



ICAO SEMINAR ON **GREEN AIRPORTS**

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01

Introduction

Rotterdam The Hague Airport

02

Sustainability Strategy

Roadmap

03

Sustainable Aviation Fuels

Short term perspective

04

Hydrogen roadmap

Long term perspective

05

Global perspectives

Is it enough?

01 Introduction

Rotterdam The
Hague Airport





Amsterdam Airport Schiphol



Regional airports

International airports



Rotterdam The Hague Airport



Eindhoven Airport



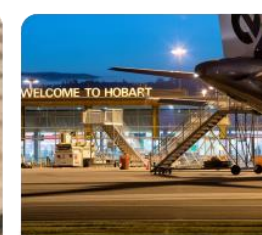
Lelystad Airport



Maastricht Aachen Airport



Brisbane Airport



Hobart Airport



JFK (T4) New York

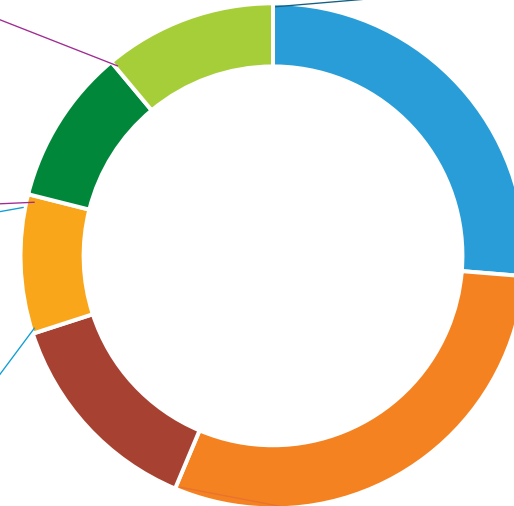
Rotterdam The Hague Airport

Regional Airport in the Netherlands

Pax: 2.224.276

Aircraft movements: 56.480

1. Commercial aviation
2. Business general aviation
3. Recreational general aviation
4. HEMS/police operations



■ Commercial aviation
■ Private
■ HEMS

■ Flight lessons
■ Business aviation
■ Other



Rotterdam The Hague Airport - Credit: [MaykovNikita / DepositPhotos](#) - License: [DepositPhotos](#)

POLITICS BUSINESS ROTTERDAM ROTTERDAM THE HAGUE AIRPORT THE HAGUE HOUSING CRISIS

» MORE TAGS

THURSDAY, 9 MARCH 2023 - 07:00

SHARE THIS:



Rotterdam political leaders drop proposal to close airport to build 10,000 homes

Activists block private jet terminals around the world to protest 'super rich mega polluters'



Schiphol working conditions unsafe & unhealthy, union says

Due to Schiphol always focusing on cutting costs to remain the cheapest airport, employees there are working in unsafe and unhealthy conditions, trade union FNV said to Trouw after surveying 1,100 of its members who work at Schiphol.

Dutch Labor Regulator Tells Schiphol To Cut Workplace Emissions

[Victoria Moores](#) May 31, 2023



TRAVEL | NETHERLANDS

Dutch government plans to cut Amsterdam airport's flights

09/01/2023

Currently, the Schiphol Airport accommodates around 500,000 flights a year, but the government wants it to be capped at 452,500. Airlines are challenging the move.



02 Sustainability Strategy

Roadmap



Sustainability Strategy



Quality Of Life

Responsible
Passenger Journey

Noise &
Air Quality

Communities

Healthy & Inclusive
Working Environment

Engagement With
Local Community

Electric
Aviation

Hydrogen
Aviation

Fossil-free Aviation

Sustainable
Aviation Fuels

Testbed For
Innovation



Biodiversity &
Climate Adaptation

**Sustainable
Airport**

Sustainable
Mobility

Energy Positive



Circular
Economy

Rotterdam
The Hague
Airport

Energy positive airport

Zero-emissions ground operations in 2030



Renewable energy 14 MWp

- 37.000 panels in 7,7 ha
- 3x energy demand of airport



Electric ground equipment

- 45% in 2024 up to 100% in 2030



Fossil free fuel HVO100

- Reduction of 89% CO₂



Electric taxi

- 100% electric taxi from RTHA
- Pilot with autonomous bus from RTHA to the metro station

Towards a circular economy

Zero waste in 2030



Sustainable materials

- Wooden construction
- Measuring embodied carbon



Reuse of materials

- Platform renovation
- Recycled asphalt (50% smaller footprint)



