S&P Global
Commodity Insights

Long-term outlook for biofuels in Europe

Future of Biofuels

Copenhagen, Denmark

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Agenda

- Policy landscape
- Long-term biofuels demand outlook
- Ramping up RD and SAF supply

Policy landscape

Final agreement has been reached on the RED II revision

	RED II (2018/2001) Current	Final agreement
Definition of energy in transport ("numerator")	Road and rail	Road, rail, maritime and aviation
GHG intensity reduction of fuels by 2030	-	14.5% GHG intensity reduction or 29% renewable energy share in transportation (member states can choose; they can reduce the overall obligation if the cap on food and feed crops is lower than 7%)
Renewable energy share in transportation in 2030	14% (with double counting)	
Subtarget: Advanced biofuels and biogas (Annex IX-A)	3.5% (with double counting)	Common target for advanced biofuels and RFNBO of at least 1% by 2025 and 5.5% by 2030 Minimum share of RFNBO: 1% Both advanced biofuels and RFNBOs can be double counted Advanced biofuels and RFNBOs benefit from an additional multiplier of 1.2x and 1.5x, respectively, if used in aviation and marine sectors
Subtarget: RFNBO	-	
Cap on crop/feed-based biofuels and biogas	2020 share in energy in road and rail transport +1%, up to max 7%	2020 share in energy in the transport sector +1%, up to max 7%
Cap on Annex IX-B biofuels and biogas	1.7%	1.7% but member states can increase the limit (double counting allowed)
Definition of high indirect land-use change-risk biofuels	10%	8%
Electricity multiple counting	x4	x4 for road x1.5 for rail

Data compiled Oct. 1, 2023.

RED = Renewable Energy Directive; RFNBO = renewable fuel of nonbiological origin; GHG = greenhouse gas.

[1] "Amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652" published on July 14, 2021.

Source: S&P Global Commodity Insights.

ReFuelEU Aviation and FuelEU Maritime set LT targets for aviation and shipping

ReFuelEU Aviation introduces a volume-based target, with sub-mandate on e-fuels

Volumetric SAF target	2%	6%	20%	34%	42%	70%
E-fuels submandate		1.2%*/2%**	5%	10%	15%	35%

Obligated parties have to pay twice the price difference between SAF and conventional jet fuel as a penalty in case they miss the target

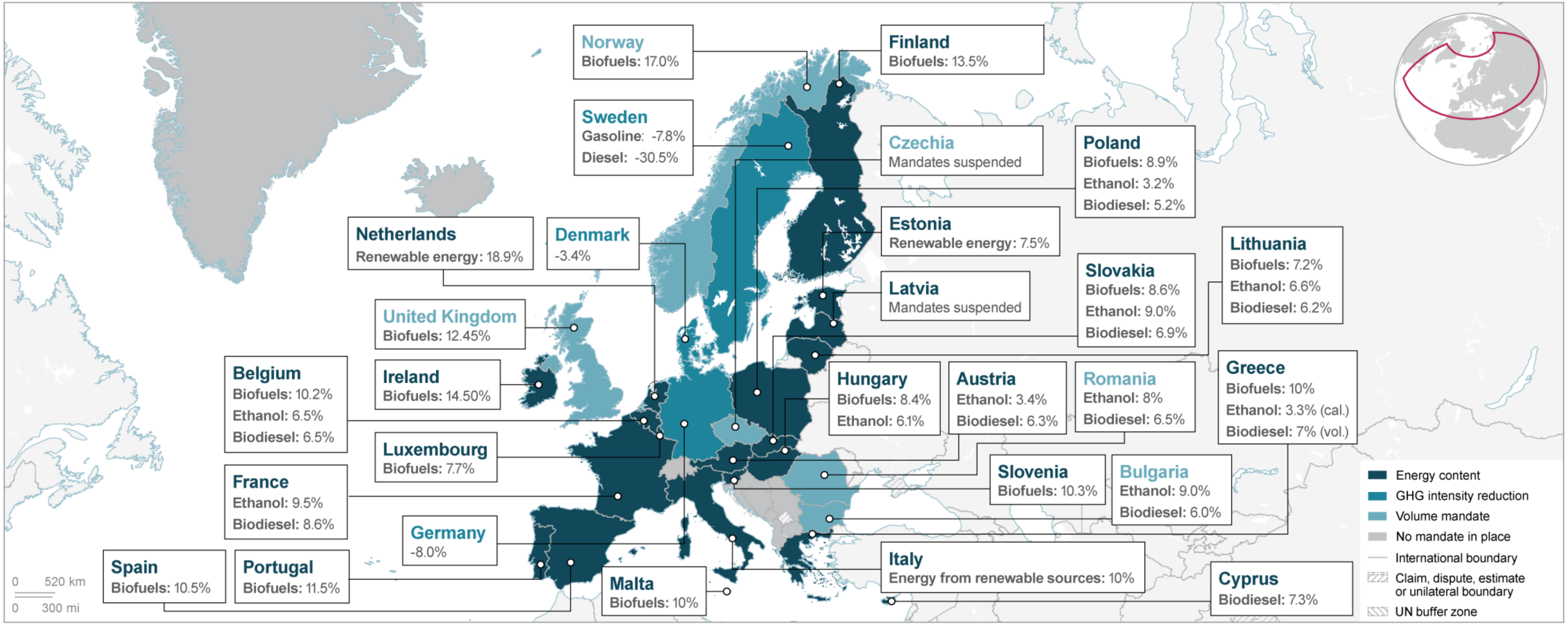
FuelEU Maritime targets GHG intensity reductions (vs. 2020 baseline, well-to-wake basis)

