Where do we stand with regard to global market scale-up of SAF?

Sumit Maharjan, presenting work of Alessandro Martulli, Kristin Brandt, Florian Allroggen, Robert Malina

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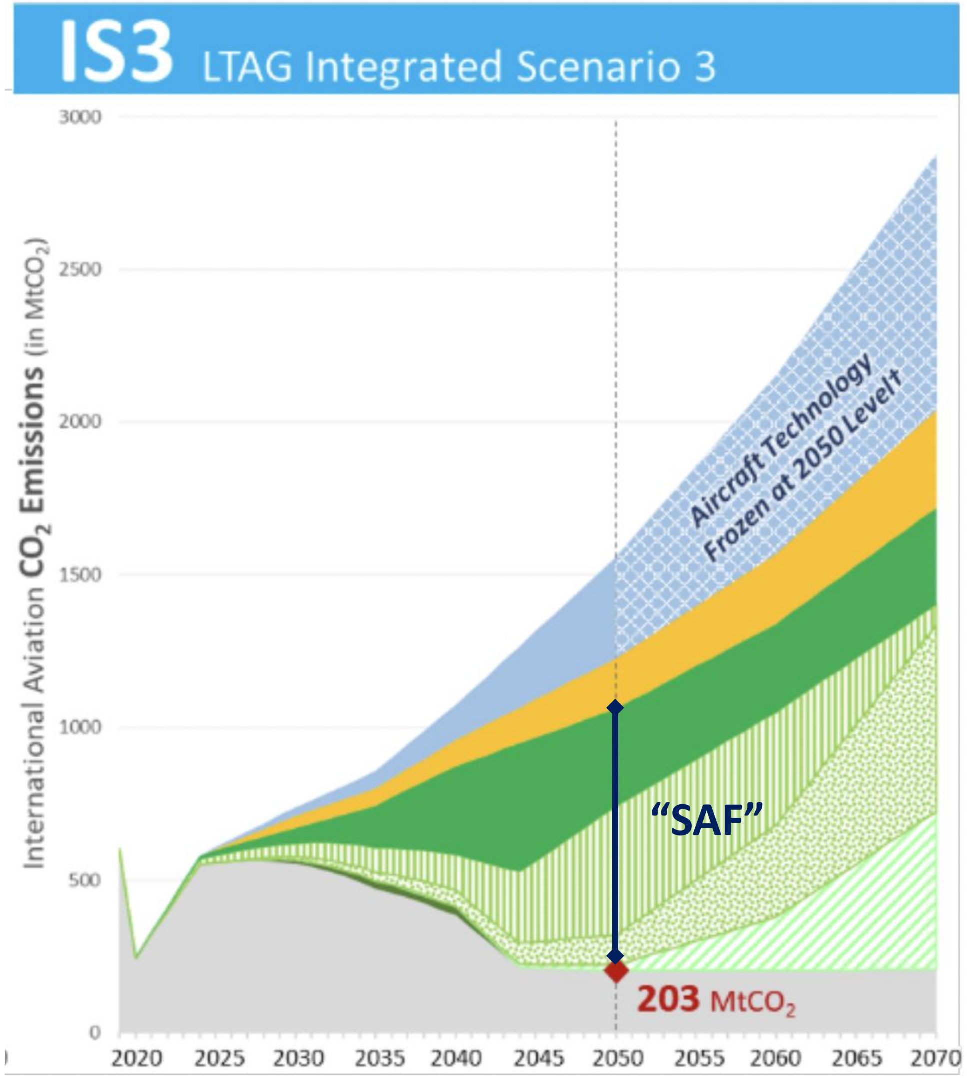
Net Zero CO_2 goal of ICAO and role of SAF



There is general agreement across industry and governmental actors that SAF is the biggest lever to drastically reduce aviation GHG emissions.

