

Annual Report 2020



DFS Deutsche Flugsicherung

The business year 2020

This is a courtesy translation of the German original of the DFS Annual Report 2020. It is provided solely for your information and for the convenience of English-speaking readers. In the event that the English and German versions permit different interpretations, the German text shall prevail.

Report of the Supervisory Board

Type and scope of review and consultation

In the business year 2020, the Supervisory Board performed its functions as prescribed by law and the Articles of Association. It regularly advised and monitored the Executive Board and was involved in decisions of fundamental importance to the company.

In fulfilling its tasks, the Supervisory Board was supported by the audit committee, the committee for the commercial business, the personnel committee and the project committee. The committees thoroughly discussed the resolutions to be adopted and prepared recommendations for the decisions to be taken at the plenary meetings. The committee for the commercial business also provides general advice to the Executive Board on the further development of the commercial business. To this end, the committee was continuously informed about important projects in the commercial business.

In the business year 2020, there were several changes to the composition of the Supervisory Board. Dr Martina Hinricher left the Supervisory Board after more than eight years. She was succeeded by Dr Tamara Zieschang, including in her function as Chairperson. At the end of the year, the position of Deputy Chairperson of the Supervisory Board passed from Mr Markus Siebers to Ms Sabrina Leitzbach. Mr Peter Schaaf and Mr Frank Best had already left the Supervisory Board at the beginning of the year. They were succeeded by Mr Oktay Kaya and Mr Armin Havenith.

The Executive Board reported to the Supervisory Board on the basis of quarterly reports in accordance with Article 90(1)(3) of the German Stock Corporation Law (AktG). The Supervisory Board was also provided with ad hoc information on important issues. For example, it was informed monthly about the financial situation and, from the summer onwards, in particular about the liquidity situation. The Executive Board reported to the Supervisory Board in due form.

During the business year 2020, the Supervisory Board held four ordinary meetings to discuss the situation and development of the company. Two extraordinary meetings were held to discuss and decide on the appointment of Mr Dirk Mahns as managing director for operations (Chief Operating Officer, COO) and Mr Arndt Schoenemann as CEO and Chairman of the Executive Board.

The Supervisory Board specifically dealt with the following topics at its meetings:

- the 2019 annual financial statements and consolidated financial statements, the management report as well as the group management report and the audit report on the 2019 annual financial statements and consolidated financial statements
- the 2021 group economic plan, with the associated investment and financial plan
- the issuance of a *Schuldscheindarlehen* (debenture loan) to secure short-term liquidity
- the handling of the pandemic and the corresponding development in traffic volume as well as the associated forecasts
- personnel issues concerning the Executive Board, in particular the succession to the position of Chief Human Resources Officer (CHRO) as well as the succession to the post of CEO and Chairperson of the Executive Board
- the ZAAS project (future architecture ATS (air traffic services) systems), which manages the systems for air traffic control on cloud-based data centres
- the MaRS project (modernisation and replacement of surveillance infrastructure), which involves the renewal of radar facilities over the next few years
- requests for proposal involving FREQUENTIS DFS AEROSENSE GmbH for installations of remote tower solutions for various airports

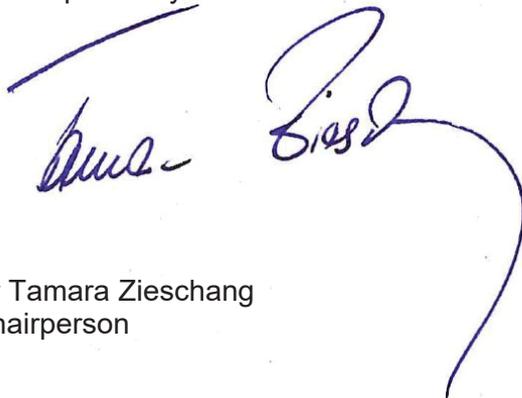
Result of the review

The Supervisory Board notes that the company responded quickly and effectively to the biggest crisis ever in the aviation industry. Decisive measures were taken early on to safeguard the health of employees, while costs were reduced immediately. At the same time, the social partners succeeded in addressing the constantly changing traffic situation with a flexible collective agreement, guaranteeing the safe conduct of flights and reducing (cost-intensive) overtime in the long term. Simultaneously, the Executive Board postponed investments, and projects that were not urgently needed were cancelled. Due to the lack of revenues from air navigation charges, liquidity had to be secured in the short term through a *Schuldscheindarlehen* (debenture loan).

On the basis of the audit report prepared by the auditors Mazars GmbH & Co. KG, the Supervisory Board discussed the 2019 annual financial statements and consolidated financial statements and the management report including conclusions in accordance with Article 53 of the German Budgetary Principles Act (HGrG) as well as the group management report. The audit committee met for discussions in advance. The comprehensive control and risk management system established in the company was included in the audit. The auditors were present at the discussions. They gave an account of the key results of their report and were available to answer questions. The Supervisory Board found no exceptions to be taken against the audit report and the auditors' findings. It proposed that the Shareholder Meeting approve the annual financial statements and the consolidated financial statements. The Supervisory Board reviewed the proposal of the Executive Board on the use of profits and agreed to it.

The Supervisory Board would like to express its thanks to the Executive Board for its work in the interests of the company as well as the successes achieved in 2020. Our thanks and appreciation also go to all employees and works councils who played a decisive role in these successes.

The Supervisory Board



Dr Tamara Zieschang
Chairperson



Dr Tamara Zieschang

Members of the Supervisory Board

Chairperson

Dr Tamara Zieschang

State Secretary
Federal Ministry of Transport and Digital
Infrastructure
(Member of the Supervisory Board from
26 February 2020, Chairperson from
28 April 2020)

Deputy Chairperson

Sabrina Leitzbach

Air traffic controller
(Deputy Chairperson from
17 December 2020)

Dr Martina Hinricher

Ministerialdirektorin (retired)
(Member of the Supervisory Board and
Chairperson until 25 February 2020)

Markus Siebers

Air traffic controller
(Deputy Chairperson until
16 December 2020)

Frank Best

Colonel (G.S.)
Federal Ministry of Defence
(Member of the Supervisory Board until
17 March 2020)

Carmen von Bornstaedt-Radbruch

Ministerialrätin (retired)

Antje Geese

Ministerialdirigentin
Federal Ministry of Transport and Digital
Infrastructure

Armin Havenith

Colonel (G.S.)
Federal Ministry of Defence
(Member of the Supervisory Board from
18 March 2020)

Oktay Kaya

Chairperson of the Central Staff Council
Air traffic controller
(Member of the Supervisory Board from
18 January 2020)

Dr Angelika Kreppein

Regierungsdirektorin
Federal Ministry of Finance

Dr Carl-Stefan Neumann

Managing Director
Carl-Stefan Neumann Advisory &
Investments GmbH

Peter Schaaf

Chairperson of the Group Staff Council
Air traffic controller
(Member of the Supervisory Board until
17 January 2020)

André Vöcking

ANS engineer

Andrea Wächter

Head of Hamburg Tower

Jörg Waldhorst

Senior expert air navigation obstacles

Members of the Advisory Council

Chairperson

Steffen Bilger

Member of the German Bundestag
Parliamentary State Secretary

Dr Constantin Alsheimer

Chairperson of the Management Board
Mainova AG

Dr Karsten Benz

Chairperson of the Supervisory Board
Droniq GmbH
(Member of the Advisory Council from
March 2020)

Dr Jürgen Bierbaum

Alternate Member of the Boards
ALTE LEIPZIGER – HALLESCHE Group

Chris Fischer Hirs

Group Chief Executive Officer
Allianz Global Corporate & Specialty AG
(Member of the Advisory Council until
July 2020)

Ingo Gerhartz

Chief of Staff, Air Force
German Air Force Command

Prof Dr Elmar Giemulla

President
Aircraft Owners and Pilots Association
(AOPA Germany)

Winfried Hermann (Member of the *Land* Parliament)

Minister
Ministry of Transport
Baden-Württemberg

Jörg Hessenmüller

Member of the Board of Managing
Directors
Commerzbank AG
(Member of the Advisory Council from
April 2020)

Michael Hoppe

Chairperson
BARIG – Board of Airline
Representatives in Germany e.V.

Dr Detlef Kayser

Member of the Executive Board
Deutsche Lufthansa AG

Kirsten Lühmann

Member of the German Bundestag

Oliver Luksic

Member of the German Bundestag

Joachim Müller

Group Chief Executive Officer
Allianz Global Corporate & Specialty AG
(Member of the Advisory Council from
April 2020)

Alois Rainer

Member of the German Bundestag
(Member of the Advisory Council from
February 2020)

Prof Dr Bernd Sanner
Medical Director
AGAPLESION BETHESDA
KRANKENHAUS WUPPERTAL gGmbH

Dr Stefan Schulte
President
German Airports Association (ADV)
Chairperson of the Executive Board
Fraport AG

Björn Simon
Member of the German Bundestag
(Member of the Advisory Council from
February 2020)

Prof Dr Sven Simon
Member of the European Parliament
(Member of the Advisory Council from
February 2020)

Ralf Teckentrup
President
German Airline Association (BDF)
CEO of the Executive Board
Condor Flugdienst GmbH

Klaus Thiemann

Correct at 31 December 2020

Group management report

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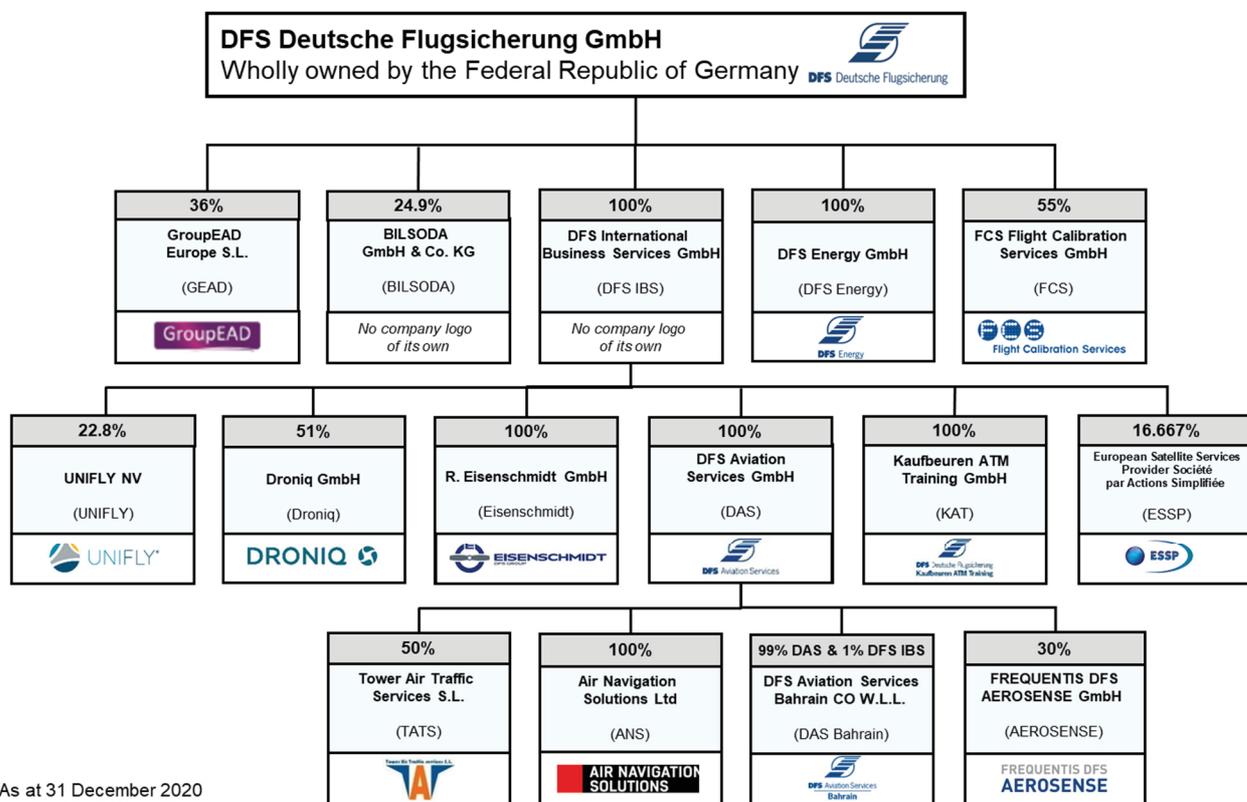
The term 'Executive Board' has replaced the term 'Board of Managing Directors' used in previous publications.

Group management report

for the business year 2020

1 Group organising principles

1.1 Structure of the Group



As at 31 December 2020

DFS Deutsche Flugsicherung GmbH (DFS) manages the DFS Group as the ultimate parent company and carries out operational activities itself. The subsidiary and investment entities supplement the portfolio of services offered by the Group and operate in areas closely related to the aviation industry.

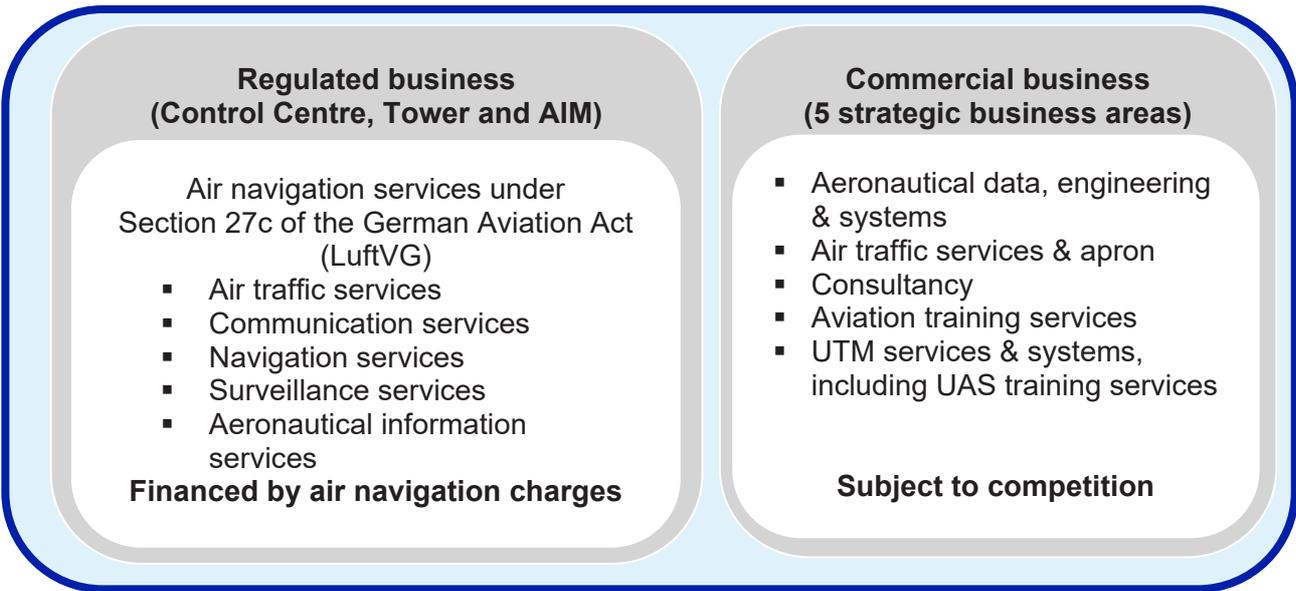
The consolidated financial statements cover eight indirect and direct investments. The results and financial position are primarily determined by the business activities of DFS. Information on the scope of consolidation can be found in Note 3.2.

1.2 Business activities

1.2.1 Overview

The DFS Group, which employs 6,139 operational and administrative staff (of which 5,659 at DFS), ensures the safety of German airspace and also offers additional products and services on the free market (the commercial business).

The DFS Group divides its business activities into two segments. One segment – the regulated business – is financed by air navigation charges, while the other segment – the commercial business – competes for business on the free market. The segment financed by air navigation charges is the main business.



1.2.2 Regulated business

The regulated business – providing air navigation services – is defined by the tasks set out in Section 27c of the German Aviation Act (LuftVG). As a company entrusted to perform State functions, DFS provides air traffic services (ATS) and support services. It operates control centres in Langen, Bremen, Karlsruhe and Munich as well as 16 control towers at the designated international airports in Germany. For this purpose, it develops and operates ATS systems as well as communication, navigation and surveillance systems.

Control Centre division

The Control Centre division at DFS provides air traffic control in the terminal area (approach control service) and en-route (area control service), including the flight information service and the alerting service, and operates the corresponding ATS systems.

Since 1 January 2012, the European Commission has regulated en-route services by means of a performance and charging scheme for air navigation services and network functions (currently regulated across the European Union in Regulation (EU) 2019/317, as amended by Commission Implementing Regulation (EU) 2020/1627 on exceptional measures for the third reference period (2020-2024) of the Single European Sky performance and charging scheme due to the COVID-19 pandemic). The focus is on European and national requirements covering safety, environment, capacity and cost-efficiency. As the national supervisory authority, the Federal Supervisory Authority for Air Navigation Services (BAF) determines the German contribution to the performance plan at the level of the Functional Airspace Block

Europe Central (FABEC). The performance plan is adopted by the FABEC Member States. The current performance plan period runs from 2020 to 2024. The charges are laid down by EUROCONTROL per calendar year on the basis of a decision of the enlarged Commission in accordance with the German Ordinance on Route Charges of the Air Navigation Services (FSStrKV).

Tower division

The Tower division at DFS controls air traffic at Germany's designated international airports (aerodrome control service), including all ATS systems as well as the flight information service and the alerting service.

The aerodrome control service has been subject to economic regulation since 2015. Terminal charges are set by means of a statutory instrument of the Federal Government (FSAAKV).

Aeronautical Information Management (AIM) division

The AIM division at DFS provides its customers with all relevant aeronautical information and aeronautical information services for the safe conduct of flights. AIM collects, processes and publishes aeronautical data, such as flight plans and NOTAM, and publishes numerous aeronautical publications and products, such as the Aeronautical Information Publication (AIP).

1.2.3 Commercial business

The management of the Group has bundled the commercial business (see also section 3.2) in subsidiary and investment entities primarily under the DFS International Business Services GmbH (DFS IBS) holding company to the extent legally possible and economically sensible.

The subsidiary and investment entities support and enhance the portfolio of products and services offered by the Group on the free market. These commercial services are offered worldwide, while air navigation services are only offered in Europe. In contrast to the regulated business, the commercial business is not subject to regulatory requirements. Intra-Group transactions are conducted at arm's length conditions and prices.

Derived from the DFS Group strategy for the commercial business, DFS is positioning itself as a leading provider of solutions and systems for the traditional air traffic management (ATM) business as well as for the developing business with the management of drone flights (UTM – UAS traffic management; UAS – unmanned aircraft system).

In the ATM market, DFS offers the complete range of its expertise in air navigation services and has a broad product and service portfolio in the following strategic business areas:

- Aeronautical data, engineering & systems
- Air traffic services & apron management services
- Consultancy
- Aviation training services (such as training of air traffic controllers)

In the UTM market, the overall regulatory framework is still largely unclear, as rules from the European Aviation Safety Agency (EASA) on U-Space have not been adopted yet. Through its UTM service portfolio, DFS would like to belong to the leading players and take on an active role in the market. Here, DFS is establishing the business area with

- UTM services & systems, including UAS training services (support services for the operation of drones)

with the objective of the safe and fair integration of unmanned aircraft systems into the airspace.

These five strategic business areas cover the products and services offered by the DFS Group. The execution is assigned to individual subsidiaries.

1.3 Legal framework and management organisation

In 1993, DFS was entrusted with the tasks of the Federal Administration of Air Navigation Services (BFS) by the Federal Republic of Germany. The Headquarters of DFS are located in Langen near Frankfurt at: Am DFS-Campus 10, Langen, Germany. The company is registered under HRB 34977 on the Commercial Register at the Local Court in Offenbach am Main.

The object of the company is the development, provision and execution of the air navigation services delegated to the company by the Federal Ministry of Transport and Digital Infrastructure (BMVI). The company can also provide air navigation services in Europe as well as carry out related sideline activities in Germany and abroad.

The sole Shareholder is the Federal Republic of Germany.

The following distribution of responsibilities among the Members of the Executive Board of DFS forms the basis for the management organisation (as at 1 March 2020).

Chairperson and Chief Executive Officer	Chief Operating Officer	Chief Technology Officer	Chief Human Resources Officer Labour Director
<ul style="list-style-type: none"> • Strategy, organisation, international affairs • Institutional and legal affairs, risk management, compliance • Export control • Safety and security management systems • Internal audit, quality management • Corporate communications, public relations, environment • Finance, including taxes and charges, insurances • General administration • Procurement • Consulting services and system deliveries • Military affairs 	<ul style="list-style-type: none"> • Air traffic services • Airspace management • Air traffic flow management • Aeronautical information service • Capacity planning and operational training for operational ATM and AIS personnel • Product management for ATM and AIS systems • Project management for ATM and AIS systems 	<ul style="list-style-type: none"> • Research and development • IT architecture management • Communication, navigation and surveillance (CNS) services • Product management for CNS systems • System management for technical systems • Logistics • Technical and infrastructural facility management • Business and administrative information technology • Development of software products 	<ul style="list-style-type: none"> • Human resources strategy • Collective bargaining (strategies and policies) • Human resources management • Human resources development, initial and continuation training • Initial training for operational personnel (air traffic services) • Staff planning (excluding capacity planning of operational personnel) • Payroll accounting • Compensation and incentive systems • Occupational pensions • Social and health management • Industrial safety, accident prevention • Labour law, collective bargaining law

The Executive Board meets weekly in the Executive Committee, a body which also includes all members of the executive management level (division directors), to discuss important corporate issues and share information.

The Supervisory Board of DFS comprises 12 members, six appointed by the Shareholder and six elected by the employees (see Note 46.2 for the members of the Supervisory Board).

The subsidiary and investment entities in the commercial business are managed primarily through the holding company DFS International Business Services (DFS IBS). It holds, manages, administers and finances its operating investments by means of intercompany (Group) contracts, such as control agreements, profit and loss transfer agreements and cash pool agreements. It also limits the liability of DFS to the carrying amount of the investment of DFS IBS. The company implements the structural and operational rules laid down by the management of the Group by means of shareholder resolutions, employees of DFS taking on supervisory board membership and the contractual commitments set out in intercompany (Group) contracts. The board of DFS IBS consists of DFS executives, who carry out this role in addition to their normal duties.

The management of the Group is responding to the continuing consolidation in the aviation industry and the resulting diversified framework conditions and regularly reviews whether further measures to adapt and realign the structure of the Group need to be taken.

