PEOPLE, ENVIRONMENT AND DEVELOPMENT FOR A CHANGING LAND

Roadmap to Net-Zero: a shared commitment

Marco Troncone – CEO

Rome, 21 September 2022

The current context shows significant critical issues with respect to the climate change challenge


Bloomberg Green

Tense Mid-Year Climate Talks Raise Concerns of COP27 Flop

The divide between rich and poor nations widened after two weeks of fraught negotiations in Germany.


The Financial Times Limited 2022.

Failure of US climate leadership compounds fears for COP27 summit

Supreme Court ruling is latest setback to global climate efforts that are being undermined by Russia's invasion of Ukraine


THE NEW STATESMAN

Does anyone care about Cop27?

Negotiators are meeting in Bonn to drum up momentum for the summit in Egypt, but international tensions won't help climate diplomacy.

- Overall, the outcome of **COP26** (Glasgow Climate Pact) **was perceived to be ambiguous, while COP27** (scheduled to take place in Egypt in November) risks failing to produce concrete results, rendering even the EU **'Fit for 55'** initiative **less effective.**

- The **current geopolitical and macroeconomic** context appears to impose a different order of **priorities with respect to climate change:**
  - **energy security** as the main focus, **carbon footprint** reduction as a **secondary priority**
  - **post-conflict Russia-Ukraine political trends** complicate effective alignment on a global agenda (e.g. China) and actions that favour a 'just transition' for disadvantaged countries

- **Public opinion and local politics** appear to distract from tackling this issue, the climate challenge does not appear to be central

In the meantime, the problem remains and will only worsen: the pact will have to provide credible and scientific answers

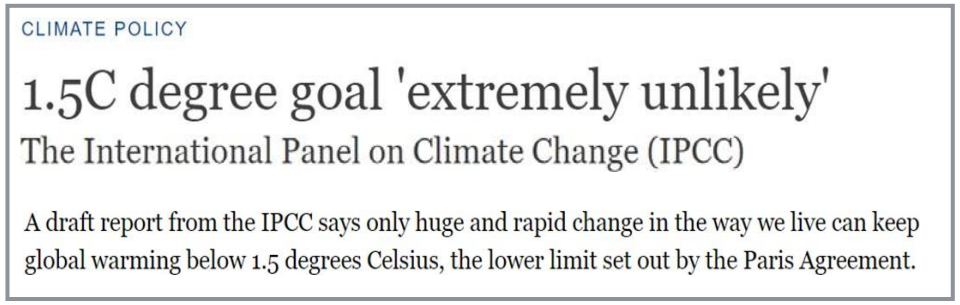

NewScientist

The world's 1.5°C climate goal is slipping out of reach - so now what?

Scientists say it is still theoretically possible to limit global warming to 1.5°C, but realistically that now seems practically impossible. Should we admit our failure and double down on holding warming below 2°C?


We have 48% chance of breaching 1.5°C target by 2026, says Met Office

The world could soon temporarily overshoot the 1.5°C warming threshold – showing how close we are coming to missing the Paris Agreement's target


CLIMATE POLICY

1.5C degree goal 'extremely unlikely'

The International Panel on Climate Change (IPCC)

A draft report from the IPCC says only huge and rapid change in the way we live can keep global warming below 1.5 degrees Celsius, the lower limit set out by the Paris Agreement.

1) Source: NOAA

- The targets set for combating climate change are clear but objectively challenging
  - for 2050, containment of **global warming to within +1.5°C (Paris Agreement** target), phasing out fossil fuels
  - 2030, reduction of EU emissions by 55% ('Fit for 55')
- Objective risk of target revision well ahead of schedule (the first half of 2022 recorded a global average temperature 0.85° higher than the 20th century average[1]))
- Predictable rapid growth in public awareness and sensitivity, **decarbonisation is set to return strongly to the top of global agendas** in the medium term

Work in progress

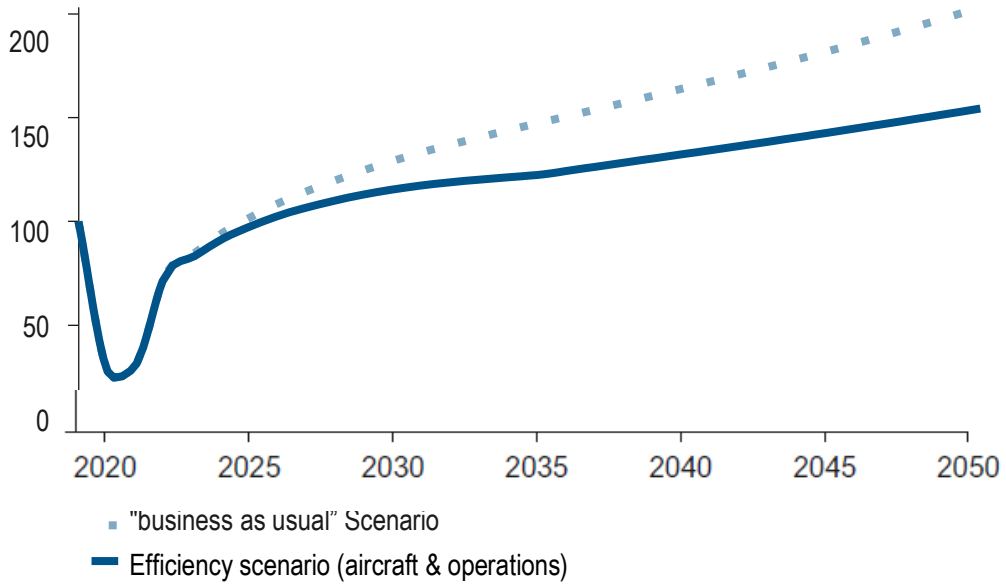
In this perspective, the airline industry risks finding itself in a dangerously vulnerable position for the coming years

