

# The Netherlands accelerates towards sustainable aviation



An initiative of the Sustainable Aviation Table

# Why flying should be cleaner

Flying takes you to other worlds. For holidays, family visits, a business trip. But flying also has an impact on the climate. Aviation must get cleaner. Flying must become more sustainable. That is why the aviation sector is joining forces with the government, knowledge institutes and the business community. To make new breakthroughs together to realise and meet the goal of the Sustainable Aviation Agreement: reducing CO<sub>2</sub> emissions



## 2015

All of the participating countries to the Paris Climate Agreement agreed that the Earth may not heat up by more than 2 degrees Celsius. The aim is a maximum of 1.5 degrees. To achieve this there are as many as 600 targets in Climate Agreement. The Netherlands also commits to these targets.

## 2018

The Paris Climate Agreement has been translated into a national Climate Agreement. This includes agreements about the contribution of domestic aviation and ground-based activities [to the climate]. In addition to this, the participating parties in the Netherlands have also made agreements about international aviation. The Sustainable Aviation Table was established at the initiative of Minister Cora van Nieuwenhuizen.

## 2019–2020

The parties at the Sustainable Aviation Table have set ambitions and objectives for reducing CO<sub>2</sub> emissions caused by domestic aviation, aviation originating in the Netherlands and from airport operations. These are documented in the Sustainable Aviation Agreement.

## The Dutch approach to a global challenge

Global agreements will be implemented at a European and a national level. In this way, there is room for the EU and Europe to take responsibility, extra responsibility even, and fulfil an ambitious role in the reduction of CO<sub>2</sub> from aviation.

The Netherlands recognizes the agreements made within the UN's aviation organization, ICAO, and is exploring options for improving their 2050 target. In this way, Dutch aviation contributes towards global targets.

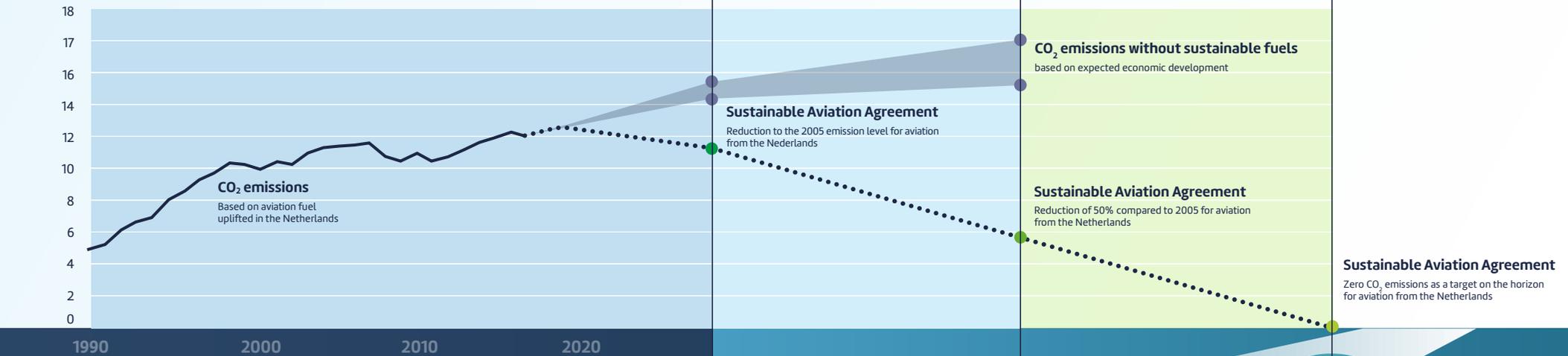
## Is The Netherlands the hotspot for innovation in aviation? Yes, because we have everything here:

- Strong cooperation qualities
- Business spirit and entrepreneurial spirit
- Universities held in high regard worldwide
- Plenty of technological knowledge and brainpower
- Relevant manufacturing industry for the aviation sector
- One of the largest hub airports in the world
- Pivotal research institutes (TO2)

# Large ambitions

Aviation must become more sustainable. This is something that the aviation sector will achieve itself with measures until there are no more CO<sub>2</sub> emissions.

CO<sub>2</sub> emissions (megaton) **Development of CO<sub>2</sub> emissions from flights from the Netherlands and indication of the achievement of targets (Source: Aviation White Paper)**



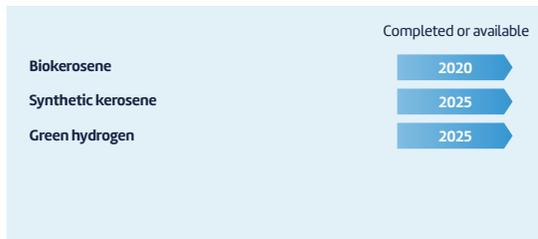
In order to reduce CO<sub>2</sub> emissions from flights and to meet other CO<sub>2</sub>-reducing targets before the agreed deadlines, acceleration is badly needed.