Changes in the DFS Executive Board from 2020

Following the resolution of the Supervisory Board dated 23 December 2019, DFS restructured the Executive Board as of March 2020. The distribution of responsibilities now provides for four functional areas, whereby the tasks of the directorates Chief Executive Officer and Human Resources remain unchanged. The management responsibilities and duties of the former Directorate Operations were split and supplemented by the new position of Chief Technology Officer (CTO). The former Managing Director and COO Mr Robert Schickling left the company at the end of January 2020 at his own request. He was succeeded by Mr Dirk Mahns on 1 February 2020. The Technology directorate was taken over by Mr Friedrich-Wilhelm Menge as of 1 March 2020.

On 13 February 2020, Dr Michael Hann, who had been with the company since 2012 as Managing Director Human Resources and Labour Director, died suddenly and unexpectedly. He left a lasting mark on the company. His duties were initially taken over by Prof Klaus-Dieter Scheurle until Dr Kerstin Böcker succeeded Dr Hann on 15 August 2020.

Changes in the DFS Executive Board from 2021

After eight years as Chairman of the Executive Board of DFS, Prof Klaus-Dieter Scheurle left the company on 31 December 2020. He is being succeeded by Mr Arndt Schoenemann, who is joining DFS from the aircraft supplier Liebherr-Aerospace Lindenberg GmbH.

(See also Note 42 "Post-balance-sheet-date events")

1.4 Strategies and objectives

1.4.1 Strategic direction

"Together for safe and smart European skies"

The corporate strategy is based primarily on the sovereign task entrusted to DFS: handling air traffic in a safe, orderly and expeditious manner. With the premise of being the leader among the major European air navigation service providers (from German ANS to European ANS), DFS is positioning itself with its corporate vision "Together for safe and smart European skies". DFS guarantees its future viability and positioning within Europe through safety, innovative technology and economic viability.

Automation and digitalisation are becoming increasingly important in the whole aviation industry, as in other areas, and are becoming key success factors. Digital change offers a wealth of opportunities. The systematic analysis and networking of large volumes of data enables more efficient operations, greater economic efficiency as well as lean, efficient processes. It brings far-reaching changes at all levels across every stage of industry. It requires new ways of thinking, however.

In air traffic control, digitalisation offers opportunities for optimisation in terms of quality, productivity, new procedures and services, for example. It is therefore crucial for DFS as an air navigation service provider to upgrade its technologies and to rigorously exploit the potential of digitalisation and automation to reduce staff workload and boost efficiency, for example.

Since the provision of our services is already based on the close interaction between our highly specialised employees and a complex technological system landscape, change management is an important success factor for DFS to establish new working environments and ways of working.

DFS is meeting these challenges in line with the objectives of the Single European Sky (SES) regulatory process. Our main focus is centred on customer orientation, safety and the innovative technological positioning of DFS.

To achieve this, DFS pursues four central corporate objectives:

1. We aim to maintain an outstanding safety level at DFS and continuously develop and refine it.
2. We aim to fulfil all regulatory requirements through top performance in all key performance areas (KPA's).
3. We aim to increase profitability and productivity within the entire DFS Group.
4. We aim to achieve sustainable growth within the DFS Group.

Against the background of the current COVID-19 pandemic, which has hit the entire aviation industry hard, it is all the more important for DFS to position itself robustly. To this end, the focus in the years leading up to the end of the third reference period (RP3) will be on increasing cost-efficiency.

1.4.2 Sprint2024 programme

With the start of the third reference period (2020-2024, see also section 2.2.2), DFS launched the Sprint2024 programme to achieve the objectives described above. The programme has defined seven strategic lines of action and focuses on capacity and productivity through innovation and digitalisation under the banner of safety:



Safety

Safety forms the basis for the Sprint2024 programme and is an integral part of all lines of action. In the understanding of DFS, safety does not happen by itself; it has to be achieved again from scratch each day. DFS will therefore create the framework for an innovative and efficient safety management system.

1. People & corporate culture

We will remain an attractive employer, develop our employees and attract new talented staff. We will embrace our values and standards and will create a culture in which all generations work together in an interdisciplinary way.

2. Capacity

We will expand our position as a leader in quality and guarantee a high safety level. We will react flexibly to capacity requirements and support our air traffic controllers and engineering staff by providing high-performance systems and procedures.

3. Innovation & digitalisation

We strive for technological leadership. We will modernise and invest in safe future technologies and establish an open exchange of data. We will embrace innovation and reduce complexity.

4. Economic viability

We will ensure the financial viability of the DFS Group and generate an adequate return through strict cost discipline. We will design efficient processes and use our resources optimally.

5. Commercial business & investments

In the area of commercial business, we will be a leading full-service provider for ATM and UTM solutions and systems, including for the Bundeswehr. We will create expertise through cooperation agreements and investments, and we intend to generate revenues of €200 million by 2030 with an average return of 6 percent.

6. Environmental & climate protection

We will align our corporate actions with the demands of environmental and climate protection in a consistent and exemplary manner. We will become a climate-neutral company.

7. Europe & regulation

We will strengthen our position as a leading air navigation service provider (ANSP) in Europe and will be the driving force for SES in Europe. Together with our European partners, we will meet the challenges faced in aviation.

In all strategic lines of action, additional measures are being pursued to help address the crisis caused by the COVID-19 pandemic. For the same purpose, the STEP strategic efficiency improvement programme was also initiated, which contributes to the achievement of objectives, particularly in the economic viability cluster, and thus fundamentally to securing the future of the DFS Group.

1.4.3 Financial strategy

The financial strategy of DFS promotes the financial stability of the Group and is based on the following areas:

Good to very good credit rating

Investors, business partners and employees should be able to continue to trust in the financial stability of the company and its subsidiaries. The company secures the very good investment grade rating in combination with its Shareholder (see section 2.6.3.1).

Adequate liquidity

In the current low interest rate environment, DFS maintains its room to manoeuvre over the near term by issuing attractively priced commercial paper (short-term) and using demand deposits (short-term). This will allow the company to react flexibly to changes in its environment at all times. In the medium to long term, DFS has fund assets not protected against insolvency at its disposal.

Adequate capital structure and equity ratio

Measures are being taken to continuously monitor the capital structure and equity ratio. The negative impact on the equity as defined under International Financial Reporting Standards (IFRS) stemming from the revised standards on the recognition of long-term employee benefits (see Note 28.8) from the 2013 business year will be reduced step by step over the following reference periods by being considered in the air navigation charges. DFS will continue to

maintain the equity ratio shown in 'adjusted equity' (see Note 39.1) of 20.3 percent and to progress towards a fully funded status for occupational pensions in a step-by-step manner.

Low leverage

The infrastructure of the company is unencumbered and remains the property of the company. This creates a stable asset base that is in essence freely available.

Risk management system

A modern risk management system supports the planning and control of financial risks in a consistent manner (see section 6.2.2.1).

1.5 Planning and control

When managing the Group, the Executive Board differentiates between the regulated business and the commercial business as required by the provisions of the German Transparency Directive Implementation Act (TranspRLG).

Regulated business

The management of the regulated business is aligned with the regulatory environment, the strategic dimensions and objectives, the requirements of the regulated business and the organisational structure.

The achievement of these objectives and requirements is measured by means of planned/actual comparisons, which are carried out both on a regular basis (monthly, half-yearly and yearly) and ad hoc. Achievement is monitored and reported at corporate, divisional and product level. A system of financial indicators has been developed, which are primarily IFRS based. The performance indicator of operating costs, which is determined and laid down on the basis of the following, contains primary costs as well as income and charges from internal costs allocation:

Operating costs
Staff costs
+ Other operating expenses (e.g. material costs)
+ Depreciation and amortisation
= Primary costs
+ Charges from internal cost allocation
- Income from internal cost allocation
= Operating costs

Planning and control also uses non-monetary indicators, such as the analysis of the traffic forecast, in addition to financial metrics on cost-efficiency.

As regards non-monetary indicators, DFS constantly measures indicators for the key performance areas of safety, air traffic control (ATC) capacity and the environment, such as infringements of separation, punctuality indicators and horizontal flight efficiency.

The Sprint2024 programme was launched in 2020 to concretise the strategic goals. DFS is pursuing an agile planning approach with Sprint2024. Regular reassessment and prioritisation of the strategic measures ensures that they are up to date and can be adapted to changing conditions, which is of crucial importance against the background of the COVID-19 pandemic. The measures are incorporated in the rolling planning cycle and monitored.

Commercial business

The commercial business is materially influenced by the competitive environment in which it operates. Planning and control is carried out by setting targets for contribution margins and returns on sales, whereby a positive contribution to earnings at the EBIT or EBITDA level should be generated.

The operating subsidiary and investment entities should generate a profit before tax typical for the industry. The rate of return is to be raised to 6 percent in the medium term.

1.6 Research and development

German airspace demands a particularly high-performing air navigation service provider over the long term, as this airspace is extremely busy and complex in international comparison. Technological and operational innovations represent an important prerequisite for managing growing cost pressure, the increasing requirements as regards environmental sustainability and the rise in air traffic predicted in all forecasts for the medium term. These issues must all be managed while maintaining an unrestricted safety level. Therefore, DFS has been involved in international and national research projects for many years. It concentrates on applied research which leads to new products, procedures and working methods and follows the path from invention to innovation.

The most prominent project at the international level is the SESAR programme (Single European Sky Air Traffic Management Research), which encompasses all areas of air navigation services. It is organised within the scope of the SESAR Joint Undertaking, which DFS joined as an active member in June 2009, along with other leading organisations (air navigation service providers, airspace users, airports and manufacturers).

National activities focus on regional challenges, such as the optimisation of flight routes for overflights and the operation of busy airports, such as Frankfurt and Munich (including their arrival and departure procedures). DFS conducts real-time and fast-time simulations, tests new key technologies and subsequently develops air traffic control software and suitable simulators. DFS also participates in grant funding programmes from the Federal Government, such as the aeronautical research programme and the mFUND research initiative (*Modernitätstfonds*). In the aeronautical research programme, DFS is once again managing a consortium project. The goal of grant funding projects, and of all other forms of cooperation, is to work jointly with German partners from research and industry to improve the starting basis for subsequent international activities.

DFS promotes the development of innovations. These currently include:

- The remote provision of aerodrome control services (see section 7.2.1 under *Remote tower control (RTC)*).
- Surveillance systems that use all available sensors, such as various radar systems, multilateration and the positions transmitted by the aircraft themselves, to be able to track the aircraft seamlessly from gate to gate, on the ground as well as in the air.
- Controller assistance tools that reduce their workload by means of optimised information processing, especially through advice on conflict avoidance, and by means of step-by-step automation.
- The interoperability of European air traffic management systems that keeps pace with new developments – an important precondition for the SES initiative (Single European Sky) (see section 7.2.1).
- An advanced, cost-efficient standardisation of technical infrastructure and procedures as a precondition for further automation and innovation.
- Extensive virtualisation of air traffic control systems and establishment of data centres in the medium term.
- Comprehensive activities for a safe and fair integration of unmanned aircraft systems (see section 2.2.1 under *Drones*).

DFS allocated a total of approximately €50.8 million and around 273 staff posts to research and internally generated developments. The capitalisation ratio equals roughly 44.9 percent.

Grant funding payments of €20.2 million were received in 2020 from European research framework programmes for this purpose, including from SESAR and the German aeronautical research programme. The implementation of the R&D results also takes place within the scope of the SESAR Deployment Alliance (SDA) together with air navigation service providers (ANSPs), airlines and airport operators.

2 Report on economic position

In addition to the overall economic situation, political, legal and industry-specific factors have a fundamental influence on the development of air transport. A flourishing global economy acts as a growth engine for the aviation industry. Nevertheless, there are factors which have negative effects, such as political tensions, natural disasters, negative regulatory, legal and tax issues as well as temporary and local, or even global, geographic concentrations of illnesses (pandemics). The number of flights has a material influence on the business activities of the regulated business. It is also a major factor for the commercial business, as DFS Aviation Services (DAS) – at German regional airports – and Air Navigation Solutions Ltd. (ANSL) – at Gatwick and Edinburgh airports in the United Kingdom – provide air navigation services as well. The aviation-related consultancy projects, technical support services and specialist publications follow the general trend of the aviation sector.

2.1 Overall economic situation

The global economy experienced a historic downturn in 2020 as a result of the COVID-19 pandemic. Through the use of unprecedented stimulus and monetary policy support, the impact of the crisis on major economies was less than initially feared. Nevertheless, the pandemic is causing long-term economic damage in many countries, is increasing social inequality and is reversing progress in poverty reduction. The International Monetary Fund (IMF) expects the global economy to shrink by 4.3 percent in 2020, the Organisation for Economic Cooperation and Development (OECD) expects global economic output to fall by 4.2 percent. In the previous year, the OECD was still forecasting global growth of around 3.0 percent for 2020, while the World Bank expected 2.5 percent in 2020.

Economic activity in Europe suffered a severe shock in the first half of 2020 and recovered strongly in the third quarter. This was due to the gradual lifting of containment measures as well as measures taken by EU Member States and initiatives taken at the European level that helped cushion the impact of the pandemic on the economy and the labour market. For 2020 as a whole, EUROSTAT estimates that gross domestic product (GDP) will fall by 7.4 percent year on year. In the Autumn 2019 Economic Forecast, the European Commission had still expected GDP growth in the euro area of 1.2 percent in 2020.

The German Federal Statistical Office reported a decline in GDP of 5.0 percent for Germany in 2020, after ten years of year-on-year growth. The economic climate, however, presented a divided picture. On the one hand, the service sector was severely impacted by the restrictions on social contacts, while the industrial sector developed in a largely robust manner. The development in the aviation industry in particular was adversely affected by the restrictions in the service sector. The decline in GDP is less than the comparable value for Europe overall. In addition to the resilience of the German economy, this is also due to the very extensive packages of measures taken by the German Federal Government to support the economy and stabilise incomes. The forecasts for 2020 had still assumed an increase of 1.1 percent in real terms compared with 2019.

2.2 Development of business

The COVID-19 pandemic hit aviation on an unprecedented scale in 2020. Few other industries are struggling more with the effects of the global crisis. This relates not only to airlines and tour operators, but also to air navigation service providers.

In January and February 2020, traffic volumes could still be described as 'normal'. However, March, and even more so April 2020, will go down in history as the months with the biggest air traffic volume declines to date.

In April 2020, EUROCONTROL Member States agreed to defer air navigation charges owed by airlines amounting to approximately €1.1 billion in the subsequent months. The DFS share of this amounts to €119 million. The decision is intended to support the liquidity of the airlines during the COVID-19 pandemic. This comes at the expense of air navigation service providers. The agreement stipulates that the en-route charges for February do not have to be paid until November 2020. For March to May 2020, payments must then be made at three-month intervals from November 2020. This exacerbated the liquidity difficulties DFS was facing as a result of the collapse in traffic.

DFS reacted immediately to the changed external conditions and initiated countermeasures. As early as the end of February 2020, a Corona Core Team was established to coordinate all aspects related to COVID-19 within the DFS Group and decide on the measures to be taken. The objective was to ensure the best possible protection of employees while maintaining operational performance and safeguarding the financial performance of the company.

Because DFS counts as part of the critical infrastructure of the German Federal Government, it is obliged to maintain its services. Air traffic controllers in control towers at airports must issue take-off and landing clearances and work from control centres to monitor en-route flights in order to handle the remaining air traffic in a safe, orderly and expeditious manner. Air traffic controllers and other employees who are directly responsible for managing air traffic in German airspace continue to work in DFS control towers and control centres, albeit at a lower staffing level.

DFS has concluded a corona collective bargaining agreement with its collective bargaining partner, which allows an accumulation of up to 300 negative working hours. With this collective agreement, DFS has created the required flexibility to be able to provide the necessary capacity in the event of a rebound in air traffic volumes.

In addition, DFS drew up a cost-cutting programme. First and foremost, vacant positions were not filled unless absolutely necessary, non-staff costs were cut and project plans were reviewed. Projects that were not urgently needed were cancelled or postponed.

After the end of the government-imposed lockdown in spring 2020, the prospects for an improvement in the economic situation in many countries initially strengthened in the summer. With the increase in new infections in autumn 2020, government restrictions came into force again, which seriously reduced economic activity. The associated travel restrictions throttled air traffic back to a minimum.

The traffic declines and the associated revenue shortfall, as well as the deferral of route charges, needed to be funded in the short term. DFS issued a *Schuldscheindarlehen* (debenture loan) of €500 million in August and October 2020, thus securing the necessary liquidity.

The fact that there were no insolvencies of major airlines in the business year had a positive impact on business performance. This is probably due to the government support measures across the globe, which allowed the continuation of business operations for the time being.

The opening of the new main terminal on 31 October 2020 marked the first step in the process of opening Berlin Brandenburg Willy Brandt Airport (BER). The first commercial flights took off on 1 November 2020 and a second runway, the southern runway, went into operation on 4 November 2020. On that day on, the new flight procedures to safely control air traffic at the airport also came into effect. For DFS, this saw the end of a transition period that lasted more than eight years.

In parallel to this, DFS continued to control air traffic at Berlin Tegel Airport until it closed on 8 November. Since this date, DFS has been operating only one tower in Berlin, and not two as had previously been the case. Overall, 91 air traffic controllers, aerodrome coordinators and apron controllers monitor ground and air traffic at the new Berlin Airport.

The business performance of the DFS subsidiaries varied greatly. Being air navigation service providers, DFS Aviation Services (DAS) and Air Navigation Solutions Ltd. (ANSL) suffered most from the COVID-19 pandemic. While ANSL managed to break even at the end of the business year thanks to agreements with employees, customers and trade unions, DAS was not able to do so despite the cost-cutting measures which were also introduced.

Nevertheless, despite the difficult conditions, successes were also recorded in 2020. DFS Aviation Services Bahrain CO W.L.L. (DAS Bahrain), for example, extended its contract with Bahraini Civil Aviation Affairs, thus consolidating its commitment in the Middle East region. Frequentis DFS Aerosense GmbH (Aerosense), a joint venture of the Austrian Frequentis AG and the DFS subsidiary DFS Aviation Services GmbH, participated for the first time in important international tenders in the new growth field of remote tower control technology. Droniq GmbH (Droniq), a joint venture between Deutsche Telekom and DFS, was able to launch its UTM system in June, laying the foundation for further business expansion in the field of drones. This put in place one of the central preconditions to be able to safely operate drones across larger distances, and not just in close vicinity to the pilot. Delivering this precondition is a necessary step for the economic operation of unmanned aircraft systems. DFS considers itself well positioned to achieve its goal of becoming the technological leader in this field as well. The DFS subsidiary FCS Flight Calibration Services GmbH (FCS) successfully carried out the calibration of an instrument landing system (ILS) using a NAVaid drone.

2.2.1 Development of air traffic

IFR flights 2020

In 2020, there will be an unprecedented contraction in air traffic and a pronounced decoupling of the volume of air traffic from overall economic development. The air transport industry came to a virtual standstill around the globe following the outbreak of the COVID-19 pandemic in the months from April to June.

The COVID-19 pandemic and the associated travel restrictions globally throttled air traffic back to a minimum in March 2020. At the end of February 2020, IFR movements in German airspace were still close to the previous year's level, down 2.4 percent.

In April 2020, air traffic volumes were only 12.9 percent of the previous year's level. Demand for air transport came to a standstill. Passenger volumes at commercial airports fell to less than 2 percent of the previous year's level. Only urgently needed flights, such as patient transports as well as cargo or repatriation flights continued to be handled.

In June 2020, German and foreign airlines gradually resumed the first international flight connections. This became possible with the lifting of the blanket travel warning for the European Union and associated States in the middle of the month. The increase in traffic was largely driven by tourism to the European Mediterranean and Black Sea coasts, as well as trips for private and family reasons. At the end of August 2020, air traffic was almost 50 percent of the previous year's level.

However, some of the popular vacation regions were declared risk areas as of September 2020 due to the outbreak of a renewed pandemic wave. The new testing and quarantine regulations adopted for returnees from these areas had a strong dampening effect on the rest of 2020. With the changeover to the winter flight schedule, tourist traffic declined as usual from November onwards. At the same time, no stimulus from business travel and/or intercontinental traffic was expected for the fourth quarter of 2020 as a result of the second lockdown from 2 November 2020. These factors led to another decline in air traffic for September to December 2020, down to a level of around 35 percent of that of 2019.

DFS handled 1,460,768 IFR flights during the reporting period. This represents a 56.2-percent decline in traffic compared with 2019. This level was last reached in 1989. At that time, DFS registered 1.46 million flights.

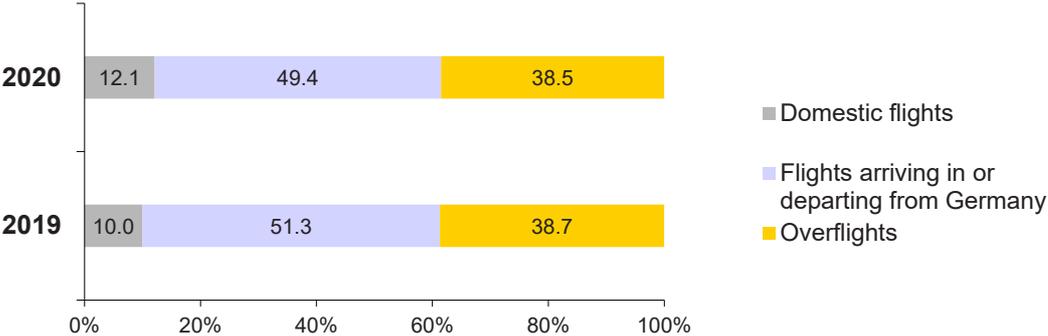
IFR flights in Germany			
	2020	2019	Change
Civil flights	1,418,619	3,292,207	-56.9%
Military flights	42,149	42,217	-0.2%
Total	1,460,768	3,334,424	-56.2%

The busiest day of 2020 was 21 February, with 8,797 controlled flights.

A massive drop was recorded for all traffic segments due to the COVID-19 pandemic. The traffic decline was most pronounced for entries and exits (-57.8%) and overflight traffic (-56.4%); domestic traffic recorded a decline of 47.2 percent.

The plunge in all traffic segments led to the respective shares of the total traffic volume changing only slightly compared with the previous year. Entries and exits share of traffic declined due to the worldwide travel restrictions, while domestic connections rose. The share of overflights remained basically the same as in the previous year.

Distribution of IFR flights (%)



Traffic at the airports where DFS operates

At the designated international airports in Germany, a decline in traffic comparable to the development in en-route could be observed in 2020. Overall, there was a decline in traffic of around 58.7 percent.

