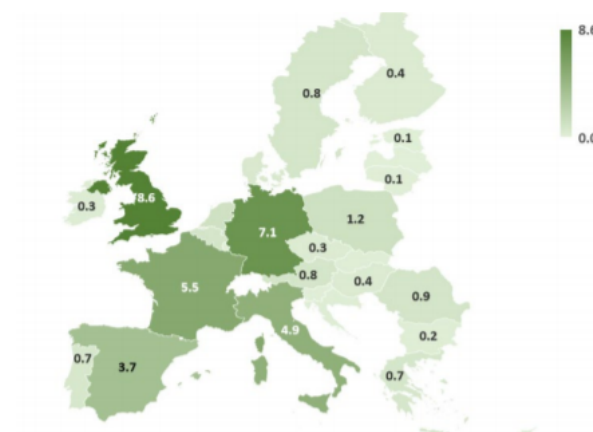
<https://www.concawe.eu/publication/sustainable-biomass-availability-in-the-eu-to-2050/>

- **Basis for the Analysis:**
- **Focus on biofeedstocks in RED II Annex IX (Part A and B).**
  - Traditional biofuel crops and wastes & residues beyond Annex IX not included (**1<sup>st</sup> generation**) **not included**
  - Biomass sustainability criteria of RED II
  - Granularity at EU country level (EU-27+UK), by 2030 & 2050
  - Allocation of biomass raw materials to bio-energy and bio-based products
- **Allocation biomass to fuel production is additional and come on top of biomass allocated to biobased products (bioplastics, biopharmaceuticals, construction materials, etc) and other energy uses.**
- **Low ILUC risk concept integrated in the study**
- **No negative effect on biodiversity:**
  - i) conservation of land with significant biodiversity values
  - ii) land management without negative effects on biodiversity
- **Imports potential (up to 50-60 Mtoe/y in 2030/2050)**

# Imperial College London's scenarios

SCENARIOS	GRANULARITY
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1. **LOW. Low mobilization:**
  - Farming and forest practices at 2020 levels.
2. **MEDIUM. Improved mobilisation in selected countries:**
  - Improved mobilisation in **countries with high biomass availability**
3. **HIGH. Enhanced availability through R&I and improved mobilisation in all EU countries:**
  - Pushed to a higher technical sustainable potential in **all EU countries**



Example. Regional distribution and estimated biowastes potential for bioenergy - excluding the known demand for non-energy uses (in million dry tonnes, Scenario 1: Low mobilisation, for 2030)

Country	Scenario	Year	Potential (M dry tonnes)
Germany	Low	2030	8.6
Germany	Low	2050	8.6
France	Low	2030	5.5
France	Low	2050	5.5
Spain	Low	2030	3.7
Spain	Low	2050	3.7
Italy	Low	2030	4.9
Italy	Low	2050	4.9
UK	Low	2030	0.3
UK	Low	2050	0.3
Poland	Low	2030	0.8
Poland	Low	2050	0.8
Sweden	Low	2030	0.4
Sweden	Low	2050	0.4
Denmark	Low	2030	0.1
Denmark	Low	2050	0.1
Netherlands	Low	2030	0.1
Netherlands	Low	2050	0.1
Austria	Low	2030	0.3
Austria	Low	2050	0.3
Belgium	Low	2030	0.8
Belgium	Low	2050	0.8
Portugal	Low	2030	0.4
Portugal	Low	2050	0.4
Greece	Low	2030	0.9
Greece	Low	2050	0.9
Cyprus	Low	2030	0.7
Cyprus	Low	2050	0.7

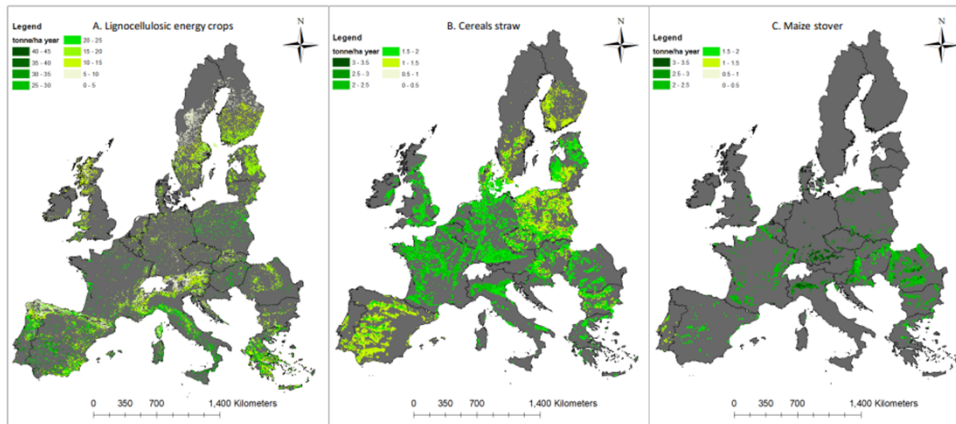
**In a dedicated excel file** : potential availability per **feedstock** and **country** and **scenario**, by **2030** and **2050**.