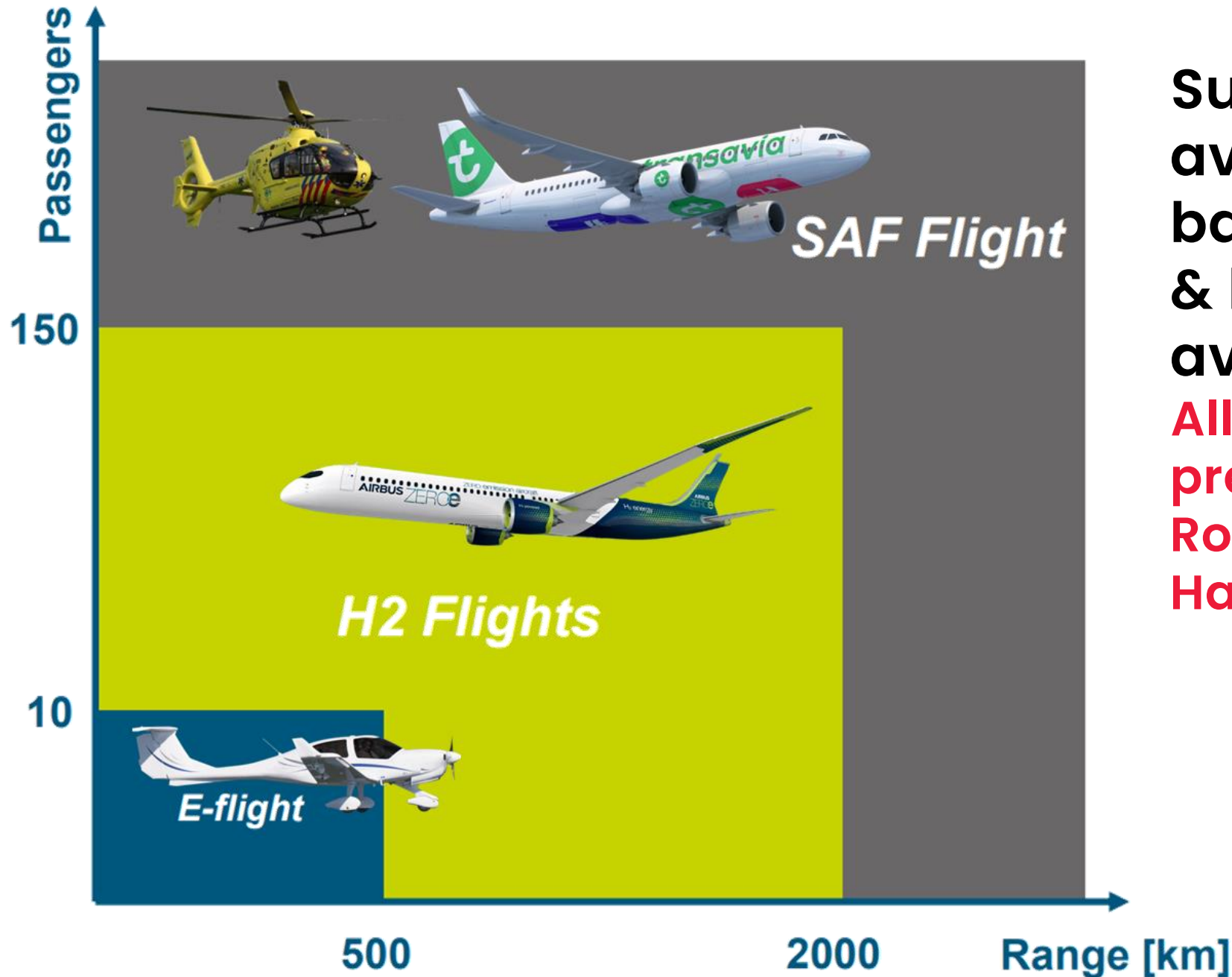
In the terminal

- Waste separation & digital innovations



Food & Beverage

- Buy local & offer biological and plant-based food



**Sustainable
aviation fuels,
battery-electric
& hydrogen
aviation**

**All needed and
present at
Rotterdam The
Hague airport**