	2025	2030	2035	2040	2045	2050
GHG intensity reduction target	-2%	-6%	-14.5%	-31%	-62%	-80%

*Average for the 2030-2031 period. Minimum 0.7% each year.
**Average for the 2032-2034 period. Minimum 1.2% each year.
Source: S&P Global Commodity Insights.

The European biofuels regulatory landscape is and will likely remain heterogenous after RED III is implemented by Member States

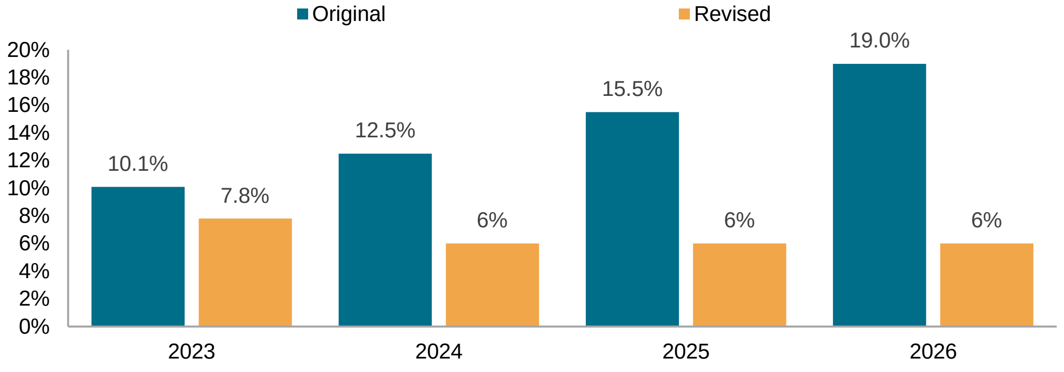
Europe biofuels mandates: 2023



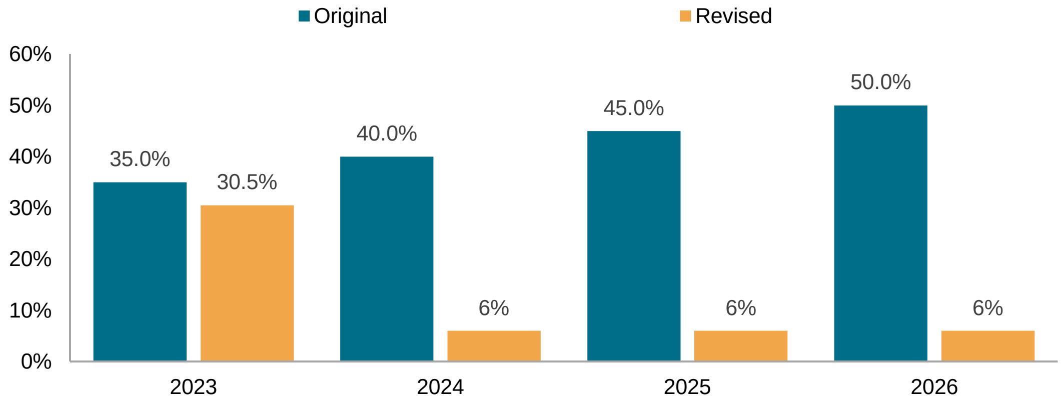
Data compiled May 10, 2023.
Source: S&P Global Commodity Insights: 2009543.

Sharp cuts of ambitious biofuel mandates in the Nordics to hamper biofuel demand outlook

