

Air traffic control and environmental protection

Our commitment to people and nature



DFS Deutsche Flugsicherung

Dear reader

Flying is a wondrous invention. It overcomes boundaries, forges bonds and brings us closer to distant cultures. These positive aspects are increasingly being overshadowed in public discourse by the environmental impact of flying. Although it is true that air transport only accounts for a small part of the impact we humans are causing, the aviation industry, in particular, is increasingly being asked to prove its environmental commitment.

What is often overlooked in the process is that the aviation industry has long been on the right path. Aircraft are becoming quieter and per capita fuel consumption in Europe has almost halved over the past 30 years. New materials, new designs, even more efficient aircraft engines will bring it down further. New forms of propulsion are being researched. Intensive work is being carried out on numerous technologies, for example electricity, hydrogen or sustainable fuels that can power the aircraft of the future. There will probably be a mix of everything. The only thing that is clear is that flying will become ever greener.

We as DFS are playing our part, even if our sphere of influence is rather limited. We are well on our way along the path to protect the environment and conserve resources. We already guide the aircraft under our control to their destinations on an almost direct route. We have introduced new approach procedures that reduce noise and lower fuel consumption. We have significantly reduced taxiing times on the ground. At our sites, we use combined heat and power generation, geothermal and solar technology, we have achieved record levels of recycling, and we promote biodiversity.

We have planned much, much more for the next few years. The spectrum of initiatives ranges from new, satellite-supported navigation procedures that enable targeted flights around populated areas, to airspaces

in which pilots can choose the best and most fuel-efficient route themselves, to the decommissioning of terrestrial navigation facilities. This will create even more space for the expansion of wind energy, and thus for one of the energy sources of the future.

This is how we at DFS ensure that flying, and thus our world, becomes a little greener every day. In this environmental report, we invite you to draw your own conclusions.

Sincerely

Arndt Schoenemann



[Arndt Schoenemann](#)
Chairman and Chief Executive Officer

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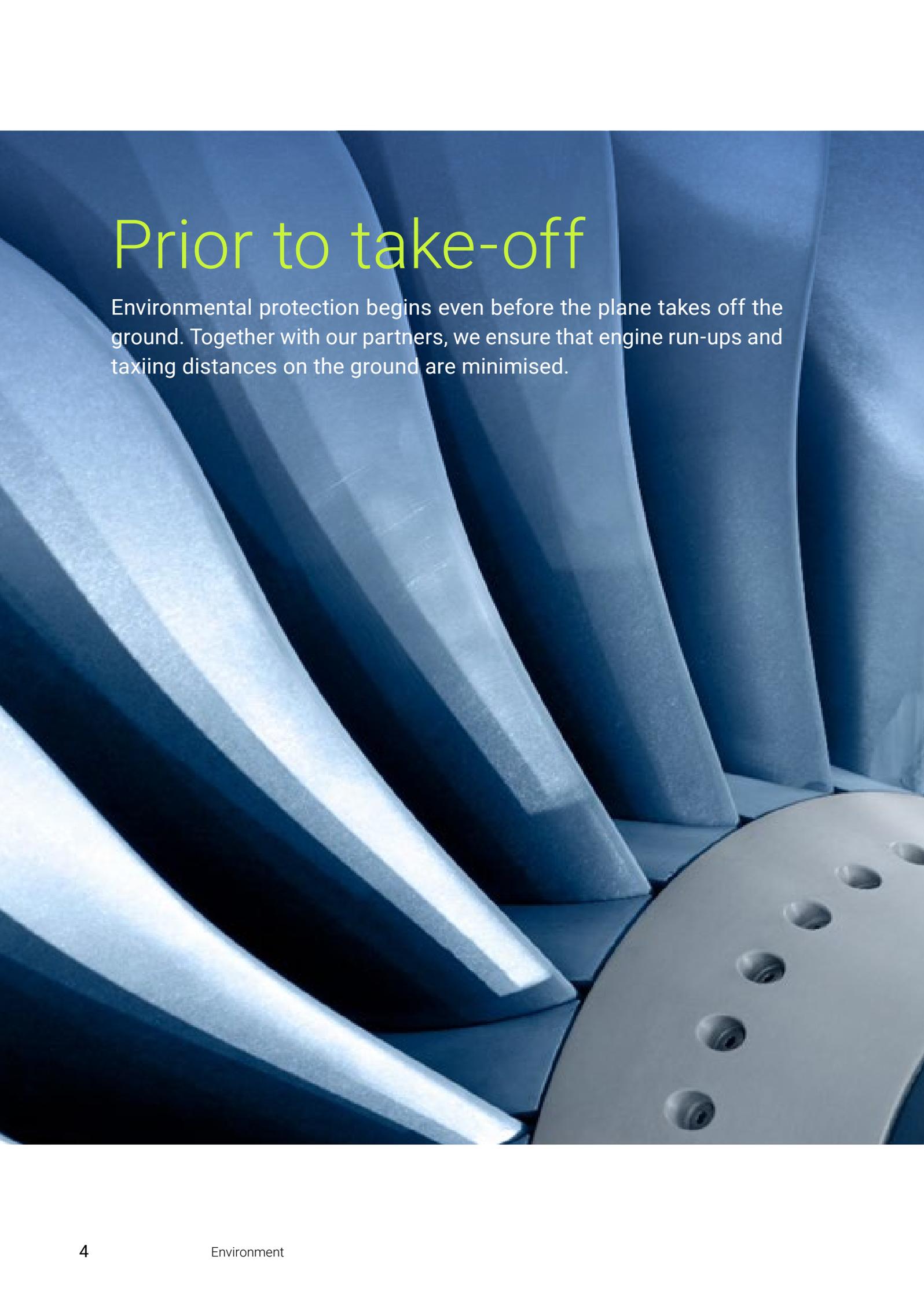
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Prior to take-off

Environmental protection begins even before the plane takes off the ground. Together with our partners, we ensure that engine run-ups and taxiing distances on the ground are minimised.



Prior to every take-off, there are processes in which airlines, airports and DFS are all involved. To ensure that everything runs smoothly, we are networked with airlines and airports and exchange operational data in real time. This type of collaboration is called airport collaborative decision making, or A-CDM for short, where all those involved on the ground make decisions as a team.

Our common goal is to shorten holding procedures on the ground and thus engine run times, or ideally to make them superfluous altogether. This saves fuel, reduces carbon dioxide emissions and has a noise-reducing effect.

A-CDM was first introduced at Munich Airport in Germany in 2007. The procedure is currently in use at six major airports in Germany: Munich, Frankfurt, Düsseldorf, Hamburg, Stuttgart and Berlin.

The success speaks for itself. Since its introduction, taxi times of departing aircraft at these airports have decreased by about 10 percent.

Take-offs and landings

Take-offs and landings are the phases of a flight that cause the most aircraft noise for residents around airports. DFS is now developing new flight procedures to ease the situation.

Aircraft noise occurs whenever the aircraft engines generate thrust or the aircraft's air resistance increases, for example, because the pilot has extended the landing gear or set the flaps for landing. That is why we are developing procedures that minimise the impact of noise on residents living in the vicinity of airports. Our air traffic control technology and systems also play a role in this.



