Shaping the SRIA for Renewable Fuels and Bioenergy

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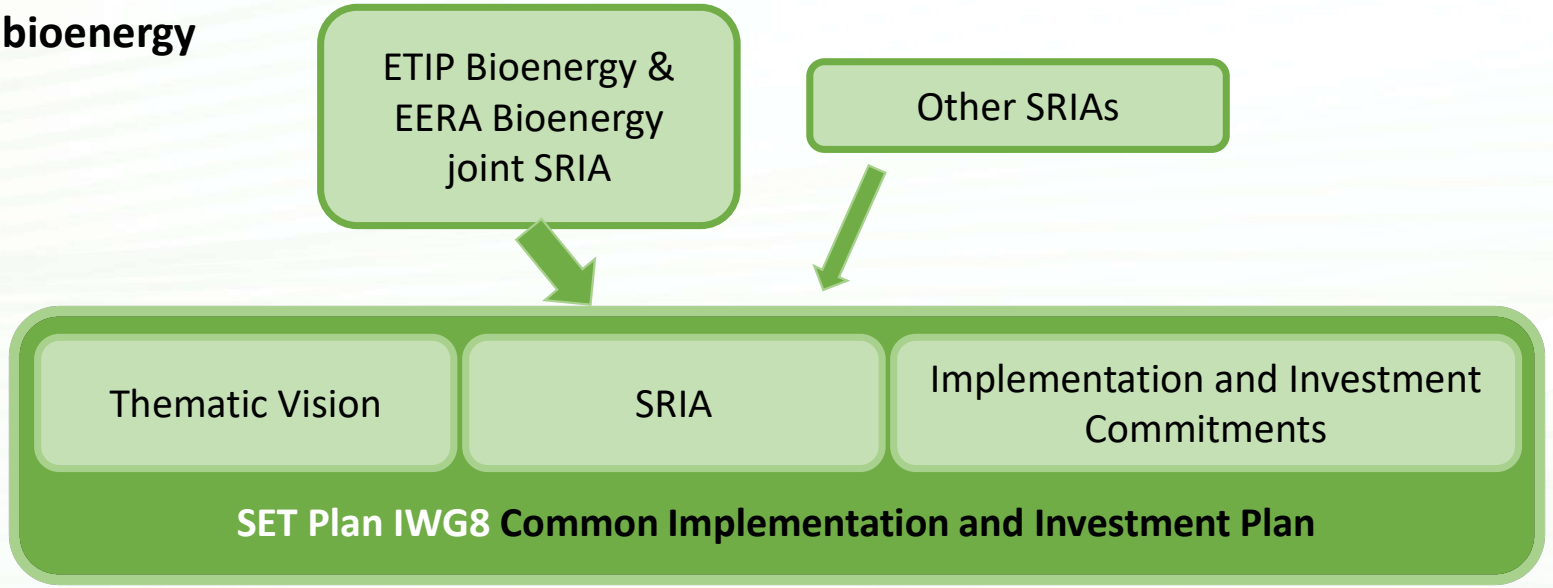
European Technology and Innovation Platform

Strategic Research and Innovation Agenda

- ETIP Bioenergy supports **development of cost-competitive, innovative, world-class bioenergy and renewable fuels value chains**
- EERA Bioenergy assesses R&D&I priorities to **accelerate the implementation of biomass technologies in Europe**
- SRIA: highlight **key research and innovation priorities**
- Scope: **renewable fuels, bioenergy**