# This is how we accelerate sustainability

The Sustainable Aviation Agreement focuses on measures that deliver the greatest climate gains and that may be globally adopted. The measures are bundled into themes with their own objectives and own programme of actions.

## Sustainable Fuels

Clean fuel is one of the most important instruments in reducing aviation's CO<sub>2</sub> emissions. The Netherlands, together with its chemical industry, pipelines, airports, seaports and knowledge institutes have everything available to play a pioneering role in the market for sustainable fuels. The target is that by 2030 14% of the fuel uplifted in the Netherlands is sustainable and that 100% may be reached by 2050.



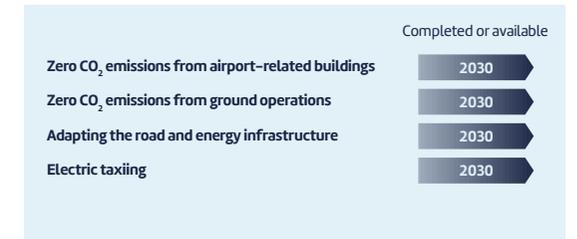
## Fleet renewal and retrofitting

The aim is that in 2030 30% of the flights to and from Schiphol will be with the cleanest aircraft available. This could be by new designs, alternative propulsion methods and lighter materials. Another way to fly cleaner is retrofitting: modifying aircraft to equip them with the latest technologies.



## Ground-based operations

An airport uses a lot of energy. Handling equipment drives back and forth. Buses bring passengers to and from the aircraft. Stationary aircraft use electricity. There are buildings that need to be cooled, heated and illuminated, that are full of computers and other equipment. The aim is that the ground-based operations at Dutch airports are emission-free from 2030. There are also additional savings possible up to 2070.