10

PERCENT

reduction in
taxi times at
the largest
airports

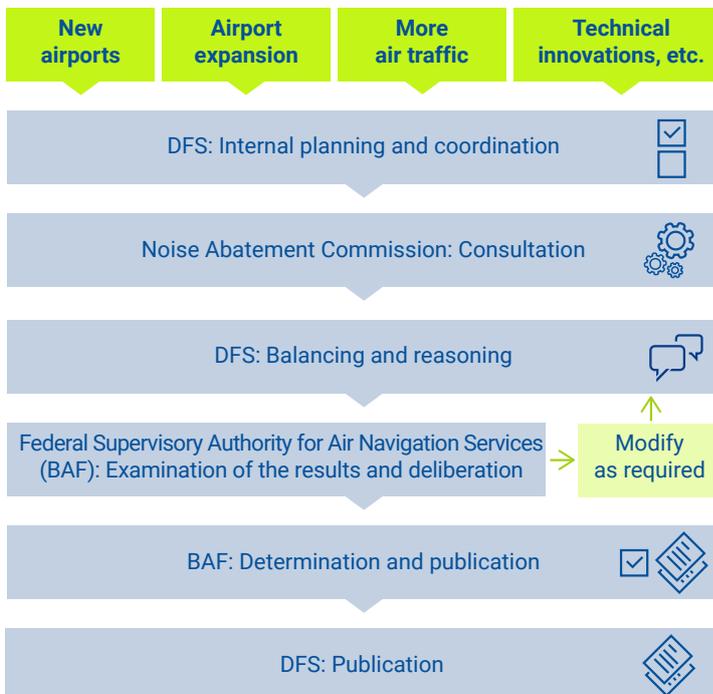
We will adjust around 2,500 procedures to make flight routes more flexible.

Around 60 AIRPORTS and aerodromes will be switched to modern navigation procedures over the next few years.

Arrivals to and departures from airports are always carried out according to established procedures, which we design in accordance with the criteria of the International Civil Aviation Organisation (ICAO) and in compliance with German aviation law. These procedures mean we can handle air traffic in a safe, orderly and expeditious manner, because that is our legal mandate. At the same time, we are called upon to avoid unacceptable aircraft noise wherever possible. This is a difficult balancing act that requires compromises to be made again and again.

To protect people from aircraft noise, we rely on technical progress. With the help of a modern navigation method known as performance-based navigation (PBN), we can offer airlines more accurate flight procedures than before. In the coming years, we will gradually convert our conventional procedures to PBN at about 60 German airports and aerodromes with instrument flight operations. In total, we will adapt around 2,500 procedures in order to make flight routes more flexible and to be able to take greater account of population centres.

Planning of approach & departure procedures



Noise abatement commissions in Germany



With the steady increase in air traffic over the years, inevitably more people are affected by aircraft noise. The first citizens' initiatives against aircraft noise emerged in Germany as early as the mid-1960s. Since 1971, noise abatement commissions (Fluglärmkommissionen) have been mandatory at every large airport in Germany. Through such commissions, municipalities near airports are kept informed and involved at an early stage when new flight procedures are to be introduced or existing ones changed. The noise abatement commissions have an advisory function for the air navigation service provider, the German Federal Supervisory Authority for Air Navigation Services (BAF) and the competent licensing authority for each airport. Today, there is no approach and departure procedure at any large airport in Germany that the respective noise abatement commission has not advised on.



Departure

DFS has high standards for new departure procedures. We are only satisfied when we have found the best compromise between performance and noise protection.





The ideal departure procedure brings benefits for all. It helps air traffic controllers to handle traffic in a safe, orderly and expeditious manner. And it ensures that only a small level of noise emissions from the aircraft reaches the ground.

Continuous climb

To minimise aircraft noise, aircraft must reach their cruising level as quickly as possible. Because the faster an aircraft climbs, the less audible it is on the ground directly below its flight path. We have developed a special take-off procedure for this purpose: continuous climb operations. With this procedure, aircraft reach their cruising level as quickly as possible by climbing in a straight line. Ideally, aircraft do this without any intermediate horizontal flight phases.

*In a continuous climb,
the aircraft reaches its cruising
level as quickly as possible.*

However, this procedure, which we have optimised once again within the framework of the Alliance for Noise Protection for Frankfurt Airport, is only possible if the conditions are right. Among the requirements are that no other aircraft are crossing and that weather conditions are favourable.

Individual departure clearances

Up to a specific level, compliance with the prescribed procedures is a must. The worldwide standard states that as soon as the air traffic controller sees the aircraft on the radar screen and the minimum safe altitude is reached, they can issue the pilot a clearance to



1.5

KILOMETRES

high – that is the minimum altitude for aircraft to be allowed to leave the departure route.

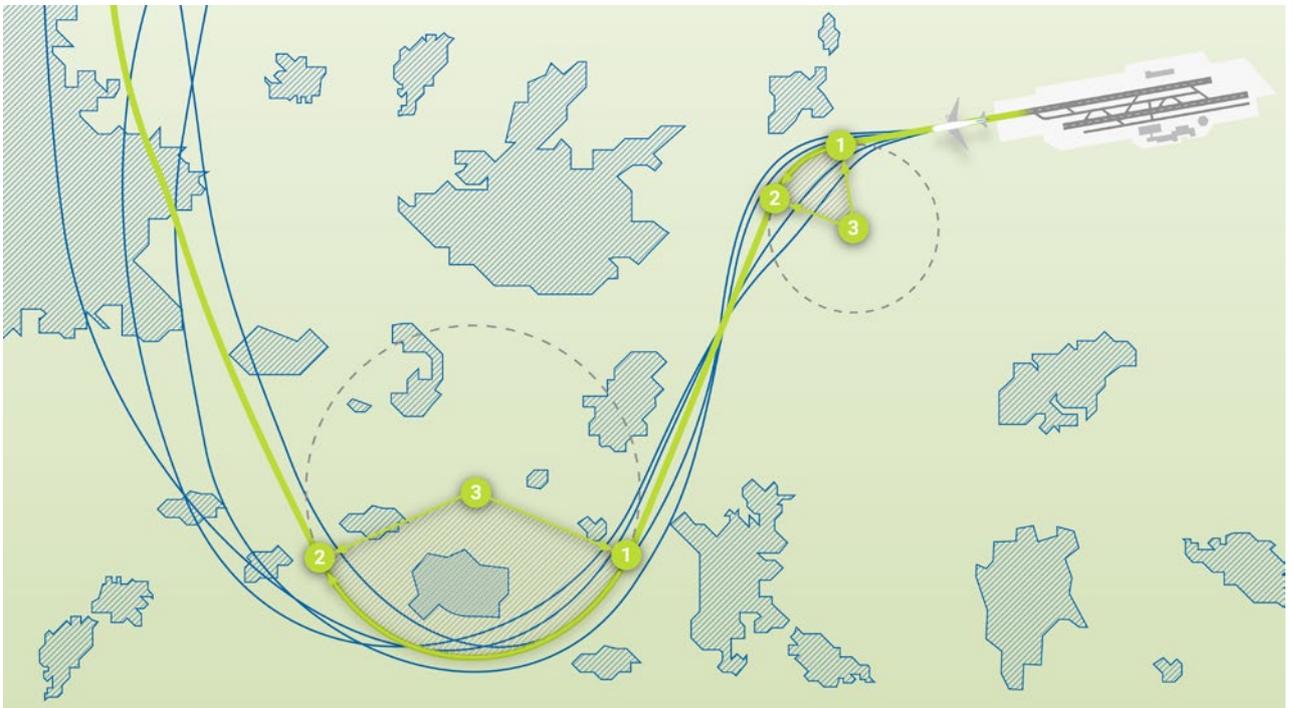
leave the departure route. This means that the following traffic can also be handled smoothly.

Wherever possible, air traffic controllers issue this clearance for a flight to leave the departure route earlier than originally planned so they can make their way to the next route segment. This is called an individual clearance. For noise abatement reasons and in consideration of population centres in the vicinity of airports, we have undertaken not to give clearance to deviate from the departure procedure below 5,000 feet as a matter of principle, which corresponds to an altitude of about 1.5 kilometres.

