Implementation of Low Emissions Measures: Sustainable Aviation Fuels

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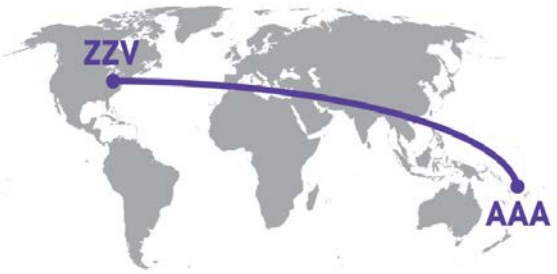
To represent, lead and serve the airline industry

The birth of commercial aviation: 1914

The Aviation Prize

CONNECTING THE WORLD

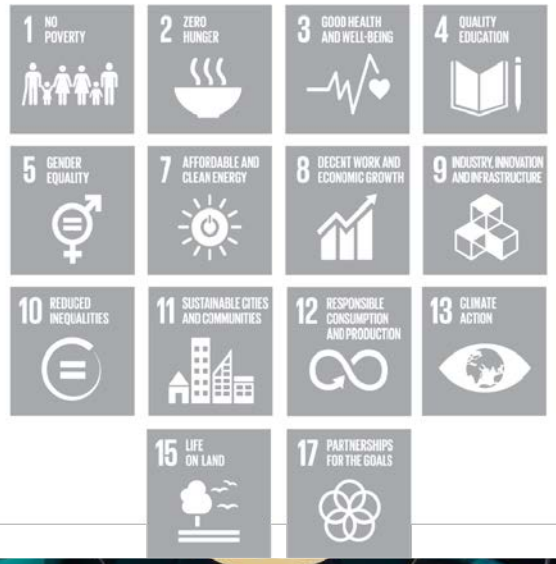
4 BILLION PASSENGERS
51,000 ROUTES



35% OF WORLD TRADE
54% OF GLOBAL TOURISTS

SUPPORTING GROWTH

62.7 MILLION JOBS
$2.7 TRILLION IN GDP
14 SDGS SUPPORTED



EFFICIENCY GAINED