# This is how we accelerate sustainability (continued)



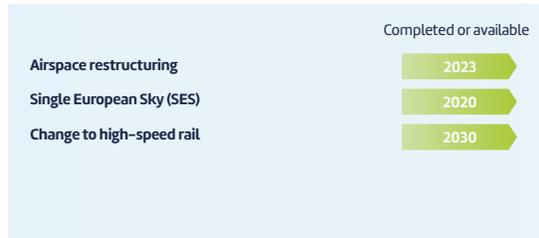
## Hybrid electrical flight

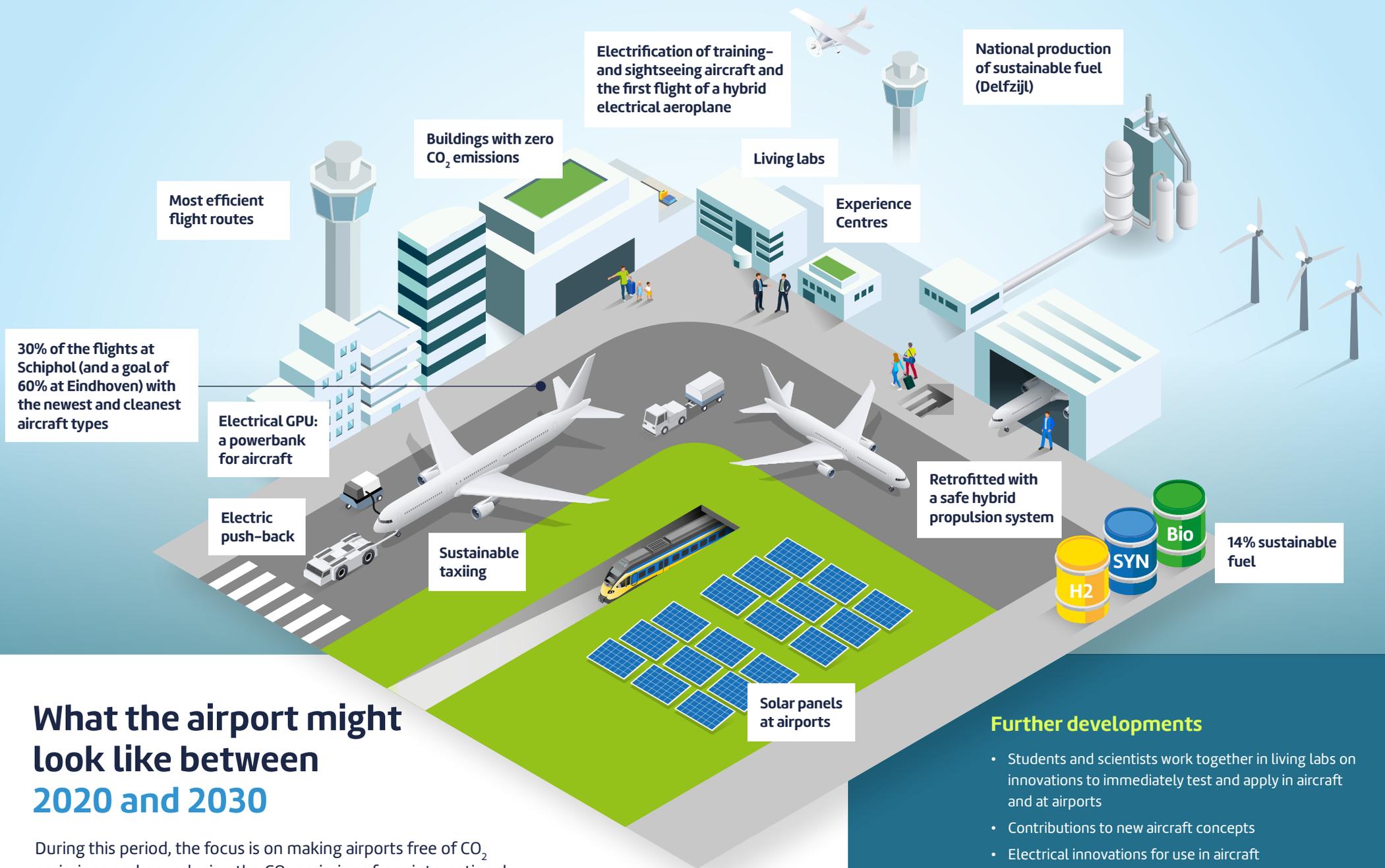
Innovators are working, world-wide, on hybrid electrical and fully electrical aircraft. The Netherlands is an important laboratory in this. By 2030 hybrid electrical flight must be possible for aircraft carrying 20 to 50 passengers and, in 2050, short-distance flights must be possible with fully electric aircraft. In this way, aviation will no longer emit CO<sub>2</sub> by 2070.



## And further...

Various initiatives that contribute to the sustainability of aviation are running parallel to the Sustainable Aviation Table in the Netherlands and Europe. For example, airspace restructuring for more efficient (e.g. shorter) routes within the Netherlands, a Single European Sky for more efficient use of airspace within Europe and the replacement of short-distance flights by rail transport.