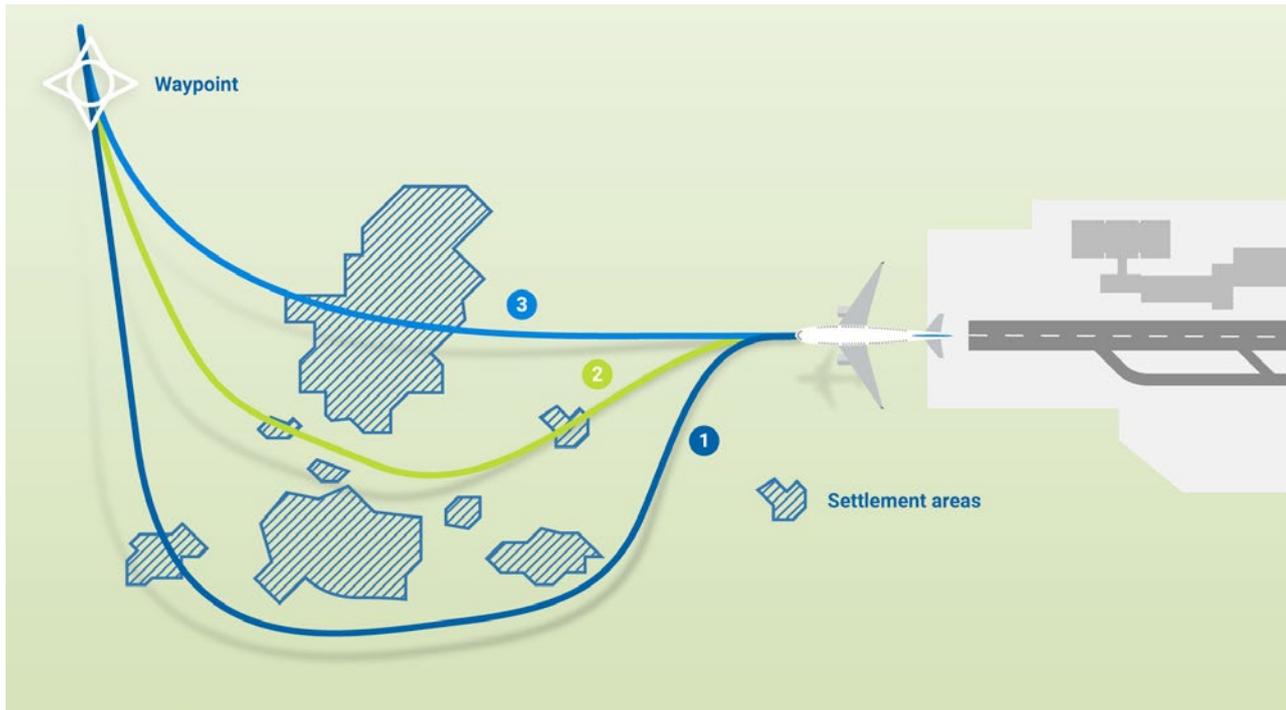
Calm curving flights

The required navigation performance (RNP) standard enables more precise departures after take-off, and thus less aircraft noise for cities and communities near airports. Pilots using this satellite-navigation-based method fly a curving path with high precision. This curving path is defined by air traffic control, starting from a fixed point based on a fixed radius.

With GPS support, aircraft can maintain their pre-set ideal curve at a constant distance from the reference point. RNP thus ensures that the aircraft noise generated during take-off is less dispersed. All this adds up and has positive effects for the people who live in the affected areas.



Satellite-based procedures provide aircraft with greater tracking accuracy when flying turns. The aircraft stays exactly on the specified ideal line (green) and without deviation based on a specified radius ① and ②, starting from a fixed point ③. This enables aircraft to fly more precisely around built-up areas.



With NIROS, it is possible to determine noise-optimized flight procedures. Different variants are compared in the process. The aim is to fly around densely populated areas as far as possible while avoiding unnecessary detours. Variants 1 and 3 are therefore out of the question, variant 2 is the best solution.

Technical support from NIROS

DFS develops several variants of each flight procedure. To weigh up which variant is the most favourable, we use the Noise Impact Reduction and Optimisation System, or NIROS for short. This system can handle all aircraft types, including their individual technical equipment and noise emission data as well as geodata and information on the population density of particular areas of the country.

Based on the number of aircraft, their

aeronautical performance characteristics and speed, as well as the altitude in the individual flight phases, the system calculates how long the aircraft flies over a location. This in turn results in an index that reveals how many people live within a certain sound level class. NIROS thus helps DFS to select the most noise-optimized variant among the possible procedures.

En-route flights

At cruising level, DFS guides aircraft as directly as possible. To achieve this, we continue to develop our air traffic control systems and adapt airspace structures to meet the needs of airspace users.





Additional fuel consumption and greenhouse gases occur whenever traffic does not flow smoothly and aircraft cannot be guided along a direct route to their destinations. Our aim is to prevent this.

The latest air traffic control systems – less CO₂

With our latest air traffic control system iCAS (iTEC Centre Automation System), we continue to innovate in air traffic control. iCAS allows air traffic controllers to plan and handle every flight even more precisely than before. This technical support is particularly valuable during peak traffic periods, as many work steps are automated. This means more flights can be handled at the same time.

» We make better use of capacity in the limited German airspace.

The system works across borders, reacts faster, is more efficient and is even more accurate in its display of flight destinations. iCAS makes better use of capacity in the limited German airspace, reducing re-routings and delays. This means lower fuel consumption and fewer carbon dioxide emissions. In addition, the controller can offer pilots flight paths tailored to the aircraft's performance characteristics, which simultaneously take into account information on current weather conditions and available airspace.



0.81
PERCENT

This is the deviation of the actual flight routes in 2021 from the ideal route.



iCAS – a European project



iCAS is part of the joint European project iTEC (interoperability Through European Collaboration). DFS is thus showing its support for the idea of the Single European Sky. It has been working on this with LVNL (the Netherlands), PANSO (Poland) and Oro Navigacija (Lithuania). The iTEC Alliance consists of the DFS Group (Germany), NATS (United Kingdom) with its project partner AVINOR (Norway) and ENAIRE (Spain).

Individual clearances in upper airspace

Individual clearances can have a positive environmental impact both in the immediate vicinity of airports as well as in upper airspace. With individual air traffic control clearances, pilots are allowed to leave the originally planned flight path at cruising level, too. The prerequisite is, of course, that the traffic situation permits this. These direct routings can shorten the travel distance considerably or make better use of existing tailwinds.

Free Route Airspace

One variant of flying directly in upper airspace is the offer made by DFS to airlines to use free route airspace. This means that there are no more traditional flight routes in the sectors that the controllers monitor in upper airspace. Instead, only the entry and exit points are defined. Between these points, the pilots fly the route that they planned independently and is best for the flight in question, naturally still under the control of DFS.