Net CO_2 emissions [indexed, 2019 = 100]

Aviation1) share of total CO2 emissions

<3% → ≈ 5% → ≈ 10%

Situation as of 2019 | Possible increase by 2030 | Hypothetical 'no action' scenario in 2050



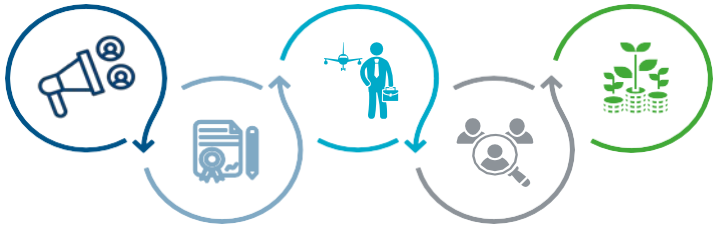
1) Forward-looking data assume that decarbonisation targets will be achieved (or approached) by the other sector

- The **relatively small weight of the sector (<3%)** in terms of CO_2 emissions is :
  - in itself not an alibi **(≈ 1 bn tonne CO_2** pre-Covid)
- at high risk of temporary growth in the short term due to increased **air traffic and the evolution of other** less 'hard-to-abate' **sectors**

- **In the short term**, an **increase in absolute emissions** is possible, if the traffic growth trend continues against a carbon intensity not yet significantly reduced

- In the absence of adequate management of expectations (concrete and realistic prospects), there is a real risk that the sector will find itself displaced
  - Hostility from the market/finance and public opinion ('flight-shaming')
  - Risk of short-range restrictive policies (restrictions)
  - Risk of punitive policies in the medium to long term (taxation)

On the other hand, the sector is crucial and must be supported, through solutions that are not necessarily immediate but are realistic and effective



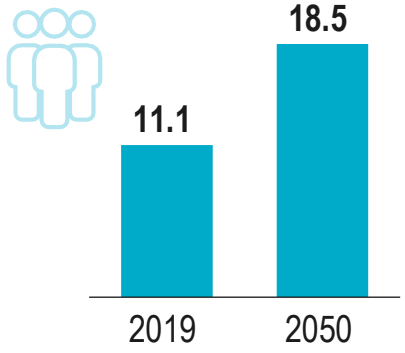
Restrictive laws and new taxes

Abandonment of talent

- For the sector to continue towards decarbonisation, a proactive approach by all stakeholders is crucial in order to avoid a potential vicious circle and instead nurture long-term sustainable growth

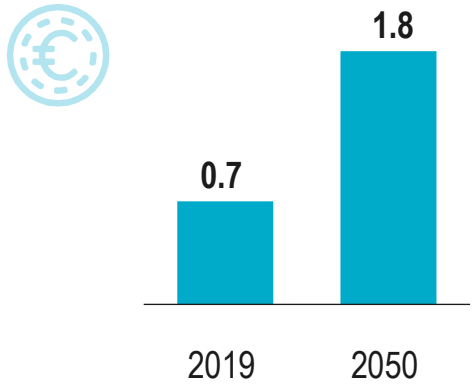
Employment contribution of aviation in Europe1)

[mln workers].



Aviation's contribution to GDP in Europe1)

[EUR tln, 2019 prices].



- Risk of **serious impacts on the sector** (dangerous and harmful impoverishment) and the community (reduced access to air transport, social costs)
- The sector can and must find the necessary resources **within itself for decarbonisation**

1) Includes direct, indirect, induced and catalysed work (e.g. tourism)

Source: Oxford Economics

Work in progress

Decarbonisation requires that ecosystem actors play an active role in a shared roadmap

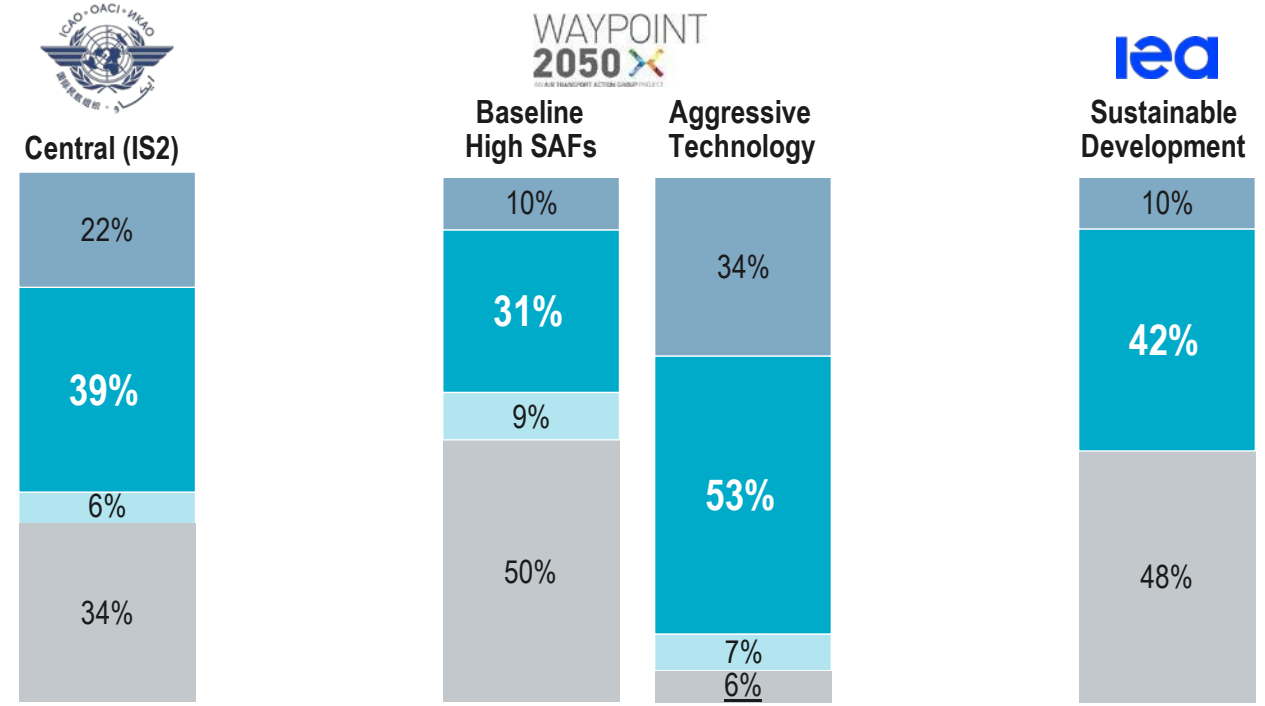
Source: Clean Aviation Joint Undertaking (CAJU)