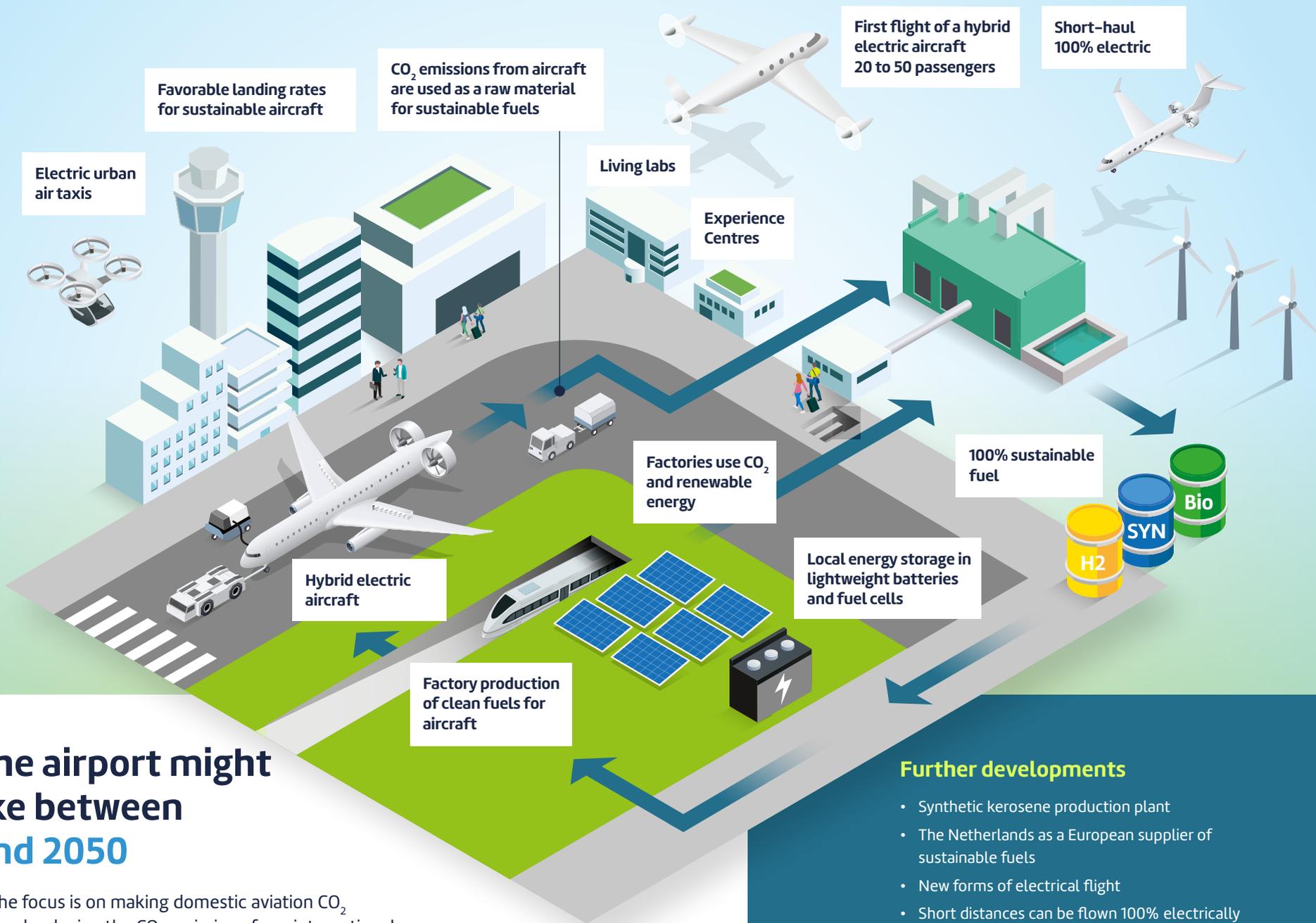


# What the airport might look like between 2020 and 2030

During this period, the focus is on making airports free of CO<sub>2</sub> emissions and on reducing the CO<sub>2</sub> emissions from international commercial aviation departing the Netherlands to its 2005 level.

## Further developments

- Students and scientists work together in living labs on innovations to immediately test and apply in aircraft and at airports
- Contributions to new aircraft concepts
- Electrical innovations for use in aircraft
- Airlines and the preeminent aircraft manufacturers examine what the potential effect of fleet renewal and retrofitting is
- Requirement to have a fuel mix with 14% bio-fuel in 2030.



## What the airport might look like between 2030 and 2050

In this period, the focus is on making domestic aviation CO<sub>2</sub> emissions free and reducing the CO<sub>2</sub> emissions from international commercial aviation departing from the Netherlands to 50% (more than 5 megatons) of its 2005 level.

### Further developments

- Synthetic kerosene production plant
- The Netherlands as a European supplier of sustainable fuels
- New forms of electrical flight
- Short distances can be flown 100% electrically