Berlin Brandenburg Willy Brandt Airport (BER) went into operation on 4 November 2020. Following the opening of BER, flight operations at Berlin Tegel Airport ceased on 8 November 2020. Formally, Berlin Tegel Airport will remain in operation until it is de-commissioned in May 2021. The northern section will continue to be available for helicopter flight operations by the Bundeswehr, the German Armed Forces, until 2029.

The percentage decline in traffic was smallest at Leipzig Halle and Cologne Bonn airports. At both airports, cargo has a high share of traffic volume. Air cargo remained largely stable during the COVID-19 pandemic compared to passenger traffic.

Traffic at the designated international airports			
	2020	2019	Change
Berlin Brandenburg	8,324	N/A	N/A
Frankfurt	212,334	513,722	-58.7%
Munich	144,268	414,068	-65.2%
Cologne Bonn	79,810	142,117	-43.8%
Düsseldorf	78,647	225,440	-65.1%
Leipzig Halle	62,222	75,432	-17.5%
Berlin Tegel	60,498	192,958	N/A
Hamburg	60,144	149,239	-59.7%
Stuttgart	49,980	132,669	-62.3%
Berlin Schönefeld	34,963	90,124	N/A
Hannover	27,367	64,781	-57.8%
Nürnberg	20,205	49,417	-59.1%
Bremen	15,187	29,984	-49.3%
Münster Osnabrück	10,525	18,939	-44.4%
Dresden	8,773	20,707	-57.6%
Saarbrücken	4,062	7,988	-49.1%
Erfurt Weimar	3,618	4,704	-23.1%
Total	880,927	2,132,289	-58.7%

Traffic in the United Kingdom (UK)

Air Navigation Solutions Ltd. (ANSL) provides air traffic control and engineering services at Edinburgh and Gatwick airports. At Gatwick Airport, ANSL had safely handled up to 60 runway movements an hour in 2019, making it the busiest single-runway operation in the world with a total of 280,681 commercial flight movements per year. Due to the impact of the COVID-19 pandemic, air traffic volumes at Gatwick Airport fell by 72.6 percent in 2020, totalling 76,964 commercial flight movements. In 2020, Edinburgh Airport logged 43,264 commercial flight movements, a 67.6-percent decrease on the previous year, down from 127,017 commercial flight movements and a record 14 million passengers in 2019.

The impact of the global pandemic on the UK aviation industry continues in 2021 and operations at Edinburgh and Gatwick airports will continue with significantly reduced air traffic volumes.

Competition and airlines' pressure to reduce costs and restructure

The major airlines operating in Germany all had to significantly reduce the number of flights as a result of the slump in demand. For example, Lufthansa operated almost 350,000 fewer flights in 2020 than in the previous year. Similarly, Eurowings (minus around 157,000 flights), Ryanair (minus 140,000 flights) and easyJet (minus 118,000 flights) remained far behind the flight volumes of previous years.

The share of the top ten customers of the total traffic volume also decreased. While it was still around 50 percent in 2019, it shrank to around 43 percent in 2020. The main reason for this was the varying trends in the individual industry segments. While cargo and business traffic suffered hardly any losses, traditional airlines and low-cost carriers in particular had to make significant reductions due to the travel warnings and the subsequent decline in passenger numbers.

There were no insolvencies of major airlines in 2020. This is probably due to the government support measures across the globe, which allowed the continuation of business operations for the time being. Within the airlines, on the other hand, a number of restructuring measures have been taken, such as reduced working hours (furloughing), salary adjustments or staff reductions, to reflect significantly lower revenues. Some airlines, such as Norwegian Air Shuttle and LATAM, have filed for insolvency, but can continue their flight operations for the time being under self-administration due to creditor protection agreements.

Climate action plan and emissions trading system

The European Union's Emissions Trading Scheme (EU ETS) was introduced in 2005 to implement the Kyoto Protocol, the global environmental agreement. It is the central European climate protection instrument. Since 2012, intra-European aviation has also been included in the EU ETS. Since 2020, the system has also been linked to the Swiss Emissions Trading Scheme. The EU ETS incorporates all aircraft that take off or land at an airport located in the EU in an emissions trading system and allocates certificates to the aviation industry (pollution rights), of which 85 percent have been assigned to the airlines involved. The remaining 15 percent are auctioned off.

At the beginning of October 2016, ICAO adopted the global market-based climate protection instrument CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation). From 2023, the EU emissions trading system will be replaced by ICAO's CORSIA system. While the current EU emission trading scheme only monitors the airlines within Europe, the new system will monitor overall CO₂ emissions of the airlines in ICAO Member States. CORSIA not only aims to reduce global CO₂ emissions in aviation, but also to ensure fair competition.

Conflict of interests between renewable energy and air safety

Within a radius of 15 kilometres, wind turbines can interfere with the proper operation of VOR and DVOR facilities and pose a hazard to air safety. (VOR is the short form of VHF omnidirectional radio range and the acronym VHF itself stands for very high frequency, while DVOR stands for Doppler VOR.) The German Federal Supervisory Authority for Air Navigation Services (BAF) decides if the erection of new wind turbines can be approved within this radius based on the expert opinion submitted by DFS.

Investors promoting the expansion of renewable energy sought legal remedies when they saw the feasibility of their projects being put at risk when approval was not granted. They objected to the assessment methodology on which the opinions of DFS were based and, in particular, considered smaller distances to air traffic control facilities to be technically appropriate.

In April 2016, the German Federal Administrative Court (BVerwG) fully confirmed the DFS assessment methodology. In this matter, the Federal Administrative Court stated that the DFS methodology could be considered justifiable until a new scientific state of the art had been established which made the DFS approach appear unjustifiable. This ruling has been taken up by the administrative and higher administrative courts. Lawsuits by investors were regularly dismissed in this respect.

As part of the WERANplus project, the German national metrology institute, the *Physikalisch-Technische Bundesanstalt* (PTB), reached a new scientific state of the art with regard to possible interference on DVORs stemming from wind turbines. The new scientific findings were incorporated into DFS practice in June 2020 in the form of a modified assessment formula. This new formula generally leads to the more frequent approval of wind energy projects. This reduces the potential for conflict between air navigation services and the wind energy industry.

In the course of 2021, DFS expects the PTB to deliver similar results, which could also lead to an adjustment of the calculation methodology for conventional omnidirectional radio beacons (CVOR).

Drones – integration and detection

In line with a directive from the German Federal Ministry of Transport and Digital Infrastructure (BMVI), DFS conducted a broad-based test campaign with various drone detection systems (DDS) at Frankfurt and Munich airports in 2020.

The foundation of the successful systematic detection of unmanned aircraft systems (UAS) in the vicinity of airports is the capability and performance parameters of available systems. This applies with regard to the detection area (DDS protection zone), the detectability of the aircraft (UAS size classes and types), the integration into existing airport infrastructures (including freedom from interference with air traffic control and other airport systems) and the degree of automation, also in interaction with the requirements of drone defence set by the police authorities.

In order to test the feasibility of these requirements, six systems from different technology providers were tested in a real airport environment during and outside of operating hours from August to November. Per test, around 100 different missions were flown with different types of drones at varying distances.

As a next step, the results of the feasibility study will be used to derive the prerequisites for a call for tenders for drone detection systems to be installed at German airports. The importance of the issue is underlined by the hazards posed by drones in the area of responsibility of DFS. By the end of October 2020, 84 sightings had been tallied, with the total number of incidents of threat level red – and thus a temporary suspension of flight operations – increasing.

DFS sees the detection of uncooperative drones flying without authorisation in the vicinity of airports as a complement to the air situation display in the area close to the ground of the UAS traffic management (UTM) system it has developed. With the interaction of both systems, it is possible to distinguish lawfully used drones on airport grounds from unlawful flights. In addition, safety in the air and on the ground is increased as the data generated by the DDS is integrated in the UTM system.

Since 2020, available services based on the digital DFS UTM platform have been offered on the market by the Group company Droniq. Thus, the DFS developments for the safe and fair integration of unmanned aircraft systems into German airspace are in line with the European draft regulations on the U-Space, which are to be realised in the coming year.

2.2.2 Principal legal and regulatory influencing factors

Calculation of charges and definition of profit

In accordance with the European regulations for air navigation service providers, DFS switched the cost-base for calculating charges from German Commercial Code (HGB) to IFRS issued by the International Accounting Standards Board (IASB) as at 1 January 2007.

The regulatory conditions had to be adjusted to avoid volatility in the level of charges, in particular, by the revised IAS 19. Its revision in 2013 led to considerable fluctuations in equity capital. In a directive dated 12 December 2012, the Federal Supervisory Authority for Air Navigation Services (BAF) stipulated that the actual financing expense for occupational pensions should not be subject to the cost-efficiency targets of the performance plan, but is instead considered as a determined cost in the performance plan and therefore part of the cost-base. Charges take the length of service and interest cost into account in a mutatis mutandis application of IAS 19 as part of the performance plan. The uniform discount rate for the third reference period (RP3) used to determine the obligation is based on the interest rate that can be earned on plan assets (2.85%, previously 3.54% in RP2). This rate reflects prudent commercial judgement. The differences between the obligation and plan assets (plan deficit/plan surplus) are allocated in a rolling fashion over the average remaining time to work of the staff (15 years) and are also taken into account in the following reference periods as a component of the charges (imputed model). Additional conservative assumptions for career, salary and inflation trends support the correct matching of the funding of occupational pensions and avoid random fluctuations in the cost-base for charges and therefore arbitrary charges for airspace users. A difference (funding deficit) between the obligation and the assets that is determined in the planning phase for the following reference period is distributed over 15 years and increases revenues and liquidity.

In addition, the regulatory authority has given DFS the right to spread the material measurement differences from the conversion from German Commercial Code (HGB) to IFRS for balance sheet items directly in equity, namely fixed assets (development costs, borrowing costs, depreciation and amortisation), pension obligations and other provisions (catch-up effects). The regulatory authority has also given DFS the right to invoice airspace users over a period of 15 years (until the end of 2022) for the ex-post financing requirements (Article 6 of Regulation (EC) No 1794/2006).

There is a divergence between the commercial accounting rules and the basis for determining revenues from air navigation charges. This divergence leads to a corresponding divergence in the expense line items. Since 2013, the assessment basis for tax has been based on the charges-related result in accordance with Section 31b(3) of the German Aviation Act (LuftVG). However, a corresponding regulation to determine the basis for the payment of dividends is still not in place.

Strengthening of the equity position by the Federal Republic of Germany

On 11 December 2020, the German legislator approved a contribution of €300 million to the registered capital of DFS. This was carried out as part of a budgetary appropriation under the Law on the Approval of the Federal Budget for the Fiscal Year 2021 (*Gesetz über Feststellung des Bundeshaushaltsplans für das Haushaltsjahr 2021*, Bundestag publication 19/22600). The Federal Republic of Germany as the sole Shareholder undertook to raise the registered capital accordingly.

This measure is intended to stabilise the equity base of DFS and partially compensate for revenue shortfalls caused by COVID-19.

On the basis of the international and national legal framework and regulations, a secure liquidity plan and the repeated very good credit ratings of DFS in combination with its Shareholder for 2020 in both the short and long term (AAA/A-1+ stable) by Standard & Poor's (see section 2.6.3), DFS, together with the shareholder, anticipates a positive going-concern situation (see also the Note 4.1).

Third reference period

The European Commission set the third reference period (RP3) for the period from 2020 to 2024, combined with binding European targets for the key areas of safety, capacity, cost-efficiency and the environment, as well as a financial incentive system for the key area of capacity.

The German contribution to the FABEC performance plan, which was approved by Germany on the basis of a so-called 'national solution' between airspace users and DFS in autumn 2019, has not yet been adopted by the European Commission against the background of the massive traffic collapse as a result of the COVID-19 pandemic. Instead, a supplementary regulation, Commission Implementing Regulation (EU) 2019/1627, was published at the beginning of November, the main elements of which are a complete revision of the current reference period and thus performance plans which are to be developed on the basis of new targets. The deadline for submission of the new performance plans is 1 October 2021.

The European Commission's declared goal for this supplementary regulation is to achieve a (retroactive) cost-reduction effect stemming from the traffic-risk-sharing mechanism that continues to apply that would lead to higher charges. The final assessment of the financial impact on DFS will probably not be possible until 2022, when the revised performance plans have been adopted by the European Commission.

The cost pressure on DFS, which has already been present since the beginning of the SES performance regulation in 2012, will increase again with the upcoming revision of the performance plans.

Uncontrollable costs – costs exempt from cost-sharing

For the third reference period (RP3) from 2020 to 2024, Article 28(3) of Regulation (EU) 2019/317 also allows for the sharing of costs with airspace users for the costs that do not lie within the control of air navigation service providers. However, due to the Covid-19 pandemic, RP3 has been restarted with Regulation (EU) 2020/1627. A performance plan for the third performance plan period is only to be drawn up by 1 October 2021 and will only then be approved retroactively by the European Commission for the entire performance plan period 2020 to 2024. It has therefore been agreed with the Federal Supervisory Authority for Air Navigation Services (BAF) in the meantime that there will be no recording of the difference between the planned and actual costs mentioned in Article 28(3) of Regulation (EU) 2019/317 for the year 2020. This eliminates the need to report uncontrollable costs for the year 2020.

European funding programme

The EU plans to provide more than €2.5 billion of grant funding for targeted investment in the ATM (air traffic management) sector through its Connecting Europe Facility (CEF) until the end of 2023. (This includes the new EU financing programme from 2021; currently in preparation.) DFS participates in this programme and currently receives grant funding of a maximum of €212.2 million until the end of 2023. However, under Article 14(2)(13) of Regulation (EU) No 409/2013 (Common Projects), such grant funding counts as 'other revenue' as set out in Article 2(k) of Regulation (EU) No 1794/2006 and should be used to reduce air navigation charges.

Exemption from the levy imposed under the German Renewable Energy Sources Act (EEG)

In a letter dated 14 November 2019, Amprion GmbH (Amprion), as the responsible transmission system operator for the subsidiary DFS Energy GmbH (DFS Energy), communicated its legal opinion that the prerequisites for an exemption from the EEG levy for the electricity generated decentrally and consumed by DFS and the Paul Ehrlich Institute (PEI) are not met. The legal opinion of Amprion is that there is no exempt own generation/supply of electricity and DFS Energy has no right to refuse performance under Section 104(4) EEG 2017.

In the event of a lawsuit, the amount likely to be in dispute as at the balance sheet date for the electricity quantities subject to EEG levies retroactively since June 2014 amounts to approximately €13.5 million plus interest. Of this amount, approximately €9.6 million is attributable to DFS and approximately €3.9 million to the PEI.

DFS Energy therefore consulted a law firm specialising in energy law in 2019 to assess the legal risk for DFS and PEI as to whether the conditions for the exemption from the EEG levy, and thus the right to refuse performance within the meaning of Section 104(4) EEG in favour of DFS and PEI, had not been met and whether the EEG levy would have to be paid retroactively for the past and on an ongoing basis for the future. In the opinion of the law firm, the chances of winning in the final round in the event of a legal dispute are measurably higher than the risks of losing.

This risk assessment remains unchanged, even taking into account the amendment to the EEG which came into force on 1 January 2021. This amendment has, however, improved the risk assessment by adding an alternative course of action (see Section 104(5) EEG) in favour of DFS Energy. It is now possible to finally remove the risks of possible EEG apportionment levies in the past, if a future obligation to pay the EEG apportionment is accepted from 1 January 2021. Whether such a compromise is advisable for DFS Energy cannot be reliably assessed at this point in time. Firstly, the regulation is still subject to European state aid rules, and secondly, there are currently numerous lawsuits whose outcome should be awaited in the first court of appeal before voluntarily accepting EEG levy costs in the higher six-digit range annually for reasons of legal certainty for the past. In view of the deadline for such a compromise set out in Section 104(5) EEG (30 June 2022), DFS Energy has sufficient time to validate this option in detail.

If, in the event of a court decision, DFS Energy is nevertheless required to pay the EEG levy for the past and for the future, DFS Energy can pass on these costs to its energy customers DFS and PEI under the operator model. Both DFS and PEI have expressly confirmed the relevant contractual provisions to DFS Energy at the beginning of 2020.

In view of the above-mentioned prospects of winning in the final round in the event of a legal dispute and the additional option of a settlement with the transmission system operator created by the amended EEG, DFS does not currently consider it necessary to make provisions in the balance sheet for this eventuality.

2.2.3 Forecast/actual comparison

Forecast/actual comparison 2020			
	Actual as at 31 Dec 2019	Forecast for 2020	Actual as at 31 Dec 2020
Service units	En-route services: 15.13 million Terminal services: 1.49 million	Significant decline in traffic	En-route services: 6.79 million Terminal services: 0.63 million
Revenues (total)*	€1,109.5m	Not cost-covering	€1,099.3m
Revenues: commercial business (total operating revenues and income)	€87.1m (€91.1m)	Reduced revenues	€79.8m (€80.7m)
Depreciation and amortisation	€104.1m	Approximately at previous year's level	€102.0m
Earnings (total)**	€34.8m	Losses in the mid three-digit euro range	-€94.0m
Earnings (commercial business)	€1.9m	Losses in the low two-digit euro range	-€7.4m
ATC training starts (of which DFS share)***	142 (126)	Increase in ATC training***	116 (94)

* The 2020 revenues include a carry-over from the traffic deviation of €521 million.

** DFS share 2019: €35.6m / 2020: minus €92.7m.

*** Start of theoretical basic training at the DFS Air Navigation Services Academy. As of 31 December 2020, a total of 408 people were undergoing multi-year air traffic controller training Group-wide, of these 368 were at DFS (see also section 4). Due to the COVID-19 pandemic, the number of trainees was reduced, but remains at a stable level as DFS sees the need to secure staffing levels for the future.

More information on earnings can be found in section 2.5.

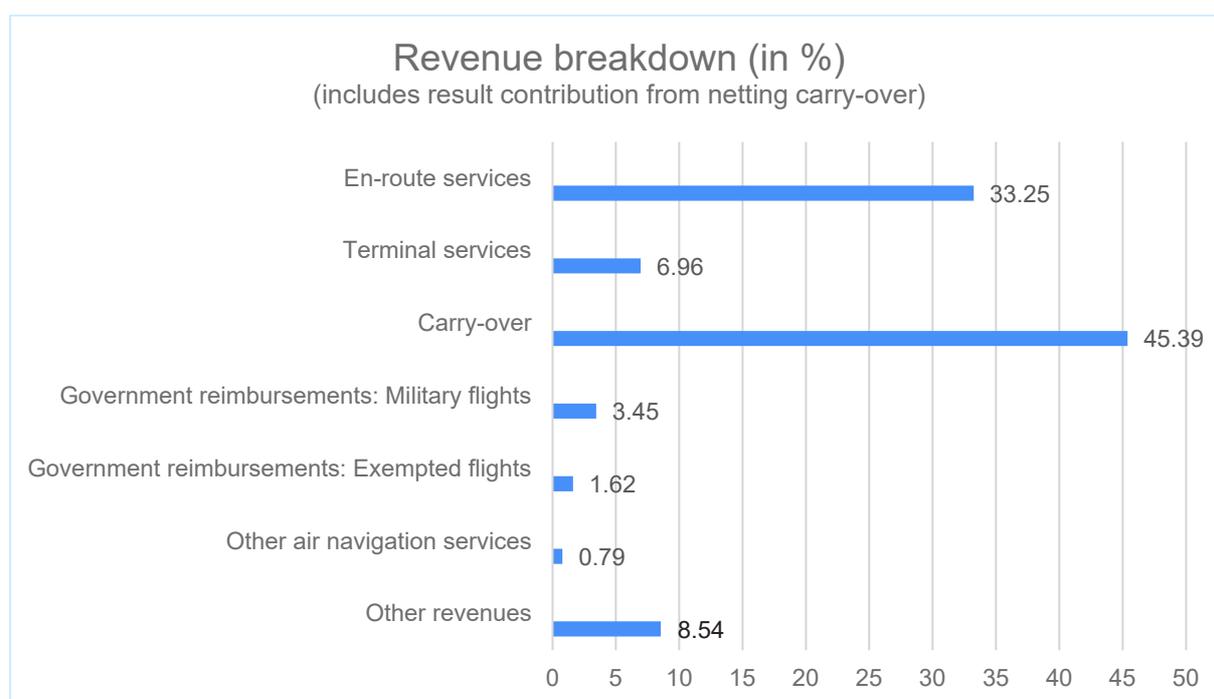
2.3 Results of operations

2.3.1 Revenues

In the business year 2020, the DFS Group generated revenues of €1,111.3 million (previous year: €1,109.7 million), 0.1 percent higher than the previous year's level.

Revenues from air navigation services increased slightly from €1,007.4 million to €1,016.3 million. However, these revenues take into account the offsetting of the carry-over from previous years (€103.7 million) as well as the particularly high carry-over of the business year 2020 (€400.7 million) due to the COVID-19 pandemic, which results from the greatly reduced traffic volume. This reduced traffic volume will be borne by the airspace users only in the future via a compensation mechanism. The actual operating revenues generated from en-route and terminal services fell massively due to the sharp drop in service units as a result of the COVID-19 pandemic (see section 3.1).

Within certain limits, the DFS Group is exposed to rewards and risks resulting from the development of air traffic (see section 3.1.3).



Revenues from en-route charges (€m)

	2020	2019	2018	2017	2016
Total	369.5	826.8	867.4	859.8	899.3
Compared with previous year (%)	-55.3	-4.7	+0.9	-4.4	-6.5

These revenues were exclusively generated by DFS.

Revenues from terminal charges (€m)					
	2020	2019	2018	2017	2016
Gross	77.7	182.2	185.4	182.5	211.5
Reimbursements paid	(0.4)	(1.0)	(1.0)	(0.9)	(0.7)
Net	77.3	181.2	184.4	181.6	210.8
Compared with previous year (net, in %)	-57.3	-1.7	+1.5	-13.9	-9.6

These revenues were exclusively generated by DFS.

Revenues from government reimbursements (€m)					
	2020	2019	2018	2017	2016
Military operational air traffic	38.4	38.9	44.0	43.9	61.6
Exempted flights	18.0	18.0	18.0	18.0	6.5
Total	56.4	56.9	62.0	61.9	68.1
Compared with previous year (%)	-0.9	-8.2	+0.2	-9.1	+0.9

These revenues were exclusively generated by DFS. The exempted flights relate to en-route flights under visual flight rules.