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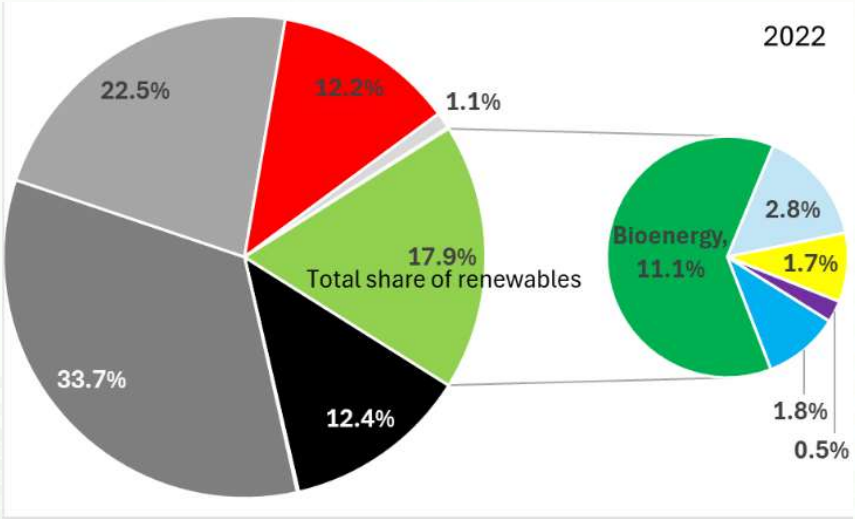
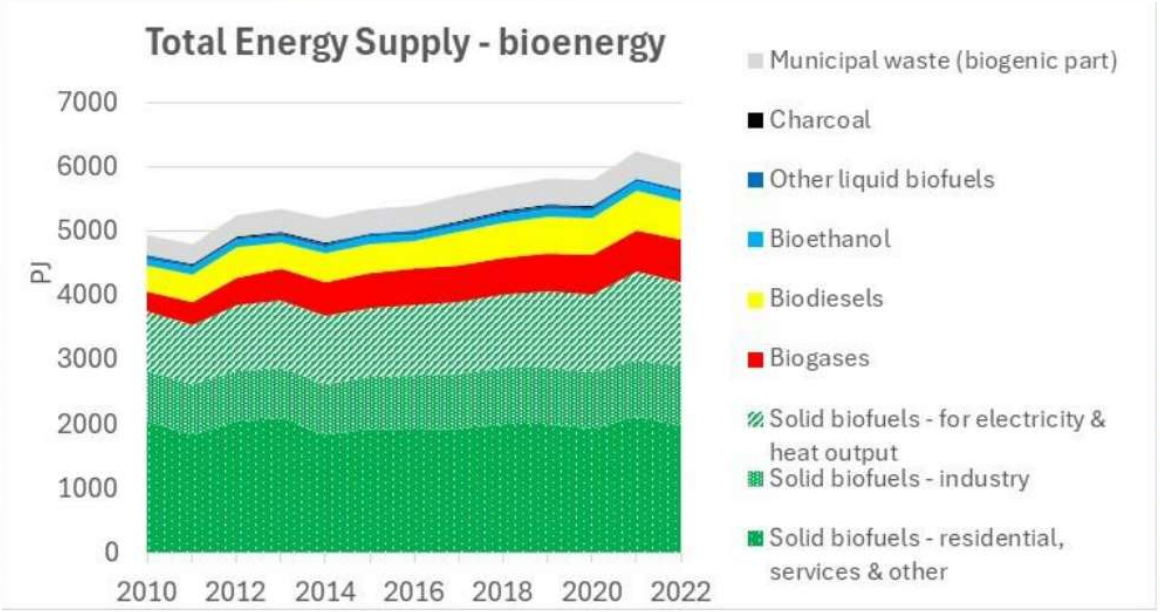
Deployment of Renewable Fuels





Figures taken from IEA Bioenergy Countries Report 2024, EU27;
Left: Total energy supply and the contribution of different energy sources in the EU27, with distribution in 2022
Right: Development of total energy supply from bioenergy in the EU27
Data source for both: IEA (2024) World Energy Balances and Renewables Information

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Which R&I challenges for further deployment do you still consider relevant?

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Are there any other challenges for deployment?

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Biomass Mobilisation

Figure 3 Annex IX/A, B biomass potential in technical, low, medium, and high potentials in 2030 and 2050 and distribution over sectors delivering biomass