FUEL EFFICIENCY ↑ 2x
SINCE 1990

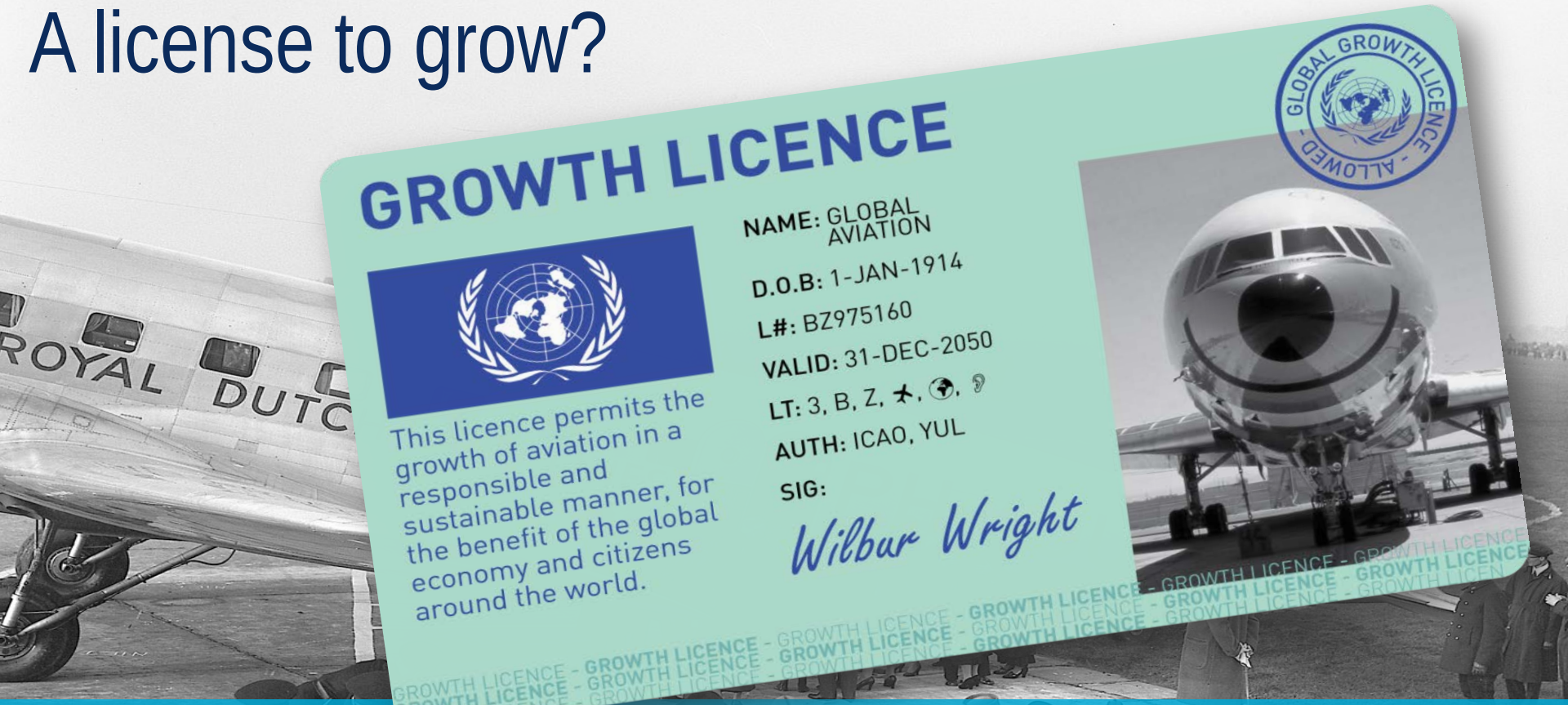
80% REDUCTION IN CO_2

100+ AIRPORTS WITH SOLAR

56m TONNES CO_2 SAVED
THROUGH WINGLETS SINCE
2000

www.enviro.aero/climatesolutions

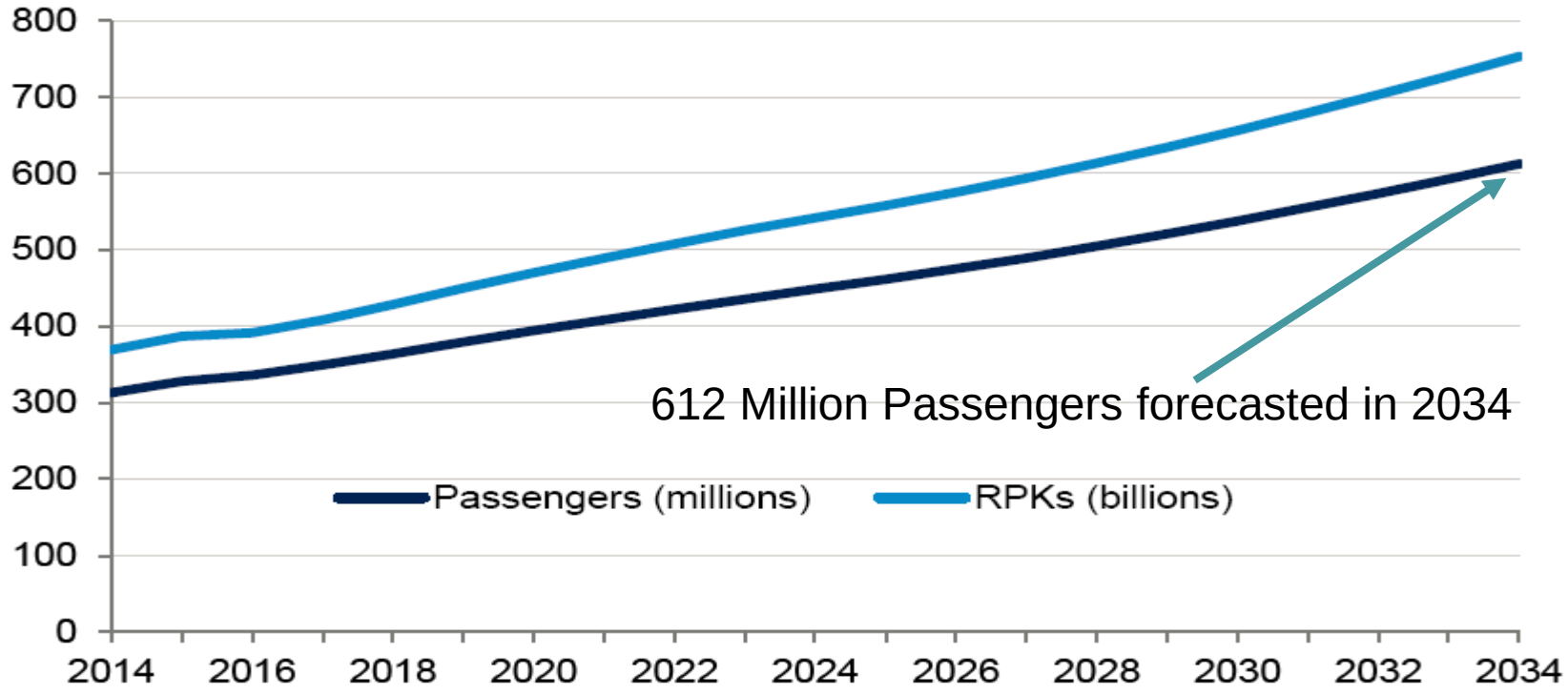
A license to grow?