Revenues from other air navigation services (€m)					
	2020	2019	2018	2017	2016
Aeronautical publications	4.4	4.4	4.3	4.3	4.2
Flight inspection services	3.6	3.5	3.6	3.8	2.7
Other air navigation services	0.8	0.7	0.7	0.5	1.4
Total	8.8	8.6	8.6	8.6	8.3
of which commercial business	4.4	4.4	4.3	4.2	4.2
Compared with previous year (%)	+2.3	0.0	0.0	+3.6	-17.8

Other revenues (€m)					
	2020	2019	2018	2017	2016
Total	94.9	102.3	79.4	71.6	52.5
of which commercial business	75.4	82.5	60.9	62.3	48.7
Compared with previous year (%)	-7.2	+28.8	+10.9	+36.4	+39.3

The Group generates other revenues primarily from air traffic control services at the German regional airports where DFS Aviation Services (DAS) operates and at London Gatwick and Edinburgh airports, from consultancy and staffing services, apron management service and training services.

2.3.2 Other operating income

Other operating income (€m)					
	2020	2019	2018	2017	2016
Total	39.5	52.8	53.4	59.4	46.6
of which commercial business	0.5	5.8	1.9	1.5	0.5
Compared with previous year (%)	-25.2	-1.1	-10.1	+27.5	+39.9

Material components:

- Project-specific funding by the European Commission (€20.8 million)
- Income from the qualified technological equipment (QTE) transaction, exchange rate gain (€10.3 million)
- Reversal of provisions (€4.1 million)
- Remaining (€4.3 million)

2.4 Principal expense categories

Employee expenses (€m)					
	2020	2019	2018	2017	2016
Total	973.1	935.2	878.9	862.8	838.5
Wages and salaries	643.2	660.3	621.0	605.2	609.2
Social security costs and expenses for pensions and assistance	321.9	266.4	249.4	249.1	206.4
Costs of personnel belonging to the Federal Aviation Office (LBA)*	7.9	8.5	8.5	8.5	22.9
of which commercial business**	63.4	62.7	46.1	40.3	33.1
Share of total costs (%)	78.7	77.2	76.1	75.4	77.1
Compared with previous year (%)	+2.0	+1.4	+1.9	+2.9	-1.4

* Federal Aviation Office (LBA): The Federal Government had taken over the administration costs for the public service employees of the Federal Administration of Air Navigation Services still working at DFS amounting to €1 million per year.

** This item contains allocated costs.

Interest of €64.1 million accruing from provisions for pensions and early retirement is charged to the financial result. The return on plan assets (€35.5 million) is credited to the financial result.

Other operating expenses (€m)					
	2020*	2019*	2018*	2017*	2016
Total	147.8	156.9	145.0	147.2	128.9
of which commercial business**	13.0	17.7	13.8	23.9	11.3
Share of total costs (%)	12.0	12.9	12.6	12.9	11.8
Compared with previous year (%)	-5.8	8.2	-1.5	+14.2	-1.5

* From 2018, the item no longer contains the impairment losses on financial assets and contract assets as these must be separately disclosed in accordance with IAS 1(82). The disclosures for 2017 have been adjusted.

** This item contains allocated costs.

Material components:

- Spare parts and maintenance (€55.2 million)
- Occupancy costs (€14.4 million)
- Costs of external personnel (€12.8 million)
- Rental and leasing (€6.5 million)
- Telecommunication costs (€10.2 million)
- Exchange rate losses from the QTE transaction (€10.3 million)
- Legal and consultancy costs (€6.1 million)
- Travel costs (€3.3 million)
- Other employee expenses (€7.5 million)
- Vehicle costs (€3.0 million)
- Insurance (€4.2 million)
- Remaining (€14.3 million)

Depreciation and amortisation (€m)

	2020	2019	2018	2017	2016
Total	102.0	104.1	117.2	116.3	108.9
of which commercial business*	6.3	4.4	4.0	3.1	1.8
Share of total costs (%)	8.2	8.6	10.2	10.2	10.0
Compared with previous year (%)	-4.0	-15.4	+0.8	+6.8	-0.6

* This item contains allocated costs.

In the business year 2020, an impairment loss of €1.6 million was recognised on the Unify investment entity.

Impairment losses on financial assets and contract assets (€m)

	2020	2019	2018	2017	2016
Total	1.0	4.8	0.9	5.6	---
of which commercial business	0.1	---	---	---	---
Share of total costs (%)	0.1	0.4	0.1	0.5	---
Compared with previous year (%)	-79.2	+433.3	-83.9	---	----

The item shows the impairment losses on financial assets and contract assets previously disclosed under other operating expenses. These are mainly specific allowances and write-offs of receivables.

2.5 Group earnings

In 2020, the DFS Group generated a net loss of €94.0 million (previous year: net income of €34.8 million).

Net income (€m)					
	2020	2019	2018	2017	2016
Total	-94.0	34.8	-30.1	30.8	86.6
attributable to the ultimate parent company	-92.7	35.6	-30.1	30.8	86.6
of which minority interest	-1.3	-0.8	---	---	---
of which commercial business	-7.4*	1.1*	-4.6	2.2	1.2
Compared with previous year (%)	-370.1	+215.6	-197.7	-64.4	-29.9

* Includes the result component of the minority shareholder in Droniq.

The earnings contain the costs reimbursed by airspace users for previous years of €61.0 million (previous year: €59.0 million) from the conversion of the cost-base for calculating charges from the German Commercial Code (HGB) to IFRS as at 1 January 2007 (catch-up effects). They also contain costs of €78.3 million (previous year: €51.2 million) from the application of the imputed model for occupational pension (closing the deficit, see section 2.2.2) within the scope of the introduction of regulated charges as at 1 January 2012. In addition, they contain capitalised development costs of €22.8 million (previous year: €20.3 million) as well as grant funding of €20.8 million (previous year: €26.7 million). The carry-over from previous years (€103.7 million) and the carry-over for the business year 2020 (€400.7 million) had a positive impact on earnings.

Earnings before taxes (€m)	
Net loss	-94.0
Taxes on income and gains	-2.3
EBT	-96.3

Total operating revenues and income was only slightly lower than in the previous year. However, Group earnings turned negative due to higher employee and financial expenses – especially in connection with occupational pensions.

DFS also took into account the reduced income from charges from 2018 to be offset in the charges for users in 2020 (see section 2.2.2).

The commercial business recorded a net loss of €7.4 million (previous year: net income of €1.1 million).

A net loss of €1.3 million was attributable to the minority shareholder of the Droniq subsidiary (previous year: net loss of €0.8 million).

Overall, the Group earnings were impacted by material special items, primarily due to COVID-19.

2.6 Assets and financial position

2.6.1 Capital expenditure (CAPEX)

The DFS Group invests in a targeted manner in preserving and developing the required infrastructure. Regulations and standards from ICAO, EUROCONTROL and the EU are taken into consideration. The safety of air traffic plays a decisive role when it comes to decisions on capital expenditure. Against this background, capital expenditure amounted to €82.3 million (previous year: €120.5 million) in the business year 2020.

Cost-saving measures were initiated due to the COVID-19 pandemic. The planned investments for projects (projects, launches, etc.) were subject to a review. DFS has reduced the capital expenditure (CAPEX) planned in the Group Business Plan 2020 by approximately 42 percent (just under €58m) for 2020. These investments will be postponed primarily to 2021.

The principal projects with the highest share of capital expenditure are:

iCAS programme (interoperability through European collaboration Centre Automation System)

DFS launched the iCAS programme (iTEC Centre Automation System) to consolidate all projects, sub-projects and individual measures for the development of iCAS, the future air traffic control system at all DFS control centres. The programme comprises both concrete procurement and development measures to provide iCAS at the DFS control centres as well as a variety of bilateral and multinational cooperation measures at a European level. The iCAS programme ensures that the multinational initiatives to shape the future European air traffic management system and the development of iCAS are conducted in a coordinated manner and that the interests of DFS are suitably taken into account. The future iCAS air traffic services system for control centres will in particular meet the interoperability requirements of the SES regulations. The iCAS programme is given grant funding from the European Commission as part of the Connecting Europe Facility (CEF) infrastructure fund.

Following the successful launch in the Karlsruhe control centre at the end of 2017, the programme has the following additional objectives:

- Step-by-step introduction of iCAS at the control centres for lower airspace in Munich (mid-2022), Bremen (beginning of 2024) and Langen (end of 2025 / beginning of 2026).
- Harmonisation of air traffic services (ATS) systems at all DFS control centres and creation of system and technical conditions to optimise the maintenance organisation of control centres.
- Creation of the technical system platform to implement the operational concepts of the future with the goal of boosting performance (SESAR, FABEC), cooperation and cost splitting with other ANSPs in the iCAS realisation and use.

DFS has thus taken the first step on the path of harmonising the systems used within DFS and subsequently in Europe.

Construction of the new logistics building

Since the end of 2019, DFS has been constructing a new building on the campus in Langen for central logistics and maintenance. The opening is scheduled for 2021.

Radio Site Upgrade and Modernisation (RASUM) 8.33

DFS is equipping 95 radio stations for the 8.33 kHz channel spacing requirements in lower airspace, including all necessary structural and infrastructural measures. The project creates urgently needed radio frequencies and implements the conclusion taken by the ICAO European Air Navigation Planning Group (EANPG) 48 dated November 2006 and Regulation (EU) No 1079/2012. The volume of capital expenditure amounts to €100 million over the entire period.

Replacing VOR/DME systems

As part of its statutory obligation, DFS provides a navigation infrastructure that supports the aircraft equipment required by the German Regulation Concerning Avionics Equipment of Aircraft (FSAV). The navigation facilities mentioned there ((D)VOR, DME and NDB) must fulfil the requirements from the ICAO Standards & Recommended Practices (such as ICAO Annex 10), as the flight procedures are based on ICAO-compliant navigation services.

Since satellite navigation is not yet mandatory for airspace users in either Europe or Germany and there is also no (voluntary) comprehensive equipment level for aircraft operating in Germany, a ground-based navigation infrastructure is still required as fallback to a reduced extent yet to be determined.

The aim of the project is the age-related replacement of the VOR/DME systems. This will ensure the long-term security of navigation in German airspace – independent of satellite-based systems. Further objectives of the project are the operational optimisation of the navigation infrastructure – airspace concept – in the context of site analyses (individual case analyses) as well as a joint procurement process between DFS and LVNL with the aim of achieving synergy effects with regard to procurement, training, spare parts costs and joint use of resources. In the first phase of the project, 13 locations are to be replaced.

TANGe (Tower ATS Next Generation)

The TANGe project is part of the ZAAS programme.

With the vision "from German ANS to European ANS", the DFS Executive Board has set itself the goal of positioning the company as a high-performance air navigation service provider in Europe through technological leadership in order to meet future challenges. This vision is now to be fleshed out in a future-oriented architecture for DFS ATS systems. TANGe is the pilot project in the ZAAS programme (future architecture ATS systems) and accordingly makes an important contribution to the success of ZAAS.

The vision with TANGe is a new future-proof tower ATS system, which will provide air traffic controllers with harmonised system support and an ergonomic working position tailored to their needs. TANGe relies on a requirements management process that is agile and oriented to ATC procedures. A service-oriented, cloud-based architecture enables efficient product maintenance and innovation throughout the value chain.

The existing tower ATS systems for all tower sites are to be gradually replaced by tower ATS services which will be operated in a cloud environment.

VAN-NG (Value Added Network-Next Generation)

VAN-NG is a development project to provide a replacement for the current VAN message switching system.

With the replacement, new functions specified within the framework of SESAR will be made available at the same time. These functions can be easily extended through the use of modern software modules (to meet further requirements from SESAR2020, for example).

The development complies with the Pilot Common Project (PCP) of Regulation EU No 716/2014 for the iSWIM requirement.

Intercom system GS2

The aim of the GS2 project is to replace the previous GS-D intercom system with its successor, Intercom 2 (GS2). The replacement affects all the Control Centre division's branches for lower airspace, all DFS control towers as well as numerous external communication partners, such as the apron management service and the regional airports. An intercom system is primarily used for direct communication between the above-mentioned communication partners, supporting the efficient handling of air traffic control.

The main innovations of GS2 are the transmission of voice data via the voice over internet protocol (VoIP) as well as the provision of a role system in which an operational role can be assigned to any working position across the area control centres (ACC).

Centralised Interoperable Centre Information Service (CICIS)

CICIS is a component of the ATS systems of the Control Centre division for the display of aeronautical information at the air traffic controller's working position, which provides static and dynamic information on weather, airspace status, air traffic flow, among other things. CICIS replaces the ATCISS component at all DFS control centres. The pilot site is the Karlsruhe control centre. The software is made available as a container-as-a-service (CaaS) and is data-centre capable.

Remote tower control (RTC)

As part of the RTC project, DFS is bundling the provision of aerodrome control services decoupled from location in a Remote Tower Control (RTC) Centre at its site in Leipzig.

After the successful start at Saarbrücken Airport at the end of 2018, Erfurt and Dresden airports will follow.

The new endorsement concept for the air traffic controllers working in the RTC Centre will allow DFS to have significantly more flexible staff deployment in the future than is currently the case.

A sophisticated camera system that acts as a replacement for the out-of-the-window view lies behind the RTC solution from DFS. The solution has innovative functionalities which do not yet exist in this combination.

Using high-performance sensors from high-definition cameras and high-performance infrared sensors as well as the integration of position data, the multi-sensor system enables safe and efficient operations during good (VMC) and bad (IMC) visual meteorological conditions (such as at night and during rain and fog).

The system consists of three independent systems:

- A 360-degree video camera delivers a colour panoramic view of the airport.
- It is supplemented by a 360-degree infrared camera.
- In addition, two pan-tilt-zoom (PTZ) cameras mean the controller can zoom in on and track objects of interest ("extended binocular function").

The result is displayed on several monitors at the respective remote working position on the premises of the Leipzig control tower.

DFS thus ranks in a leading position as an innovative air navigation service provider and is one of the first that to have introduced this technology of the future operationally.

With the successful introduction of RTC for Saarbrücken Airport, DFS, together with its technology partner Frequentis, was shortlisted for Jane's ATC Awards, which are awarded annually at the World ATM Congress in Madrid for outstanding projects and innovations from the world of air navigation services.

In the business year 2020, assets under construction worth a total of €7.8 million were completed (previous year: €21.2 million).

With these projects, the DFS Group secures its position as a reliable partner for aviation.

2.6.2 Balance sheet structure

Balance sheet 2020

In 2020, the balance sheet total increased by 16.6 percent over the previous year to €2,590.4 million (previous year: €2,222.1 million).

Assets

Non-current assets rose by 60.7 percent from €823.2 million to €1,322.7 million, while current assets decreased by 9.4 percent from €1,398.9 million to €1,267.7 million.

The structure of non-current assets remained almost constant compared with the previous year, with the exception of other receivables and assets. The significant increase in other receivables and assets by 680.1 percent from €76.5 million to €596.8 million is mainly related to the carry-over from the 2020 traffic deviation as a result of the COVID-19 pandemic.

Within current assets, trade receivables decreased by €36.5 million (-24.0%). While liquid funds decreased by around €114.6 million (-31.3%), the capital investment in plan assets that have not been assigned increased by around €31.3 million (+4.1%). Tax assets fell by €15.8 million (-19.8%).

Equity and liabilities

Equity changed noticeably by 59.4 percent from minus €1,419.2 million to minus €2,262.3 million. The remeasurement of the net defined benefit liability (€748.8 million, OCI) and the net loss (€94.0 million) weighed significantly on it.

Non-current liabilities rose by 40.5 percent from €3,178.6 million to €4,464.6 million. The increase in the net liability from pension obligations of €735.2 million, mainly due to actuarial losses, had a significant impact. The allocation of additional plan assets (€180 million) strengthened plan assets, while the measurement on the reporting date negatively affected them.

Based on the prior-year figures, the net liability (difference between obligation and plan assets) rose by 29.0 percent to €3,550.0 million (previous year: €2,751.8 million), primarily as a result of the significantly lower discount rate at the balance sheet date (0.6%, previous year 1.1%), with the salary trend remaining unchanged (2.5%).

Non-current financial liabilities increased mainly due to the issuance of a new *Schuldscheindarlehen* (debenture loan) with a remaining term of up to ten years (€500 million).

Current liabilities fell by 16.1 percent from €462.8 million to €388.2 million, mainly due to the repayment of maturing *Schuldscheindarlehen* (debenture loan) (€87.5 million).

Current effects				
	2020 (€m)	2019 (€m)	Change (€m)	Change (in %)
Balance sheet total	2,590.4	2,222.1	368.3	16.6
Intangible assets	216.0	206.4	9.6	4.7
Property, plant and equipment	469.1	499.3	-30.2	-6.0
Property (financial investment)	0.6	0.7	-0.1	-14.3
Financial assets	22.0	24.4	-2.4	-9.8
Trade receivables	0.1	0.1	0.0	0.0
Other receivables and assets	596.8	76.5	520.3	680.1
Deferred tax assets	18.1	15.8	2.3	14.6
Non-current assets	1,322.7	823.2	499.5	60.7
Trade receivables	115.7	152.2	-36.5	-24.0
Contract assets	5.1	2.4	2.7	112.5
Other receivables and assets	34.4	32.8	1.6	4.9
Inventories	6.3	6.2	0.1	1.6
Financial assets	790.2	758.9	31.3	4.1
Cash and cash equivalents	252.0	366.6	-114.6	-31.3
Tax assets	64.0	79.8	-15.8	-19.8
Current assets	1,267.7	1,398.9	-131.2	-9.4
Equity	-2,262.3	-1,419.2	-843.1	59.4
Pension provisions	3,550.0	2,751.8	798.2	29.0
Other provisions	232.0	217.2	14.8	6.8
Financial liabilities	648.5	152.8	495.7	324.4
Trade payables	0.3	0.3	0.0	0.0
Other liabilities	14.8	25.6	-10.8	-42.2
Income tax obligations	19.0	30.9	-11.9	-38.5
Non-current liabilities	4,464.6	3,178.6	1,286.0	40.5
Other provisions	235.8	234.7	1.1	0.5
Financial liabilities	4.9	98.5	-93.6	-95.0
Trade payables	26.8	25.7	1.1	4.3
Contract liabilities	3.1	2.3	0.8	34.8
Other liabilities	116.9	101.5	15.4	15.2
Income tax obligations	0.7	0.1	0.6	600.0
Current liabilities	388.2	462.8	-74.6	-16.1

Balance sheet indicators			
	2020	2019	2018
Net financial indebtedness (€m)* (Financial liabilities – liquid funds)	-388.8	-874.2	-895.6
Leverage ratio (%) (Net financial indebtedness / balance sheet total)	-15.0	-39.3	-41.5
Asset intensity (%) (Non-current assets / balance sheet total)	51.1	37.1	37.4

* A minus sign means that there is an overcompensation from liquid funds.

Balance sheet indicators when fully considering catch-up effects from the conversion to IFRS and the deficit			
	2020	2019	2018
Net financial indebtedness (€m)* (Financial liabilities – liquid funds)	-388.8	-874.2	-895.6
Leverage ratio (%) (Net financial indebtedness / balance sheet total)	-6.4	-17.6	-21.6
Asset intensity (%) (Non-current assets / balance sheet total)	21.9	16.6	19.4

* A minus sign means that there is an overcompensation from liquid funds.

In Note 39, a detailed reconciliation can be found of the equity as at 31 December 2020 to the charges-related equity taking consideration of catch-up effects from the conversion to IFRS and the procedure approved for the treatment of occupational pensions by the BAF (see section 2.2.2).

2.6.3 Liquidity

2.6.3.1 Financial management

Financial management at the Group is responsible for securing and supporting the statutory obligation of DFS and, at the same time, fostering the competitiveness of the commercial business. DFS optimises its performance through an appropriate equity and debt structure, the economical use of equity capital, an optimised use of debt and the planning and control of cash flows.

Financing is carried out primarily by drawing on the cash inflows from operating activities and on funds from a money and capital market programme.

Group Treasury plans and controls the level of cash and cash equivalents and the procurement of funds. It incorporates subsidiaries in the flow of funds by means of intra-Group liquidity offsetting (cash pool agreements). Funds are collected and centrally controlled where legally allowed and commercially sensible. The financing requirements of subsidiaries are satisfied by intra-Group settlement accounts and loans. The DFS Group aims to achieve a balanced financing structure and holds, despite the negative interest rate environment, liquid reserves to effectively meet unexpected changes in the environment and market (see section 6.2.2).

Business dealings with a select group of core banks are conducted using uniform standards and existing reciprocal cash flows are continuously improved.

The DFS Group finances its non-current liabilities congruently with debenture loans. Short-term liquidity is covered by means of a multi-currency commercial paper programme. This financing form was not used in the business year. The solvency of the DFS Group is supported by fund assets not protected against insolvency.

With its money and capital market programme, the DFS Group attracts both national and international investors. These investors base their investment decisions and price fixing on the credit rating of each debtor. To support their decision-making process, DFS has its creditworthiness rated by means of standardised credit ratings from a credit rating agency according to internationally uniform and consistent procedures. The rating agency Standard & Poor's confirmed for DFS the ratings for 2020 in combination with its Shareholder for both their short- and long-term ratings (AAA/A-1+ stable).

DFS issued a *Schuldscheindarlehen* (debenture loan) totalling €500 million in tranches of five to ten years. The nominal issuance volume at the end of 2020 thus amounted to €610.0 million (previous year: €197.5 million).

The average weighted interest rate of the debenture loans amounted to 1.013 percent at the balance sheet date (previous year: 2.618%).

2.6.3.2 Group cash flow statement

Cash and cash equivalents at year-end are made up as follows:

Cash and cash equivalents (€m)			
Cash inflow (+) / cash outflow (-)	2020	2019	2018
Operating activities	-416.1	77.2	-198.3
Investing activities	-80.6	-118.0	-110.9
Financing activities	413.3	34.1	201.1
Changes impacting cash flow	-83.4	-6.7	-108.1
Cash and cash equivalents at the beginning of the year	1,125.6	1,132.2	1,240.4
Cash and cash equivalents at the end of the year	1,042.2	1,125.5	1,132.3*

* Contains fund assets not protected against insolvency

Additional information can be found in the cash flow statement and in Note 35. No dividend was paid out to the Shareholder in the business year 2020.

2.7 Overall assessment on the economic situation

The results and financial position were influenced primarily by the COVID-19 pandemic and the associated revenue shortfall. Issuing a *Schuldscheindarlehen* (debenture loan) of €500 million offset the loss of liquidity and, within the framework of the risk-sharing mechanism, the carry-over will almost compensate in subsequent years for the liquidity shortfall in the business year according to the currently applicable legal situation. Other influencing factors are the legal framework, regulatory requirements, catch-up effects, subsidies, capitalisation of development costs, the persistently low level of interest rates due to the development on the capital markets and the measures taken by the Executive Board on cost containment.