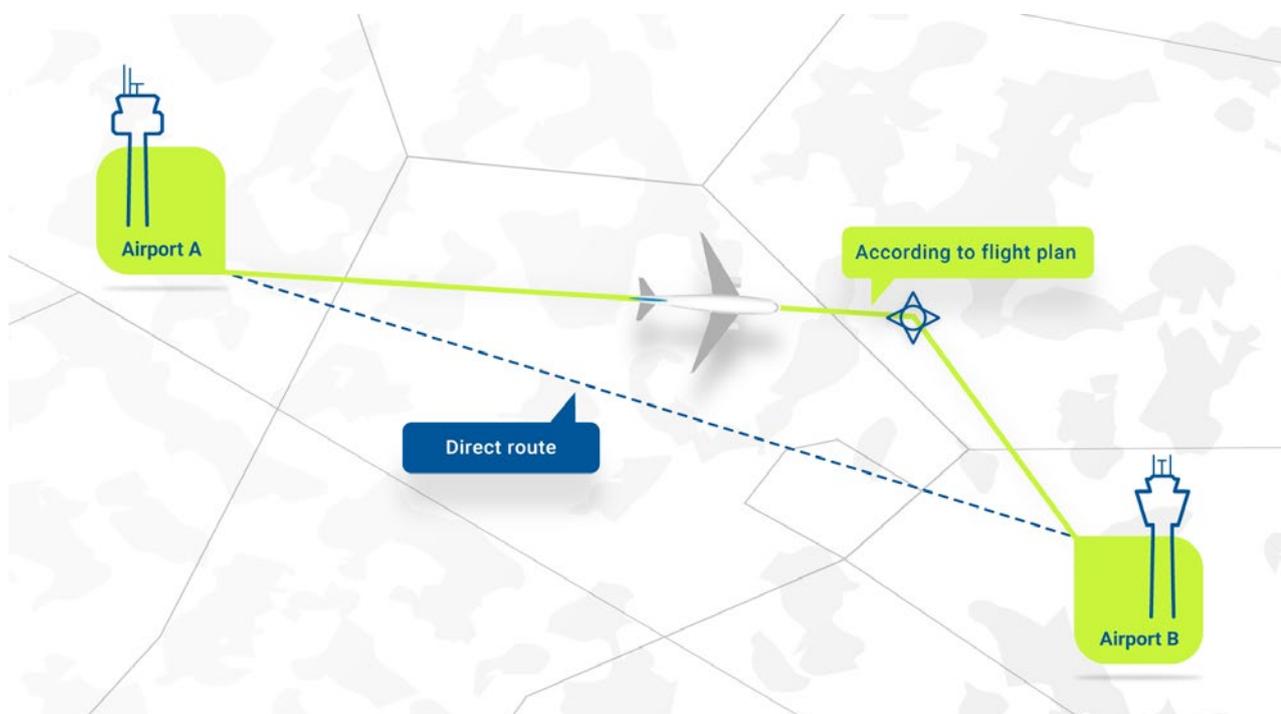
Free route airspace helps to further improve horizontal and vertical routing. Aircraft need less fuel and emit fewer greenhouse gases. Since the airlines can already take this into account when planning flights, they also need to have less fuel on board.

Free Route Airspace

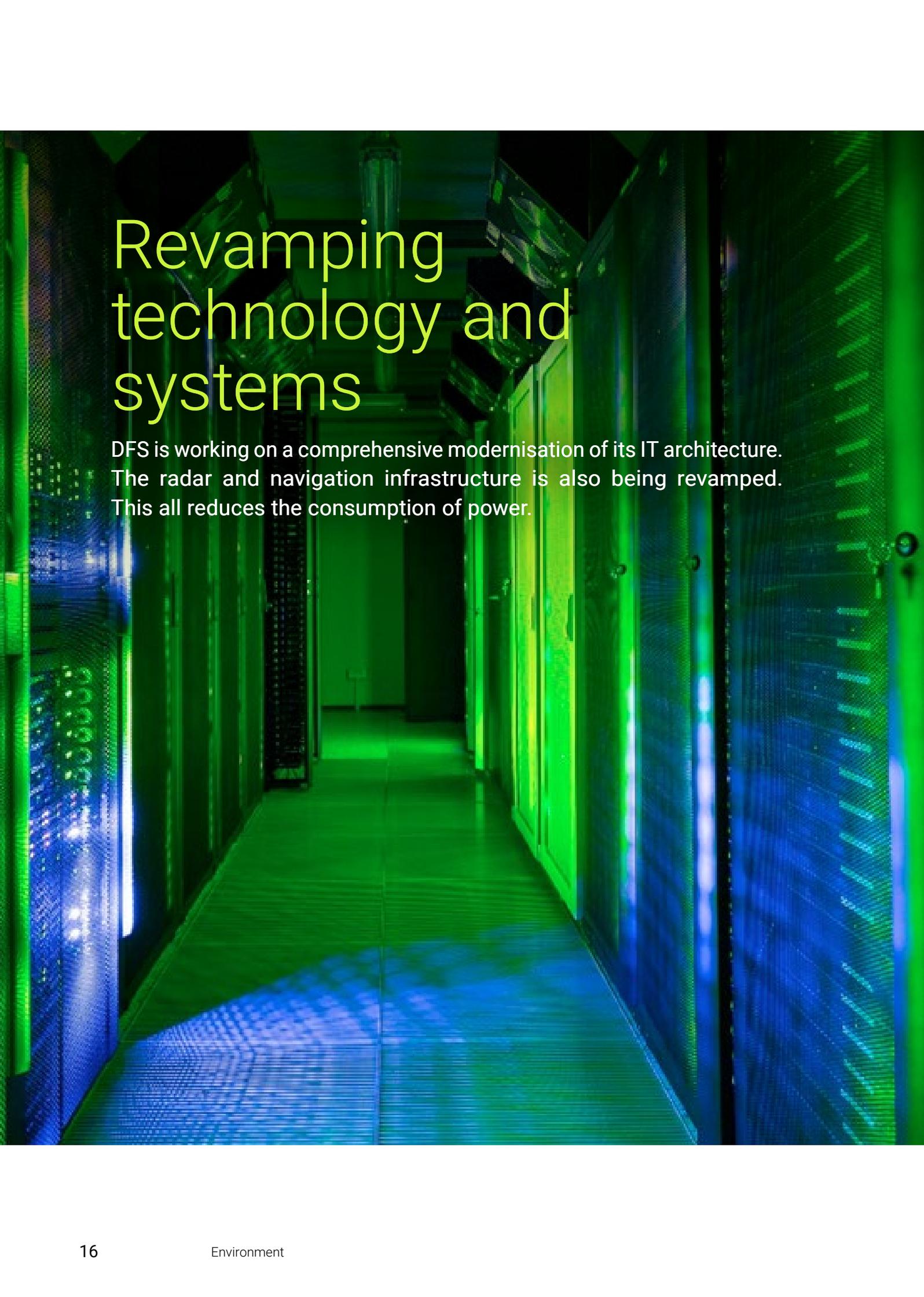


DFS introduced the first free route airspaces in 2018. Since February 2021, free route airspace in specific airspaces has no longer been limited to night hours. It is a European project that the FABEC States (Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland) established together in 2017.

Free route airspace is also available in part of the airspace controlled by the Bremen and Munich control centres. DFS intends to extend the time this service is offered as well as create further cross-border airspace offers.



During its flight, an aircraft passes GPS-based waypoints (blue symbol). They mark the route set out in the flight plan and are not always on the direct route to the destination. However, if the traffic situation permits, air traffic controllers can clear shorter flight paths.



Revamping technology and systems

DFS is working on a comprehensive modernisation of its IT architecture. The radar and navigation infrastructure is also being revamped. This all reduces the consumption of power.



DFS maintains a modern technical infrastructure to enable safe flight. Air traffic control systems support air traffic controllers in their work, radar systems show them where the aircraft are currently located. Radio stations enable communication between the ground and the cockpit, and navigation facilities help pilots find their way.

Air traffic control in the cloud

Technology changes, and with it DFS. The company is taking advantage of this progress to make its systems even more capable, robust and efficient. In many cases, software is no longer operated in local data centres, but is made available centrally via cloud technology. We are now following this path with our air traffic control systems. Step by step, we will move these to cloud-based data centres. In this way, we are reducing the number of technical installations nationwide and saving precious energy.