Source: https://www.icao.int/environmental-protection/LTAG/Documents/REPORT%20ON%20THE%20FEASIBILITY%20OF%20A%20LONG-TERM%20ASPIRATIONAL%20GOAL_en.pdf

Policymakers adopting measure to increase supply and uptake

Country	Year	SAF %	Fuel Volume
ICAO	2030	5%	23 Mt
EU	2030	6%	6.4 Mt
UK	2030	10%	
India	2025	1%	
China	2025		50,000 t
Turkey	2030	5%	
Brazil	2027	1%	
Sweden	2030	27%	
Finland	2030	30%	
Indonesia	2025	5%	
Australia	2030	10%	
Japan	2030	10%	
Philippines	2030		175,000 t

In view of policy targets, **where do we stand in terms of SAF production capacity worldwide?**

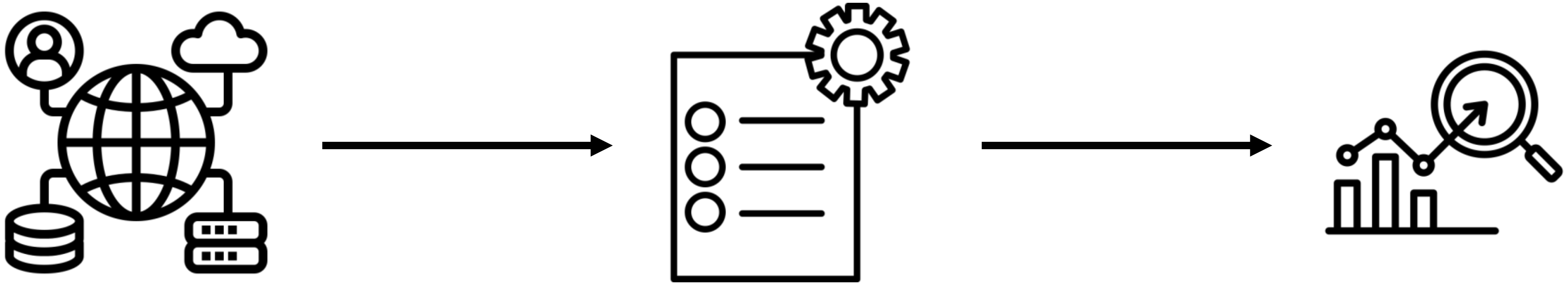
Research Goal

- Quantify current Operational SAF production capacity
- Quantify announced SAF production capacity by 2030
- Classify SAF production capacity projects by development status
- Define the rate of announced capacity that became operational

Source: The potential scale-up of sustainable aviation fuels production capacity to meet global and EU policy targets Alessandro Martulli, Kristin Brandt, Florian Allroggen, Robert Malina, Nature Communications, 2025

Global SAF production capacity database

SAF Database | Key Attributes | SAF Capacity Estimation



SAF Database

Public announcements between 2013 and 2024: **425 projects**

Key Attributes

Each announcements include
- ❖ Company name and location
- ❖ Technology Pathway
- ❖ Expected start date
- ❖ Announced total fuel capacity
- ❖ Project development status