More than 70 billion passengers have taken a flight in the first 104 years!

A license to grow in LATAM and the Caribbean

Fig. 13. Unconstrained passenger and RPK forecasts



Source: Oxford Economics, IATA

Setting the strategic direction

GOAL 1

PRE-2020 AMBITION

1.5% ANNUAL AVERAGE FUEL EFFICIENCY IMPROVEMENT FROM 2009 TO 2020.

T O I

GOAL 2

IN LINE WITH THE NEXT UNFCCC COMMITMENT PERIOD

STABILISE NET AVIATION CO_2 EMISSIONS AT 2020 LEVELS WITH CARBON-NEUTRAL GROWTH.

T O I +M

GOAL 3

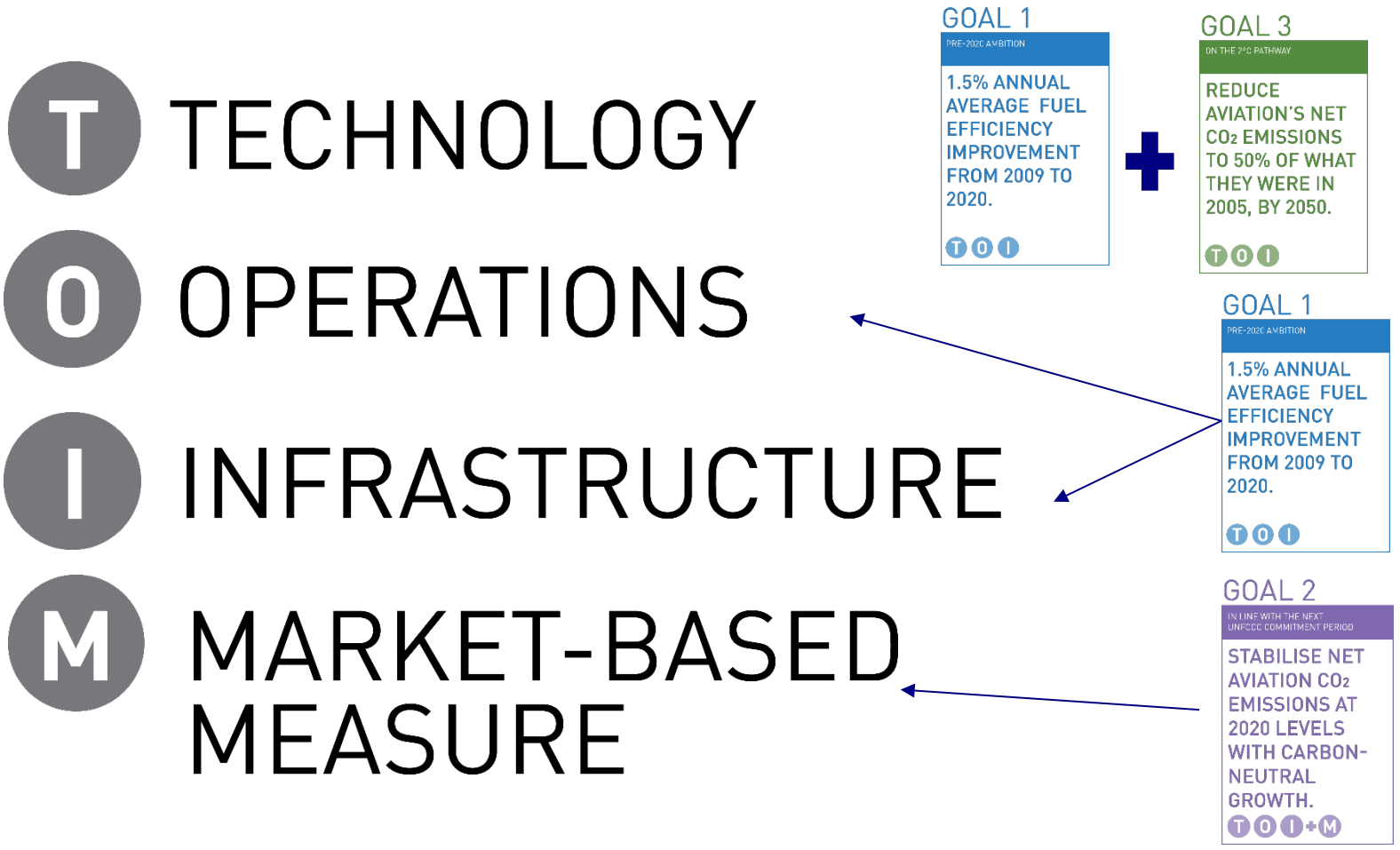
ON THE 2°C PATHWAY

REDUCE AVIATION'S NET CO_2 EMISSIONS TO 50% OF WHAT THEY WERE IN 2005, BY 2050.