In the business year 2020, DFS generated revenues slightly above the previous year's level, despite a sharp drop in service units, due to the recognition of the 2020 carry-over (€400.7 million) and the collection of the 2018 carry-over (€103.8 million). It recorded a net loss of €94.0 million with slightly lower total expenditure, which was still significantly higher than revenue due to the reduction in the discount rate for pension provisions. The net loss was primarily influenced by the financial result, catch-up effects and regulatory effects (carry-over as well as the imputed model for closing the deficit in occupational pensions).

The Executive Board considers the earnings situation to be critical due to the critical interest rate environment and the resulting steady increase in pension provisions. Since these are treated as expenses, but do not represent cash outflow, and since the losses in revenues can be largely recovered through the carry-over, the financial situation can be assessed as being significantly better.

3 Segment reporting

3.1 Regulated business

3.1.1 Control Centre division

Service unit

In the Control Centre division, a service unit is computed as the square root of the weight factor multiplied by the distance factor. The economic value of each flight conducted is thus taken into account and the value of the air traffic control service performed is considered by the legislator when establishing the relevant air navigation charges.

Definition of service unit:

$$\text{En-route services: } \sqrt{\frac{\text{max. take-off weight in tonnes}}{50}} \times \frac{\text{distance in km}}{100}$$

The amount to be paid by the airspace user is given by multiplying the service unit by the en-route unit rate.

Service units – en-route services

	2020	2019
Total	6,792,538	15,132,422
Compared with previous year (%)	-55.1	+1.3

In 2020, the number of service units declined by roughly 55.1 percent over the previous year as a result of the COVID-19 pandemic. This was 55.8 percent lower than the performance plan, which forecast 15,367,000 service units for 2020.

The national en-route unit rate comprises air-traffic-related cost elements of DFS, the German Meteorological Service (DWD), EUROCONTROL, the Maastricht Upper Area Control Centre (MUAC) and other national bodies, such as the German Federal Ministry of Transport and Digital Infrastructure (BMVI) and the Federal Supervisory Authority for Air Navigation Services (BAF).

The national en-route unit rate is calculated by taking the determined costs for the year in question as defined in the performance plan plus the adjustments defined in Regulation (EU) 2019/317 and dividing by the service units based on the basic forecasts of EUROCONTROL's Statistics and Forecast Service (STATFOR) for the year in question.

En-route unit rate (EUR)

	2021	2020	2019	2018	2017	2016
Total	66.80	63.61	63.63	67.07	69.36	82.59
DFS share	57.68	54.39	54.63	58.09	60.10	66.68
Compared with previous year (total, in %)	+5.0	+/-0.0	-5.1	-3.3	-16.0	-8.4

The EU Regulation on the common charging scheme for air navigation services contains compensation mechanisms to partly offset losses in revenues as a consequence of deviations in traffic volumes as well as an inflation adjustment. The decrease in the unit rate in 2019 was primarily attributable to the carry-over from the above-mentioned compensation reasons. In 2020, the unit rate will remain almost constant on the basis of the provisions in the performance plan. The DFS share of the unit rate for 2020 sank by 0.4 percent over the previous year, while the share of the unit rate for en-route services was at around 86 percent. In 2021, the unit rate will increase by around 5.0 percent and the proportionate unit rate of DFS by 5.6 percent, with a constant share of the total unit rate of around 86 percent.

3.1.2 Tower division

Service unit

For terminal services, a service unit is the quotient obtained by dividing by 50 the maximum take-off weight, expressed as a figure taken to two decimal places, to the power of 0.7. The calculation is applied consistently at all 16 designated international airports in Germany.

Definition of service unit:

$$\text{Terminal services: } \left(\frac{\text{max. take - off weight in tonnes}}{50} \right)^{0.7}$$

The amount to be paid by the airspace user is given by multiplying the service unit by the unit rate for terminal services.

Service units – terminal services		
	2020	2019
Total	630,014	1,492,294
Compared with previous year (%)	-57.8	+1.2

The number of service units decreased by 57.8 percent compared with the previous year and was approximately 57.6 percent below the performance plan, which projected a total of 1,484,600 service units for 2020.

The unit rate for terminal services comprises air-traffic-related cost elements of DFS, the German Meteorological Service (DWD) and other national bodies, such as the German Federal Ministry of Transport and Digital Infrastructure (BMVI) and the Federal Supervisory Authority for Air Navigation Services (BAF), in keeping with the EU regulations concerning the provision of air navigation services. It is calculated by taking the determined costs for the year in question as defined in the performance plan plus the adjustments defined in Regulation (EU) 2019/317 and dividing by the service units based on the basic forecasts of EUROCONTROL's Statistics and Forecast Service (STATFOR) for the year in question.

Terminal unit rate (€)						
	2021	2020	2019	2018	2017	2016
Total	130.50	126.29	124.34	127.87	130.59	159.23
DFS share	126.77	122.70	121.40	125.18	127.80	151.31
Compared with previous year (total, in %)	+3.2	+1.6	-2.8	-2.1	-18.0	-12.3

In 2020, the unit rate rose slightly on the basis of the provisions in the performance plan. The DFS share of the unit rate for 2020 rose by only 1.1 percent over the previous year, while the share of the unit rate for terminal services decreased to 97 percent. In 2021, the unit rate will increase by around 3.2 percent, the proportionate unit rate of DFS by 3.3 percent, with a constant share of the total unit rate of around 97 percent.

3.1.3 Results of operations

Results of operations (€m)		
	2020	2019
Total operating revenues and income	1,093.3	1,089.9
Total expenses	-1,147.8	-1,122.8
EBIT	-54.5	-32.9
Financial result	-33.8	63.6
EBT	-88.3	30.7
Income taxes	1.8	3.0
Net loss/income	-86.5	33.7
of which DFS	-86.5	33.7
of which minority interest	---	---

More information on segment reporting can be found in Note 34.

The changeover from full cost recovery to charges based on performance for the Control Centre division (since 2012) and the Tower division (since 2015) has also had a material impact on cost structures. Savings or additional expenses are no longer passed on in the following periods but directly impact the earnings of DFS. Currently, there are still issues concerning interpretation and application which could influence the future development of the company's economic situation. From the point of view of DFS, there are a small number of measurement, accounting and charging issues which have still not been unequivocally resolved since the date of the transition (31 December 2011 / 1 January 2012). The regulatory authority and DFS continue to work on the contentious issue of drawing up a binding catalogue of qualifying uncontrollable costs (costs exempt from cost-sharing). Such costs will have to be borne in full by airspace users.

For the Control Centre division (since 2012) and the Tower division (since 2015), the regulatory situation has split the risks and rewards resulting from the differences between planned and actual traffic volume between airspace users and DFS. If defined thresholds are exceeded, DFS is authorised and obliged to return or demand any over- or under-recoveries (carry-over).

Due to the low traffic volume in 2020, the carry-over from traffic risk sharing amounts to €521 million. However, the settlement with the airspace users will take place in the future over five to seven years.

Risk/reward transfer from deviation in traffic volume		
Deviation in traffic volume (v)	DFS share	User share
$v \leq 2.0\%$	100.0%	---
$2.0\% < v \leq 10.0\%$	30.0%	70.0%
$v > 10.0\%$	---	100.0%

However, due to the COVID-19 pandemic, the third reference period (RP3) was redrawn, with Regulation (EU) 2020/1627 containing special regulations on traffic risk sharing, among other things (see section 2.2.2 under "Uncontrollable costs – costs exempt from cost-sharing").

3.2 Commercial business

3.2.1 Business activities

The main focus of the (non-regulated) commercial business is on providing air traffic control services at nine German regional airports and two UK airports, the sale of aviation-related products and publications, the training of military air traffic control personnel, the international consulting and project business as well as the provision of support services for the operation of drones. Since 2019, it has been divided into five strategic business areas.



Aeronautical data, engineering & systems

The strategic business area "Aeronautical data, engineering & systems" comprises the supply of radar, position and flight plan data of the air navigation services for airport operators and airlines in Germany. In addition, technical air navigation services (ATS engineering services, CNS services) are offered at German regional airports as well as worldwide system engineering (maintenance) for supplied air navigation systems. Furthermore, on the basis of the certification of DFS Aviation Services (DAS) as a designated body, tests of systems for on-demand lighting systems of aviation obstacles are carried out.

However, ATS systems are also being developed and offered worldwide to a much greater extent. DFS Aviation Services focuses on the development of cloud-, remote- and simulation-enabled ATS systems for tower (air and ground situation), approach and en-route systems.

The services provided to airport operators and airlines in Germany relating to radar, position and flight plan data of the air navigation services declined dramatically due to the pandemic.

System supply contracts have been concluded with LVNL Netherlands, dans Dubai, Kazaeronavigatsia Kazakhstan and ENAV Italy for the applications described above. Maintenance contracts for the period after the warranty phase are being negotiated or have already been concluded.

At the beginning of the COVID-19 pandemic, project work was delayed, especially for on-site activities at the customer's premises. During the year, remote solutions were increasingly found so that the work could continue.

Due to COVID-19, tenders in this segment are only taking place with delay or to a limited extent.

Air traffic services & apron

DFS Aviation Services provides air traffic services (ATS) at eight German regional airports (air traffic control service) and at one German airport (aerodrome flight information services, AFIS) as well as air traffic control services through its subsidiary Air Navigation Solutions Ltd. (ANSL) at London Gatwick and Edinburgh airports. In addition, apron management service is provided at German airports.

This business area also includes services, such as remote tower control as a service. In addition to classic air traffic control from the tower, DFS Aviation Services also offers ATS and AFIS as a remote service. The air traffic controllers no longer work on the basis of a view from the control tower, but rely entirely on a camera- and technology-supported replacement for the out-of-the-window view. This type of service provision is just as secure as the classic variant, but also offers the advantage that tower buildings at the airport are no longer necessary, thus saving costs. The air traffic controllers can work independent of location and are appropriately trained for such remote deployment. The technology and operational implementation required for remote ATS or AFIS is provided by the joint venture Frequentis DFS Aerosense.

This joint venture between the system supplier Frequentis AG from Vienna, Austria, and DFS Aviation Services has been active on the market since 2018.

The demand for such location-independent provision of aerodrome control service (remote tower control, RTC) and the associated new technology remains very high and will continue to grow in the coming years.

Air traffic at the regional airports where DFS Aviation Services (DAS) operates

Air traffic at the regional airports where DFS Aviation Services operates was severely impacted by the COVID-19 pandemic. Overall, traffic (as at 25 November) at regional airports served by DFS Aviation Services declined by 24 percent, with IFR traffic shrinking by 42 percent and VFR traffic by 13 percent.

Air traffic control at the regional airports where DFS Aviation Services (DAS) operates

This led to the introduction of short-time work (furloughing) at almost all regional airports served by DFS Aviation Services. In constant dialogue with the airports, the service level was adapted to the current situation. As a result of the pandemic and the slump in air traffic, Paderborn Lippstadt Airport had to file for self-administered insolvency in December.

Despite the above-mentioned challenges, DFS Aviation Services has managed to send nine trainees into training in coordination with and with the consent of the clients in order to fill planned staff departures.

At Cochstedt Airport, cooperation with the German Aerospace Centre (DLR) was intensified. DFS Aviation Services is supporting the establishment of a National Experimental Test Centre for Unmanned Aircraft Systems, including the adaptation of the airspace structure and provision of air traffic control personnel.

Air navigation services at Gatwick Airport

Gatwick Airport remains the second largest airport in the United Kingdom (in terms of passenger numbers) with more than 280,000 flight movements per year prior to the COVID-19 pandemic. This volume declined significantly due to the COVID-19 restrictions in 2020. This still makes it the most efficient single-runway airport in the world. From Gatwick, regular connections to some 230 destinations in over 70 countries are served. Its customers include more than 50 airlines, which at peak times carried more than 46 million passengers to and from the airport. Air Navigation Solutions Ltd. (ANSL) safely handles the traffic volume of up to 950 flight movements per day at peak times. This marks a new record for a single-runway airport.

Flight movements at Gatwick Airport			
	2020	2019	Change
Flight movements	76,964	280,681	-72.6%

Air navigation services at Edinburgh Airport

Edinburgh is the largest airport in Scotland with more than 130,000 flight movements and around 14 million passengers at peak times. This volume declined significantly due to the COVID-19 restrictions in 2020. It is used by 38 airlines, which fly to 157 destinations, in regular operations. ANSL has been providing air navigation services at Edinburgh Airport since 1 April 2018.

Flight movements at Edinburgh Airport			
	2020	2019	Change
Flight movements	43,264	127,017	-65.9%

Consultancy

The strategic business area "Consultancy" encompasses all consulting services on air traffic control issues for air navigation service providers, airport operators, airlines as well as supervisory authorities and the military. The consulting services for remote tower customers as well as the provision of personnel to render services related to the service portfolio of DFS Aviation Services are also included here.

It serves a large market worldwide, albeit in a very strong competitive environment. In 2020, in addition to a large number of small projects, landmark contracts were also concluded, including two extensive consultancy projects in Asia.

In particular, tenders for RTC consultancies and consultancies with on-site presence were delayed or cancelled altogether due to COVID-19.

DAS Bahrain, headquartered in Manama, Bahrain, has been providing the Bahraini air navigation service provider with relevant specialist personnel since 1 January 2019. In 2020, the development of revenues and earnings was stabilised at the previous year's level despite COVID-19-related restrictions. A contractual extension without a new tender for the 2021 business year was agreed with the customer well in advance.

Aviation training services

The strategic business area "Aviation Training Services" comprises all training measures to be provided for the external market. The focus of the services offered is on measures to maintain the competence of operational staff. In addition to traditional on-site training, online courses, including online simulations, are increasingly being developed. Customers are addressed worldwide, increasingly in the regions in which DFS Aviation Services is already active. Work is currently underway to market the training portfolio. Specific training products have been defined and promoted. The necessary structures, including the infrastructure, are being built up successively. All investments are being aligned with the potential order situation in order to achieve the best possible cost/benefit ratio.

Training of military air traffic control personnel

The training for military air traffic control personnel takes place using the contractually agreed simulator and training infrastructure. A comprehensive quality management system has been established and is actively being used.

Due to the pandemic, training had to be interrupted for a period of two weeks. As a result, part of the service for the client could not be provided within the planned time frame. Therefore, an adapted course plan was agreed upon. Adapted to COVID-19 conditions, training was provided according to plan, with 42 courses successfully completed. In 2020, 98 percent of the courses requested and commissioned by the Bundeswehr (German Armed Forces) were carried out in accordance with the service level agreement at, or above, the quality level contractually agreed. Seven further-education courses were cancelled by the Bundeswehr due to the COVID-19 pandemic.

A training course was conducted for the operational staff of the German Federal Police's air support units on the customer's premises on behalf of the DFS Aviation Services. Another course planned for the fourth quarter was cancelled due to the pandemic.

The revenue planned for the 2020 reporting year could not be achieved in full. Essentially, staff costs are lower than planned because Kaufbeuren ATM Training (KAT) did not recruit or only did so with a delay.

Aviation-related products and publications, and training services

The Group produces aeronautical charts and publications and other aeronautical information in paper and electronic form. These are distributed by R. Eisenschmidt GmbH (Eisenschmidt), which has been part of the Group since 2013. In addition to these products, further products and services for the training of pilots have also been developed, produced and distributed since 2017.

In 2020, the high stable level of revenues generated in the previous years was maintained. The earnings situation was significantly improved compared with plan and is reflected in the positive net income.

The projects initiated regarding digitalisation and automation put Eisenschmidt in a position to react very flexibly to the challenges of the COVID-19 pandemic. This was supported by moving all drives to a cloud solution and introducing the concept of a shared and clean desk. Both topics significantly support remote working.

Eisenschmidt is meeting the rising demand for digital products and improved accessibility by providing a vending machine (24/7), e-commerce, shipping in the period between Christmas and the New Year as well as the expansion of digital products, such as a new app. Digital events, videos, e-learning programmes and digital lectures were able to maintain and increase customer loyalty. Eisenschmidt sees further growth potential in this regard.

In addition, a click-and-collect service was introduced, whereby customers can pick up their order on site with prior notice. Since orders received via the Eisenschmidt online shop were processed and shipped at the usual speed even during the lockdown phases, the temporary closure of the retail shop was easily absorbed.

UTM services & systems, including UAS training services

The impact of the COVID-19 pandemic also affected Droniq. At the beginning of the pandemic, numerous sales events were cancelled and projects and investment plans were postponed. The drone market also stagnated. Potential customers and partners were not able to scale up their business models to the desired extent and the regulations imposed by the legislator were not implemented according to the planned schedule.

Despite the conditions, Droniq initiated projects within the framework of product management to stabilise existing products and to further expand the portfolio. A major milestone was the introduction of the UTM system for locating and controlling drones via LTE and for live transmission of video, image or sensor data. The drone tracking application Trackviewer was introduced as a backup solution to the UTM system. In addition, Droniq created the prerequisites for the migration of another application, the DFS Drone App. The required hardware, the hook-on device, was stabilised and upgraded with additional functions. Another milestone in product management was the development of an interoperable digital platform for scaling the business, the core of which is the implemented CRM tool and the connected applications. Here, Droniq laid the foundation for the connection of the upstream and downstream systems.

In the sales area, the customer base was further expanded. Droniq generated revenues mainly from consulting, from the rental of hardware and from the sale of UTM software licences. In addition, Droniq concluded research cooperation agreements with universities and marketing cooperation agreements with drone manufacturers. It also participated in European funding projects and won its first international contracts. The Droniq Academy, which was opened in the business year, provided online training and examinations for the proof of knowledge (drone licence). To further support sales, the CRM tool Sales Force and the online shop were introduced.

In the marketing domain, the website and social media presence were expanded to position Droniq in the market. In terms of personnel, the company was able to selectively strengthen key positions.

3.2.2 Results of operations

Results of operations (€m)		
	2020	2019
Total operating revenues and income	80.7	91.1
Total expenses	-88.6	-89.2
EBIT	-7.9	1.9
Financial result	-0.1	1.8
EBT	-8.0	3.7
Income taxes	0.6	-2.6
Net loss/income	-7.4	1.1
of which DFS	-6.1	1.9
of which minority interest	-1.3	-0.8

More information on segment reporting can be found in Note 34.

4 Personnel

Motivated and qualified staff are imperative for the long-term success of the DFS Group. This is why human resources management at DFS stresses a holistic approach from selection through attractive compensation and targeted training and development to the long-term retention of staff in the Group. Financial incentives are supported by HR policies aligned to the different phases of life and family needs.

Employee structure

As at 31 December 2020, the DFS Group had a total of 6,139 employees. This number is made up of non-exempt staff (covered by collective agreements), exempt employees (not covered by collective agreements) and executive staff as well as assigned personnel of the Federal Aviation Office (LBA) working for DFS and soldiers released from regular service. Non-exempt employees are subject to the provisions of the company-specific collective bargaining agreements.

Executive staff and exempt employees negotiate their contracts freely on an individual basis. These employees have target agreements covering corporate goals and their area of expertise. The degree of fulfilment of these agreements determines the variable salary components.

The assigned personnel of the Federal Aviation Office (LBA) working for DFS form another employee group. These established and non-established civil servants, who have remained in an employment relationship with the Federal Government, still fall under the Federal Civil Servants' Remuneration Regulation (*Bundesbesoldungsordnung*) and the collective agreement for the public service (*Tarifvertrag für den öffentlichen Dienst – TVöD*). The collective agreements of DFS do not apply to them. DFS bears the relevant expenses.

In general, air traffic controllers (from the age of 55) and flight data assistants (from 59) receive transitional payments in the period before their formal retirement. This right to receive transitional payments accounts for a significant component of the pension commitment (see Note 28).

Information on the compensation structure of the Executive Board can be found in Note 46.1.

Employees (as at 31 December)					
	2020	2019	2018	2017	2016
Permanent employees (total) (of which at subsidiaries)	6,139 (480)	6,052 (467)	5,750 (321)	5,608 (222)	5,695 (157)
Salaried staff (of which at subsidiaries)	5,559 (426)	5,475 (421)	5,249 (321)	5,156 (222)	5,210 (157)
Soldiers released from regular service	130	147	157	165	202
Wage-earners	16	18	20	22	22
Technical/commercial students & apprentices (of which at subsidiaries)	124 (14)	111 (11)	70 (4)	47 ---	41 ---
Trainee air traffic controllers (of which at subsidiaries)	192 (40)	171 (35)	138 (20)	60 ---	48 ---
Personnel belonging to the Federal Aviation Office (LBA)	118	130	140	158	172
of which established civil servants	(99)	(106)	(112)	(126)	(134)
of which non-established employees	(19)	(24)	(28)	(32)	(38)
Compared with previous year (%)	2.9	5.3	2.5	-1.5	-0.8
Share of female employees (%)	27.5	27.3	27.5	27.5	27.1
Share of foreign employees (%)	4.9	4.0	4.5	5.2	4.7

For 2020, the table contains 480 employees from the following subsidiaries:

At the end of December, DFS Aviation Services had 149 members of staff.

At the end of December, DAS Bahrain had 70 members of staff.

At the end of December, Eisenschmidt had 17 members of staff.

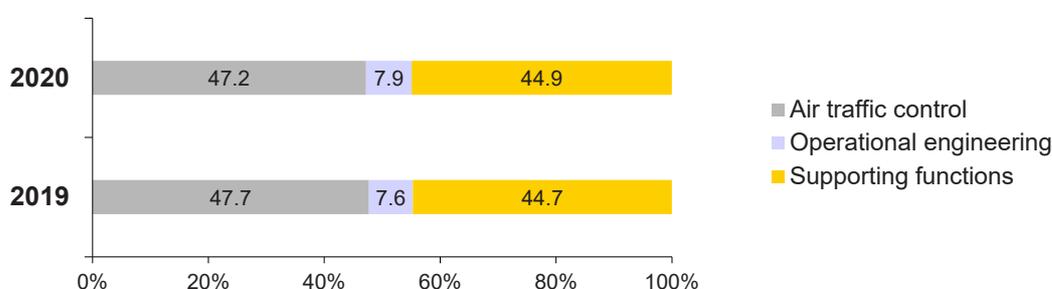
At the end of December, Kaufbeuren ATM Training had 59 members of staff.

At the end of December, ANSL had 170 members of staff.

At the end of December, Droniq had 15 members of staff.

DFS Energy and DFS International Business Services have no employees of their own.