FIELD LAB NEXT AVIATION



MARTHA – LAST MILE



RHIA

Rotterdam The Hague Innovation Airport



SMART ENERGY AIRPORT



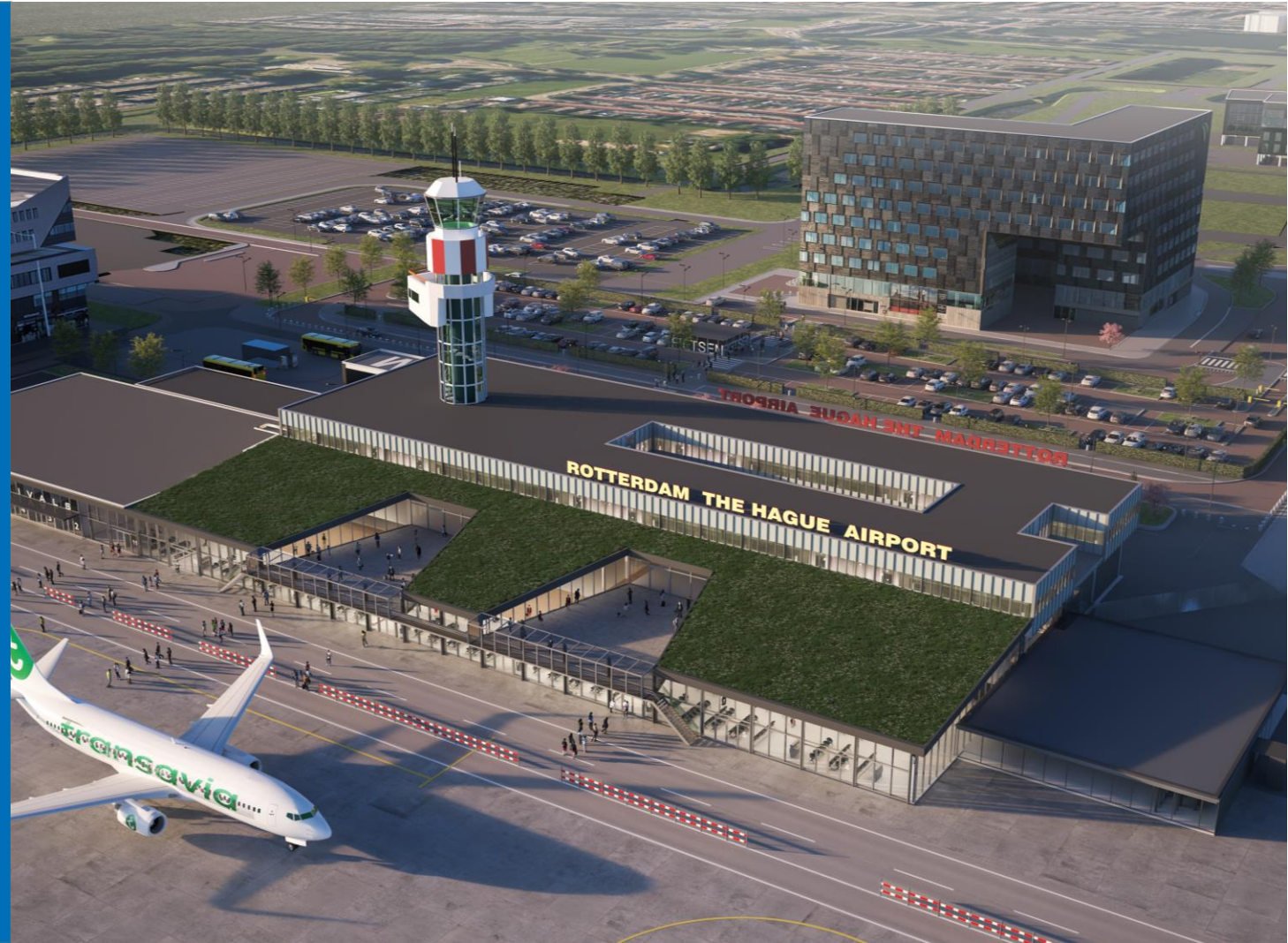
DUTCH2 AVIATION HUB



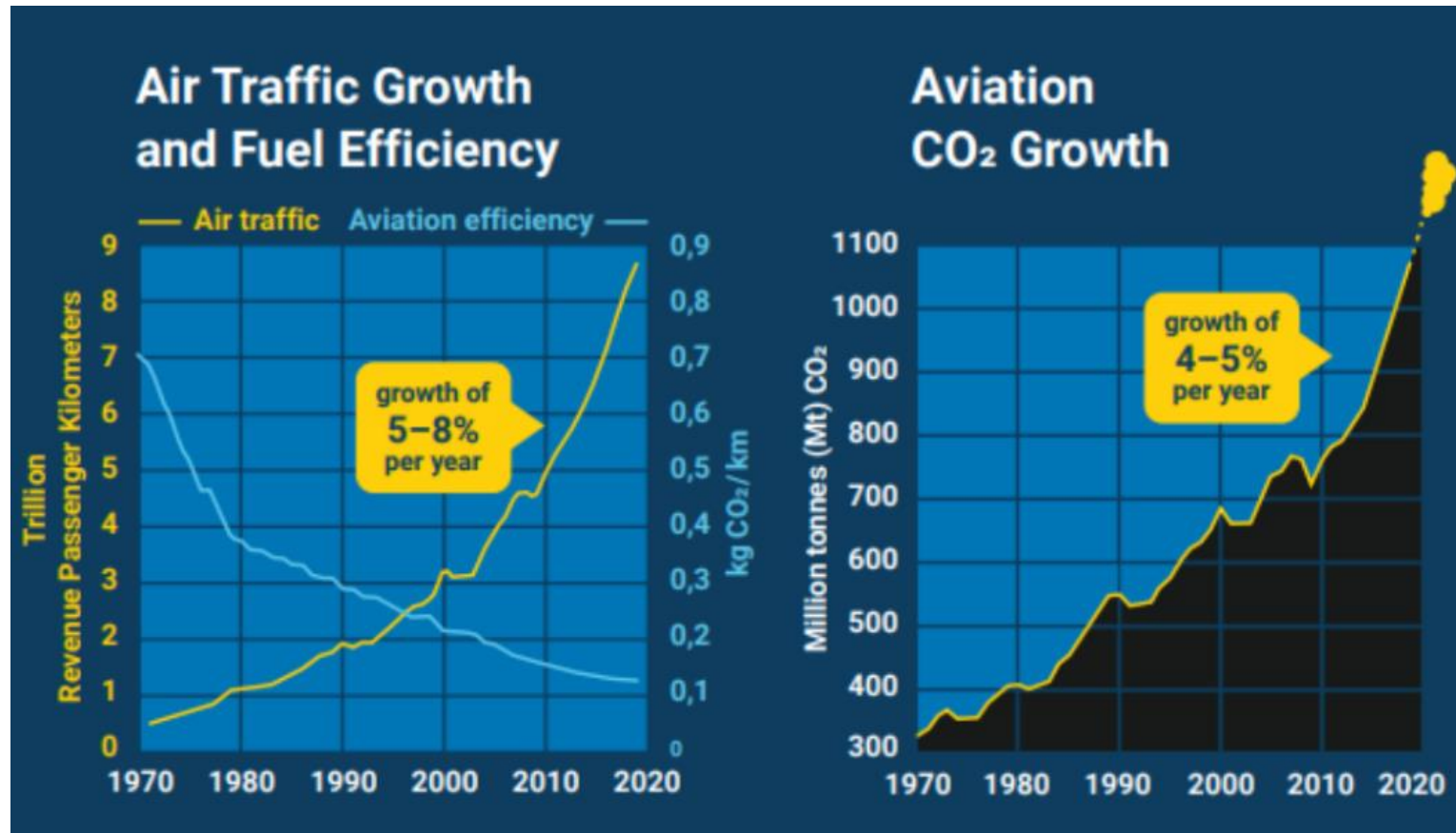
03

Sustainable Aviation Fuel

Short term perspective

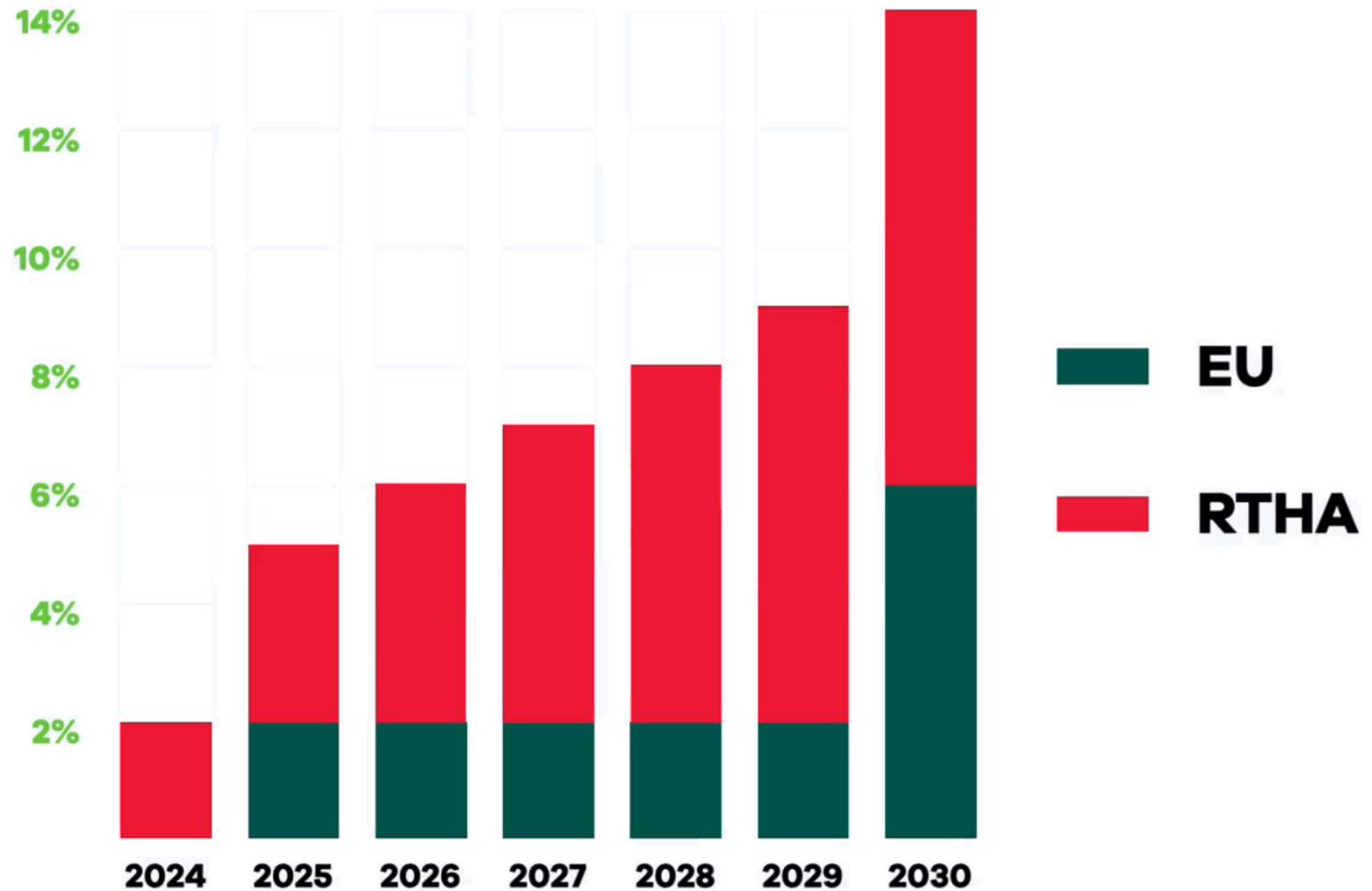


Dramatic carbon intensity reduction in aviation **undone by growth of the industry**



Today, at RTM
SAF is the only
solution.

Therefore, we
have a SAF blend
on top of EU
mandate



04 Hydrogen Roadmap

Long term
perspective

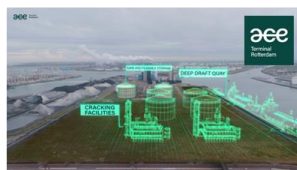


Port of Rotterdam, 'Europe's H₂ Hub'