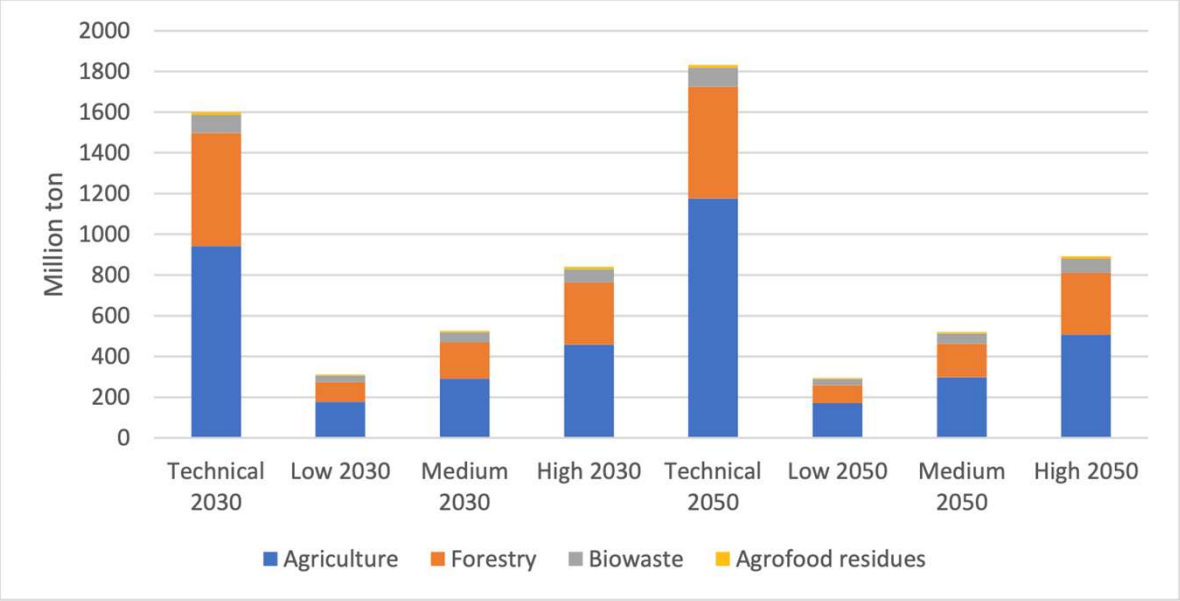

Figure taken from: European Commission: Directorate-General for Research and Innovation, Exergia, E3Modelling, Wageningen University & Research, BEST, BTG and POLITO, ***Development of outlook for the necessary means to build industrial capacity for drop-in advanced biofuels – Final report***, Georgiadou, M.(editor), Goumas, T.(editor) and Chiaramonti, D.(editor), Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2777/679307
Technical biomass potential in Europe and resulting potential biomass availability under low, medium and high mobilization scenarios

Annex IX to Directive (EU) 2018/2001 is amended as follows:

(1) in Part A, the following feedstocks are added:
“
(r) Fusel oils from alcoholic distillation;
(s) Raw methanol from kraft pulping stemming from the production of wood pulp;
(t) Intermediate crops, such as catch crops and cover crops that are grown in areas where due to a short vegetation period the production of food and feed crops is limited to one harvest and provided their use does not trigger demand for additional land, and provided the soil organic matter content is maintained, where used for the production of biofuel for the aviation sector;
(u) Crops grown on severely degraded land, except food and feed crops, where used for the production of biofuel for the aviation sector;
(v) Cyanobacteria.”.

(2) in Part B, the following feedstocks are added:
“
(c) Damaged crops that are not fit for use in the food or feed chain, excluding substances that have been intentionally modified or contaminated in order to meet this definition;
(d) Municipal wastewater and derivatives other than sewage sludge;
(e) Crops grown on severely degraded land excluding food and feed crops and feedstocks listed in Part A of this Annex, where not used for the production of biofuel for the aviation sector;
(f) Intermediate crops, such as catch crops and cover crops, and excluding feedstocks listed in Part A of this Annex, that are grown in areas where due to a short vegetation period the production of food and feed crops is limited to one harvest and provided their use does not trigger demand for additional land and provided the soil organic matter content is maintained, where not used for the production of biofuel for the aviation sector.”.

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Which R&I priorities on biomass do you still consider relevant?

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Are there any other R&I priorities on biomass?

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Decarbonising Aviation

Hydroprocessed Esters and Fatty Acids (HEFA)

HEFA is the most technologically mature pathway that uses waste oils or used cooking oils (UCO)/fats as a feedstock. Currently, all operational SAF facilities globally are based on HEFA.

Process: Removal of oxygen by hydrodeoxygenation → cracking & isomerisation of paraffinic molecules to jet fuel chain length.

Yield: 70–80% depending on feedstock and parameters.

Alcohol-to-Jet (AtJ)

AtJ involves dehydration, oligomerisation and hydro-processing to convert alcohol feedstock to SAF. Alcohols have a standard chemical formula, so feedstock variation is minimal.