Employees by area of duties (%)



Of the 6,139 employees of the Group, 1,026 were part-time – 630 women and 396 men. The share of part-time employees rose by 6.9 percent over the previous year, reaching 16.7 percent. The age structure of staff is well balanced, with the average age being 42.3 years. The turnover rate was 1.08 percent in 2020.

At present, 27.5 percent of employees are women. Currently, 71 of the 520 management positions in the company are held by women, representing a share of 13.7 percent.

DFS applies the German law on the equal participation of women and men in management positions in the private sector and in public service (FührposGleichberG) and has laid down a target for the share of female division directors of 5 percent (previously: 0%) and the share of female department heads of 13 percent (previously: 11%) for the period from 1 January 2017 until 31 December 2021. The company is increasingly fostering in a targeted manner both family-friendly policies and equal opportunities.

Foreign employees mainly come from the United States of America and the United Kingdom, followed by Spain and Austria. Overall, 56 nations are represented.

Work and family

DFS is continuing to expand measures to support staff in combining work and family life and has set up HR policies aligned with the phases of life. It has been certified by the non-profit Hertie Foundation under its 'work and family audit' (*audit berufundfamilie*) since 2014. The second recertification took place in 2020. Since 2011, DFS has been working with a childcare centre in Langen, where its Headquarters are located. Places are available for employees' children, and similar places are also available at childcare centres near the other DFS branches in Bremen, Munich, Karlsruhe and Leipzig. The summer holiday programme for school-age children at the Langen, Munich, Karlsruhe and Bremen sites was suspended in 2020 due to COVID-19 and is to be resumed in 2021. The support for employees who are caring for dependents was and continues to be expanded, for example by the HR and health management units at DFS providing comprehensive information and advice.

Over the course of their whole career, staff can make use of flexible working-time models, health programmes, a company sports club, seminars and further training opportunities.

Personal staff development

DFS is aware that a large part of the future success of the company is coupled to the further development of the individual strengths and abilities of its staff.

For this reason, DFS offers a wide range of initiatives to foster professional and interdisciplinary competences, which are continuously realigned with the changed needs of employees. The willingness to learn, the exchange of experience, networking and a feedback culture all play a central role in this regard.

Training

DFS is well aware of its responsibility to society and has been offering job-starters attractive trainee and university places with a career perspective for years.

Training starts		
	2020	2019
Total	170	198
Air traffic controllers (of which at subsidiaries)	116 (22)	142 (16)
Dual courses of studies / apprenticeships (of which at subsidiaries)	54 ---	56 ---
Compared with previous year (%)	-14.1	+10.61

On 31 December 2020, a total of 408 people (including controllers in on-the-job training – OJT) were undergoing multi-year air traffic controller training in the Group, 368 of whom (including OJT controllers) were at DFS. A total of 192 people were undergoing theoretical basic training.

In addition to the training of air traffic controllers, the portfolio of training offered at DFS also encompasses dual courses of studies in IT, air navigation technology, electrical engineering, air traffic management as well as IT-related and commercial apprenticeships. The portfolio of dual courses of studies is being supplemented by a degree course in air traffic management as a combination of a bachelor's degree in business with practical air traffic controller training.

This allows DFS to meet its demand for qualified staff. As these staff are trained internally, they will, in all likelihood, take on duties within DFS on completion of their training or degree.

Collective bargaining

The parties to the collective agreement, DFS and the air navigation services union (GdF), conducted negotiations on collective bargaining on the following topics in 2020:

The remuneration round was concluded with a collective agreement for three years, starting from 1 January 2020. On 25 January 2020, the following collective agreements were signed: collective agreement covering remuneration (VTV) no. 11, the agreement covering allowances (ZTV) no. 11 and the agreement covering remuneration for apprentices (VTV-A) no. 11.

Negotiations on the need to adjust the collective agreement governing long-term time accounts (LZK-TV) were concluded in 2019. The joint signing took place on 18 February 2020.

On 19 March 2020, the parties to the collective agreement concluded the validation for workload-related compensation for the year 2019.

On 20 March 2020, DFS and the GdF reached an agreement on the corona collective agreement within a very short period of time, which was better able to protect the health of employees, ensure flexible staff deployment and save costs than the mechanism of short-time work (furloughing).

The implementation of the collective agreement on partial retirement (ATZ-TV) was made more manageable on 17 July 2020 by means of an extension of the implementation regulations.

DFS and the GdF held joint meetings on a quarterly basis within the framework of the so-called clearing office. This mechanism was set up in 2018 to discuss various individual issues associated with the collective agreements and resolve any uncertainties in the collective bargaining system. The corresponding amendments were introduced into the collective agreements in the current year.

Amendments to the collective framework agreement (MTV) on the subject of work and family were implemented.

Collective bargaining to improve the scope for action of DFS in terms of flexibility, capacity and finances took place from October to December and was successfully concluded on 14 December 2020 with the signing of the seven collective agreements affected.

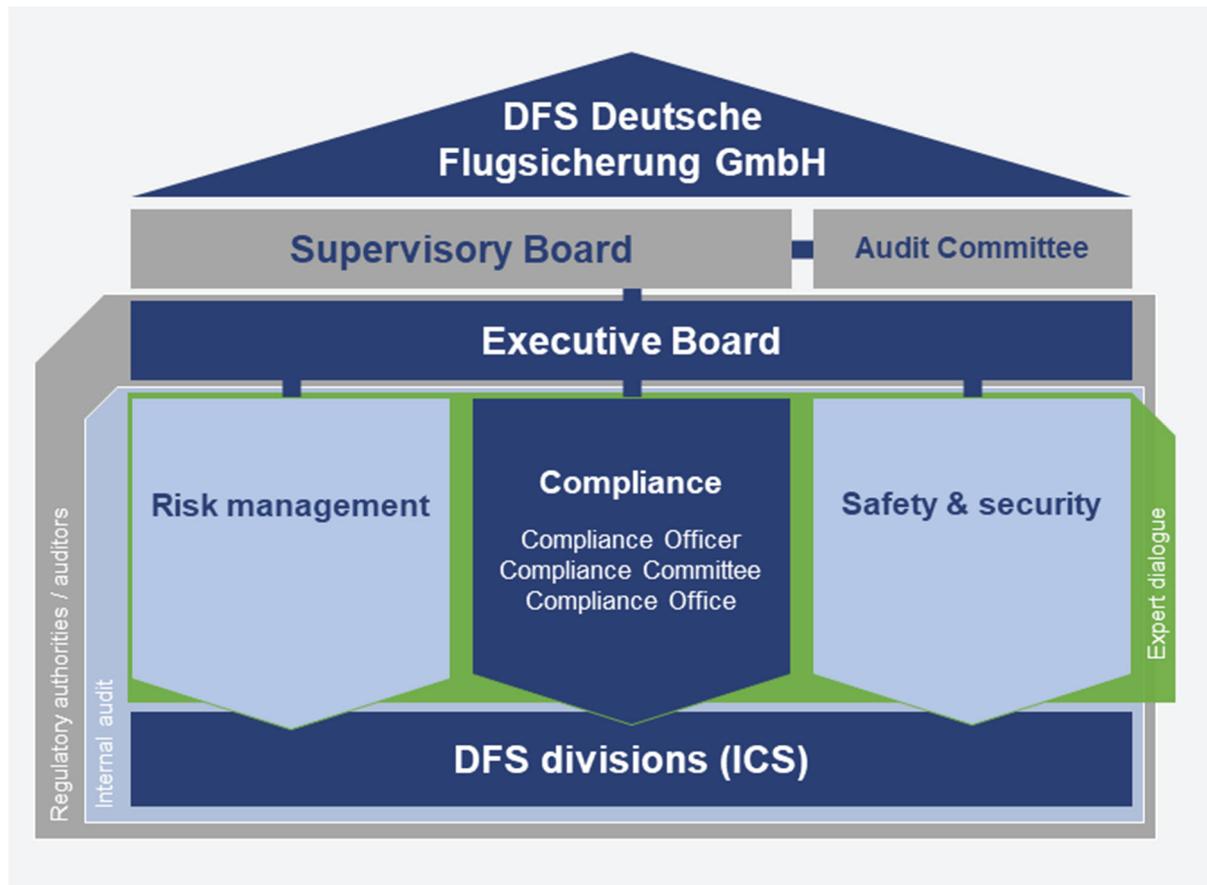
The negotiations on the new collective agreement relating to health and long-term care insurance (KTV) were also concluded in December 2020 with the signing of the collective agreement.

In addition, a complete set of collective agreements consisting of a collective framework agreement, a collective agreement relating to remuneration and a collective agreement on occupational pensions was concluded for Droniq, as well as a corona collective agreement for Kaufbeuren ATM Training (KAT).

COVID-19 pandemic

From the second calendar quarter onwards, the company's activities were largely determined by the emerging COVID-19 pandemic. In accordance with the DFS pandemic plan, it was necessary to quickly create a basis for effective pandemic management, tailored to the specific conditions and structures of DFS. The pandemic plan describes the measures and responsibilities to be applied in the event of a pandemic. It is the binding standard for the entire DFS. In cases where a pandemic requires the activation of the DFS crisis management organisation, it works in accordance with the DFS Crisis Management Handbook. (See section 6.2.4 in the 'Risk report' on the measures taken).

5 Compliance



As a State-owned entity, DFS and the domestic subsidiaries where DFS is the majority shareholder are subject to the Public Corporate Governance Code (PCGK) of the Federal Government of Germany. Under this code, the Executive Board has to ensure adherence to and compliance with legal provisions and corporate guidelines. DFS introduced a compliance management system (CMS) on the basis of this code.

The CMS, together with the risk management system (RMS) and the safety and security management system, forms the three pillars of the corporate structure for risk management.

The compliance committee advises the compliance officer. The committee is made up of members of the first management level from the following divisions: Group Data Protection & Quality Management, Safety & Security Management, Controlling, HR Management Headquarters & Strategy as well as the head of Compliance & Risk Management.

To ensure the connection of the compliance management system to the internal control system (ICS), the directors of Financial Management and Group Internal Audit are permanent guests of the committee. In 2020, the compliance committee had four scheduled meetings.

In addition to internal reporting channels, an external ombudsperson is also available to receive information from DFS employees on suspected compliance violations. This makes it possible for reports to be submitted to DFS without revealing the identity of the whistleblower.

Group management report 2020

Activities in 2020 focused on intensifying the communication of compliance issues within DFS and, following the retirement of the compliance officer, on evaluating the objectives of the CMS. In addition, the tax compliance structures were further upgraded, the majority shareholdings implemented their own codes of conduct based on a Group framework, and the reporting channels within the Group were harmonised.

The compliance management system is constantly upgraded and expanded. Organisationally, the matter is assigned to the Institutional & Legal Affairs division. There is a direct reporting channel from the compliance officer to the Executive Board and the Supervisory Board.

6 Risk report

6.1 Risk management system

The DFS Group uses a comprehensive set of instruments to identify, analyse, monitor and manage the risks associated with its business. The risk management process is managed centrally by the independent Compliance & Risk Management department. This department is supported by the risk management committee (RMC) when conducting evaluations that span several organisational divisions and processes. As a rule, the members of this body belong to the executive management level and are closely involved in the business decision-making processes, understand company-wide interrelationships and are hence in a position to contribute to forming a comprehensive overview.

The direct and indirect subsidiaries of DFS are systematically managed and monitored by means of in-house risk management systems using evaluation thresholds adapted to the respective company. The risk management systems of the material DFS investments are based on Group guidelines. These DFS investments inform the DFS Supervisory Board about the economic situation and the course of business (including risks) of the existing shareholdings within the scope of quarterly reporting in accordance with Section 90(1) of the German Stock Corporation Act (AktG) on managing shareholdings. Prior to this, consultations are held with the DFS Executive Board. This ensures communication up to Group management level.

Risk Management takes account of the changes taking place in the aviation industry and the Group, advances the risk management process methodically and therefore ensures the early identification of risks and the combatting of business risks.

This specialist department uses an operational instruction to lay down standards for the ongoing company-wide recognition, assessment, documentation and reporting of business risks. The early identification of risks begins with the applications for approval of business plans and projects. The following areas to be assessed with regard to potential effects comprise: operations (e.g. fulfilling the statutory mandate, infrastructure); finance (e.g. costs, financial markets, customers/suppliers); management (e.g. strategy, personnel, organisation) as well as the external environment (e.g. politics and legislation, disasters, including pandemics and terrorist attacks).

As part of their management duties, the directors of DFS divisions identify potential/existing risks, including for the issues mentioned above, and are responsible for ensuring that the statements on the risk situation in their organisational units are correct. They report quarterly unless an ad hoc report is required. A risk announcement contains a description and an assessment of the risk as well as the causes and countermeasures. In general, the forecasting period is one year.

Risks are assessed across all segments and are based on an evaluation of the probability of occurrence and the possible level of damage of the hazards under consideration as reported by the organisational units concerned. In principle, a quantitative assessment is the objective. In justified cases, a qualified assessment is permissible; key values for the range of a qualified assessment are centrally defined in an assessment matrix. The matrix also defines the thresholds above which a risk is to be classified as a potential going-concern risk. Only the risks to the going-concern status are included in the risk report provided to the Executive Board and the Supervisory Board.

The reporting of risks to the Executive Board takes place on a quarterly basis, while the Supervisory Board is informed on a half-yearly basis. Both reports include an overview of changes to the prior period and all notifications that were no longer judged to be business risks in the period under review.

The integrity of the risk management system is regularly tested by Group Internal Audit and has been assessed as effective and appropriate by the auditors as part of the audit of the annual financial statements.

6.2 Material risks

6.2.1 Corporate strategy risks

Corporate strategy risks arise primarily from misjudgements of external conditions and future market developments. They can lead to an inadequate alignment of corporate activities, with negative consequences for the results and financial position of the DFS Group. This is why – in particular due to the current COVID-19 pandemic as well – DFS is paying increased attention to the analysis and forecasting of air traffic, the political environment and the European charging and performance scheme. The Executive Board regularly reviews its estimates in close cooperation with all relevant bodies, checks variances, discusses risks and derives necessary measures.

6.2.2 Financial risks

6.2.2.1 Principles of financial risk management

As part of its business activities, the DFS Group is exposed to numerous financial risks. The management of these risks is an integral component of the planning and implementation system. The Executive Board lays down the associated corporate policy. The objective of the corporate policy is to contain and/or mitigate existing risks. DFS Financial Management implements these targets and uses a system to manage financial risks that is tailored to the specific business of the Group. DFS continuously monitors and analyses the events on the financial markets in a critical dialogue with its core banks and the rating agency to reassess existing strategies or develop new strategies as necessary.

As part of its overall risk management system, DFS performs Value-at-Risk (VaR) analyses to manage market price risks (interest, currencies). The risk position is assessed by the Treasury unit based on market price risks. The VaR indicates the absolute loss for a company of a defined risk position which will not be exceeded with a previously defined probability over a given period of time. The calculation of the VaR at DFS is based on a holding period of ten days and a probability of 95 percent. On 31 December 2020, the cumulative loss at a confidence level of 95 percent amounted to under €8 thousand (previous year: €2,078 thousand).

The VaR is determined with the help of statistical time series on the relevant financial market data (interest rates, exchange rates). Historical simulations are computed by extrapolating scenarios from the past to the future using simulated changes in market values for financial instruments.

This market risk analysis includes all money market transactions of DFS, issued debenture loans, currency hedges as well as the associated risk positions (foreign currency purchases and foreign currency receivables/liabilities). Quantitative information on VaR values for risks from currency and interest rate changes is summarised in Note 38.3.

Clearly defined external conditions support the planning and control of risks based on the reporting. Speculative transactions with derivative instruments where there is no underlying transaction are forbidden. As regards financial investing, transactions are only entered into with counterparties who either have a long-term rating of at least A+/A1, short-term A-2/P-2, or a correspondingly high creditworthiness or other form of collateral.

6.2.2.2 Liquidity risk

The COVID-19 pandemic led to a shortfall in revenues and income from the decline in the service units for en-route and terminal services, jeopardising the economic viability of the company. DFS took various measures to improve the liquidity situation. In addition to issuing a *Schuldscheindarlehen* (debenture loan) and strict cost savings, intensive efforts by the DFS Executive Board and close contact and communication with the Shareholder resulted in an increase in the share capital of €300 million being included in the supplementary budget of the German Federal Government for 2021 and adopted.

Daily liquidity is monitored by the Treasury unit and is managed with liquidity planning during the year and over the medium term (see section 2.6.3.1).

6.2.2.3 Default risk

DFS is exposed to default risk and, increasingly, collection and enforcement risk from the operating business in the Control Centre and Tower divisions, from the commercial business as well as from financial instruments. That is why receivables are monitored constantly in the operating business and default risks considered by means of specific allowances. In addition, for terminal services DFS demands security deposits from customers with relevant sales volumes when defined warning thresholds are exceeded.

For the Control Centre division, EUROCONTROL invoices all flights on the basis of the data transmitted by the individual Member States and supplementary information from the Network Manager. The invoices are issued based on the data known at that point in time (operator, weight, distance). In individual cases, agreements are reached under which third parties make partial payments of outstanding amounts for services received after consultation with the Member States and at EUROCONTROL's reasonable discretion. EUROCONTROL does not require any security to be lodged but initiates enforcement measures to collect amounts due which have not been paid within the deadlines laid down. This requires a resolution from the Member States.

DFS has no influence on the discretion applied when EUROCONTROL makes such decisions. The intergovernmental agreement entitled Multilateral Agreement relating to Route Charges dated 12 February 1981 (BGBl. 1984 II p. 109) at European level prevents it from demanding security deposits to limit imminent defaults for en-route services. Notwithstanding these restrictions, the regulatory authority currently rejects the inclusion of these collection, default and enforcement risks as uncontrollable costs. The maximum default risk is reflected in the carrying amounts of the financial assets recognised on the balance sheet.

Warranty obligations for the commercial business are demanded as part of a contract-related quality management.

6.2.2.4 Rating risk

The business and performance of DFS are monitored by an external rating agency and the Deutsche Bundesbank (eligibility of the debt instruments of DFS). Negative analyses and the downgrading of the ratings could make the take-up of external financing more difficult and negatively influence the conditions for such financing and lead to higher interest rates.

DFS concluded a US lease-in/lease-out transaction (five tranches) with two US investors (QTE transaction) for a portion of its air navigation systems under non-current assets in 2002 and 2003.

This transaction was basically terminated in the second quarter of 2012. The remaining German shell structure with a remaining term up to the start of 2022 is restricted to a receivable to Nord/LB bank (the borrower) and a liability to KfW Bank (the lender). The associated cash flows match as regards amount, term and currency. Over its term, DFS bears the default risk of Nord/LB bank to the amount of €20.6 million as of the balance sheet date (previous year: €30.2 million).

KfW Bank is authorised to extraordinarily terminate the loan if the rating of DFS falls under AA- (Standard & Poor's) or Aa3 (Moody's). In such a case, DFS would have to name a third party within a period of thirty days that will acquire the receivable of KfW against DFS to the amount of €20.7 million (previous year: €30.5 million).

6.2.2.5 Interest rate risk

The Group is exposed to interest rate risk from financing, financial assets as well as from the measurement of obligations under occupational pensions.

The effective management of the interest rate risk is ensured through the use of derivative financial instruments with term and volume congruence between the underlying transaction and the hedge. DFS monitors the impact of regulations to be able to react with appropriate measures to changes in the area of occupational pensions.

Variances in the present value of the pension obligations for changes in parameters of +/- 0.5 percentage points are shown in the sensitivity analysis in the Notes (see Note 28.3).

6.2.2.6 Currency risk

The DFS Group is exposed to transaction risks as part of cross-border procurement transactions. The majority of foreign currency purchases/liabilities results from suppliers invoicing in US dollars (USD/\$). The total volume amounted to approximately \$0.7 million in the reporting period (previous year: \$1.7 million). Other currencies are only of minor importance.

These risks are limited by means of hedging using derivative financial instruments. Currency risks from financial transactions (foreign bonds, commercial paper) are hedged immediately on conclusion of the transaction.

DFS International Business Services (DFS IBS) granted Air Navigation Solutions Ltd. (ANSL) a flexible credit line of €3.5 million to prevent possible liquidity bottlenecks in the current COVID-19 pandemic. This can lead to exchange rate losses for ANSL. The term is two years (2020-2022). As of 31 December 2020, the credit line had not been drawn down.

6.2.3 Performance-related and IT risks

The top priority for DFS and its subsidiaries is to ensure the safety of air traffic, which is why DFS has set up safety and security management systems for the provision of air traffic control services that correspond to the provisions of Regulation (EU) 2017/373. In addition, air navigation services are categorised as critical infrastructure under German law (*BSI-Kritisverordnung*) in accordance with Section 27c of the German Aviation Act (LuftVG). To meet the requirements of this ordinance and to minimise the risks of cyber-attacks, DFS established a Security Operations Centre, which is continuously being optimised and upgraded. The risk management system of DFS and its subsidiaries has incorporated ATM-related systems and applications as well as administrative systems and applications.

A variety of measures are taken at the level of planning, implementing and operating of the infrastructure of DFS and its subsidiaries to minimise the probability of downtime of the operational infrastructure, which would endanger the safety of air traffic and impact business performance. Where necessary for the provision of air navigation services and other business processes, detailed risk analyses are carried out, taking into account the protection objectives of confidentiality, integrity and availability, to ensure the implementation of safeguarding measures commensurate with the risk.

6.2.4 Staff-related risks

The commitment and abilities of its staff are crucial for the DFS Group to maintain safety in German airspace and to ensure an efficient level of performance.

The environment for DFS has changed noticeably in the last few years through the introduction of economic regulation and increasing technological change. The Human Resources division is therefore called upon to support staff in exploiting the opportunities offered by change.

Against the background of the predicted decline in the labour force participation rate in Germany, demographic change and the increasing competition among companies for highly qualified staff and executives constitute a further risk that should not be underestimated. The internal demographic characteristics also present a risk as regards a balanced age structure and the long-term maintenance of professional skills.

Human Resources has set up a strategic HR and development programme as well as HR marketing and recruiting measures targeted at developing the workforce further and recruiting qualified professionals externally to meet needs.

DFS has a comprehensive in-house health management programme to ensure that staff remain healthy and maintain their ability to perform.

DFS formed a pandemic team in February 2020. The primary objective is to protect DFS employees against infection with the coronavirus and to maintain the services in operational and technical domains. Comprehensive hygiene measures, business travel restrictions and cancellations of trade fair participation, etc. have been put in place to achieve this objective. In addition, the requirement to work at company sites was significantly reduced by generously granting the option to work from home (known as *flexoffice* at DFS).