Renewal of radar facilities

Without radar facilities, there can be no air traffic control. With their help, air traffic controllers obtain information on the exact position of aircraft. Now, a comprehensive modernisation of our radar infrastructure is on the agenda. We want to renew 26 facilities by 2032. They will then consume significantly less energy than their predecessors, but at the same time have a greater range. That is why in future we will need fewer radar facilities. Thanks to progress in semiconductor technology, improved receivers and digital signal detectors, the new facilities will also cause considerably fewer high-frequency emissions.

The radar buildings, some of which were erected before the 1980s, are also no longer state of the art. They are being refurbished in parallel with the renewal of the radar facilities.



26

**RADAR
FACILITIES**

are being
revamped in the
coming years.

We will reconstruct buildings that are no longer worth renovating along modern, energy-efficient standards.

Satellite navigation instead of omnidirectional radio beacons

Omnidirectional (rotating) radio beacons help pilots when navigating. Their mode of operation is similar to that of a lighthouse. Omnidirectional radio beacons continuously transmit a rotating radio signal as well as an undirected reference signal for the magnetic north pole. These signals are received and analysed by aircraft. A distinction is made between VOR (very high frequency omnidirectional radio range) and DVOR (Doppler very high frequency omnidirectional radio range).

DFS currently operates more than 50 such ground-based navigation facilities. Our operational plan is to decommission up to one third of all omnidirectional radio beacons

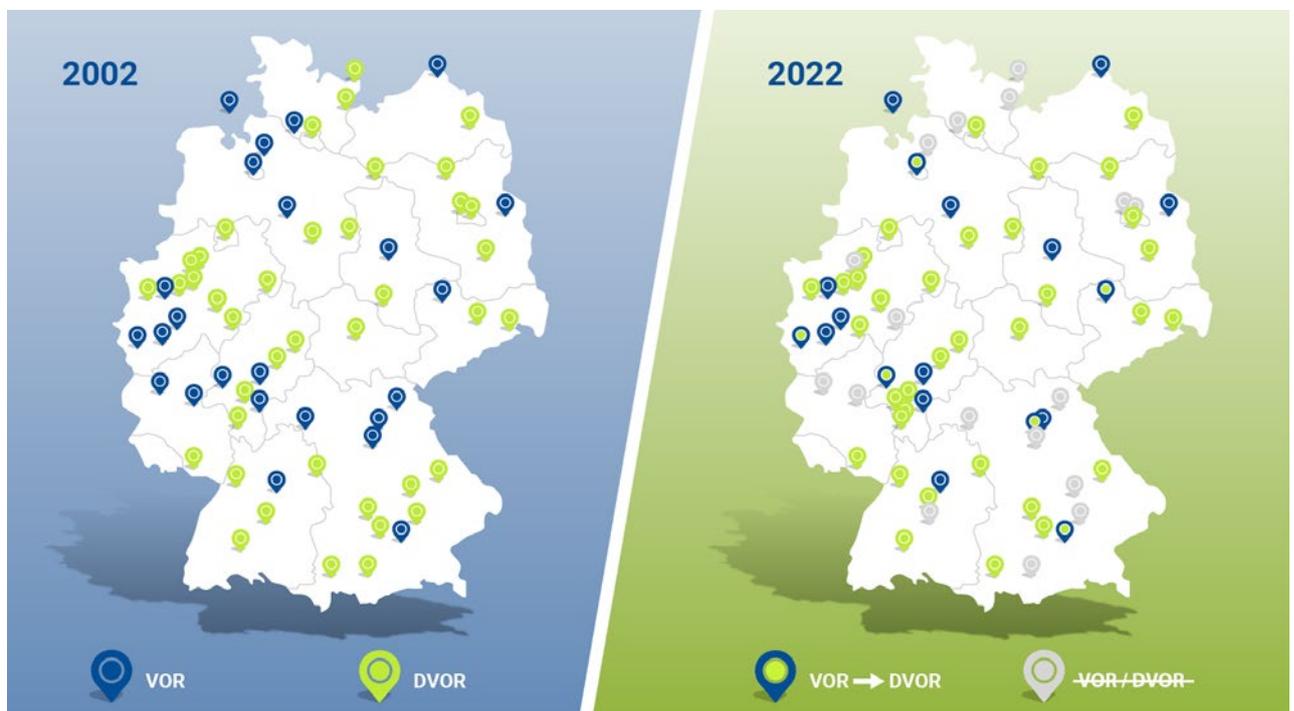
Every **3rd** NAVIGATION FACILITY will be dismantled in the medium term as DFS switches to satellite navigation.

Research for the climate

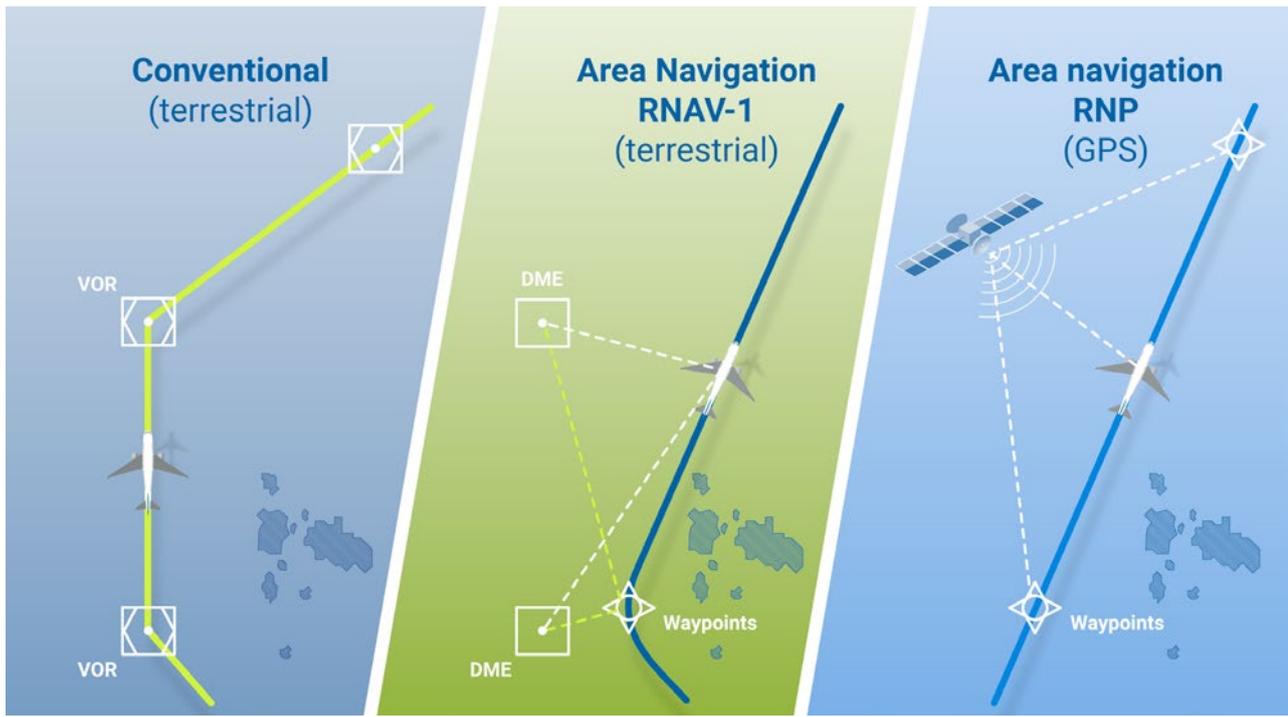


DFS is involved in contemporary areas of research, such as the effects of flying at climate-sensitive altitudes. Studies by the German Aerospace Centre (DLR) show that condensation trails, also known as contrails, at specific, albeit varying, altitudes change the climate particularly strongly under particular constellations. Together with partners from the aviation industry, we are investigating possibilities of whether and how these air layers can be flown around.

in the medium term, and even to do without the majority of them in the long term. This has been made possible because we are gradually switching to high-precision area navigation methods, so-called performance-based



DFS currently operates more than 50 VHF omnidirectional radio beacons (VOR) and Doppler VHF omnidirectional radio beacons (DVOR) as of March 2022. The comparison shows that since 2002, numerous facilities have already been converted from VORs to DVORs, which are less sensitive to interference from wind turbines, or dismantled altogether. In the future, their number is expected to decrease further.