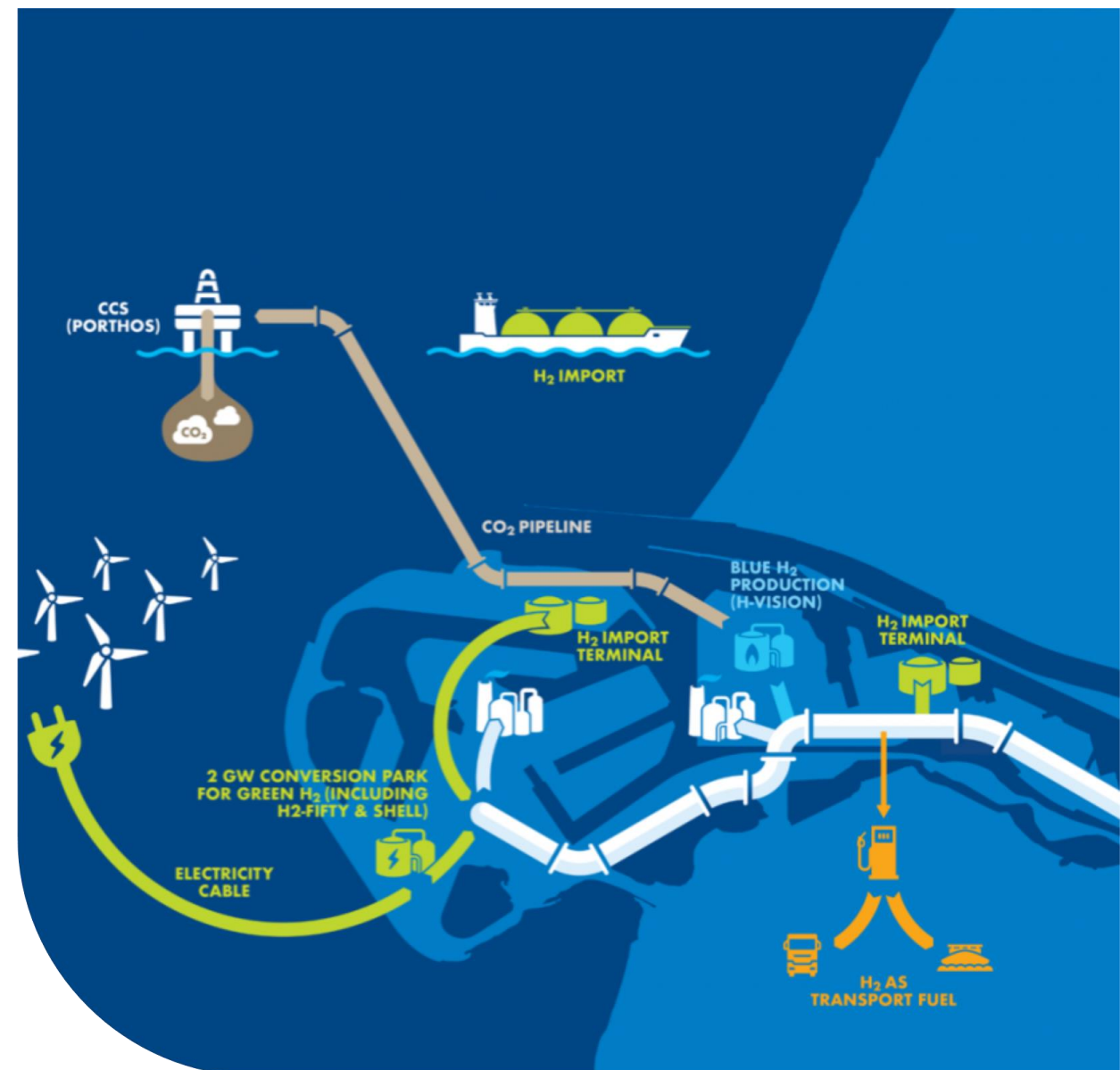
1. H₂ production (wind energy)