The main objectives of the measures are:

- To protect all DFS staff against infection with the coronavirus and
- To maintain the services of operational and engineering units (counts as critical infrastructure)

The organisation and coordination of the measures for all DFS locations is carried out by the Corona Core Team. The DFS pandemic officer was assigned to lead the core team. In the core team, representatives of the various departments, including occupational health and safety as well as Corporate Communications division regularly (three to four times a week) coordinated their assessment of the situation and the necessary measures. In essence, this involved:

- The development and establishment of the SARS-CoV-2 Occupational Health and Safety Standard for DFS.
- The procedure for tracing chains of infection in accordance with the specifications of the Robert Koch Institute (RKI).
- The preparation and dispatch of a certificate to all relevant employees stating that DFS is a company which counts as part of the country's critical infrastructure (authorisation certifications/passes).
- The establishment of a coronavirus hotline for DFS employees.
- The ongoing review and determination, including binding guidelines, on the attendance of employees, the conduct of business trips, participation in/conduct of major events, wearing of masks, social distance regulations, availability and handling of disinfectants, canteen regulations, use of external company personnel, visitor regulations, the review and tracking of country-specific coronavirus regulations.
- The establishment and continuous updating of a coronavirus reporting system on infection incidence and quarantining of DFS staff.

Employees were kept informed about all aspects via intranet bulletins, a coronavirus ticker and video messages from the CEO. In particular, managers were informed via regular video conferences and a special coronavirus guide for managers. The core team reports once a week with a status report on coronavirus/COVID-19 to DFS executives and the subsidiaries. This report is discussed weekly in a briefing with the operational areas (operations and technology). In terms of content, the scope is as follows:

- Objective, tasks and organisation
- Global situation, WHO assessment, case numbers
- Air traffic services and other ATM-relevant topics
- Major events, business trips, private trips, access regulations
- Additional measures
- Communication

DFS and its subsidiaries have succeeded in keeping the rate of infected persons very low. To date, there have been no negative effects on air traffic caused by DFS. All services under Section 27c of the German Aviation Act (LuftVG) could be maintained.

6.2.5 Insured risks

The insurance cover of DFS encompasses common insurable risks of DFS and its subsidiaries. It particularly includes compensation for the loss or damage of material assets and the resulting interruption of operations minus the usually agreed deductible.

It should be kept in mind when assessing the insured risks that DFS mainly performs sovereign functions on behalf of the Federal Republic of Germany in keeping with Article 87d of the German Basic Law (*Grundgesetz*) in conjunction with Sections 31b and 31d of the German Aviation Act (LuftVG). As a consequence, the Federal Republic of Germany is liable for claims brought by third parties for damages in line with the principles of State liability. In the case of damage culpably caused by DFS, aviation liability insurance covers a limit of €767 million per instance of damage, thus releasing the Federal Republic of Germany from its liability to this amount. For non-sovereign tasks, statutory public liability insurance is covered. For contractually agreed activities, such as the apron management service or the provision of air traffic services abroad through subsidiaries, the respective public liability agreed to the named amount in the contract is covered. In addition, claims for damages by third parties from employer's liability risks are covered by insurance.

6.3 Overall assessment of the risk situation

With the exception of catastrophic scenarios such as prolonged pandemics, the Executive Board currently discerns no additional risks – occurring individually or as a group – that would pose a threat to the going-concern status of the company.

The effects of the COVID-19 pandemic, in particular the decline in air transport and the associated financial impact due to revenue shortfalls, have been addressed with countermeasures to the extent that DFS can influence them. Regulatory changes and special measures in response to the COVID-19 pandemic as well as the forecasts on the growth of air transport are also being monitored beyond 2020 and taken into account in the planning. In addition, the Executive Board is in close contact with the Shareholder, the Federal Government, who has already decided on an equity injection of €300 million for the year 2021. Further support from the Federal Government is regularly reviewed in light of the economic situation and the level of traffic.

Liquidity is ensured due to the fund assets not protected against insolvency. Nevertheless, without further capital injections from the Shareholder, negative equity is to be expected.

7 Outlook

7.1 Development of the economic environment and the effects on air transport

Further economic growth and the recovery of air transport depend to a large extent on the course of the pandemic in Germany and worldwide as well as the availability and effectiveness of vaccines. In this context, individual countries in different parts of the world are being affected to varying degrees and differ in the measures and changes in behaviour required to contain the further spread of the virus.

As regards the global economic outlook, the International Monetary Fund (IMF) projects an increase in real gross domestic product (GDP) of 4.0 percent in 2021 and 3.8 percent in 2022, while the Organisation for Economic Cooperation and Development (OECD) expects an increase of 4.2 percent in 2021. In a difficult economic environment for exports, the forecasts for economic growth in 2021 also assume a recovery for the European Union (EU) and Germany. In its Autumn 2020 Economic Forecast, the EU expects GDP growth of 4.1 percent for 2021 and 3.0 percent for 2022 for its Member States.

Future economic growth in Germany is being assessed differently by the various leading economic research institutes. The range extends from a plus of 2.8 percent from the OECD to a rise of 4.9 percent according to the RWI. On average, the economic research institutes assume growth of around 3.7 percent in 2021. The German Federal Government expects GDP to grow by 3.0 percent in 2021, but emphasises that further economic growth will continue to be significantly influenced by the course of the pandemic and the containment measures.

EUROCONTROL's Statistics and Forecast Service (STATFOR) has outlined three possible scenarios for the development of air traffic in its Five-Year Forecast 2020-2024 published in November 2020. These vary in their degree of optimism and are mainly driven by the availability of one or more vaccines. Scenario 1 assumes vaccine availability from 2021 with 2019 traffic levels not reached until 2024. Scenario 2 is similar to scenario 1, the difference being a postponement of vaccine availability to 2022 and a recovery of air transport from 2026 at the earliest. Scenario 3 represents the pessimistic case. Here, vaccine(s) are available but ineffective; the willingness to travel suffers and with it the willingness to fly. Under these conditions, the traffic level of the year could not be reached before 2029. In the medium scenario (Scenario 2), STATFOR expects a traffic level in 2021 of around 51 percent of the 2019 level.

What the planning assumptions discussed have in common is the fragile nature of the economic growth and the uncertainties regarding the demand for air transport.

For DFS, the targets from the provisional performance plan for the third reference period (RP3) apply for the year 2021 as regards the number of service units, irrespective of the actual traffic volumes. The provisional performance plan provides for 15,653,000 service units in 2021 for en-route services and 1,496,600 service units in 2021 for terminal services. The service units specified in the performance plan were drawn up before the COVID-19 pandemic. In 2021, taking into account the current environment, DFS expects about 7,000,000 service units for en-route services and about 675,000 service units for terminal services. The performance plans will be revised in 2021 in accordance with EU requirements and will be redrafted within the framework of the third reference period for the years 2022 to 2024.

7.2 Future development

7.2.1 Regulated business

Third reference period (2020 – 2024)

The third reference period (RP3) began on 1 January 2020 on the basis of the Regulation on a common charging scheme (Regulation (EU) 2019/317) and the EU targets under Commission Implementing Regulation (EU) 2019/903. The European Commission's approval process for the performance plans had not been completed at the time of the COVID-19 pandemic outbreak in mid-March. The Member States have advocated for a suspension of the European process and, instead, a national regulation taking into account the respective national conditions for the expected crisis years 2020 and 2021, as well as a European revision of the remaining RP3 years 2022-2024. The result of months of negotiations is a supplementary regulation, Commission Implementing Regulation (EU) 2020/1627, which will mean a revision of all five years of RP3 and thus new EU targets and the development of new performance plans. These must be submitted to the European Commission by 1 October 2021. Approval of the revised performance plans by the European Commission is not expected before 2022.

Major criteria of this supplementary regulation are:

- The unit rates for 2020 and 2021 will remain unchanged as currently provided for in the performance plans.
- The years 2020 and 2021 will be considered as one year.
- A retrospective European cost-reduction target is set for both years. On this basis, the national supervisory authorities (NSAs) will set national targets. The actual costs of the air navigation service providers are to be taken into account. Together with the reduced traffic, new 'virtual' unit rates will result.
- The rules for calculating traffic risk sharing remain unchanged.
- The carry-overs from the traffic risk sharing and the deviations between actual costs and cost-reduction targets for the years 2020 and 2021 are to be spread over five to seven years starting in 2023 (five years as the European target; NSAs can further extend this period up to seven years nationally).

The FABEC Member States have again opted to establish the performance plan at FABEC level.

European Aviation Safety Agency (EASA)

The revision of the EASA Basic Regulation was published in the Official Journal of the EU as Regulation (EU) 2018/1139 on 22 August 2018 and entered into force on 11 September 2018. This Regulation significantly expanded the competence of EASA as the agency for aviation safety, for example in the areas of environment, research and drones. In the coming years, EASA will step up the development of requirements for the handling of unmanned aircraft as well as the technical interoperability and standardisation of air traffic control technology and submit them to the European Commission for determination within the framework of implementing regulations.

Further development of the SES framework regulations

On 22 September 2020, the European Commission published its proposal for a further development of the SES Framework Regulation. This is now being discussed in the European Parliament and Council. Due to the extensive and far-reaching amendments, a common understanding is expected at the earliest during the Portuguese Presidency of the Council of

the European Union, which runs from January until the end of June. In terms of content, the proposal focuses on shifts of competences between European institutions and Member States and not on the issues that, according to the European Commission's objectives, can actually drive digitalisation and emission reduction in the coming years.

iCAS programme

To minimise the risks associated with its introduction, and in response to the effects of the COVID-19 pandemic on the development progress, the previously pursued plan for the development and introduction of iCAS at the control centres for lower airspace, iCAS Phase II, was lengthened. The time windows for the introduction of the iCAS Phase II software at the control centres for lower airspace were shifted by half a year to mid-2022 for the Munich branch, by one year to the beginning of 2024 for the Bremen branch and by two years to the end of 2025 / beginning of 2026 for the Langen branch.

The project to replace the iCAS Phase I software, introduced in 2017 at the Karlsruhe branch, was also postponed. The earliest possible window for the introduction of the iCAS Phase II software at the Karlsruhe branch is now scheduled for the end of 2026 / beginning of 2027, i.e. one year after completing the introduction of the iCAS Phase II software at the Langen branch. DFS is looking into alternatives for the Karlsruhe branch, such as a possible cooperation with the Maastricht Upper Area Control Centre (MUAC).

The deadline for the introduction of Flight Object Interoperability (FO IOP) was taken out of Commission Implementing Regulation (EU) No 716/2014. The iCAS Flight Object IOP project will be suspended until the end of 2022. Until then, DFS will examine options to continue the development of Flight Object IOP within the framework of the existing iTEC cooperation.

Remote tower control (RTC)

From the third quarter of 2021 at the earliest, Erfurt Airport is planned to be the next airport to be controlled remotely. After another validation phase during which the RTC concept will be reviewed again, Dresden Airport is scheduled to follow at the end of 2022.

In addition, it is intended to provide more airports with remote tower services in a future project.

As part of SESAR 2020 at the European level, research is currently being carried out on air traffic controllers handling several smaller airports at the same time and not just one. DFS is involved in these research projects to safeguard verified and validated results at an early stage that can be incorporated in its own projects if the results are positive.

SESAR Deployment Manager

DFS aims to exert material influence on the SES initiative of the European Commission as part of its strategic orientation. To this end, DFS has been an active member of the SESAR Joint Undertaking (SJU) since June 2009, along with other leading organisations. Together with its partners, DFS is developing technologies and procedures that are fit for purpose (see section 1.6) and thus meets the European requirements for the modernisation of the air traffic management network.

Since 2014, the SESAR development process has led to the long-term phase of technical and operational implementation and the setting up of ATM procedures (deployment management). As part of the SESAR Deployment Alliance, DFS has been fulfilling the task awarded by the Commission to plan, coordinate and implement a comprehensive modernisation of European airspace within the scope of deployment management for the time period since 2014. This consortium is a cross-industry partnership of five airlines, twelve air navigation service providers and 25 airport operators. The task is financed out of the Connecting Europe Facility (CEF) funding programme, where a total of roughly €2.5 billion is earmarked until the end of

2023 for deployment management. DFS is thus able to influence the introduction of new technologies and procedures and benefits from the considerable funding, as well as from the avoidance of incorrect cost allocation and flawed capital expenditures.

The mandate of the SESAR Deployment Alliance as SESAR Deployment Manager (SDM) expires at the end of 2021. In the first half of the year, the European Commission will put the SDM function out to tender again. DFS is currently examining whether and to what extent it will participate in a new consortium consisting of the current members of the SDA and the Network Manager. In principle, DFS continues to support the benefits of the SDM function.

Withdrawal of the United Kingdom from the EU

On 31 January 2020, the United Kingdom left the European Union (EU). Air traffic is not expected to be interrupted. The airlines affected have also taken countermeasures, such as founding EU subsidiaries, transferring aircraft, changing the ownership structure and taking similar initiatives.

Reorganisation of the DFS core business

DFS is reorganising its core business – with a new structure, flatter hierarchies, high-impact teams and short decision-making channels.

The operational Control Centre and Tower units are to be merged organisationally at the Bremen, Langen and Munich locations in order to exploit the synergies resulting from close proximity. The other Tower locations are being combined into Operations Tower, thus five operations units report directly to the COO. For the services which are required across all areas of the F directorate, DFS plans to provide them in future from two central units which are closely interlinked with operations: Operational Support and Operational Performance and Development. The iCAS programme as well as the iTEC activities are to be organised in an "Issue Management". The F2020+ reorganisation started this task in mid-2020. The new structures were developed in various working groups with the involvement of all stakeholders. After successful introduction of the organisational structure on 1 January 2021, the second phase of process optimisation started.

7.2.2 Commercial business

The management of the Group is pursuing a long-term strategy to expand the commercial business in the strategic business areas of

- Aeronautical data, engineering & systems
- Air traffic services & apron
- Consultancy
- Aviation training services
- UTM services & systems, including UAS training services

when opportunities arise on the market. The commercial business offers growth potential for the DFS Group and is therefore an essential part of the Sprint2024 programme.

In the coming year, the focus will be on bringing the commercial business back to the pre-pandemic level.

In 2021, DFS plans to generate the largest revenue in the commercial business with the training of military controllers in Kaufbeuren and with apron control at Berlin Brandenburg Airport (BER). The commercial business also includes programming services and contracts for the display of the ground situation at individual airports.

In addition to further activities in the Gulf region, the management of the Group plans to transform TATS in Spain into a service provider for software development in the ATM sector, under the name DAS Spain in 2021. The project business of DFS Aviation Services (DAS) is mainly in the aeronautical data, engineering & systems and the consulting business areas. A key focus is the contract to supply the Phoenix system for a total of 15 towers and three control centres in Kazakhstan from 2020 to 2023. As the leading digital platform for unmanned aviation, Droniq is positioning itself as the one-stop shop for unmanned flight and offers its customers the safe integration of unmanned aircraft systems (UAS) into airspace with the Droniq product and service portfolio. Droniq will generate planned losses for its expansion and growth strategy and the development of its products.

Therefore, the DFS Executive Board forecasts negative earnings in the high single-digit million euro range in the commercial business of the DFS Group in 2021.

The support of commercial business by DFS provides relief for the regulated business (earnings from air navigation charges of €21.7 million) and thus for airspace users.

7.3 Results and financial position

In connection with the COVID-19 pandemic, the European Commission reacted and decided to adapt the currently valid regulation in light of the circumstances and to define new European targets for the third reference period (RP3) on the basis of a supplementary regulation to the performance and charging regulation (exceptional measures for the third reference period (2020-2024) of the single European sky performance and charging scheme due to the COVID-19 pandemic) and to have new performance plans drawn up.

This Commission Implementing Regulation (EU) 2020/1627 was published on 3 November 2020. Among other things, the regulation provides for amended rules for the calculation of the carry-over from traffic risk sharing, the preparation of a new performance plan for the third reference period (2020-2024) with cost-reduction targets as well as new unit rates for 2022 to 2024. The concrete targets will not be set until 2021 and, as a result, a reliable revenue and profit forecast from 2022 onwards is not possible at this point in time.

7.3.1 Revenues and costs

Due to the crisis caused by the COVID-19 pandemic in the aviation industry, revenues from air navigation charges in the regulated business are expected to remain very low in 2021. It is currently anticipated that a return of air traffic to pre-crisis levels will not be possible until 2024/2025 at the earliest.

Therefore, DFS will continue to face major financial challenges in the years to come. The Executive Board is addressing these challenges with measures within the scope of the STEP and Sprint2024 programmes. The Sprint2024 programme focuses, among other things, on boosting productivity and responding to dynamic demand with increased staff flexibility and a targeted, heavily restricted pipeline of new staff. Airspace structures and procedures are being optimised and capital expenditure on recoverable, high-performance and harmonised ATM systems is being stepped up. In this manner, project and general costs are to be reduced. The STEP strategic efficiency improvement programme aims at saving personnel costs in combination with process and structural optimisations.

Expenses in both the regulated business and the commercial business are primarily influenced by staff costs, including the cost of occupational pensions. Staff costs will continue to rise considerably due to the rise in the recruitment of air traffic control staff and the increase in costs for occupational pensions because of the continued decline in the discount rate, if appropriate countermeasures do not take effect within the framework of the STEP strategic efficiency improvement programme.

The conclusion of the new collective agreement on remuneration (see section 4) allows DFS to reliably plan costs up to and including 2024.

7.3.2 Capital expenditure (CAPEX)

Despite the impact of the COVID-19 pandemic in terms of revenue, DFS will continue to invest primarily in capacity-expanding and productivity-enhancing air traffic control systems. These capital expenditures, as well as those on replacement investments, will be financed from cash flow or loans and amortised by matched depreciation/amortisation charges.

Overall, the level of depreciation and amortisation in 2021 is scheduled to come in at the level of 2020.

7.3.3 Liquidity

The financial strategy of DFS is primarily influenced by two counteracting effects from events on the capital markets. Low interest rates on the capital markets are favouring the take-up of debt and ensuring low interest expenses. At the same time, the returns that can be earned on the market make it difficult to earn substantial low-risk income. In this environment, DFS is currently paying penalty interest rates of 50-80 basis points on its demand deposits.

DFS assumes that air traffic volumes will increase moderately. This will continue to result in a tight liquidity situation, which is being countered by cost-cutting measures already introduced and by increasing the share capital (the corresponding shareholder's resolution was passed on 22 January 2021). Any liquidity constraints can be offset by withdrawals from the fund assets that have not been assigned.

7.3.4 General statement and earnings forecast

The year 2021 will continue to be marked by the effects of the spread of coronavirus. The crisis is of historic proportions. Years will probably pass before the business of most companies returns to pre-crisis levels. Across Europe, the aviation industry continues to be particularly hard hit. The number of flights in Europe has almost halved compared with 2019. Air transport is not expected to recover to 2019 traffic levels before 2024 at the earliest. Airlines, airports and air navigation service providers are struggling with existential revenue losses and liquidity problems.

DFS formed a coronavirus team in February 2020. The primary objective is to protect DFS employees against infection with coronavirus and to maintain the provision of services in operational and technical domains. The measures taken to date have ensured this.

Based on the latest developments, DFS assumes in its overall view for 2021 that the negative effects due to the spread of coronavirus and the necessary containment measures will be felt throughout the year despite the mass vaccinations that started at the end of 2020. Since many companies have also imposed travel and cost restrictions on their employees, air transport in and over Germany and the project business worldwide are being particularly affected. It cannot currently be predicted when entry restrictions for travellers from Germany will be lifted again. The effects on the demand for air travel and the services provided by DFS Aviation Services (DAS) are therefore considerable. Although massive monetary and fiscal policy measures were introduced in many countries, these will not immediately stabilise air transport for the long term.

The Executive Board assumes that the consequences of the crisis will continue to affect the economic development of the Group in 2021 in all segments and regions. The duration of the adverse effects cannot be estimated at present, as they depend to a large extent on the further course of the crisis. Possible longer-term effects as a result of the spread of coronavirus and the associated volatility of the financial markets cannot be assessed at present and are therefore not included in the outlook.

Based on current estimates, the Executive Board expects a slight increase in traffic volumes compared with 2020, but at a very low level. This will lead to a significant shortfall in the planned revenues from air navigation charges for 2021 again, and thus to a corresponding reduction in liquidity. Revenues from the commercial business are also expected to decrease.

Staff costs, the largest component of total costs, will increase, among other things due to the collective bargaining agreement, the continued low interest rate environment and the pipeline of new air traffic controllers (trainees).

DFS intends to counteract the decline in revenues with the STEP strategic efficiency improvement programme described above.

In 2020, the third reference period began, for which no final targets are currently available. The reason for this is the COVID-19 pandemic, which has not only led to a massive drop in traffic in Europe, but also involved considerable financial losses for all partners involved. The European Commission reacted to this and, on the basis of a supplementary regulation to the performance and charging regulation (Commission Implementing Regulation (EU) 2020/1627), decided to amend the currently valid regulation in light of the circumstances, to define new European targets for the third reference period and to have new performance plans drawn up. It must be taken into account that the provisions are limited exclusively to the en-route cost unit.

As the final provisions of the supplementary regulation are not expected until 2021, a quantitative forecast is associated with considerable uncertainties. If the regulatory situation remains unchanged, DFS expects negative earnings in the high two-digit million euro range for 2021. Earnings will mainly be influenced by the ongoing decline in discount rates, which continue to increase pension expenses. If the new regulation, which has not yet been finalised, is applied, an additional loss in the two-digit million euro range is expected.

Irrespective of the targets which have yet to be adopted, DFS will continue to rely on the Shareholder to strengthen its equity capital in order to close the liquidity gap which is becoming apparent as a result of the decline in traffic volumes. To this end, the Executive Board is in close contact with the Shareholder, who has already decided on an equity injection of €300 million for the year 2021. Further support from the German Federal Government is being regularly reviewed in light of the economic situation and traffic growth, and may become necessary in the coming years depending on the development of regulatory requirements.