Gradually, we are converting our flight procedures to area and satellite navigation. This makes it possible to optimise routes. At the same time, the number of ground-based navigation facilities, especially omnidirectional beacons, is decreasing. This will free up space for more wind energy.

navigation. Based on satellite navigation, aircraft will be able to navigate independently of ground-based systems in the future.

Through the dismantling of radio beacons, more and more areas are being freed up for wind turbines.

Momentum for wind energy

Wind turbines will benefit from the dismantling of omnidirectional radio beacons. This is because both technologies compete for the same locations. High elevations are the ideal locations for both navigation facilities and for wind turbines. However, wind turbines can interfere with the signals of navigation facilities. Therefore, DFS must

check the compatibility of these facilities in each individual case. Even if the result of such checks is not always positive, the German Federal Supervisory Authority for Air Navigation Services (BAF) already approves four out of five applications to erect wind turbines near navigation facilities.

Now, there is more and more room for wind energy. One way of freeing up more land for wind energy in the coming years will be the dismantling of omnidirectional radio beacons. In addition, since 2020 we have been using a new, more precise calculation method to assess the disruptive potential wind turbines can have on navigation facilities. In addition, we will completely convert the VOR beacons, which are particularly susceptible to interference, to Doppler technology or dismantle them altogether in the next few years. The only exception is the VOR on Helgoland, a small archipelago in the North Sea. There is no onshore wind turbine there to cause interference. Large offshore wind farms are being built around the North Sea island for this purpose.



More than 2,100 WIND TURBINES have already been erected in the protected areas of DFS omnidirectional radio beacons.

Approach

DFS has introduced numerous new procedures and technologies in the service of noise abatement. We have left no stone unturned in this regard.





Ideally, the approach to an airport is on a straight, steadily descending glide path.

This procedure is called continuous descent operations (CDO). In a conventional approach, the descent to land is repeatedly interrupted by horizontal flight phases. In CDO, however, the aircraft remains strictly on a vertical descent path. It glides without intermediate steps to the final approach and can thus reduce the thrust required. This saves fuel and reduces unnecessary carbon dioxide emissions. In addition, the continuous descent in the vicinity of airports has a noise-reducing effect. CDO has already been introduced at almost all German airports.

 *The ideal descent begins at cruising level.*

An extension of the CDO procedure is called high transition operation (HTO). This also involves a descent. Unlike in CDO, however, it begins as soon as the aircraft leaves cruising level. With HTO, reducing aircraft noise is not the primary goal. Its main purpose is to save fuel and reduce carbon dioxide emissions.

In both cases, however, the conditions must be right. The more you reduce engine power on approach, the more difficult it becomes to actively influence separation between aircraft. Our air traffic controllers therefore only apply the procedures when the volume of traffic and – in the case of CDO – also the weather, permit. Only under this condition can the mandatory separation between aircraft be complied with and delays for the following traffic be avoided.



Up to **100**
LITRES OF
FUEL
are saved with
a continuous
descent
compared to the
conventional
method.



Around **85**
LITRES OF
FUEL

can be saved
on top if the
continuous
descent already
starts at
cruising level.

Optimising approach flows

The DFS arrival management system (AMAN) allows approach flows to be adjusted at an early stage to optimally utilise limited airport capacity. This prevents delays and results in the emission of fewer climate-damaging greenhouse gases.

Steeper approach angles reduce noise

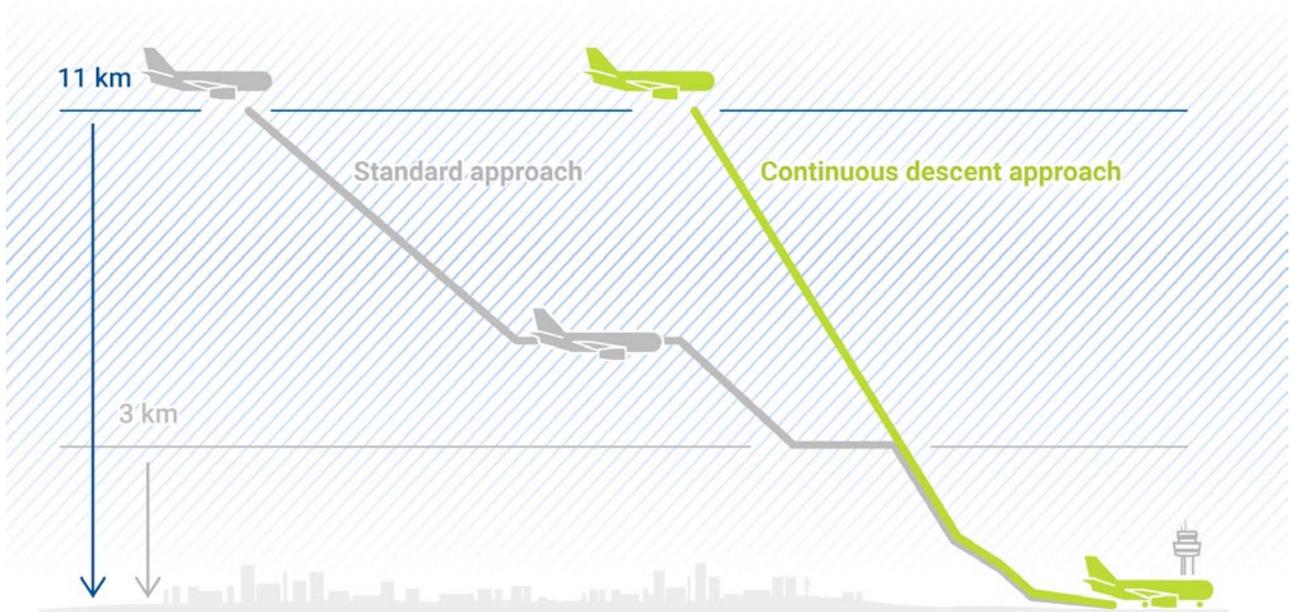
We explore every opportunity to reduce the negative impact of flying. For more noise abatement, we are constantly deploying new processes and new technology. The ground-based augmentation system (GBAS) is one of the systems we use. It allows aircraft to land at any angle, which means a steeper approach, perhaps from higher levels, than is currently the case with a conventional instrument landing system, where the angle of approach is normally three degrees.