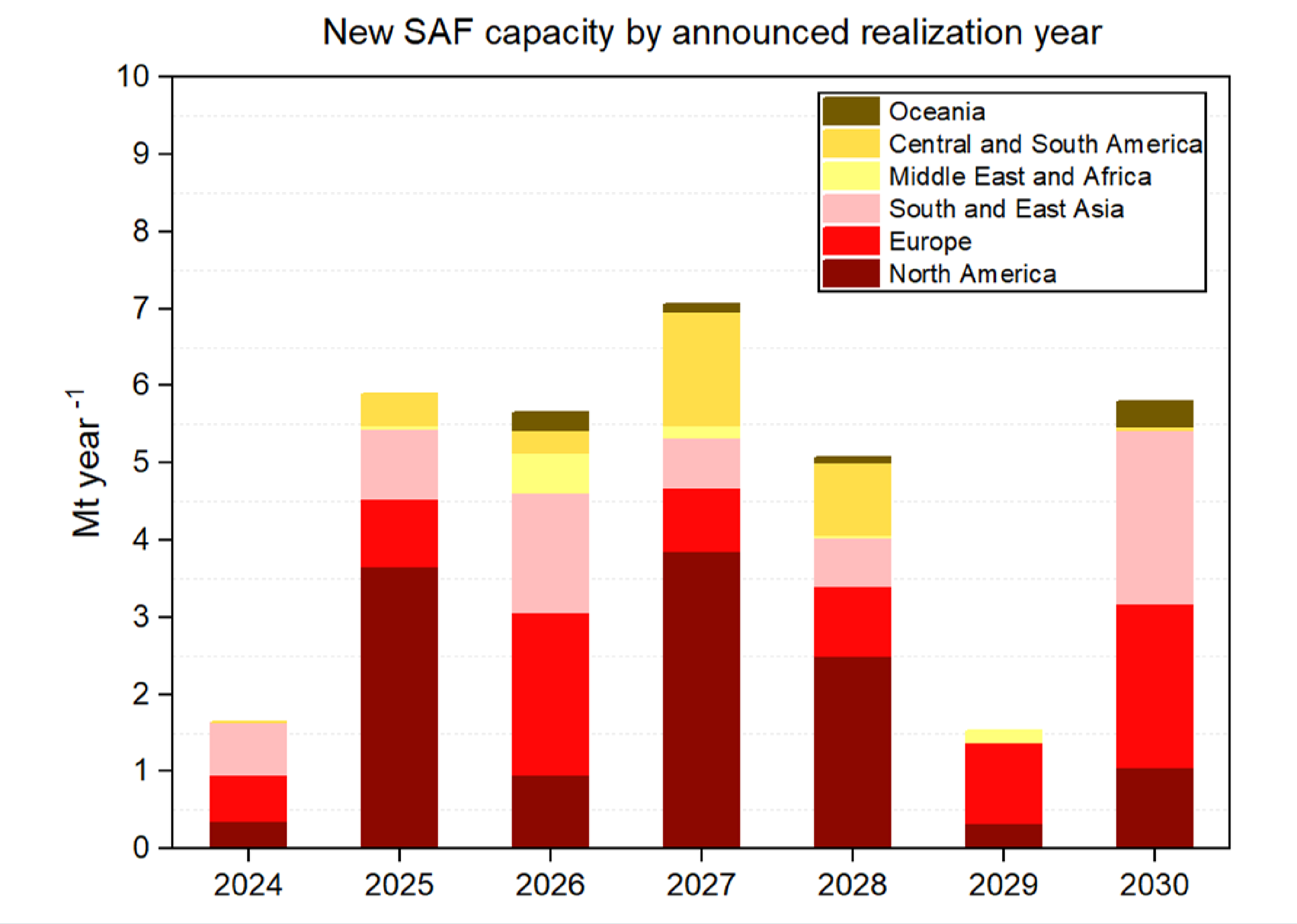
SAF Capacity Estimation

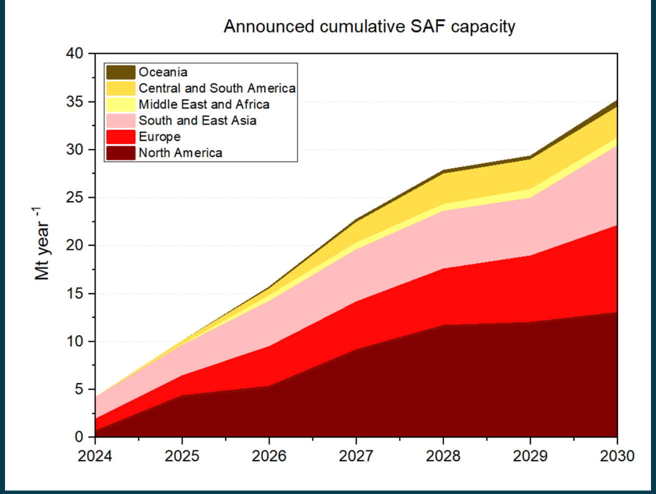
Many announcements include total SAF + Co-products
- ❖ Adjusted using literature-based SAF ratio range (Min-Max)
- ❖ Output: Estimated SAF production capacity

Global distribution of SAF production capacity

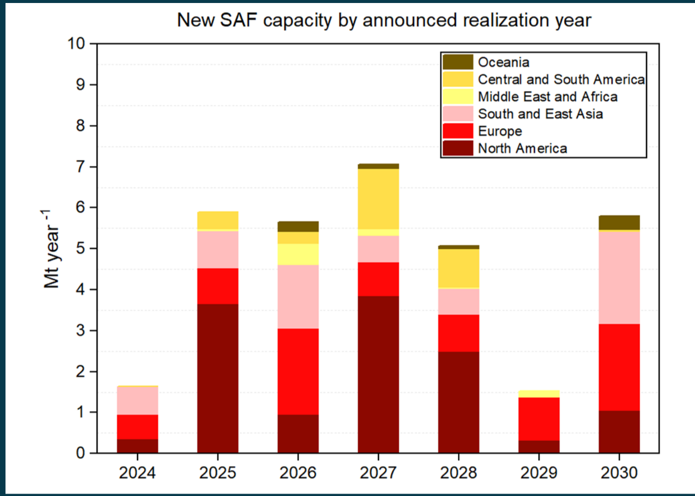
Region	Operational SAF production facilities by 2024	Announced SAF production facilities by 2030
North America	4	51
Europe	10	60
South and East Asia	7	36
Middle East and Asia	2	6
Central and South America	-	9
Oceania	-	5