Work in progress

Sustainable Aviation Fuel (SAF) is the most effective decarbonisation lever according to several independent institutes

Key levers of decarbonisation Independent global decarbonisation forecasts, 2050

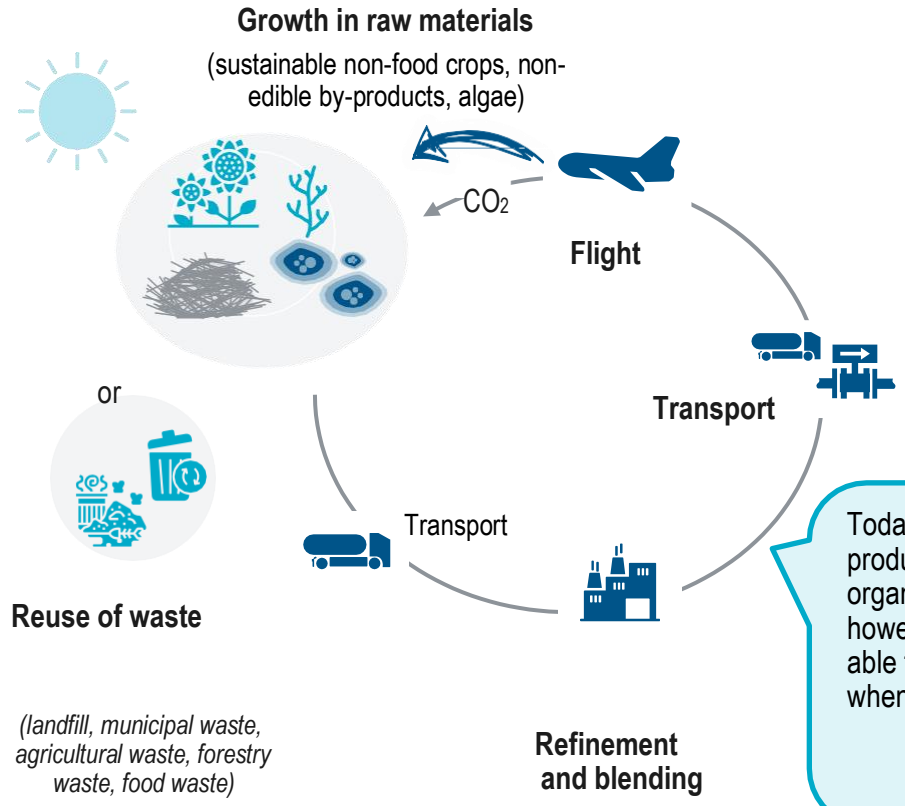
- Aircraft technology development (incl. electric, hydrogen, hybrid)
- **Using Sustainable Aviation Fuel (SAF)**
- Operational and infrastructural improvements (ATC and network)
- Residual emissions to be offset (market-based measures, DACCS)



Work in progress

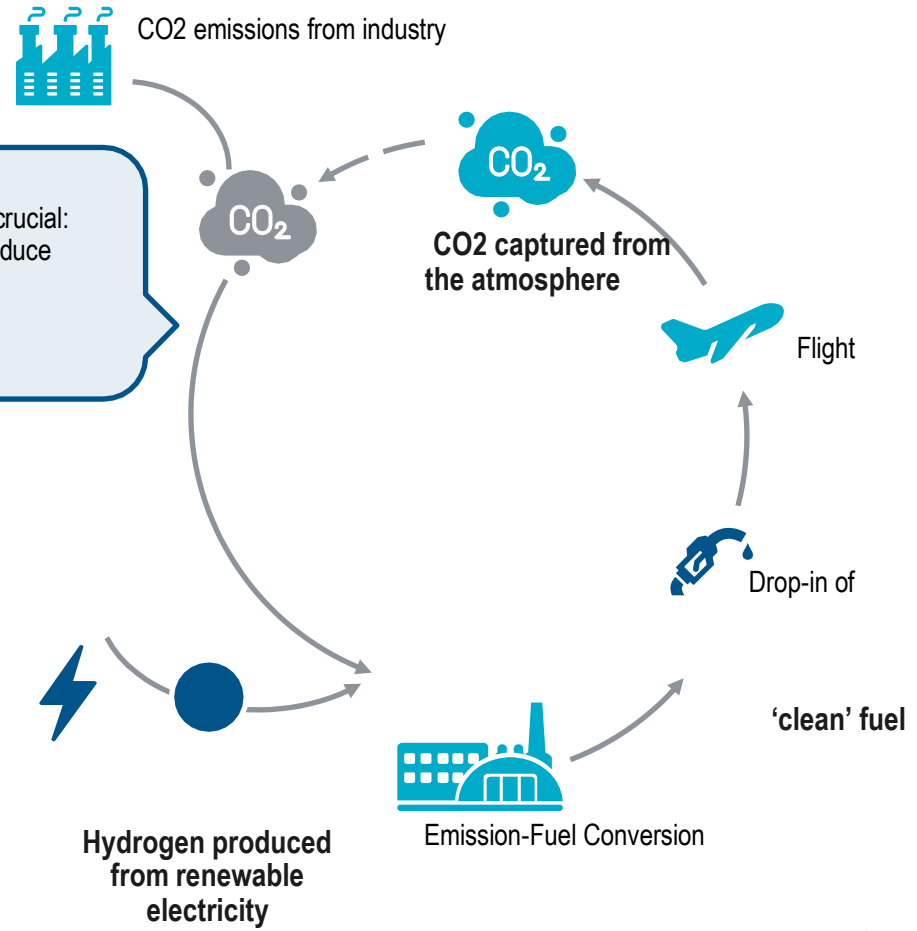
SAF from feedstock is the most immediate solution, but it will not be sufficient to meet market demand: investment is also needed on synthetic SAF