# Sustainable biomass supply chains study

- Concawe commissioned with **Utrecht University and TNO** the study: “*Sustainable biomass feedstock supply chains for advanced biofuels*” (ongoing).
- The **objective** of this work is to **determine at high granularity the economically optimal biomass to advanced biofuel supply chains across Europe** to meet the future demand
- To determine detailed supply chain costs, it is necessary to understand biomass availability potential at **high granularity**.
- Rather than the statistical based models used in the IC study at national level, in this study the agricultural biomass potentials were assessed using a spatial based model at a high granularity. For forestry and biowastes, availability potentials were scaled from a national to small regional (NUTS 3) level



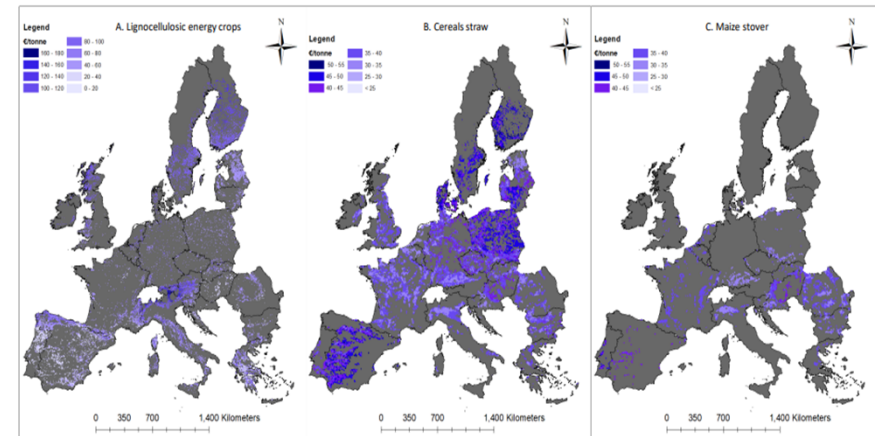
## Key finding 1: Biomass supply potentials



Spatial distribution of (A) lignocellulosic energy crops, (B) cereals straw and (C) maize stover yields for 2050 (tonne/ha year) in the high scenario. The pixel size is enhanced for displaying purposes



## Key finding 2: Costs at the roadside

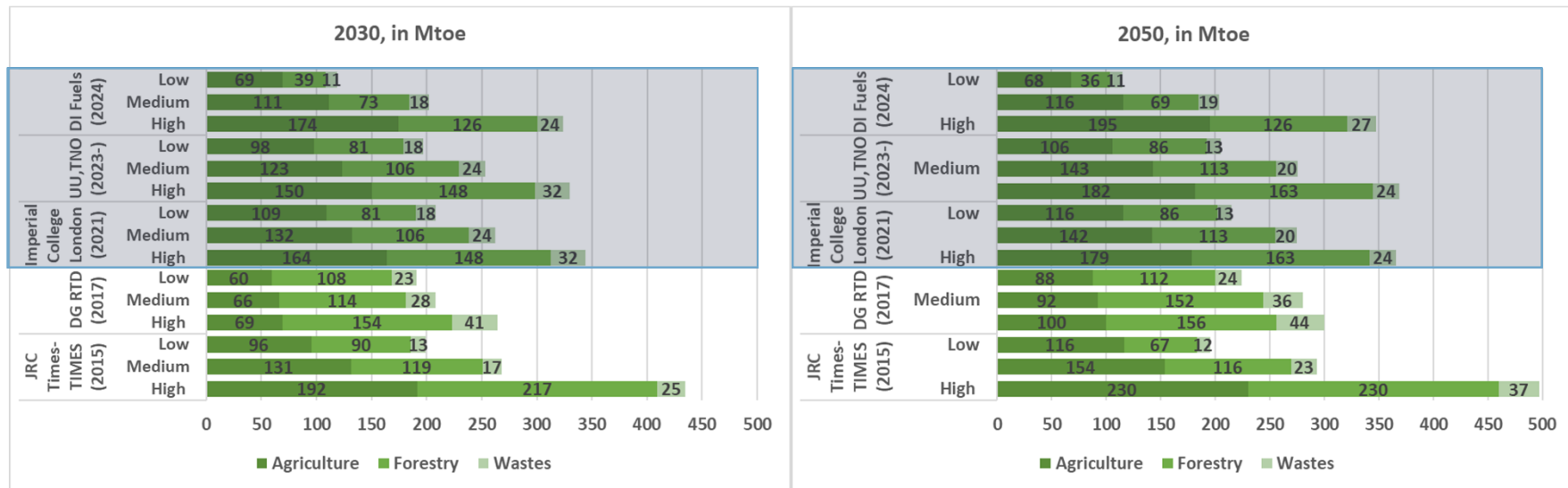


Spatial distribution of (A) lignocellulosic energy crops, (B) cereals straw and (C) maize stover costs for 2030 (€/tonne). The pixel size is enhanced for displaying purposes



## Comparison of Biomass for Bio-energy Availability Studies

- **TNO/UU vs IC:** Two studies report close values. Agricultural biomass calculated at a higher granularity, with similar results at EU level.
- **DI Fuels - 2024 (DG-RTD):** Included the new feedstocks in the Annex IX (e.g., intermediate crops).
- **Important variability across scenarios:** i.e. IC biomass availability range (2050) = 215-366 Mtoe
- Biomass availability figures are generally close between the studies for the different scenarios.
- Variability exceptions are observed for certain cases such as the low scenario of the DI fuel study due to very conservative assumptions regarding the share of available arable and severely degraded land allocated to the evaluated crops



# Conclusions

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- **In Europe there is the potential**
- The Imperial College study shows that, taking into account the competition for other sectors, **there is enough sustainable biomass potential (126-262 Mtoe for 2030 and 101 – 252 Mtoe for 2050) for biofuel production (RED II Annex IX part A/B) for all transport sectors** in Concawe’s scenarios by 2030 and 2050 <sup>(1)</sup>.
- **Agricultural and forestry biomass serve as the primary drivers for the total biomass potential**
- **To realise it, additional R&D would be required as well as the implementation of improvement management strategies.**
- **Management practices needs to be implemented**
  - New machinery, efficient crop management practices (seeding/ irrigation systems, crop rotation, cover crops, agroforestry and disease control in the field)
- **Supply chain needs to be further developed**



- The **regulatory framework** needs to be agnostic, stable and conducive for long-term investments.

**Thank you for your attention!**