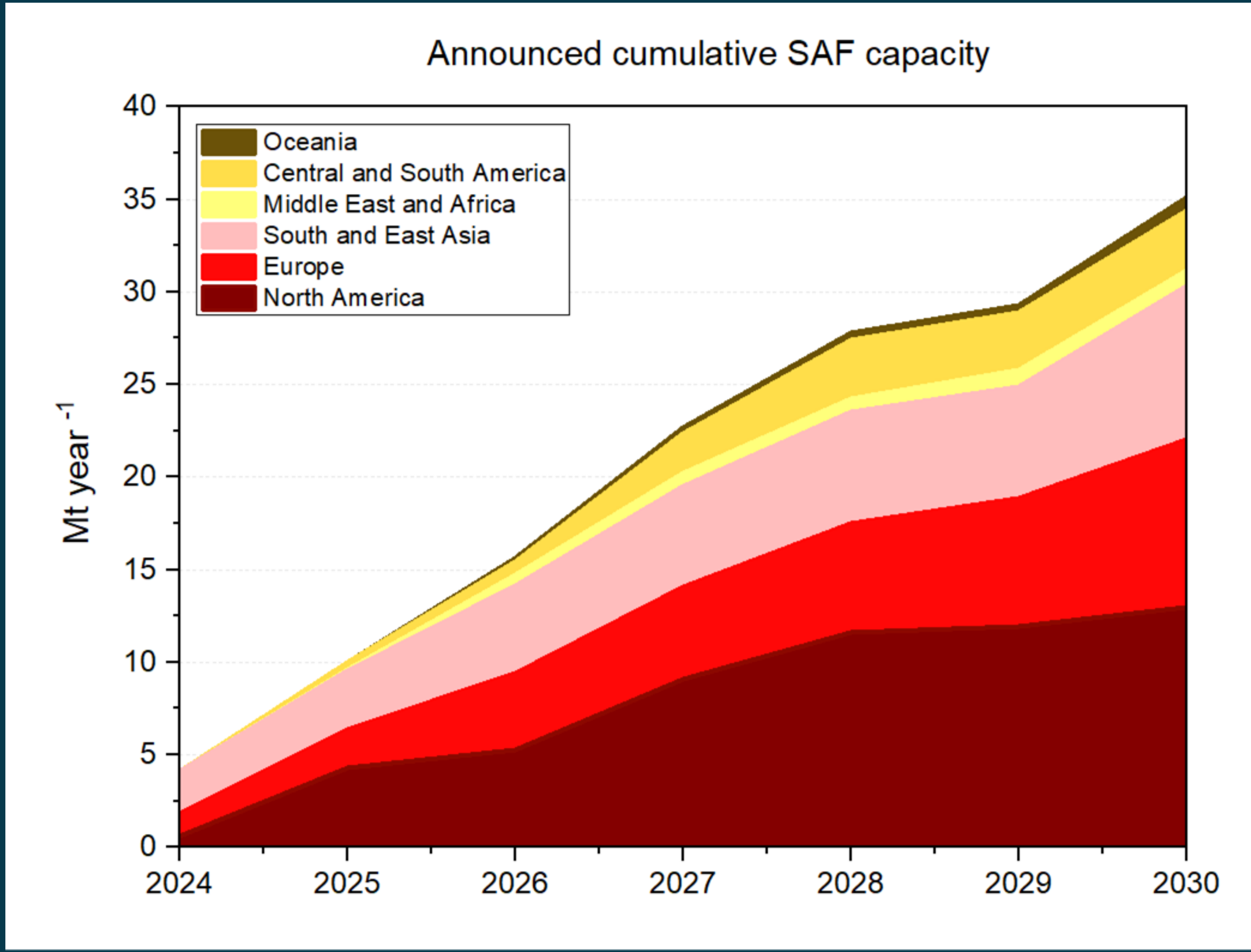
Global distribution of SAF production capacity