Bio-based SAF (HEFA)



Today, SAF is mainly produced by synthesis from organic raw materials: however, organic SAF will be able to meet 5-6% of demand when fully operational

SAF sintetici (Power to Liquid – PtL)



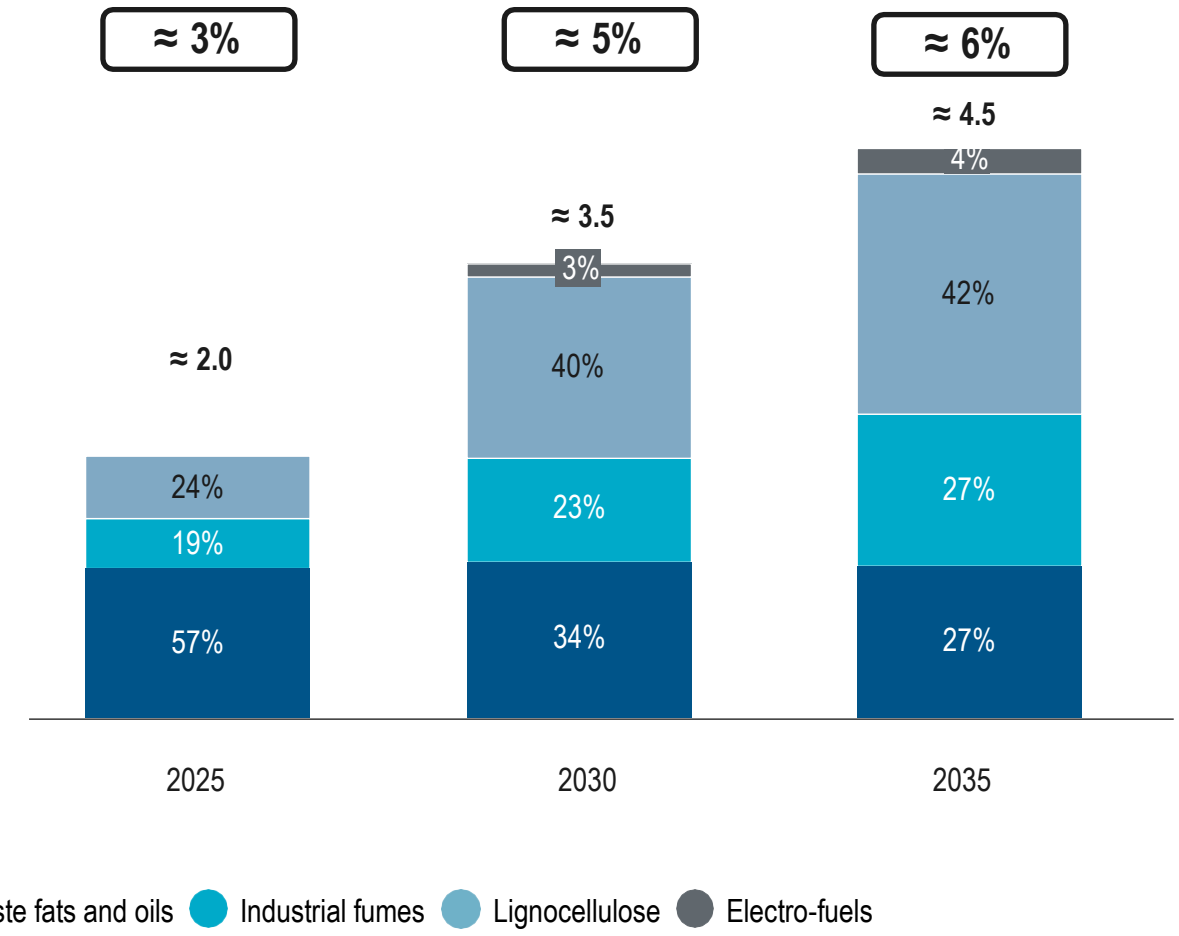
Mass production of synthetic SAF will be crucial: investment is needed to gain scale and reduce industrial costs

Source: IATA, Solar Impulse, Roland Berger

Work in progress

The feedstocks available for 'biological' SAF are in fact limited and will only partially support the transition

Production estimates of bio-based SAF in Europe [mln tonnes].