2. H₂ import and storage



3. H₂ transport (pipeline, road, rail and barge)



Expected H₂ range, In line with route profile



- Turboprop aircraft
- > 30 passengers
- 400 nm range

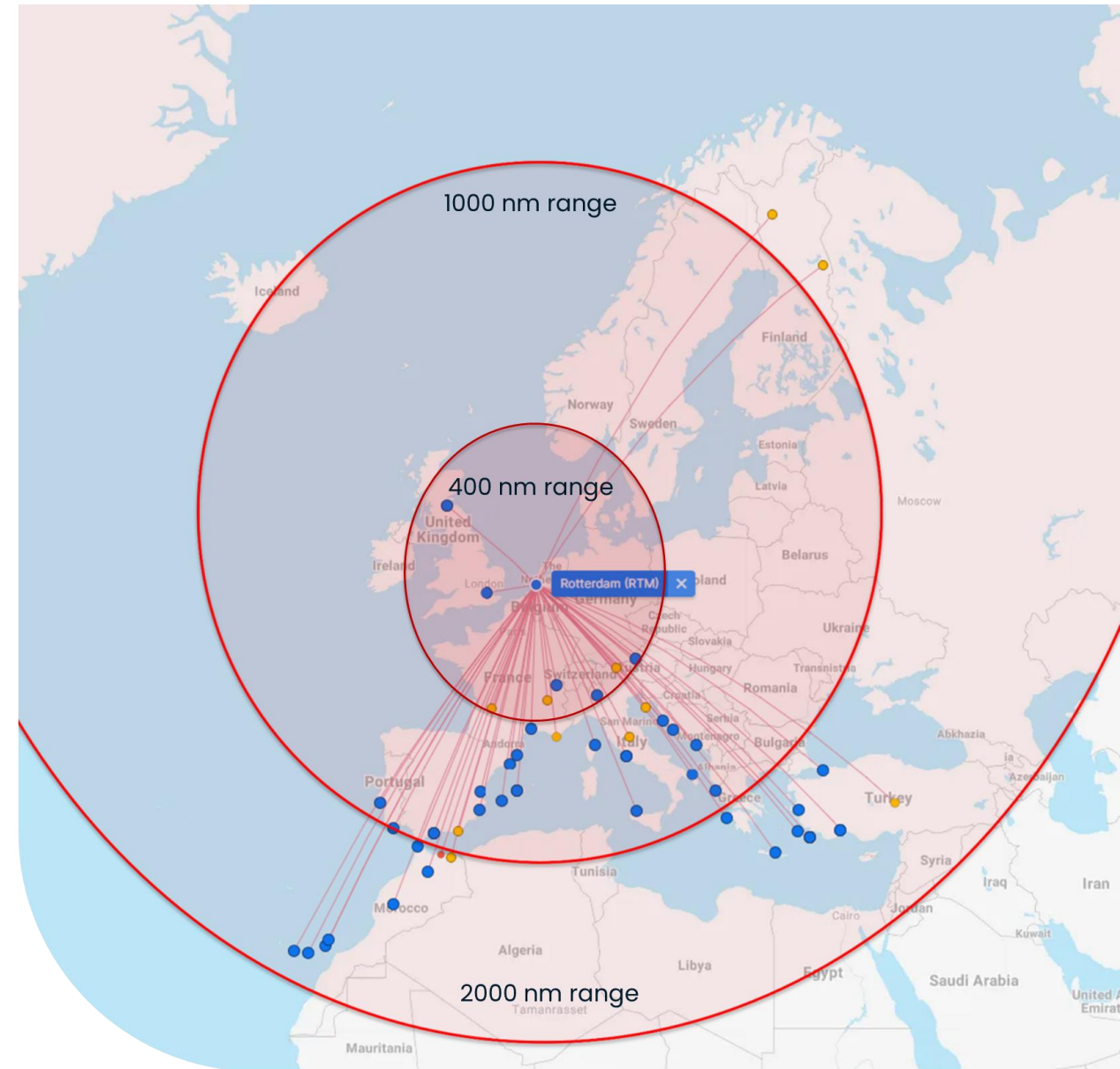


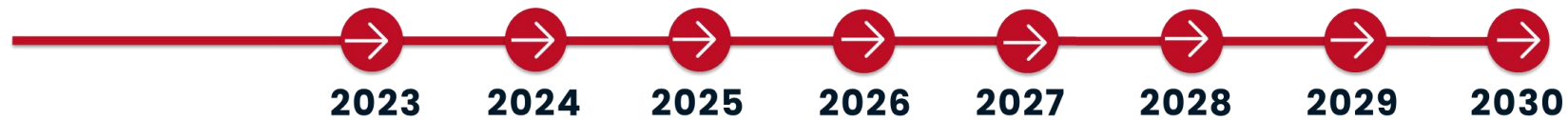
- Turboprop aircraft
- < 100 passengers
- < 1000 nm range



- Turbofan aircraft
- < 200 passengers
- < 2000 nm range

H₂ opportunities at Rotterdam are big. Most of the airport's current routes, **medium- or short-haul**, could be served by future H₂ aircraft.





- NLR Hydra 2 drone
- LH₂ turnaround



- Sling 4 aircraft
- GH₂ and LH₂



- NLR Living Lab Electric Flight
- Range extenders under wings



- Cessna Skymaster
- Retrofitted with a H₂ combustion engine



- Zeroavia ZA600 powertrain on Cessna Grand Caravan
- Mobile refuelling and demonstration flights



- LH₂ aircraft and mobile LH₂ refuelling demonstration
- Testbed for LH₂ developments



- Dutch national programme - powertrain conversion to LH₂
- Retrofit of a DeHavilland Dash 8



Needed H₂ infrastructure



≈ 10 kg



≈ 350 kg



> 3500 kg

Our innovation areas **with the focus on H₂ developments at airports**

...are key for hydrogen to be successful



H₂ airport operations



H₂ storage at airports



H₂ supply to airports



H₂ refueling



H₂ fire safety (training)



H₂ ground operation tests



H₂ safety studies



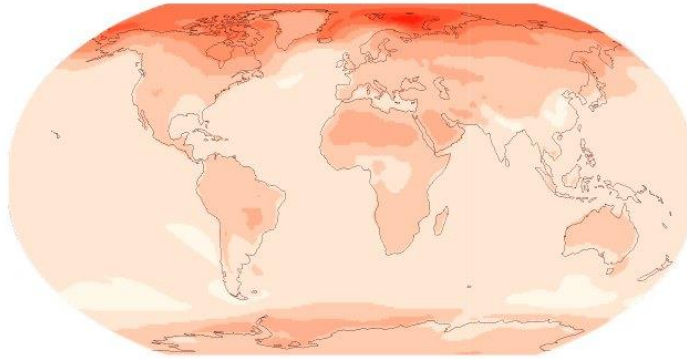
H₂ commercialization

05 Global perspective

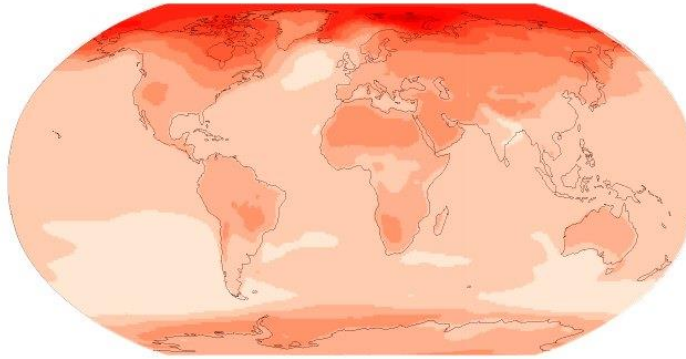
Is it enough?



