



# TOOLBOX

European Funding opportunities

AXELERA



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101037009.

# European Regulations CCU – Information from the CCU seminar performed in France in September 2023



# EU definitions around sustainable fuels

## Renewable fuels of non biological origin (RFNBOs)

- EU definition: 'liquid or gaseous fuels, the energy content of which is derived from renewable sources other than biomass'
- Also known as: CCU fuels, e-fuels, synthetic fuels, Power-to-X
- They must use renewable energy but use different carbon sources
- Meets -70% GHG threshold
- Examples: e-methane, e-methanol, e-kerosene, renewable hydrogen

## Low carbon fuels

- Energy content derived from low carbon H<sub>2</sub>
- Non-renewable sources: nuclear H<sub>2</sub>, but also everything that is not 100% renewable. But unclear for blue H<sub>2</sub>
- Meets -70% GHG threshold
- Future delegated act(s) by December 2024

## Recycled carbon fuels

- Produced from liquid/solid waste non-renewable origin which cannot be recovered
- Produced from waste exhaust gas as an unavoidable/unintentional consequence in industrial installations
- Meets -70% GHG threshold
- Example: using CO from steelmaking exhaust gases to make a fuel

Source: CO2 value Europe

## Biomass fuels (biofuels)

- EU definition: '*gaseous and solid fuels produced from biomass*'
- Definition includes biogas, bioliquids, biofuels
- They must use biomass and respect REDII criteria
- 4 types of biofuels with different rules and eligible uses:
  - 1) *Food & feed crops*
  - 2) *Advanced biofuels (Annex IX A)*
  - 3) *Used cooking oil/animal fats (Annex IX B)*
  - 4) *Other residues/feedstock*



# Progress in Fit-for-55 implementation

| Policy instrument                             | Trilogues' status   | Official publication              | Date when it's official law  |
|---|---------------------|-----------------------------------|--|
| EU Emissions Trading System (EU ETS) revision | COMPLETED           | COMPLETED                         | As of Jan 2024   |
| ETS Aviation                                  | COMPLETED           | COMPLETED                         | As of 31 December 2023 (deadline for transposition)                                |
| Carbon Border Adjustment Mechanism (CBAM)     | COMPLETED           | COMPLETED                         | Progressive: October 2023, January 2025, January 2026                              |
| Renewable Energy Directive revision (REDIII)  | COMPLETED           | Expected in October/November 2023 | Member States will have 18 months to transpose the Directive after its publication |
| ReFuelEU Aviation                             | COMPLETED           | Expected in October/November 2023 | Most provisions as of 1 Jan 2024<br>Articles 4, 5, 6 as of 1 Jan 2025              |
| FuelEU Maritime                               | COMPLETED           | Expected in September 2023        | Rules to apply as of Jan 2025  |
| Energy Taxation Directive revision            | Not started<br>WAIT | Not started<br>WAIT               | Unclear  |

*Point sur l'évolution de la réglementation européenne concernant le CCU, Source: CO2 Value Europe*



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# CCU at the heart of Fit-for-55 Package as adopted