Yield: ~60%, potentially 70–90% SAF with remaining renewable diesel and light ends.

Note: Scaling and integrating these processes at large scale poses engineering challenges.

Fischer–Tropsch (FT)

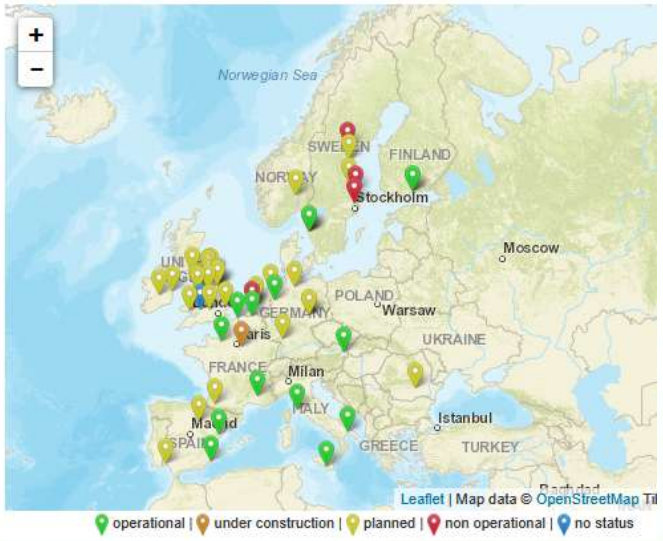
FT is one of the earliest ASTM-approved routes, converting carbonaceous waste/residues to syngas (H_2, CO) and then catalytically upgrading it to jet/diesel. Certified jet specs: SPK & SKA.

Challenges: Feedstock-specific, capex-heavy, slow to build, hard to stabilize, limiting scale.

Power-to-Liquid (PtL)

PtL combines green hydrogen (from renewables) with captured CO_2 to form syngas, then converts it via Fischer–Tropsch.

Status: Low maturity today; expected to grow post-2040 as green hydrogen & carbon capture mature.



Left: Copied from https://www.safassociation.com/about-saf.php

Right: ETIP Bioenergy Production Facilities Database, SAF Facilities

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Which R&I priorities for aviation do you still consider relevant?

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Are there any other R&I priorities on aviation?

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Decarbonising Shipping

	Feedstock Availability	Fuel Production	Fuel storage, logistics & bunkering	Onboard energy storage & fuel conversion	Onboard safety & operations	Vessel Emissions	Regulation & certification
e-ammonia							
Blue ammonia							
e-methanol							
Bio-methanol							
e-methane							
Bio-methane							
Bio-oils							
e-diesel							
Bio-diesel							

Fuel Pathway Maturity Map, copied from https://www.zerocarbonshipping.com/fuel-pathways
Green: Mature, Yellow: Solutions Identified, Red: Major Challenges Remain

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Which R&I priorities for shipping do you still consider relevant?

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Are there any other R&I priorities on shipping?