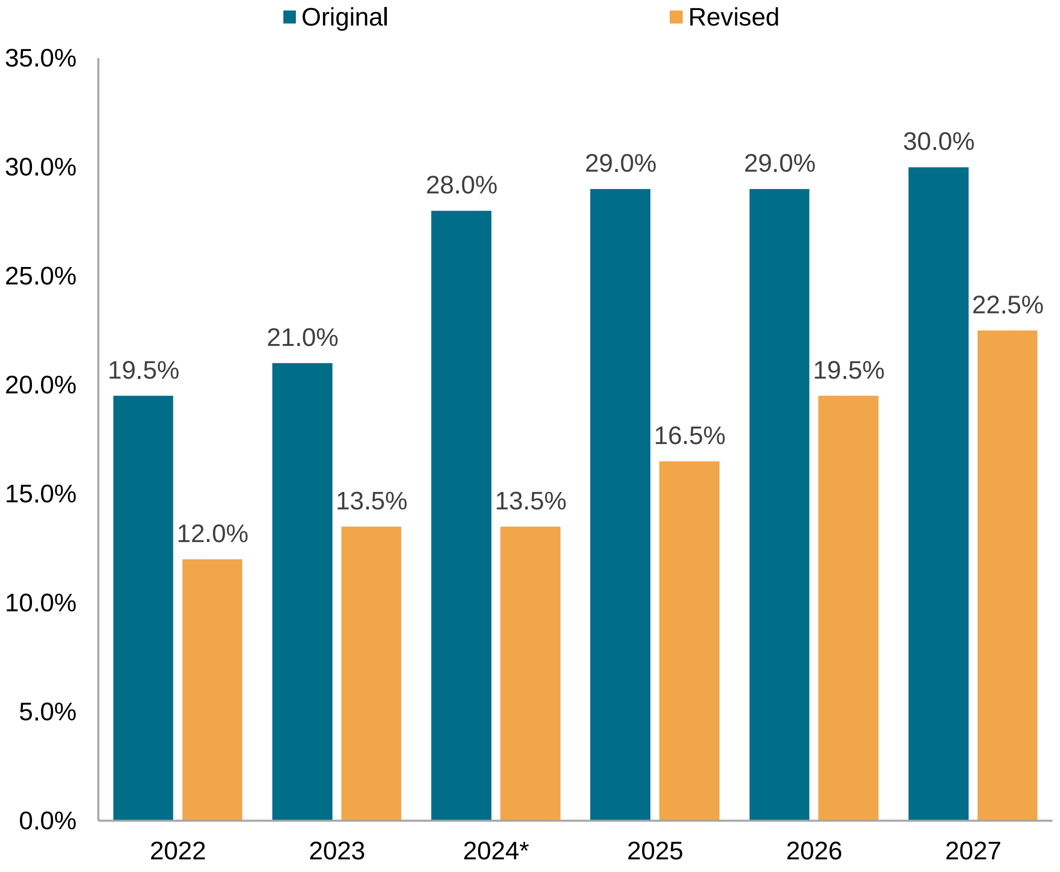
Sweden gasoline GHG emission reduction targets



Sweden diesel GHG emission reduction targets



Finland biofuel mandate (energy content)



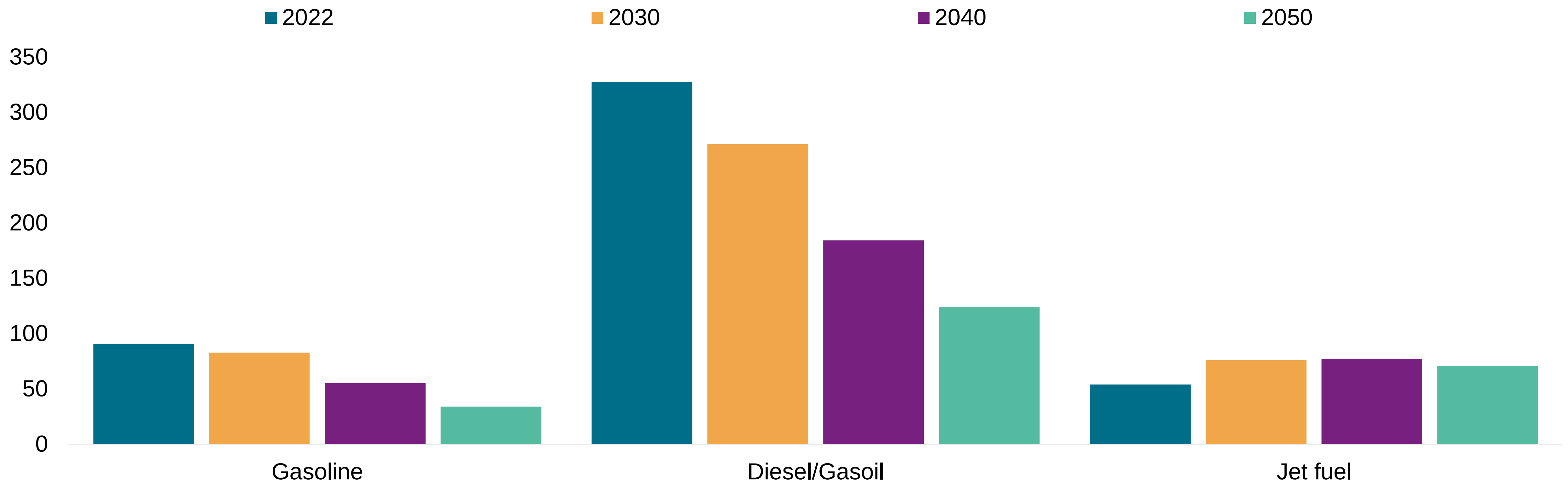
Revision was proposed, to be voted in the parliament.