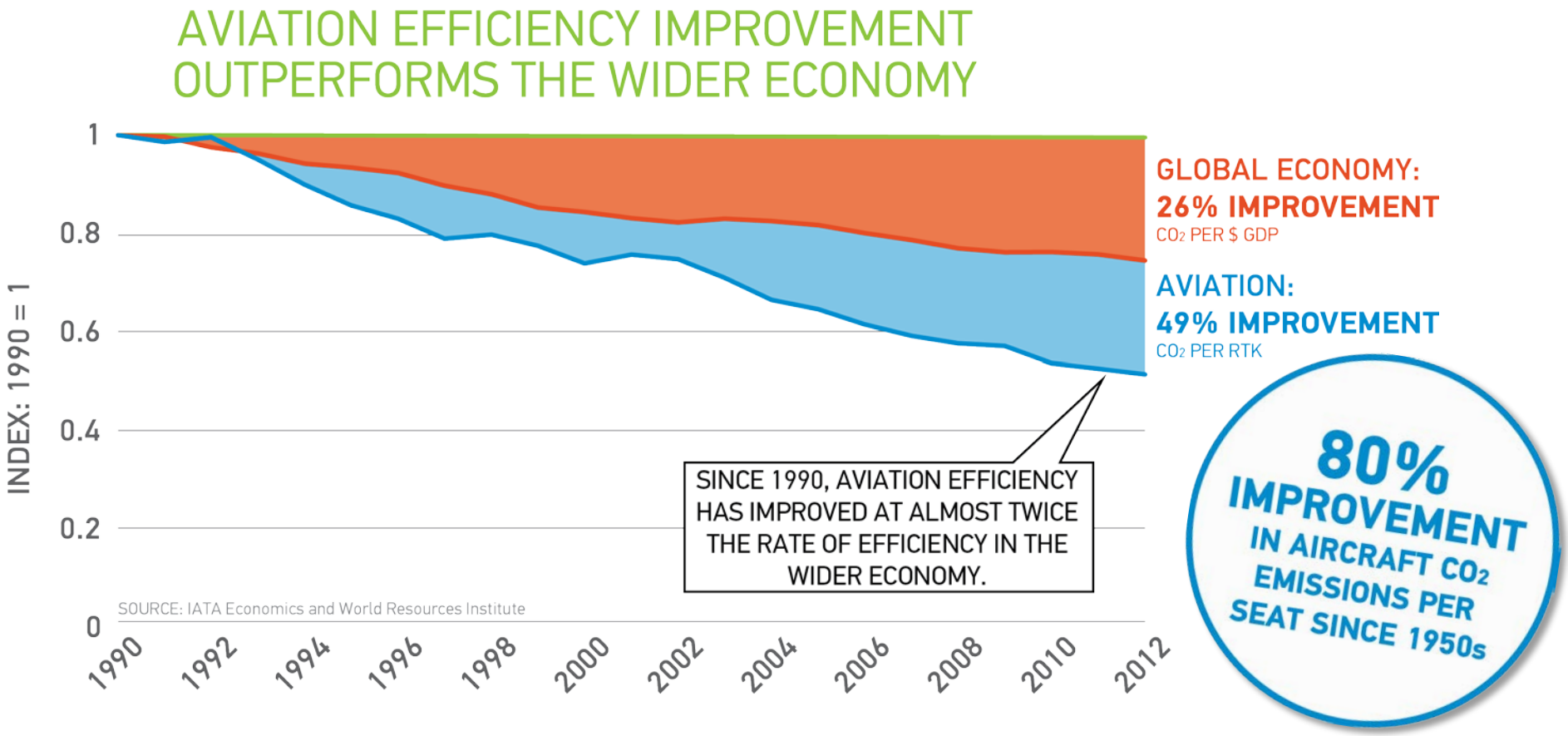
T O I

Tackling the climate challenge

A theme of continuous improvement



Aviation has a strong track record on improving efficiency



Sustainable Aviation Fuel (SAF) – the facts

- First experimental biofuel flight: January 2008
- Massive testing and certification program (through ASTM)
- Now have 5 ‘pathways’ certified for use…
- HEFA (oil plants)
- FT-SPK (biomass, forestry residues)
- FT-SKA (biomass, MSW etc)
- SIP (sugar to hydrocarbon)
- AtJ (sugar, starch, wood residues
- … and another 15+ in the pipeline…
- Drop-in specification vital
- Daily flights from 2016

SAF Facts: Testing and commercial history

- Must be technically certified as fit-for-purpose, just like regular Jet fuel
  - (ASTM d1655 / d7566).
- Meets the same technical specifications as conventional jet fuel, in particular resistance to cold and high energy content
- Sustainability criteria is important: IATA AGM Resolution / SAFUG / EU ETS / CORSIA and other
- All current certifications require some blending with fossil kerosene
- Over 5 billion liters in SAF off-take agreements

Is sustainability important?

June 2017, Cancun *- The International Air Transport Association (IATA) 73rd Annual General Meeting (AGM) approved a resolution calling for governments to implement policies to accelerate the deployment of sustainable aviation fuels (SAF).*