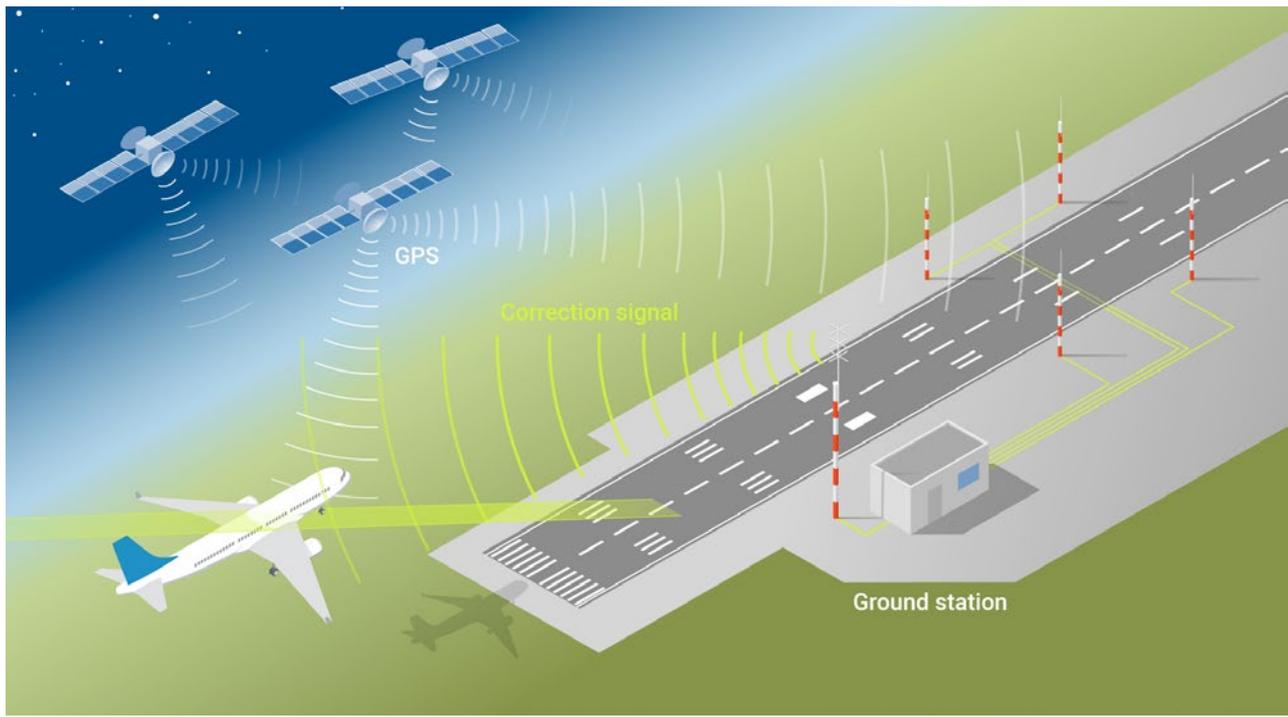
Pre-sorting boosts capacity

AMAN works on the basis of split-second simulations that support our air traffic controllers, especially during peak traffic periods. Aircraft are thus automatically brought into the optimal sequence well before landing. Our operational staff can then fully concentrate on the exact separation, the distance between the aircraft left for safety reasons.

Satellite navigation also forms the basis for GBAS. As GPS signals alone are not accurate enough for the approach to land, they are supplemented by signals from a ground station.



In a continuous descent, aircraft reduce altitude with low engine power. Horizontal flight phases – as used in the standard approach – are avoided as much as possible. This reduces carbon dioxide emissions and noise in the vicinity of airports.



A GPS signal from a satellite, corrected by a signal from the ground, guides the aircraft to the airport. Both systems together enable precise approaches with a maximum deviation of 15 metres. Satellite navigation alone cannot yet guarantee this accuracy.

The station sends a correction signal to the aircraft and guides it, in a similar precise manner to an instrument landing system, to the airport. Both systems together enable precise approaches with a maximum deviation of 15 metres. Satellite navigation alone cannot yet guarantee this accuracy.

Segmented approach

DFS and Lufthansa have developed the segmented approach for Frankfurt Airport. This satellite-supported approach procedure enables aircraft to fly around densely populated areas in several turns with pinpoint accuracy on their way to the airport. This leads to a reduction in aircraft noise. Another advantage is that segmented approach shortens the final approach. This decreases fuel consumption and emissions.

However, the procedure also has its limitations. Firstly, noise is not reduced but shifted to less populated areas. Secondly, a segmented approach requires slightly better visual conditions at the airport than the classic approach using the instrument landing system. Thirdly, the separation between aircraft needs to be larger than with the conventional approach.

This is why the procedure, which we introduced at Frankfurt Airport back in 2010, has so far only been used during off-peak hours with little traffic. In trial operations, which started in early 2021, we want to find out to what extent segmented approaches are also feasible with higher traffic volumes. We are initially testing the procedure mainly for flights approaching the airport from the south.

Protecting the environment at DFS sites

Whether at the radar screen, in a server room or in the office – light, water, electricity and comfortable working temperatures are needed everywhere. In these cases, too, DFS is making its contribution to environmental protection.



The DFS Headquarters in Langen uses neither air conditioning nor classic heating. Completed in 2002, the building was constructed as a low-energy office. At its core, the earth is used as an energy storage medium. Not only is energy sourced from it, but it is also returned to it.

We practice environmental protection in all our new buildings, renovations and extensions. This applies to our control towers as well as to the control centres and buildings that house our IT infrastructure. Through the targeted renovation of building façades, we can reduce energy consumption in the long term. We use cooling night air to lower the temperature of the rooms that are heated during the day. This is why we can do without active cooling of the administrative office areas in some buildings.

Small but powerful

Our Headquarters at the Langen site is supplied with energy generated by a company-owned combined heat and power plant. The state-of-the-art plant produces electricity, chilled water, heating water and steam from natural gas. And thanks to the combined heat/cooling and power generation, it does so particularly efficiently. The efficiency is more than 75 percent; conventional power plants only achieve up to 40 percent. The plant was last thoroughly modernised in 2014, which increased its fuel efficiency by around 20 percent.

In addition, we also use renewable energy sources. Our first photovoltaic system was installed on the roof of the DFS Academy in Langen in 2009 and has been feeding electricity into the public grid ever since. We have set ourselves the goal of increasing the use of green electricity at all our branches.



More than **75**
PERCENT

is the efficiency level achieved by the DFS combined heat and power plant thanks to co-generation.



DFS Headquarters as a low-energy building

In 2002, the low-energy technology used at the DFS Headquarters received an award in a regional competition as a resource-saving and particularly progressive project. The award was handed out by the Environment Ministry of the State of Hesse

needed. Instead of 1,400 servers, we now operate just under 90 servers. This has reduced electricity consumption by around 70 percent. Added to this is the greatly reduced energy consumption for cooling the data centres.

Instead of 1,400 servers, we now operate just under 90 servers.



70

PERCENT LESS ELECTRICITY

is being consumed by the DFS data centres.

Update for our IT infrastructure

Wherever anything is computed, electricity is consumed. That is why the energy consumption of the servers we need for the administrative IT infrastructure at our sites has been a major factor up to now. In the meantime, we have virtualised a considerable part of the applications and thus significantly reduced the hardware

When procuring new IT equipment, DFS follows recommendations from Germany's digital trade association, Bitkom, on the environmentally friendly procurement of notebooks and desktop PCs. With the help of energy-saving devices and appropriate computer settings, we have been able to reduce electricity consumption by good 50 percent over the past ten years.



The power plant also uses the energy that would otherwise escape up the chimney. This plant produces steam and hot water from the exhaust of the gas turbine. This can in turn can be used to provide cooling.



Waste is not rubbish. It contains valuable raw materials that can be reused. Therefore, DFS separates its waste accurately by type.

In addition, a modern generation of multi-function printers is contributing to saving energy. More than 200 of these units are in use at DFS; they consume 30 percent less power than the previous generation.

Recycling, short delivery routes, organic standards

DFS has been operating an operational waste management system for more than 20 years. This allows valuable raw materials to be recycled.

Waste separation is a long-standing practice at DFS. We collect about 50 different waste categories separately. They are collected and recycled by certified waste management companies. As a result, we manage to recycle almost 95 percent of the waste volume, a record rate. High-quality secondary raw materials are obtained from this, thus making a sustainable contribution to the conservation of natural resources.