Long-term biofuels demand outlook

Both gasoline and diesel consumption expected to be cut in three, due to efficiency and electrification

Projected evolution of fuel demand in Europe

(Million metric tons)



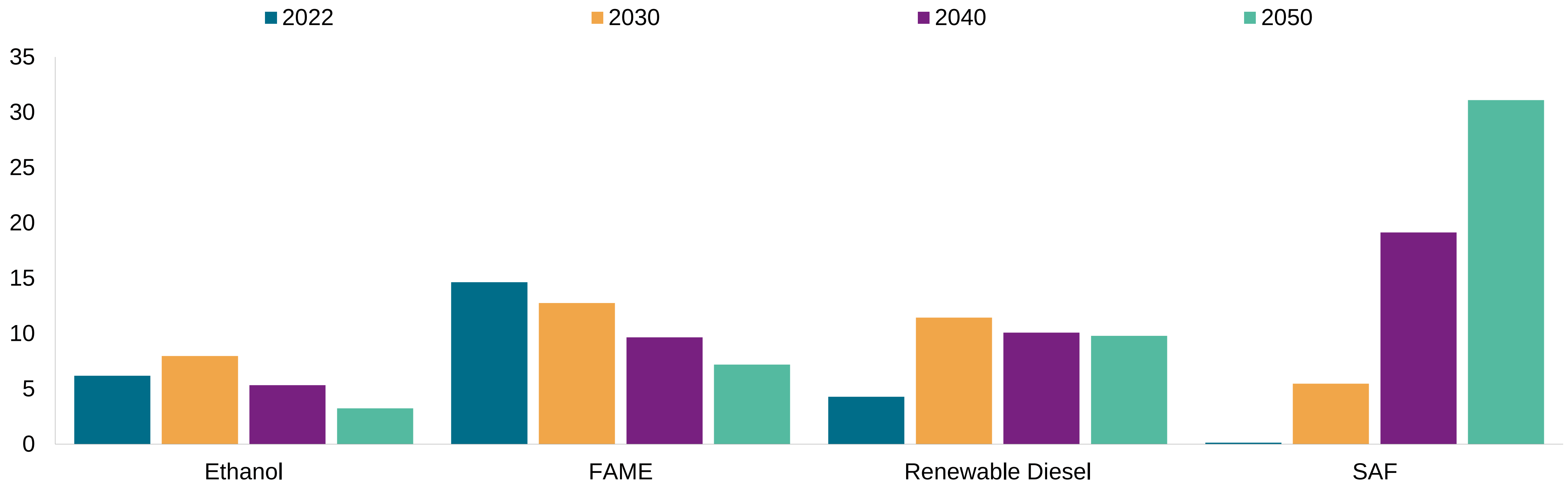
Data compiled Sept. 22, 2023.

Source: S&P Global Commodity Insights.

Biofuels demand in Europe will double between 2022 and 2050 (to 51 MMT), supported by strong growth in the SAF market

Projected evolution of biofuels demand in Europe

(Million metric tons)