| Policy instrument  | Impact on CCU   |
|--|---|
| EU Emissions Trading System (EU ETS) revision              | <ul style="list-style-type: none"> <li>✓ CO<sub>2</sub> which is chemically and permanently bound in a product under normal use (e.g. CO<sub>2</sub> mineralisation) is excluded from the obligation to surrender allowances</li> <li>✓ Avoid double-counting of emissions released by the use of RFNBOs</li> </ul> |
| Carbon Border Adjustment Mechanism (CBAM)                  | <ul style="list-style-type: none"> <li>✓ Carbon tax (equivalent to ETS price) for raw materials/energy carriers made outside Europe</li> </ul>  |
| ETS Aviation   | <ul style="list-style-type: none"> <li>✓ Complete phase-out of free ETS allowances by 2027</li> <li>✓ Dedicated funds for innovation (€450M) and sustainable fuels (€1.8B)</li> <li>✓ 95% of costs differential for synthetic aviation fuels to be covered</li> </ul>   |
| Renewable Energy Directive revision (REDIII)               | <ul style="list-style-type: none"> <li>✓ Combined target advanced biofuels+RFNBOs: minimum 5.5% of energy in transport by 2030</li> <li>✓ Sub target for RFNBOs: minimum 1% of energy in transport by 2030</li> <li>✓ 42% of the use of hydrogen in the industry to be RFNBOs by 2030, 60% by 2035</li> </ul>       |
| ReFuelEU Aviation  | <ul style="list-style-type: none"> <li>➤ SAFs quotas: min 6%, 34%, 70% by 2030/2040/2050</li> <li>➤ Synthetic aviation fuels quotas (RFNBOs): min 1.2%, 5%, 35% by 2030/2035/2050</li> </ul>  |
| FuelEU Maritime  | <ul style="list-style-type: none"> <li>✓ Binding GHG reduction targets for ships: 2%, 6%, 31%, 80% in 2025, 2030, 2040, 2050</li> <li>✓ 2% RFNBOs quota in 2034 if RFNBOs account for less than 1% in fuel mix in 2031</li> </ul>   |
| Energy Taxation Directive<br><b>STILL UNDER DISCUSSION</b> | <ul style="list-style-type: none"> <li>✓ Minimum taxation rate of zero for 10 years for RFNBOs for specific types of air and waterborne navigation</li> </ul>   |

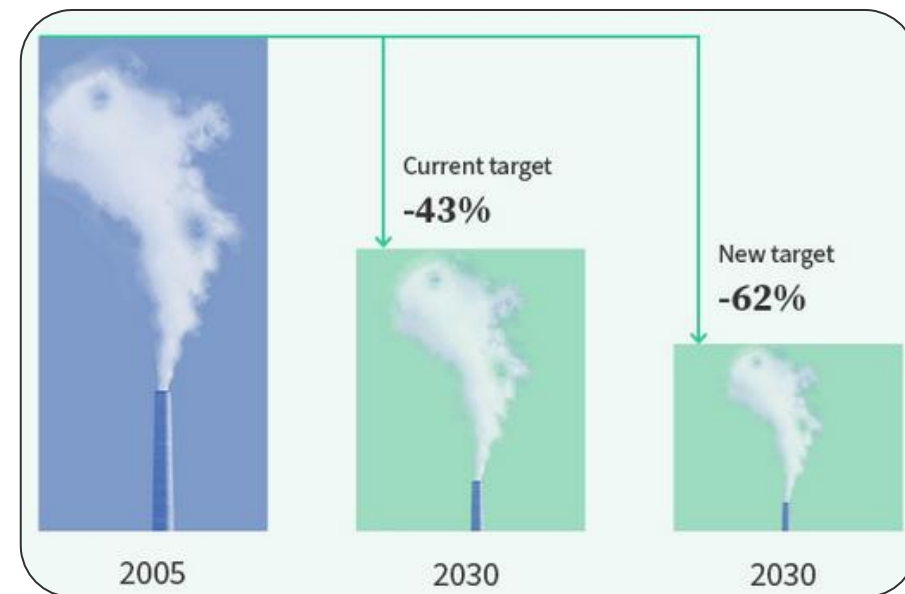
*Point sur l'évolution de la réglementation européenne concernant le CCU, Source: CO2 value Europe*



# EU adopts ETS revision and new carbon border tax

## The ETS revision

- **CCS and permanently bound CCU are fully exempted** from surrender requirements in the EU ETS
- End of **double counting** of carbon emissions for CCU fuels and CCU chemicals production
- Number of **free allowances will be reduced**, and the number of **total ETS allowances as well**. Consequence: the price of CO<sub>2</sub> will rise (currently 90€/ton on ETS market)