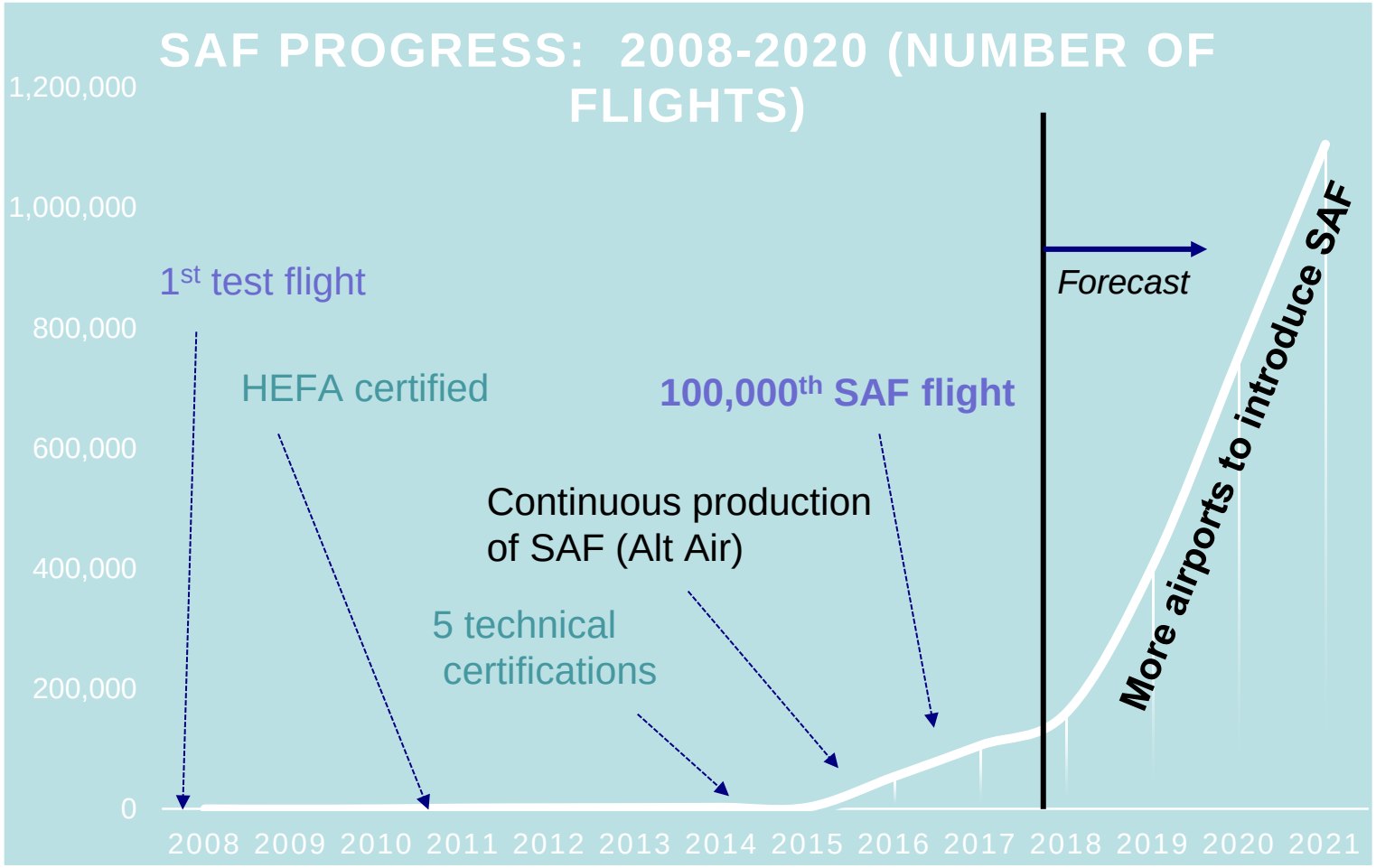
The Sustainable Aviation Fuel Users Group

- As defined by **SAFUG**: **Sustainable Aviation Fuels are those that**:
- Meet or exceed technical jet fuel standards
  - ASTM D7566
- Have significantly lower carbon emissions over their life cycle compared to fossil fuel sources
- Do not displace food crops or jeopardize drinking water supplies
- Minimize impacts of biodiversity
  - Do not contribute to the clearing or conversion of natural ecosystems and areas of high conservation value
- Have a positive socio-economic impact where feedstocks are grown
  - Support the development of government policies which promote the development, certification and commercial use of sustainable, low carbon aviation fuels