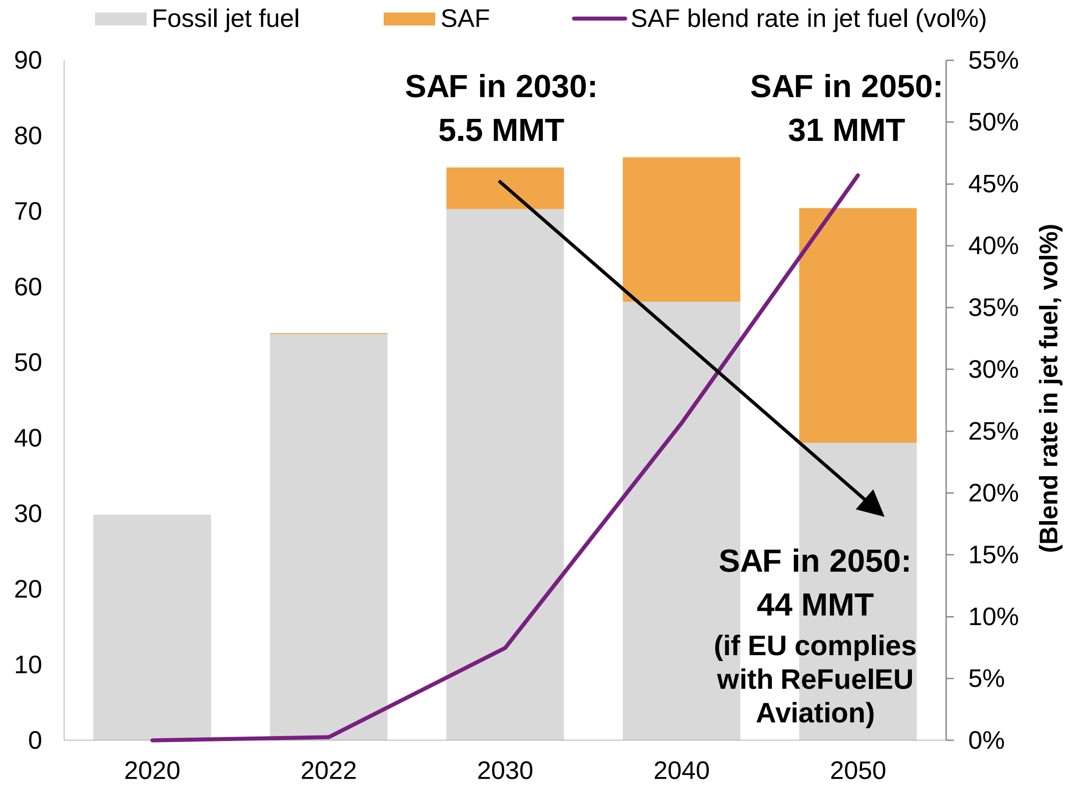


Data compiled Sept. 22, 2023.

Source: S&P Global Commodity Insights.

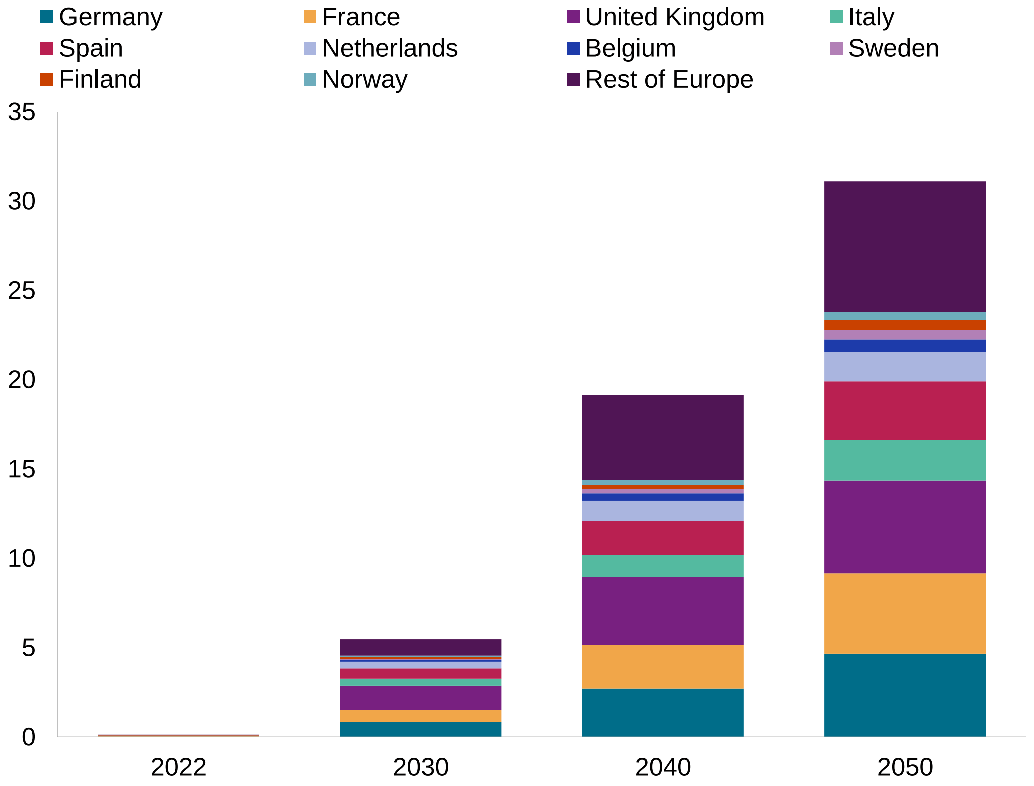
SAF to reach around 45% of the European jet fuel pool by 2050

Europe total jet fuel demand outlook
(Million metric tons)



Data compiled Sept. 22, 2023.
Source: S&P Global Commodity Insights.

Europe SAF demand by country outlook
(Million metric tons)