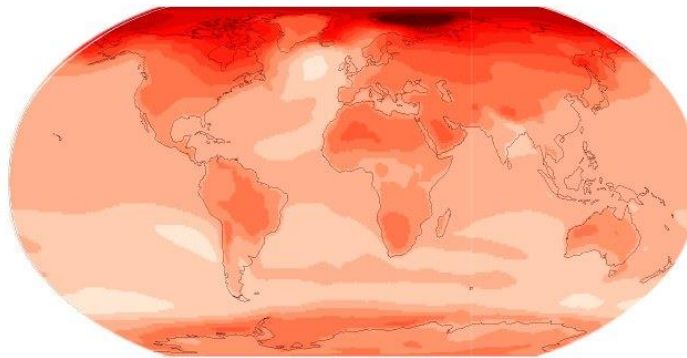
Change at 1C global warming



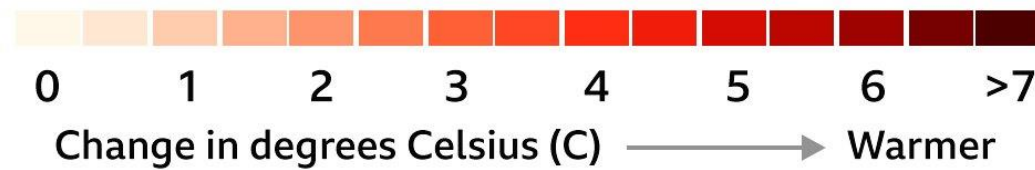
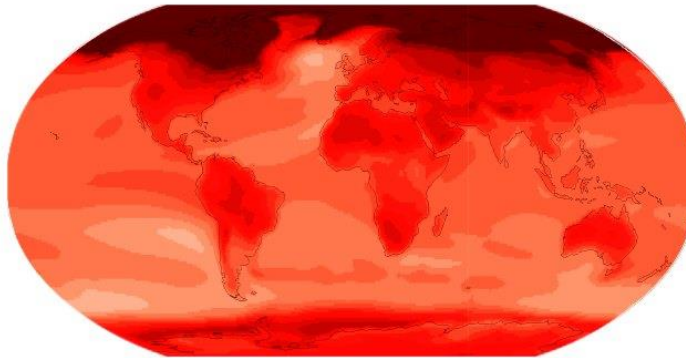
Change at 1.5C global warming