Sustainable Aviation Fuel Users Group

Commitment to sustainability exists

Rapid growth in the number of SAF flights

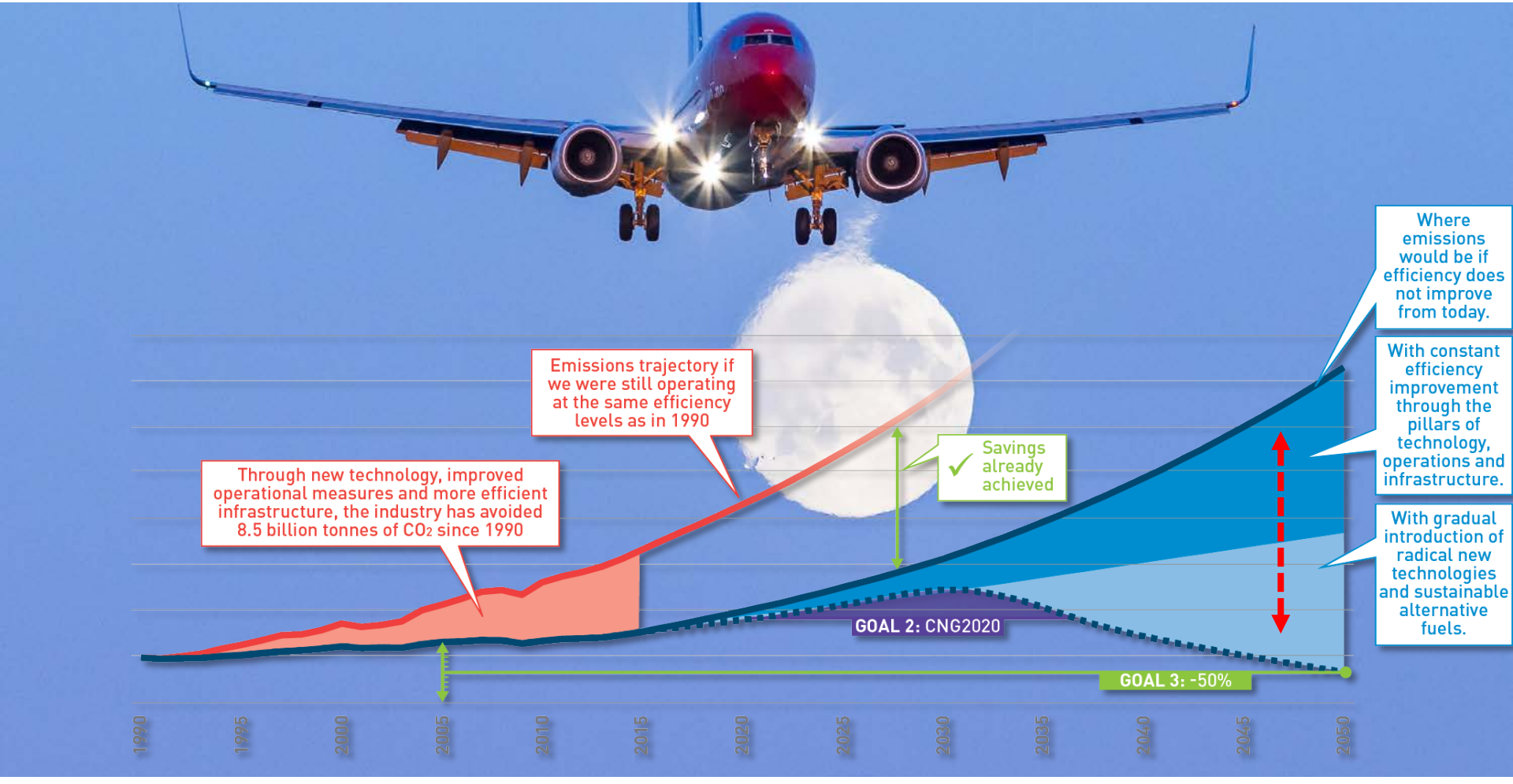


2018 estimated aviation spend on liquid fuel

$140 billion

$0.05 billion

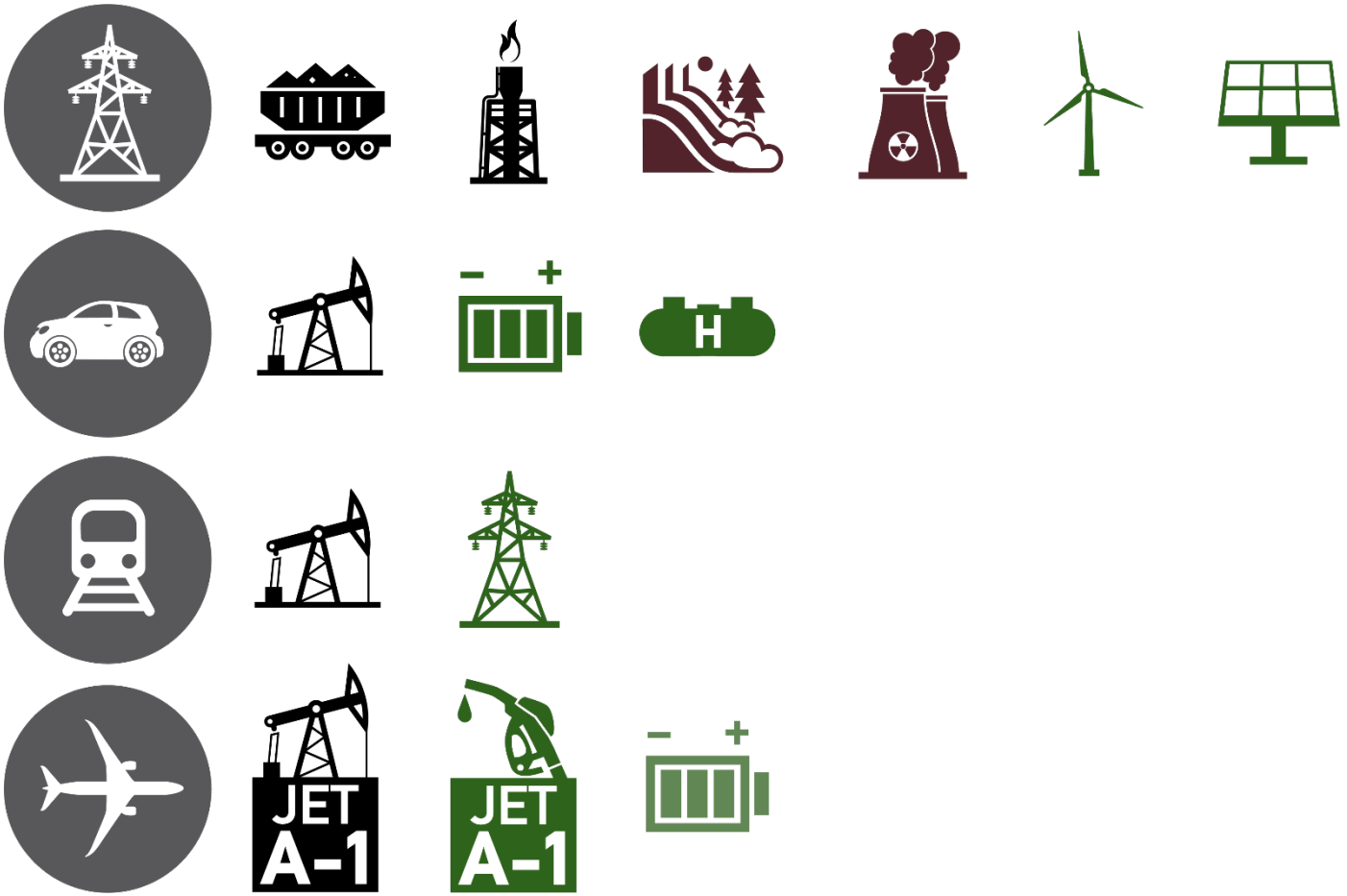
To meet our 2050 goals we need large volumes of SAF



How to make further progress

- ✓ **Research**: continue to develop new sustainable feedstocks and production processes
- ✓ **Infrastructure**: rapid construction (or refurbishment) of production facilities
  - ✓ Estimated there will be a need for investment of around $100bn a year on infrastructure
- ✓ **Policy**: incentives for offtake (or de-risking infrastructure) and a level playing field
  - ✓ Aviation is not yet seen as a potential market everywhere

Diversified energy sources is the future




IATA
AVIATION ENVIRONMENT