Regional airports for electric aircraft

Hybrid electric aircraft

Light rail connection

Economical aeroplane that no longer emits CO<sub>2</sub> on long-haul flights

Self-driving baggage carts

H<sub>2</sub> SYN Bio

## What the airport might look like between 2050 and 2070

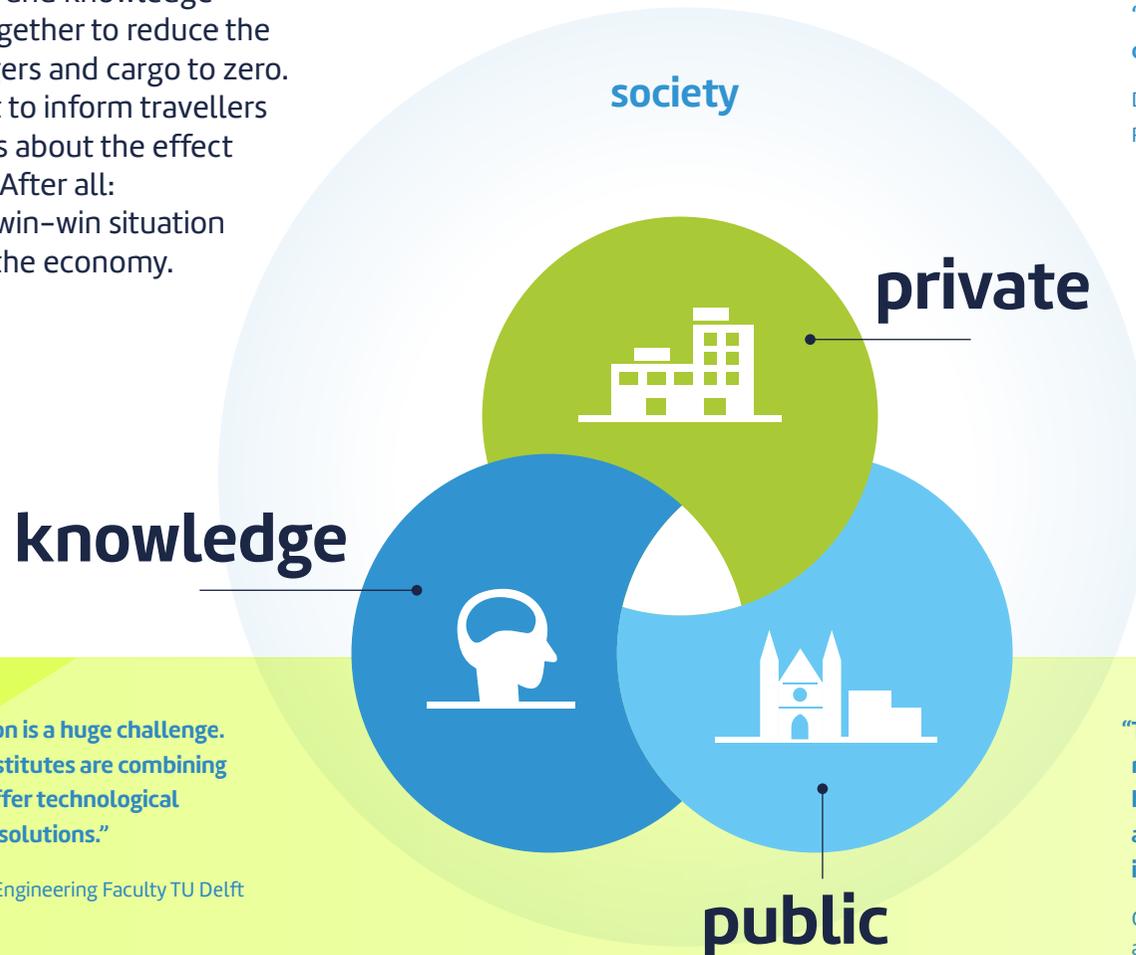
The year 2070 is a point on the horizon: the whole of Dutch aviation is emission-free! From then on, international commercial aviation from the Netherlands will no longer produce CO<sub>2</sub> emissions.

### Further developments

- Green hydrogen as an alternative to kerosene in combustion engines, in addition to raw materials for sustainable kerosene
- Flights within Europe are fully electric

# Shoulders to the wheel

To make aviation more sustainable our forces will have to be bundled. The Dutch aviation sector; companies, government and knowledge institutes are working together to reduce the CO<sub>2</sub> footprint of passengers and cargo to zero. That's why it's important to inform travellers and company employees about the effect of travel on the climate. After all: sustainable aviation is a win-win situation for people, climate and the economy.



**“It is crucial to focus our gaze towards a sustainable future; especially when the aviation sector is being so badly affected by COVID-19. This is our new “license to operate” and we embrace the challenge with conviction.”**

Dick Benschop, Chief Executive Schiphol Group  
Pieter Elbers, CEO KLM

**“The energy transition in aviation is a huge challenge. Universities and knowledge institutes are combining their strengths to be able to offer technological breakthroughs and disruptive solutions.”**

Henri Werij, Dean of the Aerospace Engineering Faculty TU Delft  
Michel Peters, CEO Royal NLR

**“The Paris Climate Agreement has changed the mindset. Aviation is going along with this whole heartedly. The Netherlands is doing what it is good at: leadership where a global change in aviation is imminent. The breakthrough will come.”**

Cora van Nieuwenhuizen, Minister of Infrastructure and Water Management



These are the participants in the Sustainable Aviation Table that have signed the Sustainable Aviation Agreement.

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**Abbreviations**

- ICAO: International Civil Aviation Organization
- TO2: Applied Research Organisations

**Definitions**

- CO<sub>2</sub>: Carbon dioxide
- H<sub>2</sub>: Hydrogen

**Footnote**

- \* The year 2005 is used internationally as a reference year for climate objectives. The Sustainable Aviation Agreement aligns itself with this reference.
- \*\* "aviation from the Netherlands" means international commercial aviation departing from the Netherlands.