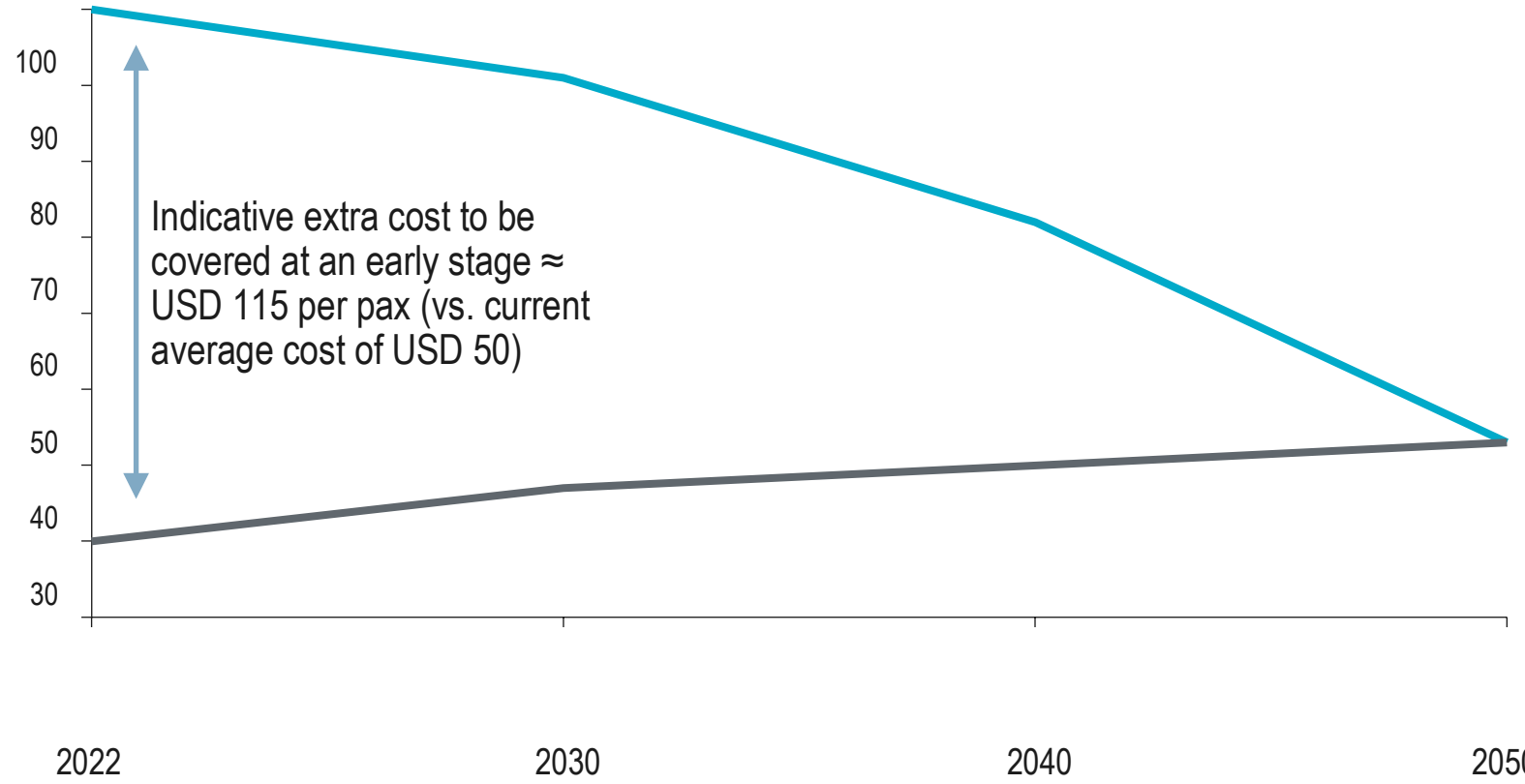
- Maximum share of fuel demand covered by SAF - According to an ICCT paper (2021), the feedstock base available in Europe would be sufficient to produce up to 12 million tonnes of SAF per year
- However, technical and economic constraints make significantly lower volumes realistic: no more than ≈ 3.5 Mt by 2030 (5.5% of fuel demand
- Need to bring the ‘e-fuels’ alternative (from C02 and green H2) to cost-competitive levels in the medium term.

Source: International Council on Clean Transportation (2021)

Work in progress

Market studies show how investment and scale, supported by subsidies, will bring SAF prices in line with the fuel currently in use

Estimated SAF vs. jet-fuel prices with carbon price [indexed, SAF price (without subsidies) 2022 = 100].



Source: IATA

Example

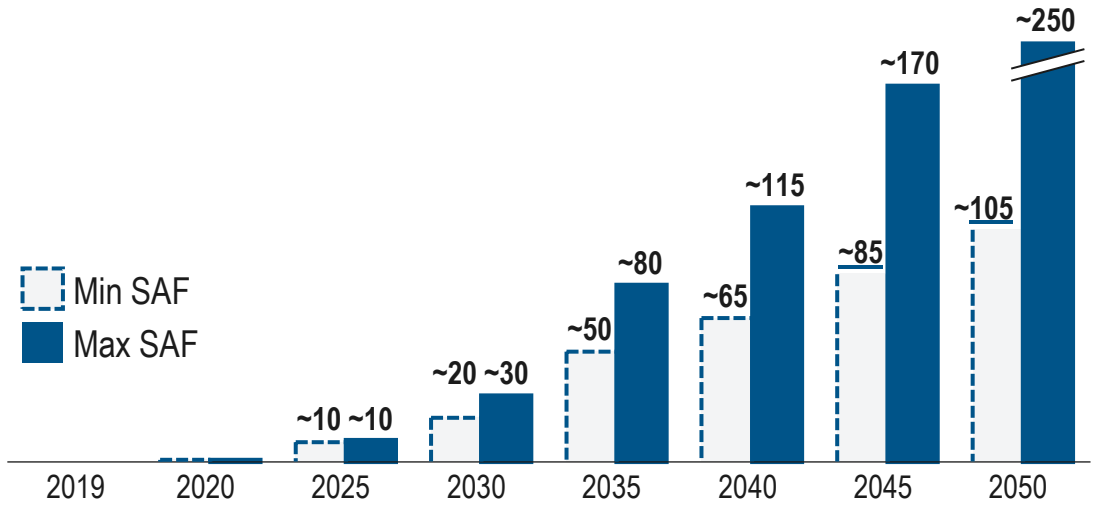
- Fuel costs now account for ≈ 25% of the cost structure of airlines worldwide (source: IATA)
- In an airline crisis (losses of ≈ EUR 10 bn in '22) the extra cost for SAF must also be borne by pax and communities