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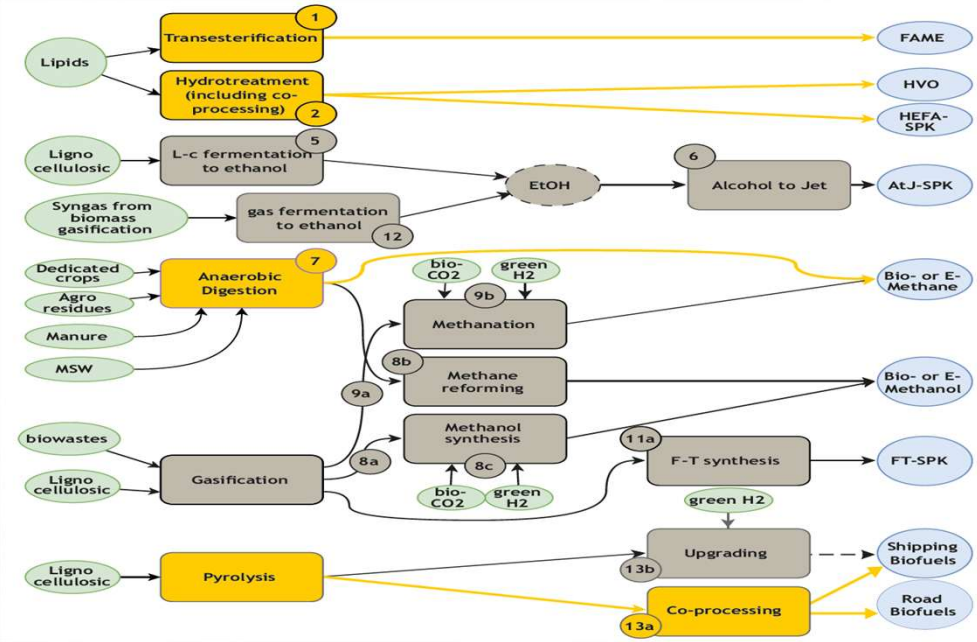
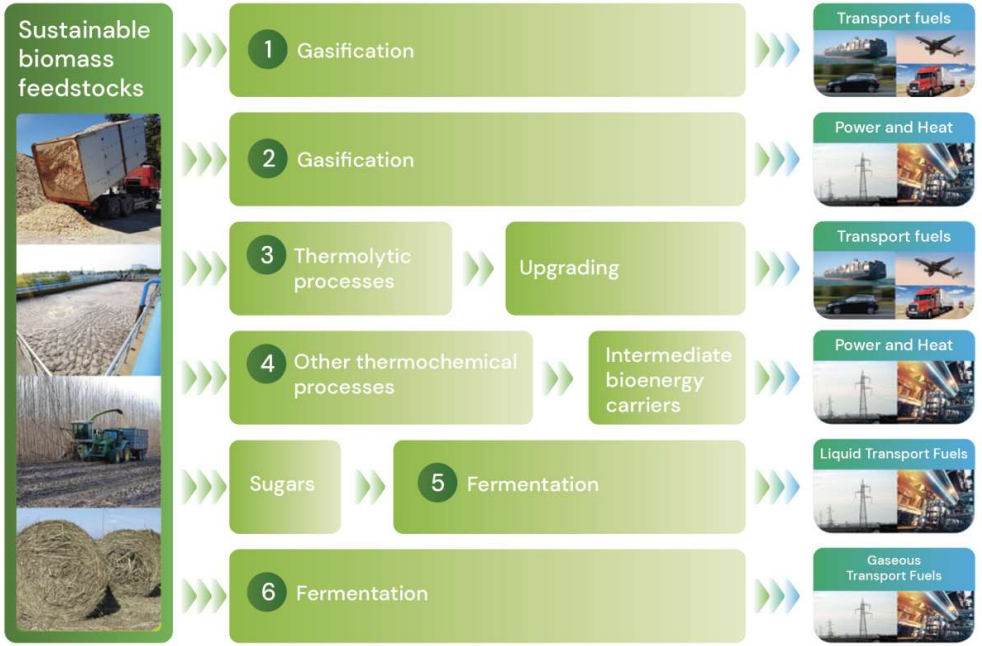
Conversion Technologies





Left: Important Renewable Fuel Production Pathways,
Figure taken from: European Commission: Directorate-General for Research and Innovation, EXERGIA, POLITO and BEST, ***Mobilization of industrial capacity building for advanced biofuels – Final report***, Georgiadou, M.(editor), Goumas, T.(editor) and Chiaramonti, D.(editor), Publications Office of the European Union, 2026, **https://data.europa.eu/doi/10.2777/2375274**

Right: ETIP Bioenergy Priority Value Chains,
https://www.etipbioenergy.eu/value-chains/

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Please provide R&I priorities for specific technologies in brief words. Make sure to mention the specific technology you are referring to.

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ETIP Bioenergy & EERA Bioenergy joint SRIA - Next Steps

Joint SRIA	Who	When
Document outline	Core group	May 2026
Collect input from stakeholders	Stakeholders	May/June 2026
First draft SRIA	Core group	June 2026
Collect feedback from stakeholders	Stakeholders	July/Aug 2026
Final document	ETIP Bioenergy SC EERA Bioenergy BoD	Sep 2026

Your input to the document will be valuable!

Please contact secretariat@etipbioenergy.eu to ensure that we reach out to you!

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EUREC The Association of European Renewable Energy Research Centres

ITA INSTITUTE OF TECHNOLOGY ASSESSMENT

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