Global distribution of SAF production capacity

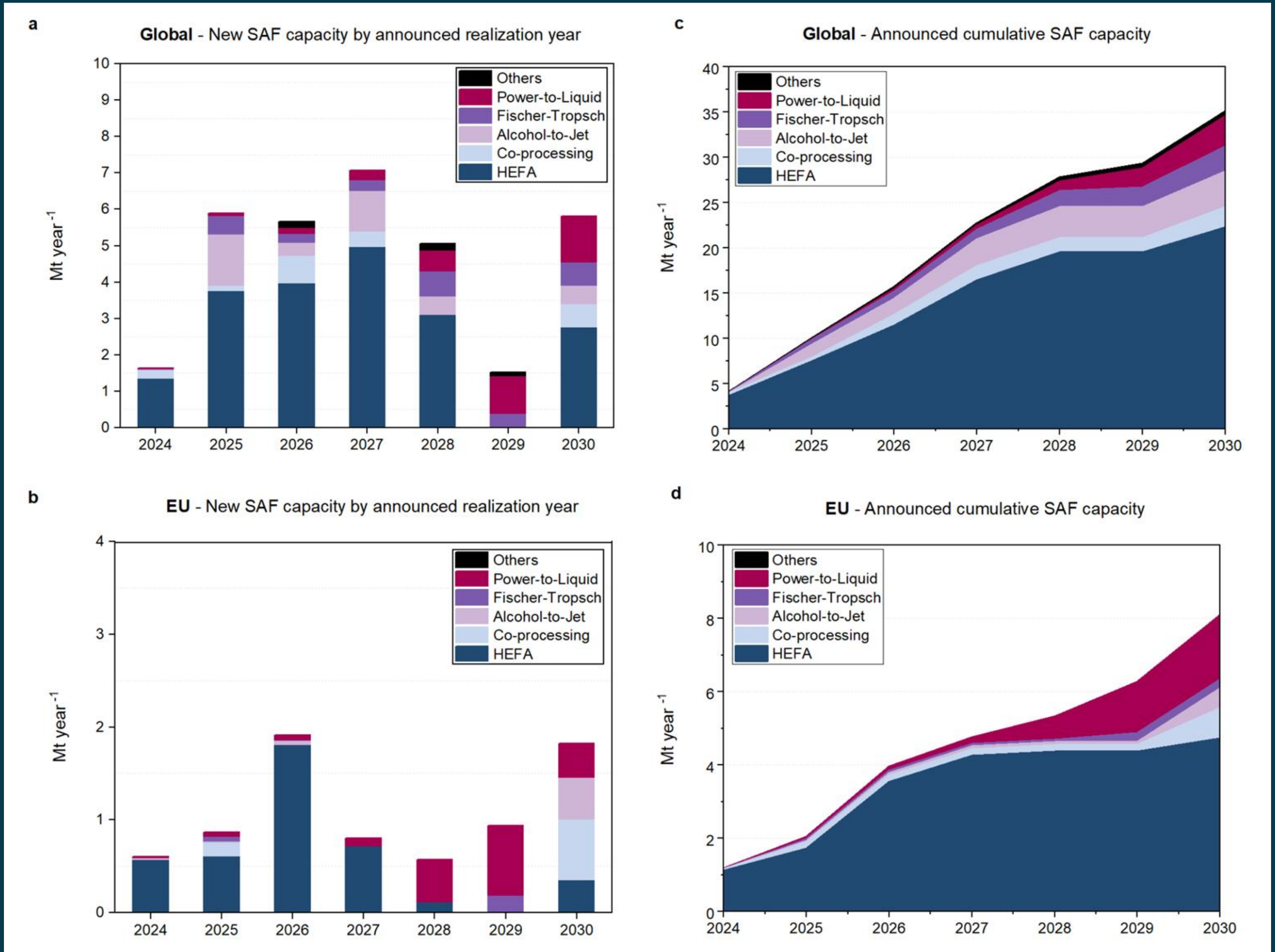




Cumulative global SAF announced to operational by 2030:

35.1 Mt/year

SAF Production capacity by conversion technology



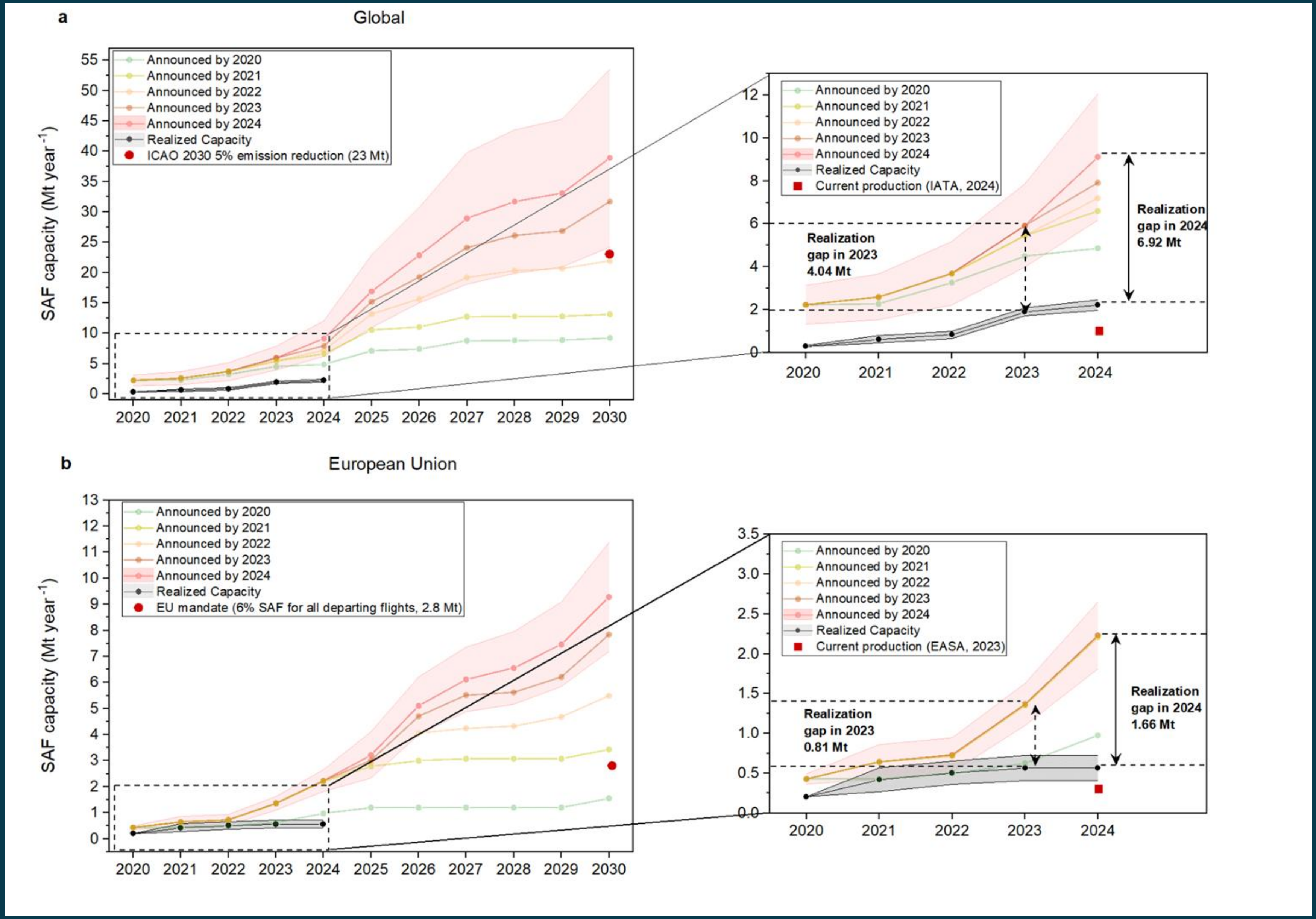
Global:

- 63% of announced SAF capacity by 2030 from HEFA

EU:

- Cumulative global SAF announced to operational by 2030 = 8.1 Mt/year
- 1.8 Mt of announced SAF capacity by 2030 from PtL