Subsidies will substantially accelerate the availability of bio-based SAF and the industrialisation of synthetic 'Net-Zero' fuels

Hydrogen will play a significant role in the medium and long term, and will be decisive in achieving 'Net Zero Emissions' targets in the coming decades

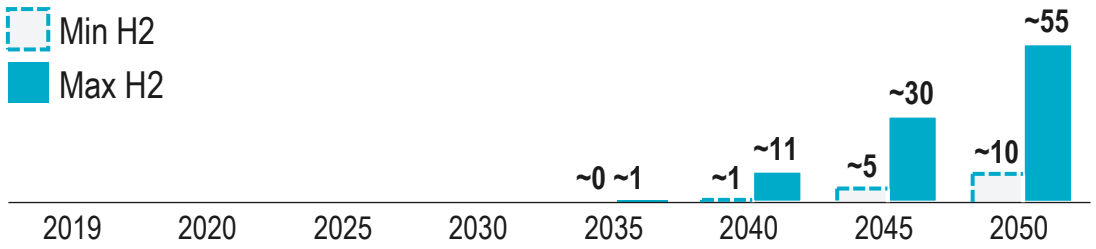
Sustainable aviation fuels (biobased and synthetic) [mln tons]

Share of powered flights in 2050: ~55% / ~20%



Liquid hydrogen [mln tons]

Share of powered flights: ~35% / ~5%



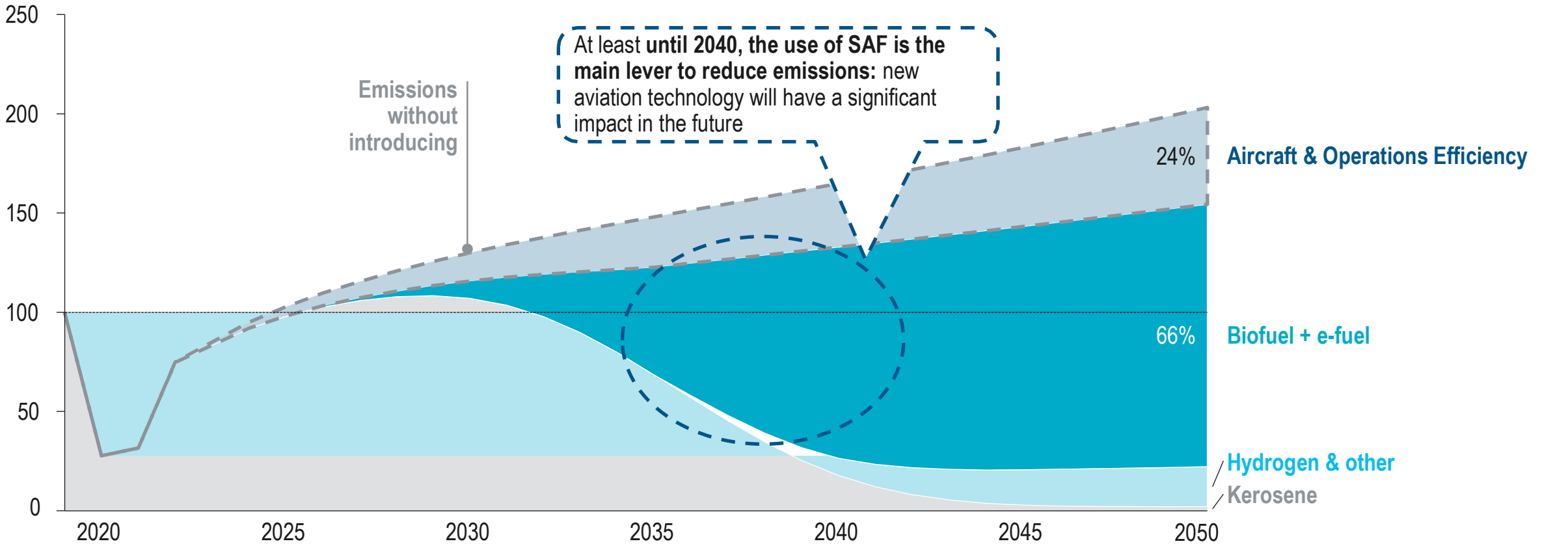
Note: "Net-Zero Emissions" Scenario

Source: Roland Berger

Work in progress

The SAF, therefore, will be the first and most important lever of decarbonisation, followed by the development of new technologies in the long term

Net CO_2 emissions [Mt CO_2, indexed, 2019 = 100]