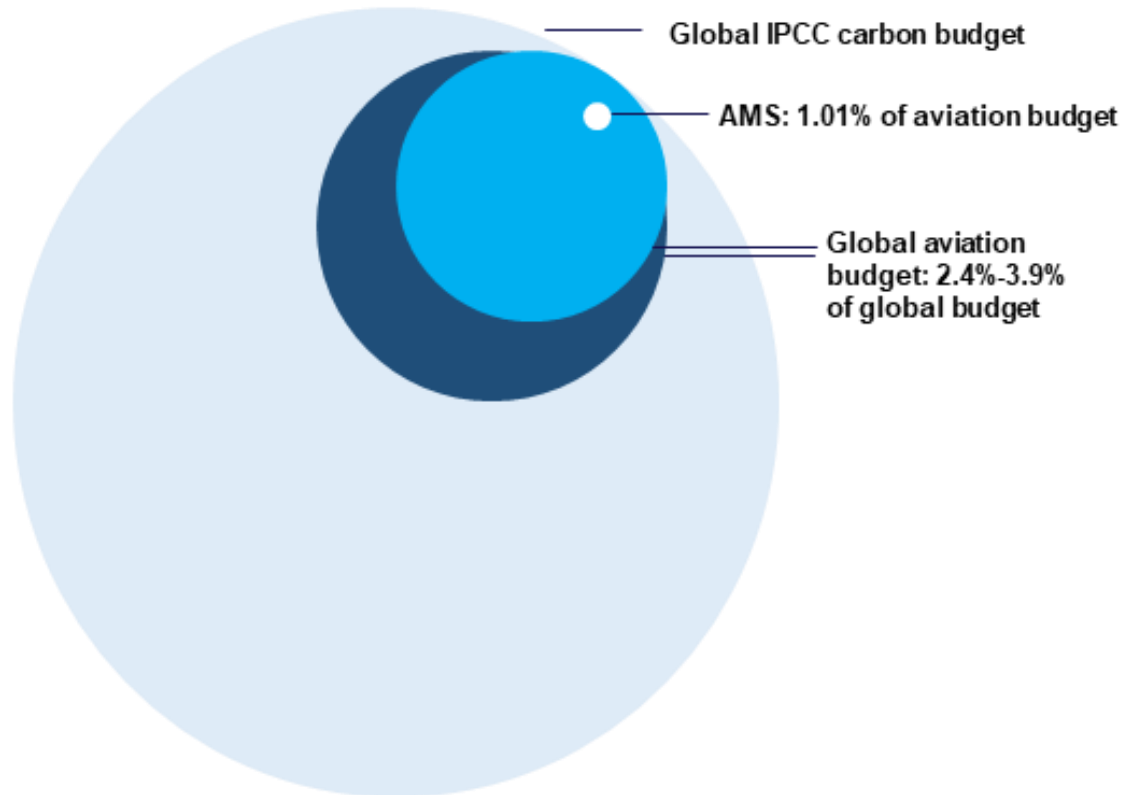
Change at 2C global warming



Change at 4C global warming



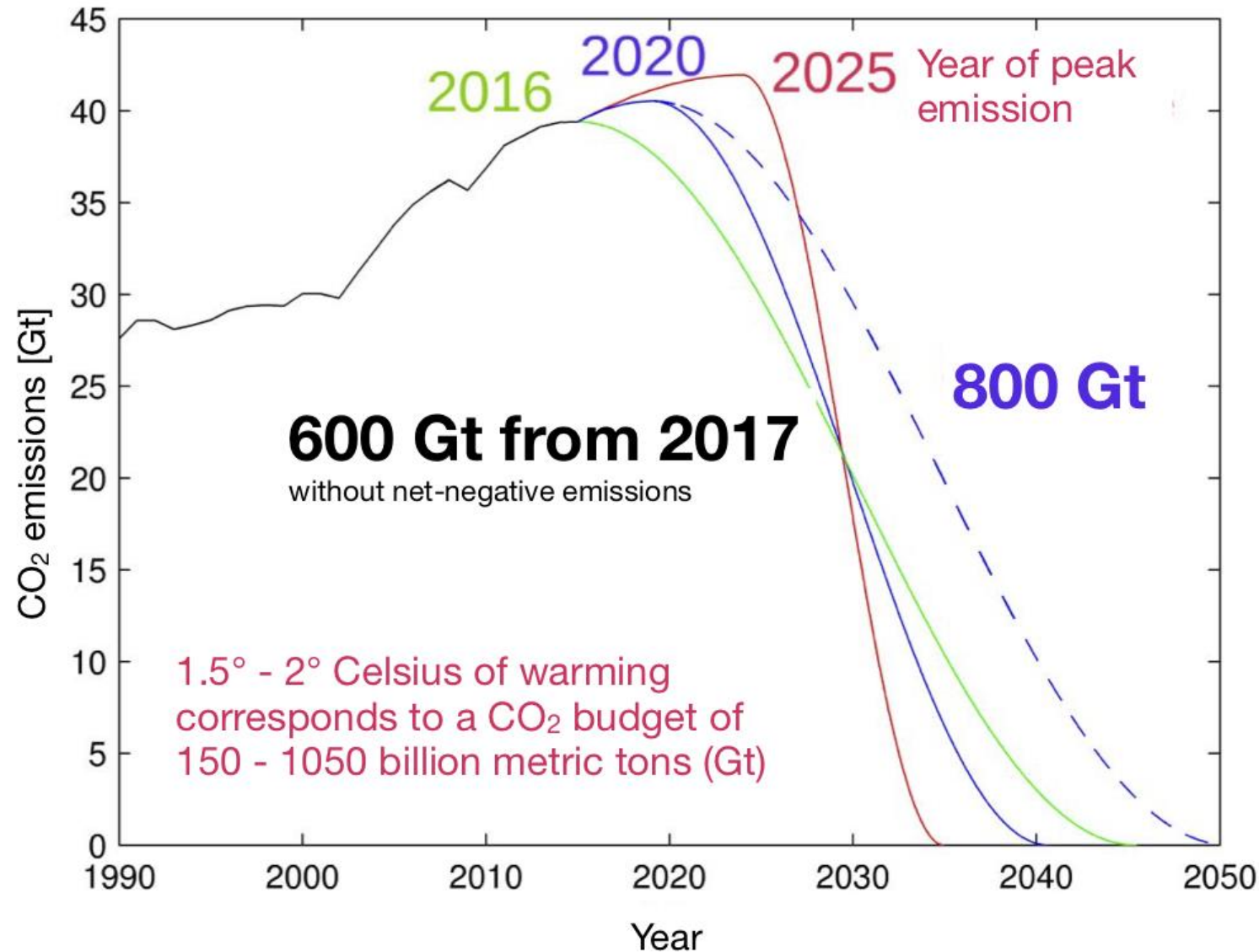
Remaining carbon budget for Dutch Aviation



Source: NLR (2023). Note: figure does not match real scales

°C	Likelihood		
	50%	66%	83%
1.5	500 Gt	400 Gt	300 Gt
1.7	850 Gt	700 Gt	550 Gt
2	1350 Gt	1150 Gt	900 Gt

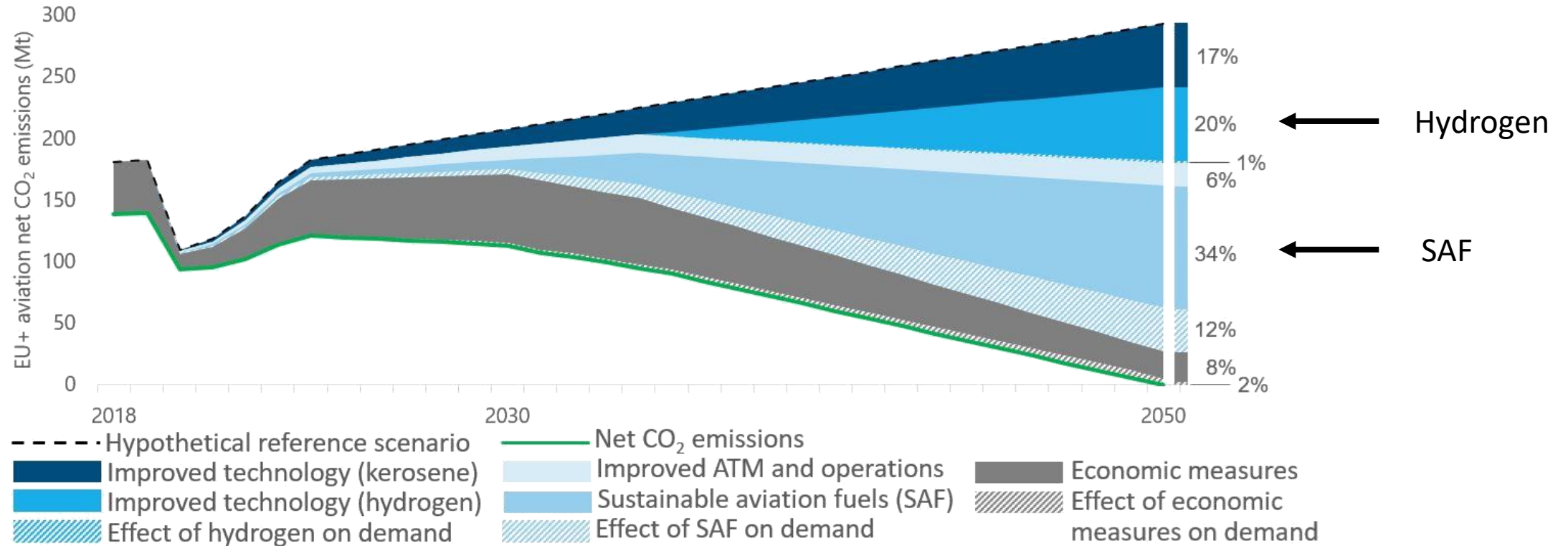
The longer we wait, the more we need to speed up



Net zero 2050 is very important, but can aviation stay within 1.5 degrees remaining carbon budget?

Decarbonisation Roadmap for European Aviation

All flights in scope



Thank You