## The Carbon Border Adjustment Mechanism

- **CBAM**: carbon tax for products made outside Europe aiming to make sure there is no carbon leakage
- **Principle**: producers outside Europe will need to pay the difference between the carbon price in a given country and the EU ETS carbon price
- **Scope**: raw materials like iron and steel, cement, aluminium, fertilisers, electricity, hydrogen, certain indirect emissions
- **Timeline**: will be phased-in as ETS free allowances are phased out between 2026-2034. Then reassessed to potentially include downstream products (e.g. plastics & chemicals)

Source : CO2 Value Europe

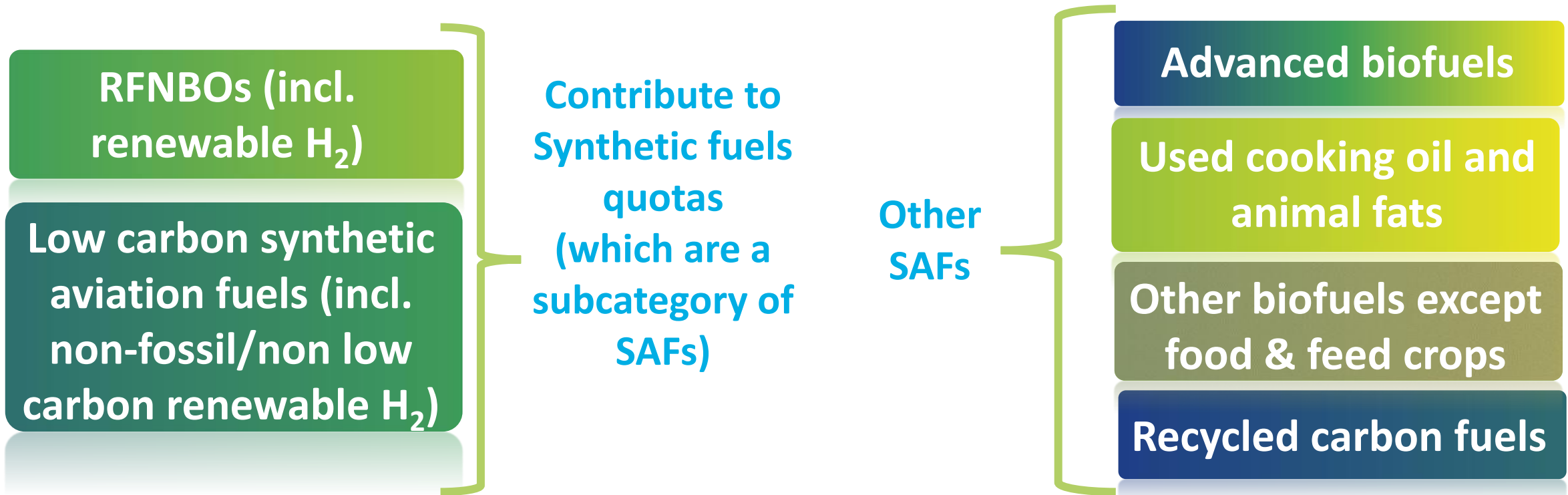


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# ReFuelEU Aviation: definitions

Two categories in the Sustainable Aviation Fuels (SAF):

- SynAF = synthetic aviation fuels
- Other SAFs = everything that do not fall in SynAF definition



Source: CO2 Value Europe



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# Race for defossilising EU shipping & aviation is on