When it comes to the responsible use of raw materials, we are also breaking new ground in addition to classic recycling. In the new Logistics Centre in Langen, for example, cardboard boxes that are no longer usable will simply be reused, for example as padding for packaging.



95

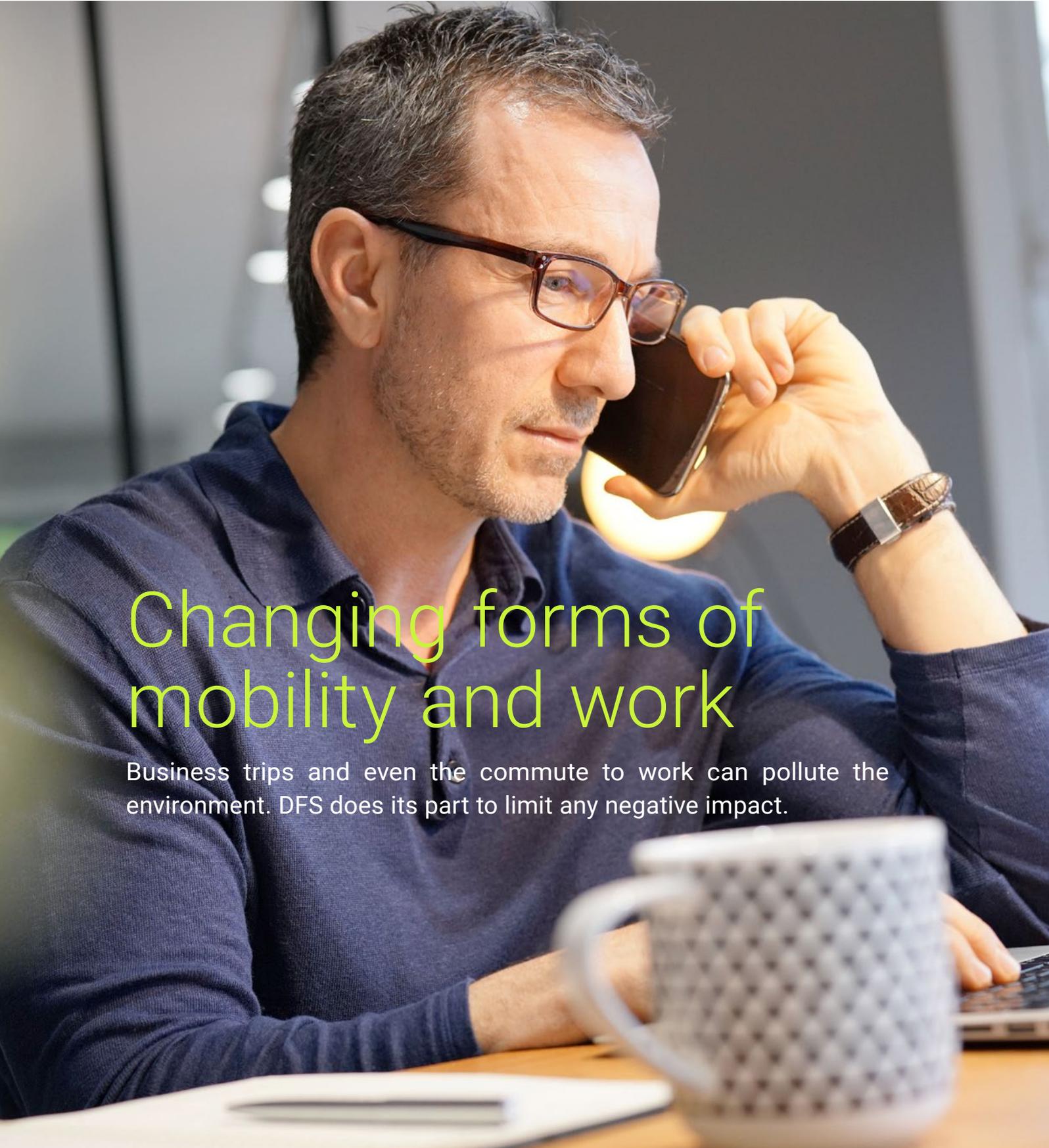
PERCENT OF THE RUBBISH

at DFS is recycled.

How heat becomes cool



The combined heat and power plant on the DFS Campus is not a classic power plant, because it produces more than just electricity. The hot exhaust gases from the gas turbines are used to generate steam and hot water. Part of it is used in so-called absorbers to cool water for the air conditioning of buildings. The plant not only supplies energy, but also provides DFS, the neighbouring Paul Ehrlich Institute and a branch of the Federal Environment Agency (UBA) with heating and cooling.



Changing forms of mobility and work

Business trips and even the commute to work can pollute the environment. DFS does its part to limit any negative impact.



We currently maintain a fleet of around 500 vehicles that produced an average of 154 grams of carbon dioxide per kilometre in 2019. This includes commercial vehicles and our all-electric vehicles for short distances. We are gradually converting our fleet to ever lower emission vehicles.

The number of business trips has decreased significantly due to the COVID-19 pandemic and new technologies. Nevertheless, technologies like Teams, Skype and Zoom cannot replace all travel. That is why climate protection will be considered even more than before in our travel planning and our internal travel regulations will be adapted accordingly.

Employer-subsidised public transport

In the Rhine-Main region and at the Bremen branch, we also promote the use of local public transport. Staff at the tower and control centre in Bremen, at the Langen site and at the control tower in Frankfurt can use a so-called job ticket. This is an employer-subsidised, low-price ticket for the local public transport network.

As a family-friendly company, DFS already made working hours more flexible in 2014. Since then, employees can perform their duties outside of their regular workplace to a defined extent, provided their job and the company's operations permit it. This mainly concerns office jobs, accounting for around 40 percent. Air traffic controllers or technicians who have to be on site are of course not included. In the COVID-19 pandemic, we have once again improved the technology for flexible working. Because fewer journeys to the place of work not only save time, but also lower fuel consumption and carbon dioxide emissions.



Around **40**
PERCENT
of DFS staff can
work from home.



Biodiversity

Insects are indispensable for the pollination of crops. DFS protects biodiversity through targeted re-naturalisation and by re-dedicating unused areas.



DFS is green. The DFS Headquarters in Langen alone has a landscaped area of more than 19,000 square metres. Just under half of it is in a natural state, with areas of forest, meadows and water. After the demolition of our guest house, we left the area as a wildflower meadow. Now, nature is reclaiming this area. Diverse plant species and a rich abundance of insects can now be found there. Occasionally, animal species that have become rare also make an appearance.

Nesting aids and water biotopes

By creating small ponds on the DFS Campus in Langen and at various tower sites, larger and smaller ecosystems have emerged. Fish, frogs, toads and ducks have found a new home. These habitats also form a valuable food base for some birds, including the grey heron, green woodpecker, kingfisher, sparrowhawk or goshawk. In Langen, we have installed nesting sites for peregrine falcons and bats, which are actively used. Piles of deadwood, such as those on the grounds of the Karlsruhe branch, also promote biodiversity.

New habitats



In addition, most of our radio and radar installations are located in natural habitats. We have started to re-naturalise vacant areas and support conservationists who are creating new habitats for amphibians and reptiles in these areas. Deadwood and stones create safe (winter) quarters for them, and rough grassland is a favoured habitat of rare butterflies.

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DFS Deutsche Flugsicherung GmbH
Corporate Communications
Am DFS-Campus 10
63225 Langen
Germany

Telephone +49 (0)6103 707-4111

E-mail info@dfs.de

Internet www.dfs.de

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Text

Nikola Demoulin, Christopher Belz

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