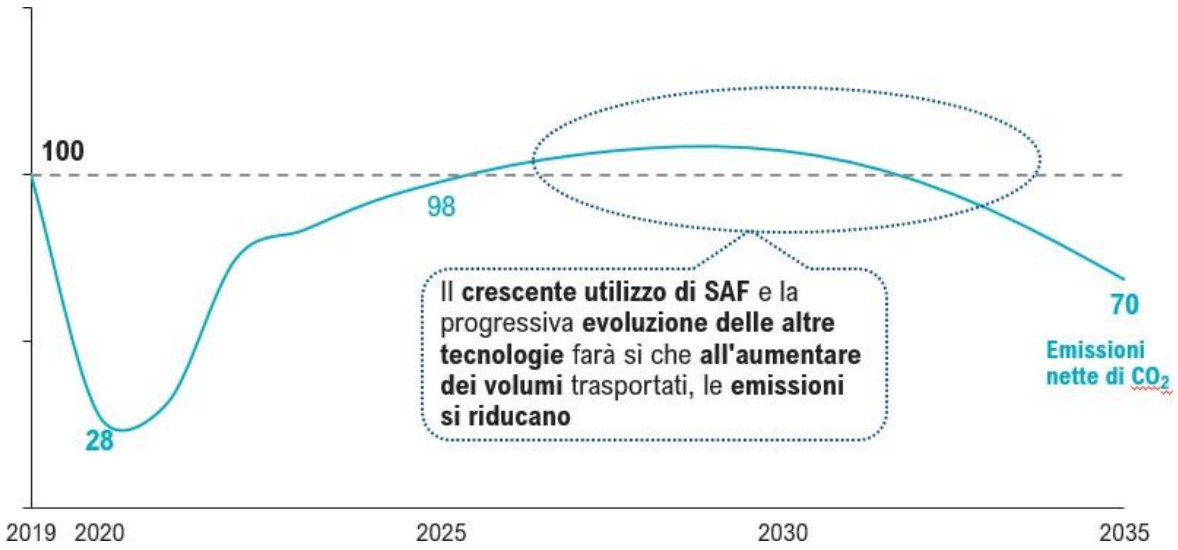


1) Key assumptions underlying forecast: ~2,3% RPK growth over 2019-50, source IATA Traffic Forecast Europe RPK

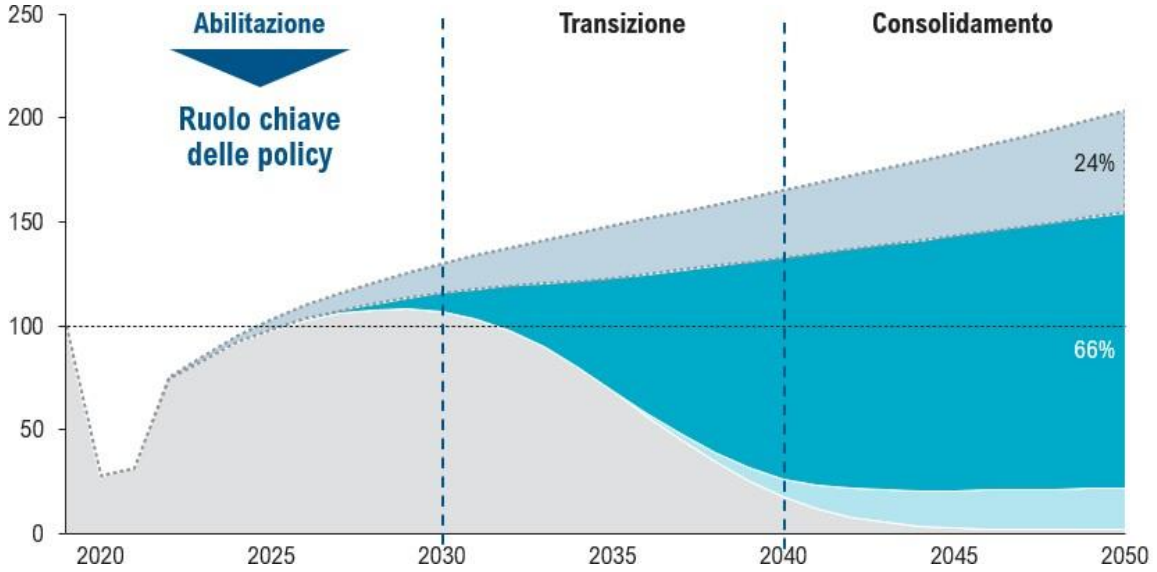
Work in progress

In the short term, CO_2 emissions will grow, but it is precisely in the next few years that temporary policies and incentives to support SAFs will have to be hinged

Net CO2 emissions in Europe, 2019-35 [indexed, 2019 = 100]