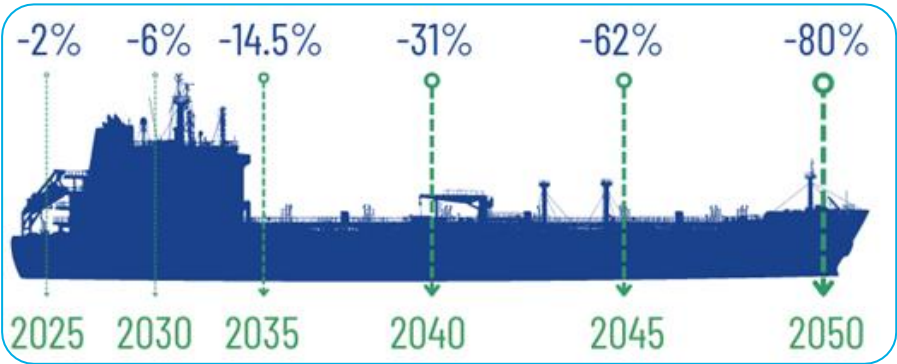
## FuelEU Maritime

- Gradually increase the use of sustainable fuels and technologies
- GHG reduction targets in the energy they use
- 2% RFNBOs mandatory target ins 2034 if by 2031 RFNBO amount to less than 1% in fuel mix

## ReFuelEU Aviation

- Mandates minimum quotas for sustainable fuels: RFNBOs, RCFs, advanced biofuels and even low carbon fuels
- Mandates specific subquotas for RFNBOs
- Sets penalties for fuels suppliers (which eventually will impact aircraft operators) if they fail to comply

GHG reduction targets



|       | 2025 | 2030                                   | 2032                            | 2035 | 2040 | 2045 | 2050 |
|-------|------|--|---------------------------------|------|------|------|------|
| SAF   | 2%   | 6%                                     |                                 | 20%  | 34%  | 42%  | 70%  |
| SynAF |      | 2030-2032: 1.2%/y<br>2030-2032: 0,7%/y | 2032-2033: 1.2%/y<br>2034: 2%/y | 5%   | 10%  | 15%  | 35%  |

Source: CO2 Value Europe



# New EU rules for renewable hydrogen & CCU fuels: fit for purpose?



- On 10 July 2023, the new rules for the production of RNFBOs became EU law
- REDII delegated act on additionality
  - Definition of additionality: ensure the renewable hydrogen comes from new renewable energy installations and do not divert existing clean power from other decarbonisation efforts
  - This includes only what is considered as 100% renewable and hence given a zero carbon intensity
  - EU rules would provide flexibility until 2028, but stricter rules after that
- REDII delegated act on GHG methodology to calculate GHG savings from RFNBOs and RCFs to reach 70% GHG reduction threshold. The rules distinguish between carbon sources to which are considered “avoided”:
  - Eligible without an end date: DAC CO<sub>2</sub>, biogenic CO<sub>2</sub> that respects REDII criteria, RFNBOs/RCFs’ CO<sub>2</sub>, geological CO<sub>2</sub>
  - ETS industrial CO<sub>2</sub> from power production (e.g. gas-fired powerplant): eligible until 2036
  - ETS industrial CO<sub>2</sub> from industrial production (e.g. emissions from cement): eligible until 2041
- Draft REDII delegated act on coprocessing: defines how to distinguish between fossil/biogenic CO<sub>2</sub> in refineries, will set precedent for future mass balance approach in other installations

During the Summer 2023, the EU Commission published a Q&A addressing technical questions on how the new rules will play out. The document is available online [here](#)

Source: CO2 Value Europe



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# Additional and updated information about the regulations can be find on the links below:

**Fit for 55 –**

<https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/>

**Position Paper: CCU regulation landscape–**

[https://co2value.eu/wp-content/uploads/2022/02/Position-paper\\_CVE\\_CCU-in-EU-Policy-Landscape\\_February-2022\\_FINAL.pdf](https://co2value.eu/wp-content/uploads/2022/02/Position-paper_CVE_CCU-in-EU-Policy-Landscape_February-2022_FINAL.pdf)

**European Commission -** [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_23\\_4754](https://ec.europa.eu/commission/presscorner/detail/en/IP_23_4754)





PYRCO<sub>2</sub>

The logo features the word 'PYRCO' in a green sans-serif font, followed by a stylized blue and green molecular structure icon, and then 'CO<sub>2</sub>' in a grey sans-serif font. The background of the slide is a close-up photograph of a complex industrial or laboratory apparatus made of polished stainless steel, with various pipes, valves, and a pressure gauge visible.

Thank you!



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