SAF Production Capacity realization Gap



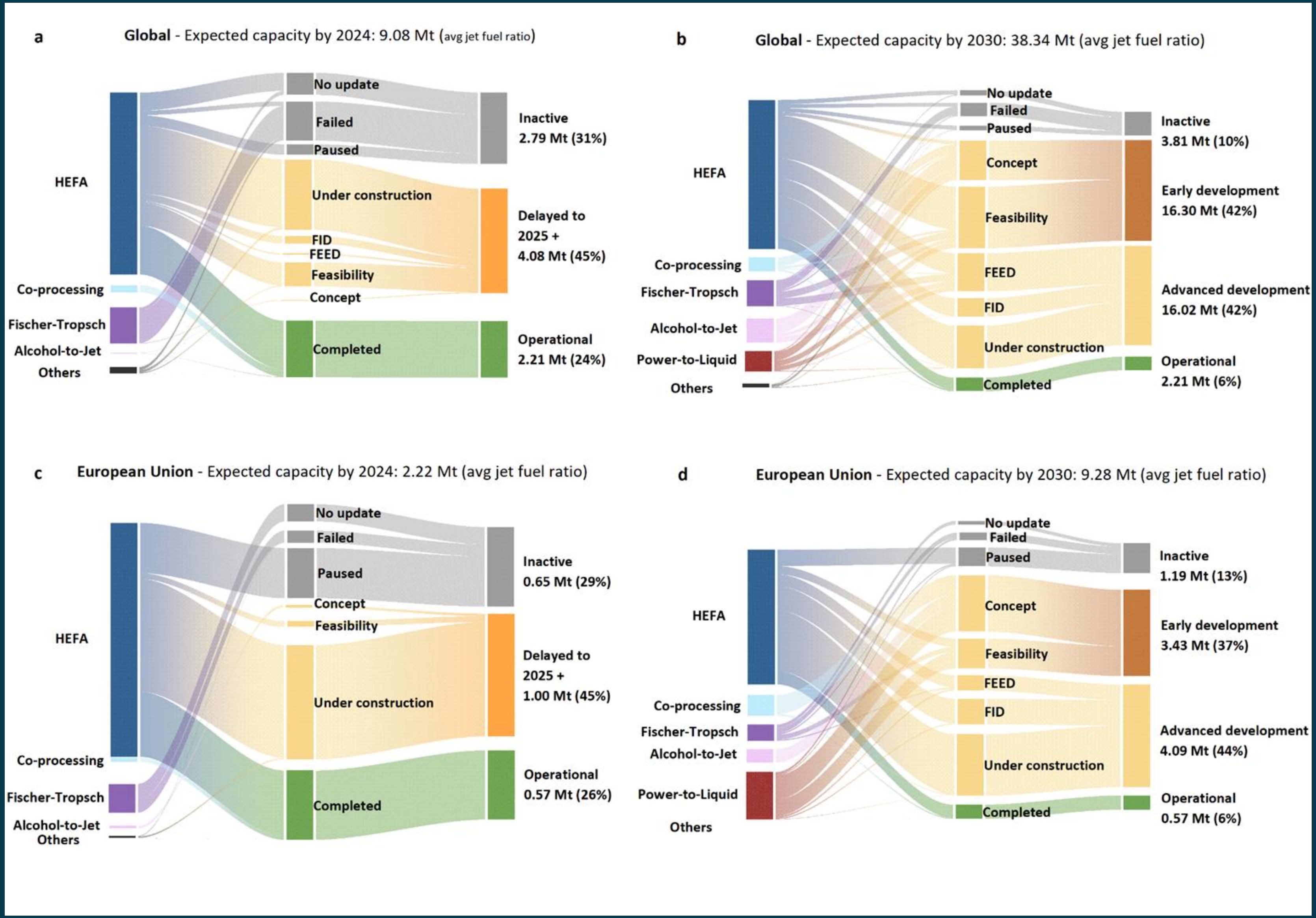
Global:

Only 24% of announced capacity to be operational by 2024 was realized on time

EU:

Only 26% of announced capacity to be operational by 2024 was realized on time

SAF Production Capacity Development Status



- **42% of global announced capacity by 2030 remains in early development stages, 10% inactive (failed, paused)**

Realization gap likely to increase

Conclusions

- Debate surrounds the pace and scale of the SAF market ramp-up, contributing to uncertainties about the potential to meet climate targets.
- A Global SAF capacity DB has been developed to address this
- By 2024, only 24% of the announced capacity was realized on time. This has led to a growing realization gap between announced and operational capacity.

Two key policy takeaways:

- Low realization rates suggest that relying only on company announcement plans to project future SAF production is unreliable → address barriers that limit SAF production capacity scale-up
- The availability of SAF risks being outpaced by jet fuel demand, forcing the aviation sector to continue relying on fossil-based jet fuel → foster SAF high-growth rates

Thank you for your attention!

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Stargate within EU Green Deal