Stages of the decarbonisation roadmap

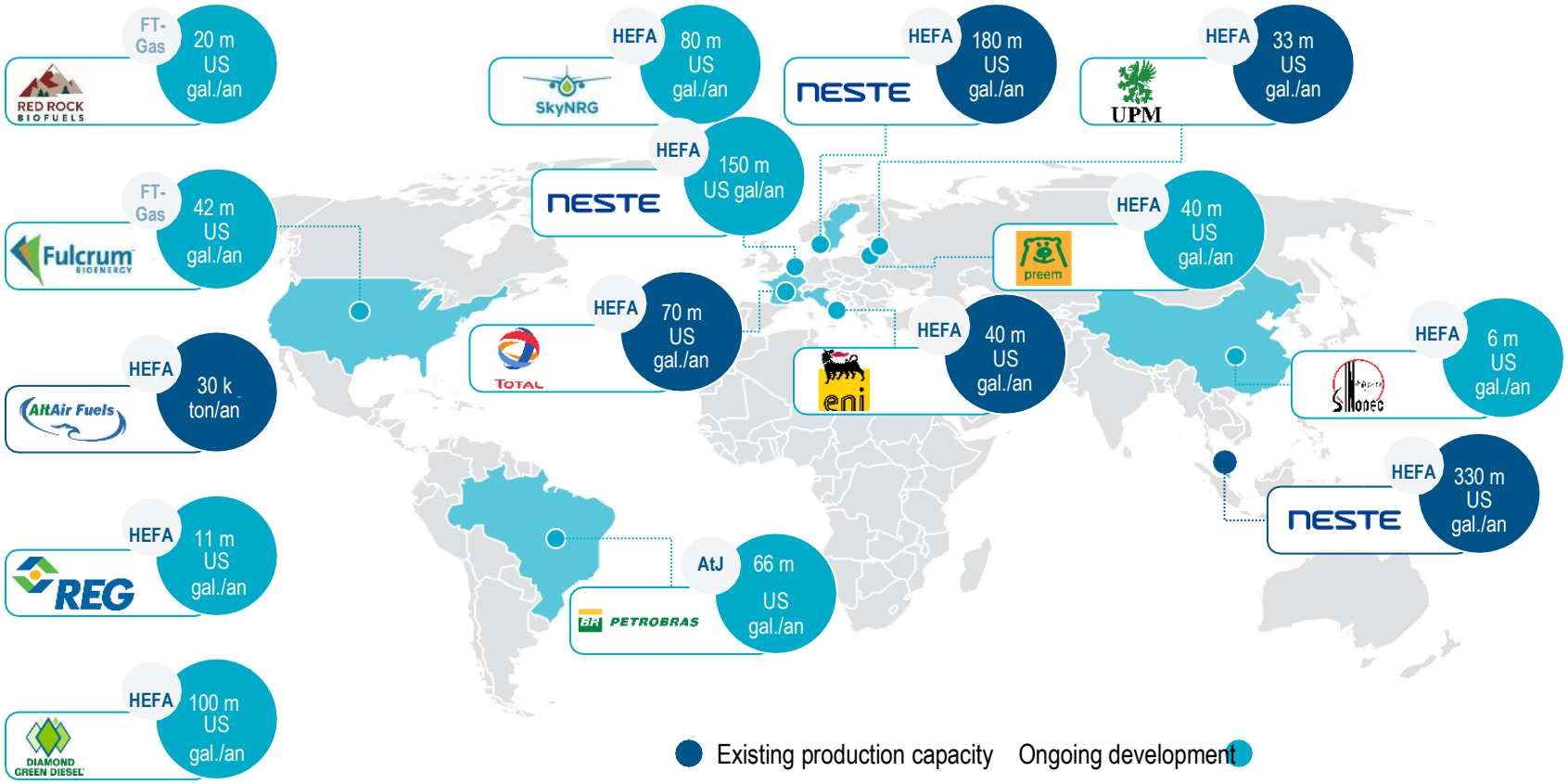


The **rebound of aviation will occur faster** than the **adoption of SAFs** and other technologies: there may be an **increase in CO2 emissions in the coming years**, before the path to Net-Zero in 2050

In the short term, it is necessary **to put in place all the legal and regulatory instruments**, **enabling factors** for **decarbonisation** in the medium to long term

Source: IATA

Several international players are actively working on the development and production of SAF: incentives will be crucial to increase their availability



SAF
Key figures in 2022

360,000 +
Flights also powered by SAF

45 +
Airlines that used SAF

≈ 0.05%
Share of fuel demand covered by SAF

- The **US** ('Inflation Reduction Act', August 2022) provides significant tax advantages for the use of SAF until 2027 (approx. $1.5/gallon)
- In October 2021, the **UK** envisaged an initial package of **GBP 180m in support of SAF**
- **Italy**, Budget Law 2022: **Sustainable Mobility Strategy Fund** (including the adoption of alternative fuels to power ships and aircraft) was created with a total budget of € 2bn in the horizon 2022-2034
- **If not adequately supported, the SAF might only cover a marginal share of European demand in the short to medium term**

Source: IATA, ICAO, S&P Global Commodity

The introduction of regulations enabling the expansion of air transport with clear, binding and achievable rules and objectives in steps is essential

Regulations

1. **Fit for 55** - Avoiding a competitive disadvantage of the sector with loss of connectivity and shifting of traffic to non-European hubs; coherence between blending mandate targets (Refuel EU) and the possibility to produce the necessary quantities of SAF; provision of a 'book & claim' system to avoid fragmentation/decentralisation of production and limit transport emissions

2. **Taxonomy** - Include SAF as a transition fuel and expand the scope of environmentally sustainable activities of airport operators included in the European Taxonomy classification system

3. **Renewables** - Identifying facilitated and fast-track approval routes (PNRR) to enable airport operators to build renewable energy production facilities and energy communities

4. **Taxation** - Avoiding the imposition of new taxes on aviation (e.g. paraffin tax) by redirecting revenues from existing purpose fees to sustainability investments in the sector

Work in progress

There is also a need to identify a roadmap that encourages the production and adoption of SAF on a large scale, consistent with technological evolution

Fuels and propulsion

1. **SAF (bio-fuel)** - Introduce ad hoc measures to ensure that there is sufficient availability of sustainable feedstock to meet demand and adequate allocation between transport modes (e.g. automotive), and that appropriate economic support measures are introduced to incentivise its use

2. **Synthetic SAF** - Stimulating the production chain of synthetic SAF (power-to-liquid/electro-fuel) to accelerate large-scale applicability through research and development incentives

3. **Hydrogen and electricity** - Support, in the medium term, research and development of alternative energy carriers for aircraft propulsion (hydrogen and electricity), also considering transport, distribution and storage infrastructures

Work in progress

Measures taken should favour electric and intermodal mobility, energy-efficient infrastructure and CO2 capture and offsetting

Infrastructure

1. **Intermodality and electric vehicles** - Facilitating rail-to-air and electric/alternative modes of travel to airports, also supporting the electrification of the airport fleet

2. **Airport efficiency and innovation** - Incentivising energy efficiency in airport infrastructure and processes aimed at optimising flight procedures and the introduction of digital innovation systems

3. **CO2 capture and offsetting** - Stimulating CO_2 absorption from the atmosphere and CO_2 capture activities and establishing the National Offset Register