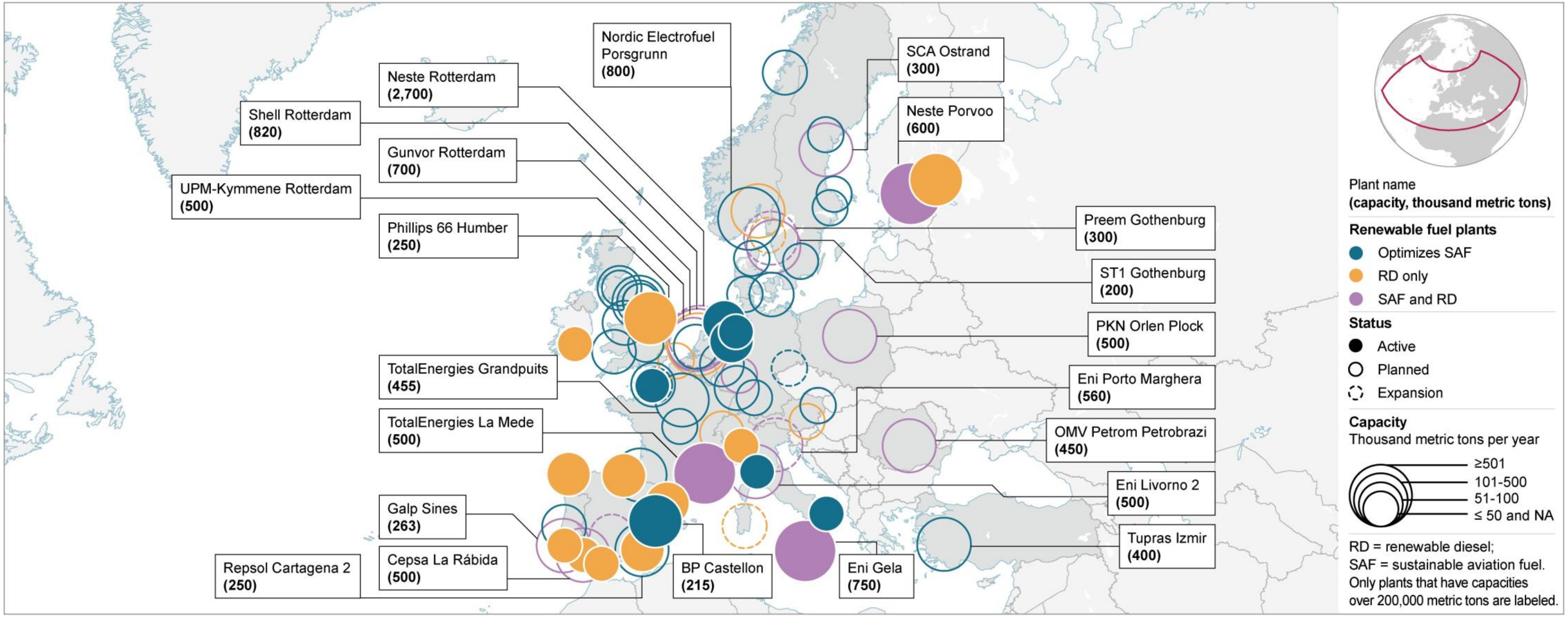


Data compiled Sept. 22, 2023.
Source: S&P Global Commodity Insights.

Ramping up RD and SAF supply

Strong demand outlook spurs investments in RD and SAF capacity in Europe (16 MMT by 2030)

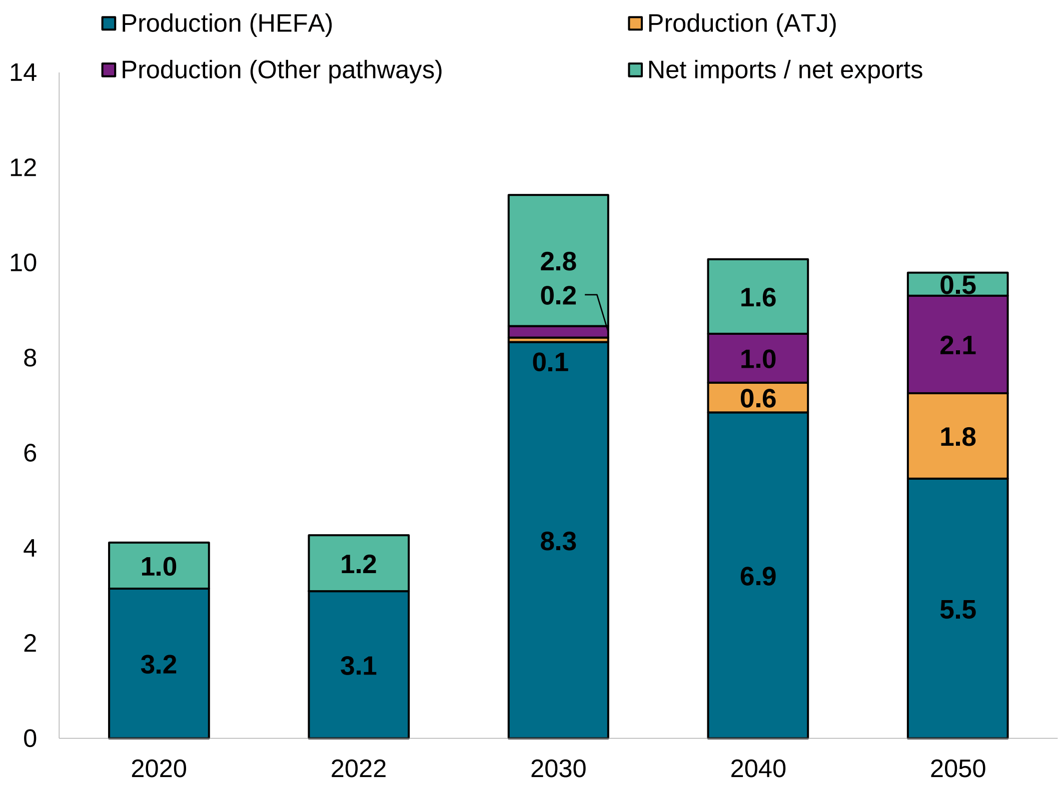
Europe renewable diesel and sustainable aviation fuel capacity



Data compiled Sept. 11, 2023.
Source: S&P Global Commodity Insights: 2010707.

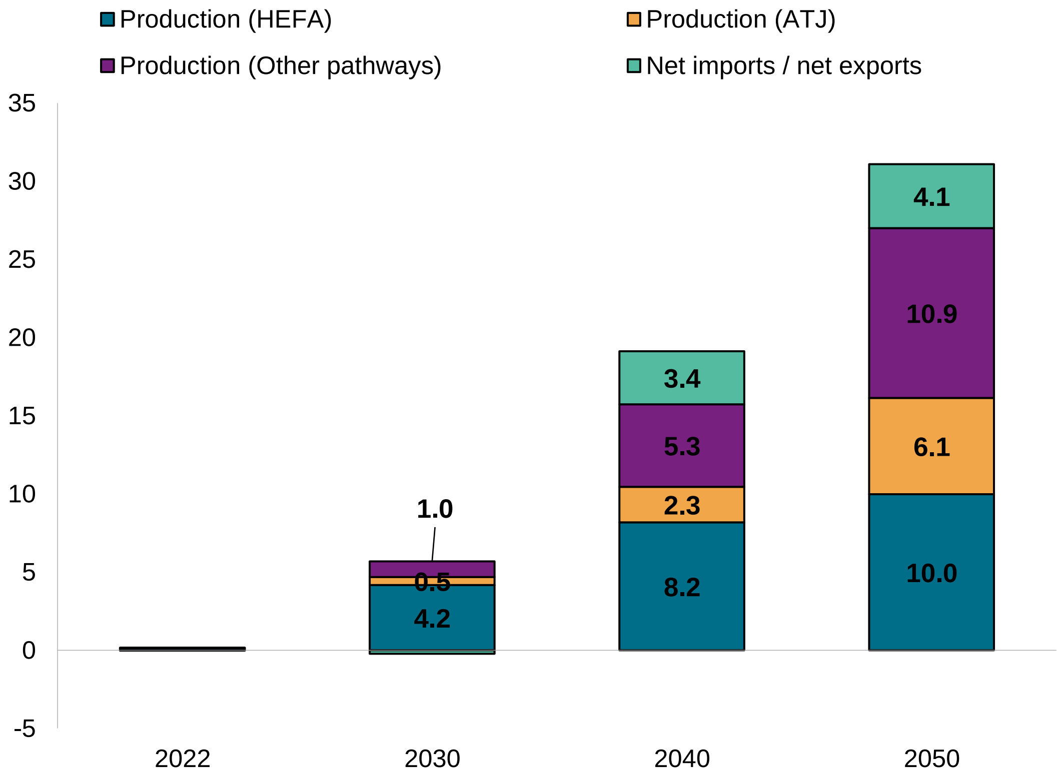
RD production in Europe is expected to almost triple by 2030; SAF production from non-HEFA pathways will ramp up post-2030

Renewable diesel supply – Europe
(Million metric tons)



Data compiled Sep. 22, 2023.
Source: S&P Global Commodity Insights.

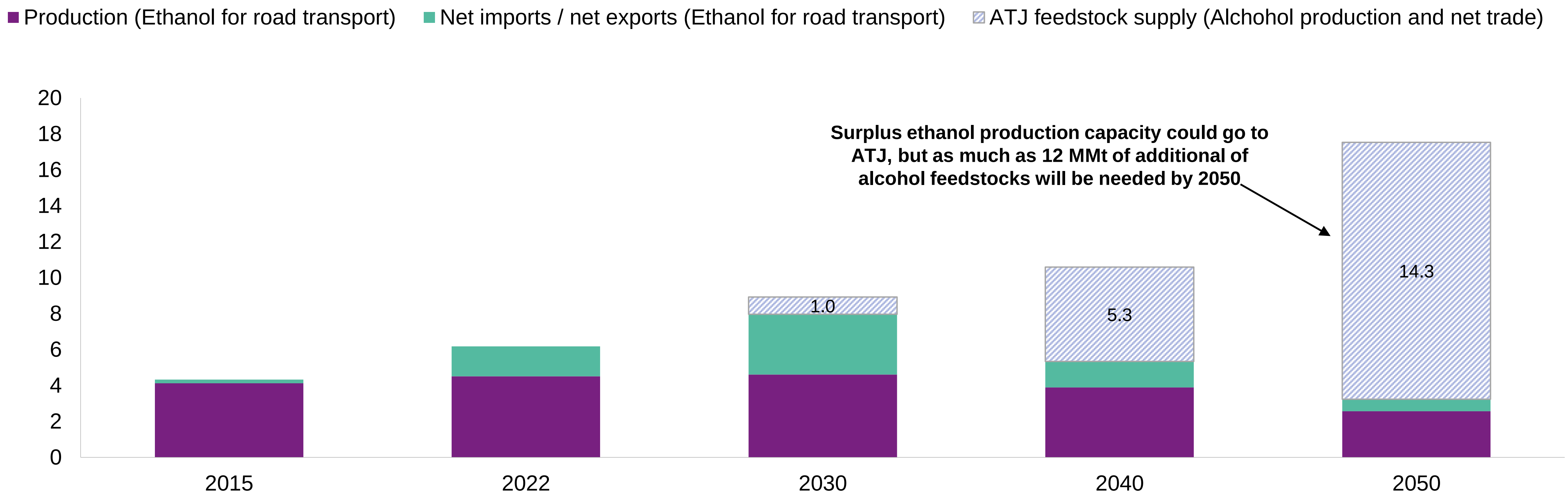
Sustainable aviation fuel supply – Europe (Thousand metric tons per year)



Data compiled Sep. 22, 2023.
Source: S&P Global Commodity Insights.

Europe's road ethanol production is expected to fall in line with demand; significant volumes of advanced ethanol will be needed for ATJ

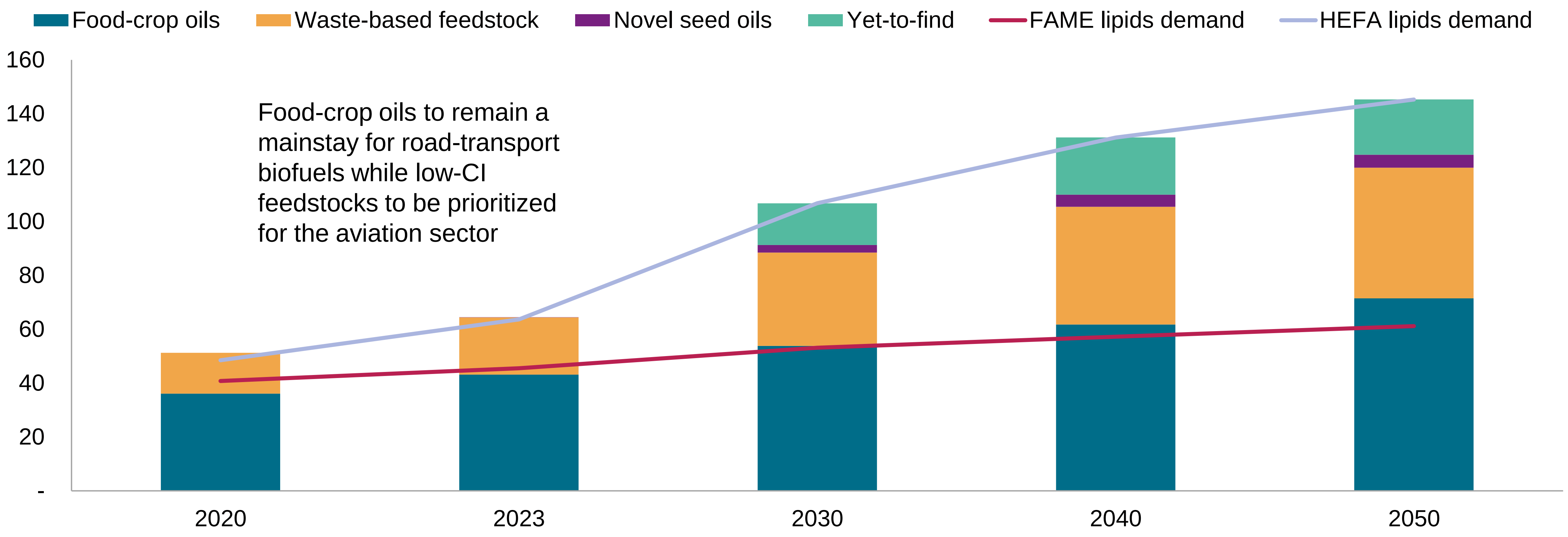
Ethanol and alcohols (for ATJ feedstock) supply – Europe
(Million metric tons)



Data compiled Sep. 22, 2023.
Source: S&P Global Commodity Insights.

In the longer term we anticipate a global shortfall of low CI lipids supply

Global fuel sector lipids demand



Data compiled Sept. 1, 2023.
Source: S&P Global Commodity Insights.

Q&A