Langen, 26 February 2021

The Executive Board

Dr Kerstin Böcker
Chief Human Resources Officer

Dirk Mahns
Chief Operating Officer

Friedrich-Wilhelm Menge
Chief Technology Officer

DFS Deutsche Flugsicherung GmbH

Consolidated statement of comprehensive income for the period 1 January 2020 to 31 December 2020

	Note	2020 €'000	2019 €'000
Continuing operations			
Revenues	5	1,111,266	1,109,717
Changes in inventory and other own work capitalised	6	23,274	18,588
Other operating revenues	7	39,451	52,752
Total operating revenues and income		1,173,991	1,181,057
Material expenses	8	-12,669	-10,933
Employee expenses	9	-973,053	-935,227
Other operating expenses	12	-147,754	-156,881
Earnings before interest, taxes, depreciation and amortisation (EBITDA)		40,515	78,016
Depreciation and amortisation	10	-102,028	-104,137
Impairment losses on financial assets and contract assets	11	-966	-4,811
Earnings before interest and taxes (EBIT)		-62,479	-30,932
Financial income	13	154,813	215,471
Financial expenses	13	-188,629	-150,109
Financial result	13	-33,816	65,362
Earnings before taxes (EBT)		-96,295	34,430
Income taxes	14	2,310	357
Earnings for the period (continuing operations)		-93,985	34,787
Allocation of the earnings of the period			
Shareholder of the parent company		-92,666	35,635
Earnings attributable to minority interests		-1,319	-848

	Note	2020 €'000	2019 €'000
Earnings for the period (continuing operations)		-93,985	34,787
Other comprehensive income			
Items not reclassified in profit or loss			
Remeasurement of the net defined benefit liability from the defined benefit obligation = actuarial gains (+) and losses (-) of the ongoing business year	27	-748,802	-793,522
Tax effects		0	0
Items that can be reclassified in profit or loss			
Currency differences from the conversion of foreign operations or investments	27	-225	95
Tax effects		0	0
Other comprehensive income for the period		-749,027	-793,427
Total results for the period		-843,012	-758,640
Allocation of the total result			
Shareholder of the parent company		-841,693	-757,792
Income and expenses attributable to minority interests		-1,319	-848

DFS Deutsche Flugsicherung GmbH

Consolidated balance sheet as at 31 December 2020

	Note	2020 €'000	2019 €'000
Assets			
Goodwill	15	80	80
Intangible assets	16	215,922	206,299
Property, plant and equipment	17	469,088	499,314
Investment property	19	632	662
Financial assets accounted for using the equity method	20	12,883	14,438
Financial assets	20	9,105	9,998
Trade receivables	21	34	51
Other receivables and assets	23	596,815	76,570
Deferred tax assets	14	18,138	15,814
Non-current assets		1,322,697	823,226
Trade receivables	21	115,698	152,194
Contract assets	22	5,094	2,431
Other receivables and assets	23	34,441	32,721
Inventories	24	6,303	6,196
Financial assets	25	790,177	758,948
Liquid funds	26	252,011	366,598
Tax assets	33	64,006	79,827
Current assets		1,267,730	1,398,915
Total		2,590,427	2,222,141

	Note	2020 €'000	2019 €'000
Equity and liabilities			
Subscribed capital	27	755,288	755,288
Capital reserve	27	74,296	74,296
Remeasurement reserves	27	-3,094,991	-2,345,964
Retained earnings	27	415	93,081
Share of equity attributable to Shareholder of parent company	27	-2,264,992	-1,423,299
Minority interest	27	2,733	4,052
Equity	27	-2,262,259	-1,419,247
Provisions for pensions and similar obligations	28	3,549,954	2,751,756
Other provisions	29	231,960	217,182
Financial liabilities	30	648,457	152,776
Trade payables	31	310	332
Other liabilities	32	14,810	25,689
Income tax obligations	33	19,023	30,869
Non-current liabilities		4,464,514	3,178,604
Other provisions	29	235,772	234,714
Financial liabilities	30	4,899	98,537
Trade payables	31	26,762	25,701
Contract liabilities	22	3,147	2,321
Other liabilities	32	116,875	101,411
Income tax obligations	33	717	100
Current liabilities		388,172	462,784
Total		2,590,427	2,222,141

DFS Deutsche Flugsicherung GmbH

Consolidated statement of changes in equity for the period 1 January 2020 to 31 December 2020

Note 27	Subscribed capital	Capital reserves	Revaluation reserves	Retained earnings	Equity attributable to Shareholder of parent company	Minority interest	Total
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
As at 31 Dec 2018	755,288	74,296	-1,552,537	57,446	-665,507	0	-665,507
Capital increase	0	0	0	0	0	4,900	4,900
Operating result							
Net income (+) / loss (-)	0	0	0	35,635	35,635	-848	34,787
Other comprehensive income							
Remeasurement of the net defined benefit liability	0	0	-793,522	0	-793,522	0	-793,522
Currency differences from the conversion of foreign operations or investments	0	0	95	0	95	0	95
Tax effects	0	0	0	0	0	0	0
As at 31 Dec 2019	755,288	74,296	-2,345,964	93,081	-1,423,299	4,052	-1,419,247
Operating result							
Net loss (-)	0	0	0	-92,666	-92,666	-1,319	-93,985
Other comprehensive income							
Remeasurement of the net defined benefit liability	0	0	-748,802	0	-748,802	0	-748,802
Currency differences from the conversion of foreign operations or investments	0	0	-225	0	-225	0	-225
Tax effects	0	0	0	0	0	0	0
As at 31 Dec 2020	755,288	74,296	-3,094,991	415	-2,264,992	2,733	-2,262,259

DFS Deutsche Flugsicherung GmbH

Consolidated cash flow statement

for the period 1 January 2020 to 31 December 2020

	2020	2019
	€'000	€'000
Net loss (-) / income (+)	-92,666	35,635
of which dividend received	602	551
of which current income taxes	0	0
of which actual income taxes received (+) / paid (-)	26,755	-54,913
Interest	-3,011	-8,539
Depreciation and amortisation on intangible assets and property, plant and equipment	102,028	104,137
Gains (-) from asset disposals	-87	-756
Losses (+) from asset disposals	1,736	1,094
Other non-cash losses (-) from fair value changes	-748,802	-793,504
Other non-cash losses (-) / gains (+) from currency translations	-225	96
Decrease (+) in trade receivables	36,513	5,496
Increase (-) / decrease (+) in contract assets	-2,663	4,715
Increase (-) in other receivables and assets	-531,347	-17,497
Increase (-) in inventories	-107	-929
Decrease (+) / increase (-) in current tax assets	15,820	-53,692
Increase (-) in deferred tax assets	-2,325	-2,175
Increase (+) in provisions for pensions and similar obligations	798,198	735,156
Increase (+) in other provisions	15,837	60,037
Increase (+) / decrease (-) in trade payables	1,040	-4,775
Increase (+) in contract liabilities	825	913
Increase (+) in other liabilities	4,585	12,021
Decrease (-) of the QTE transaction	-188	-194
Decrease (-) in income tax liabilities	-11,229	0
Cash outflow/inflow from operating activities	-416,068	77,239
Payments (-) for investments in intangible assets and property, plant and equipment	-82,238	-120,373
Payments (-) for investments in financial assets	-24	-79
Proceeds (+) from disposal of intangible assets and property, plant and equipment	782	1,836
Proceeds (+) from disposals of financial assets	894	587
Other non-cash changes from currency translation	-9	0
Cash outflow from investing activities	-80,595	-118,029
Equity transaction by minority interests	-1,319	4,052
Taking on (+) financial debt	500,104	0
Principal payment (-) of financial debt	-87,500	-1,563
Taking on (+) lease liabilities	1,816	25,530
Principal repayment (-) of lease liabilities	-2,829	-2,645
Disposal (-) and currency translation (-) from lease liabilities	-140	0
Interest expenses (+) for lease liabilities	162	168
Interest received (+)	8,874	14,464
Interest paid (-)	-5,863	-5,925
Cash inflow from financing activities	413,305	34,081
Net change in cash and cash equivalents	-83,358	-6,709
Cash and cash equivalents as at 1 Jan	1,125,546	1,132,255
Cash and cash equivalents as at 31 Dec	1,042,188	1,125,546

Notes to the consolidated financial statements 2020

1 General basis

The DFS Group is an air navigation service provider (ANSP) that operates internationally. The ultimate parent company is DFS Deutsche Flugsicherung GmbH (DFS), which has its Headquarters in 63225 Langen, Am DFS-Campus 10, Germany. The company is registered on the Commercial Register (HRB 34977) at the Local Court in Offenbach am Main, Germany, as a limited liability company (GmbH). DFS is wholly owned by the Federal Republic of Germany, represented by the Federal Ministry of Transport and Digital Infrastructure (BMVI).

The main business of the DFS Group is defined by the tasks set out in Section 27c of the German Aviation Act (LuftVG). Under this act, it is entrusted with providing air traffic services (a sovereign task). The Group management report contains information on the business activities and the object of the Group (see sections 1.2 and 1.3 in the Group management report).

2 Application of accounting standards

The regulations:

Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards

Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the Single European Sky (the service provision Regulation)

Regulation (EC) No 1794/2006 of the Commission of 6 December 2006 laying down a common charging scheme for air navigation services

Regulation (EU) No 1191/2010 of 16 December 2010 amending Regulation (EC) No 1794/2006 of the Commission on the development of a common charging scheme for air navigation services

Commission Implementing Regulation (EU) 2019/317 of 11 February 2019 laying down a performance and charging scheme in the single European sky and repealing Commission Implementing Regulations (EU) No 390/2013 and (EU) No 391/2013

Commission Implementing Regulation (EU) 2020/1627 of 3 November 2020 on exceptional measures for the third reference period (2020-2024) of the Single European Sky performance and charging scheme due to the COVID-19 pandemic

oblige the DFS Group to draw up its consolidated financial statements as at 31 December 2020 in line with International Financial Reporting Standards (IFRS). It applies the standards of the International Accounting Standards Board (IASB) and the interpretations of the International Financial Reporting Interpretations Committee (IFRIC) as recognised and endorsed by the European Union (EU).

These financial statements consider Regulation (EC) No 1606/2002, which is enacted in Section 315e of the German Commercial Code (HGB) by means of the Accounting Law Reform Act (BilReG) dated 4 December 2004.

These consolidated financial statements were prepared in accordance with the standards endorsed for use in the EU.

The business year of the Group corresponds to the calendar year (1 January to 31 December).

The Executive Board of DFS drew up the consolidated financial statements and approved them for submission to the Audit Committee of the Supervisory Board and the Supervisory Board on 26 February 2021. The Supervisory Board discussed the consolidated financial statements and the opinion of the Audit Committee and issued a recommendation to the Shareholder to approve the consolidated financial statements. The Shareholder may amend the consolidated financial statements released by the Executive Board. The approved consolidated financial statements will be available via the electronic German Federal Gazette in accordance with Section 325(2a)(1) of the German Commercial Code (HGB) and on our website at www.dfs.de.

3 Consolidation

3.1 Consolidation principles

On initial consolidation of Group companies, the DFS Group measures the acquired identifiable assets, liabilities, contingent liabilities and deferred taxes at fair value at the acquisition date for business combinations (acquisition method) and compares these to the acquisition costs (purchase price allocation). The non-acquired share of the fair values of assets and liabilities is accounted for as minority interest by the Group. Acquisition-related costs are expensed in the periods in which the costs are incurred.

After the purchase price allocation, the Group recognises the remaining difference between the purchase price and the newly measured proportionate net assets as goodwill. If the value of the net assets acquired exceeds the purchase price, the difference is recognised directly in profit or loss. The DFS Group recognises the differences from acquired minority interests directly in equity after the transfer of control. The acquisition costs of foreign entities acquired are translated into euro at the respective exchange rate at the date of acquisition.

The DFS Group eliminates the revenues, income and expenses as well as the receivables and liabilities stemming from transactions between the consolidated entities against each other. In addition, it eliminates the interim results from intercompany deliveries of non-current assets and inventories.

3.2 Scope of consolidation

DFS, as the ultimate parent company, presents the consolidated financial statements including all those investments where it holds a controlling interest, joint arrangements, associated companies and those investments where it holds a non-controlling interest.

The Group includes investments where it holds a controlling interest if it has existing rights that give it the current ability to direct the relevant activities of an investee. Relevant activities are activities that significantly affect the investee's returns. Within the meaning of IFRS 10, the DFS Group controls a subsidiary when it has exposure, or rights, to variable returns from its involvement with the investee and has the ability to use its power over the investee to affect the amount of these returns due to the ability to direct the relevant activities. In the absence of any other restrictive contractual arrangements, control is generally based on the direct or indirect majority of voting rights of the Group. For structured entities, control is based on contractual arrangements and not on the majority of voting rights. Subsidiaries have to be consolidated from the time that control passes to the Group. They are deconsolidated when control is no longer exercised. Non-controlling interests in earnings and equity of investments

with a controlling interest are disclosed separately in the consolidated statement of comprehensive income, the consolidated balance sheet and the consolidated statement of changes in equity.

IFRS 11 differentiates as regards stakes in joint arrangements between joint ventures and joint operations. The classification depends on the contractual rights and obligations of each investor. Joint arrangements exist when the DFS Group jointly controls activities with a third-party based on a contract. For joint operations, the Group recognises its direct rights to assets, liabilities, revenues and expenses as well as its share of any assets, liabilities, revenues and expenses held or incurred jointly. Stakes in joint operations are accounted for using the equity method (see Note 4.6.4).

The DFS Group measures associated companies over which it exercises significant influence, but has no control or joint control, using the equity method. Significant influence is indicated when the DFS Group directly or indirectly holds between 20.00 percent and 50.00 percent of the voting rights in an investee. The assumption of influence can be reversed through a clear demonstration to the contrary. The annual measurement is carried out by raising or lowering the carrying amount of the investment to reflect the investor's share of the net assets.

Taken together, the investments where there is a non-controlling interest exert only an immaterial influence on total assets, revenues and net income from a Group perspective and are not material for the representation of the results and financial position of the DFS Group. A materiality threshold of 5.00 percent was set out for this. The Group does not include them in the consolidated financial statements. These entities are recognised at their fair value or, if this cannot be reliably determined for equity instruments that are not listed, at amortised cost. They are disclosed as investments under non-current financial assets.

Although the DFS Group holds more than half of the shares (55.00%), individual provisions of the articles of association as well as the rules of internal procedure for the board prevent the Group from exercising control. It therefore assigns FCS Flight Calibration Services to associated companies and measures the companies using the equity method.

Companies included in the consolidated financial statements of the DFS Group

List of shareholdings under Section 313(2)(4) German Commercial Code (HGB)

Acronym	Company	Registered office	Percentage of shareholding	Equity	Net income
			in %	€'000	€'000
DFS	DFS Deutsche Flugsicherung GmbH	Langen, Germany	Ultimate parent company		
Consolidated companies (controlling interest)					
DFS IBS	DFS International Business Services GmbH	Langen, Germany	100.00	48,869	-4,625
DFS Energy	DFS Energy GmbH	Langen, Germany	100.00	5,132	0 ¹⁾
DAS	DFS Aviation Services GmbH	Langen, Germany	100.00	11,794	0 ²⁾
Eisenschmidt	R. Eisenschmidt GmbH	Egelsbach, Germany	100.00	168	0 ²⁾
KAT	Kaufbeuren ATM Training GmbH	Kaufbeuren, Germany	100.00	100	0 ²⁾
ANSL	Air Navigation Solutions Ltd.	London, United Kingdom	100.00	£383 thousand ³⁾	£95 thousand ³⁾
DAS Bahrain	DFS AVIATION SERVICES BAHRAIN Co. W.L.L.	Manama, Bahrain	100.00	720 thousand (Bahraini dinars)	613 thousand (Bahraini dinars)
Droniq	Droniq GmbH	Frankfurt, Germany	51.00	5,578	-2,692
Associated companies – measurement using equity method					
FCS	FCS Flight Calibration Services GmbH	Braunschweig, Germany	55.00	4,665 ³⁾	362 ³⁾
AEROSENSE	FREQUENTIS DFS AEROSENSE GmbH	Vienna, Austria	30.00	272	-22
Unify	Unify NV	Antwerp, Belgium	22.80	12,598 ³⁾	-3,936 ³⁾
Investments (non-controlling) – measurement using cost method					
Investment through DFS Deutsche Flugsicherung GmbH:					
GroupEAD	GroupEAD Europe S.L.	Madrid, Spain	36.00	2,068 ³⁾	516 ³⁾
BILSODA	BILSODA GmbH & Co. KG	Pullach, Germany	24.90	2,440 ³⁾	-67 ³⁾
Investment through DFS International Business Services GmbH:					
ESSP SAS	European Satellite Services Provider Société par Actions Simplifiée	Toulouse, France	16.67	15,220 ³⁾	4,995 ³⁾
Investment through DFS Aviation Services GmbH:					
TATS	Tower Air Traffic Services S.L.	Madrid, Spain	50.00	1,003 ³⁾	--

¹⁾ There is a profit-and-loss transfer agreement with DFS

²⁾ There is a profit-and-loss transfer agreement with DFS International Business Services

³⁾ Values as at 31 December 2019

Changes in scope of consolidation					
	As at 31 Dec 2019	Consolidation/ reconciliation	Additions	Disposals	As at 31 Dec 2020
Consolidated companies (controlling interest)	9	0	0	0	9
of which domestic	7	0	0	0	7
of which foreign	2	0	0	0	2
Associated companies – measurement using equity method	3	0	0	0	3
of which domestic	1	0	0	0	1
of which foreign	2	0	0	0	2
Investments (non-controlling) – measurement using cost method	4	0	0	0	4
of which domestic	1	0	0	0	1
of which foreign	3	0	0	0	3

3.3 Other investments

Disclosures on minority shareholders			
Droniq GmbH	Total	DFS Group	Telekom Innovation Pool GmbH
	€'000	€'000	€'000
Share capital	2,000	1,020	980
Shareholding in %	100.00	51.00	49.00
Business year	1 Jan - 31 Dec		
Accounting standards	HGB		
Income from investments (previous year)	0 (-)	0 (-)	0 (-)
Current assets	5,766	2,941	2,825
Non-current assets	283	144	139
Current liabilities	471	240	231
Non-current liabilities	0	0	0
Equity	5,578	2,845	2,733
Net income	-2,692	-1,373	-1,319
Revenues	525	268	257

Disclosures on associated companies				
	FCS	AEROSENSE	Unify	
	€'000	€'000	€'000	
Total registered capital	205 ⁴⁾	35	22,918 ⁴⁾	
Shareholding in %	55.00	30.00	22.80	
Additional shareholders	SKYNAV S.A., Belgium, 25.00% AUSTRO CONTROL, Austria, 20.00%	FREQUENTIS AG, Austria, 70.00%	Five individual persons: VITO, Terra Drone, PMV, QBIC Arkiv, QBIC Feeder	
Business year	1 Jan - 31 Dec	1 Jan - 31 Dec	1 Jan - 31 Dec	
Accounting standards	HGB	Austrian Commercial Code	Belgian Commercial Code	
Income from investments (previous year)	0 (0)	0 (0)	0 (0)	
Current assets	2,735 ⁴⁾	1,145	11,841 ⁴⁾	
Non-current assets	14,688 ⁴⁾	16	1,431 ⁴⁾	
Current liabilities	4,270 ⁴⁾	889	674 ⁴⁾	
Non-current liabilities	8,488 ⁴⁾	0	0 ⁴⁾	
Equity	4,665 ⁴⁾	272	12,598 ⁴⁾	
Net income	362 ⁴⁾	-22	-3,936 ⁴⁾	
Revenues	9,789 ⁴⁾	1,532	575 ⁴⁾	
Disclosures on investments (non-controlling)				
	GroupEAD	BILSODA	ESSP SAS	TATS
	€'000	€'000	€'000	€'000
Total registered capital	1,000 ⁴⁾	10 ⁴⁾	1,000 ⁴⁾	1,000 ⁴⁾
Shareholding in %	36.00	24.90	16.67	50.00
Additional shareholders	Entidad Pública Empresarial Aeropuertos Españoles y Navegación Aérea, Spain, 36.00%; FREQUENTIS AG, Austria, 28.00%	AD Grundstücksge- sellschaft mbH & Co. KG, Germany, 75.10%; BILSODA Beteiligungs GmbH, general partner, Germany, 0.00%	ANSPs from Spain, Italy, United Kingdom and France each hold 16.67%; Portugal and Switzerland, 8.33% each	INDRA Sistemas S.A., Spain, 50.00%
Business year	1 Jan - 31 Dec	1 Jan - 31 Dec	1 Jan - 31 Dec	1 Jan - 31 Dec
Accounting standards	Spanish Commercial Code	HGB	French Commercial Code	Spanish Commercial Code
Income from investments (previous year)	114 (134)	0 (0)	417 (417)	0 (0)
Current assets	3,043 ⁴⁾	403 ⁴⁾	33,607 ⁴⁾	1,003 ⁴⁾
Non-current assets	285 ⁴⁾	6,309 ⁴⁾	2,380 ⁴⁾	--
Current liabilities	1,260 ⁴⁾	604 ⁴⁾	19,234 ⁴⁾	--
Non-current liabilities	0 ⁴⁾	3,668 ⁴⁾	1,533 ⁴⁾	--
Equity	2,068 ⁴⁾	2,440 ⁴⁾	15,220 ⁴⁾	1,003 ⁴⁾
Net income	516 ⁴⁾	-67 ⁴⁾	4,995 ⁴⁾	--
Revenues	7,546 ⁴⁾	596 ⁴⁾	58,684 ⁴⁾	--
⁴⁾ Values as at 31 December 2019				

4 Accounting policies

The DFS Group carries out accounting and measurement using uniform standards. The consolidated financial statements were drawn up using historical costs unless IFRS prescribed an alternative measurement method. The associated disclosure is made with the respective accounting policy.

4.1 Going concern basis of accounting

On the basis of the current corporate plan and due to the financing measures initiated, the Executive Board maintains its realistic expectation that the DFS Group will have sufficient resources to continue its business activities for at least another twelve months. Accordingly, the consolidated financial statements were prepared on a going concern basis.

The air navigation services provided by the DFS Group count as so-called critical infrastructure. The Group is therefore obliged to maintain certain fundamental functions which ensure the safe handling of air traffic (in particular during airborne emergency missions and air cargo deliveries). This rules out the option of a complete closure or suspension of business operations.

The outbreak of the COVID-19 pandemic and the subsequent government restrictions taken to contain the virus in Germany had a negative impact on the results and financial position of the Group. As a result of these developments, the Executive Board decided to take appropriate measures to ensure the best possible protection of staff while at the same time maintaining operational effectiveness and financial liquidity. As a result, the Group made savings in staff and non-staff costs, ordered the reduction of holidays and excess hours and/or the accumulation of reduced (negative) working hours, used the option of short-time work (furloughing) and cut back or postponed planned investments.

The DFS Group reports a loss of €93.99 million for the business year ending 31 December 2020. Liquid assets fell by €114.59 million, amounting to €252.01 million at the end of the year.

The DFS Group does not expect air traffic to recover quickly and does not anticipate a return to pre-crisis levels before 2025. To ensure the necessary liquidity for the Group, the Group issued a *Schuldscheindarlehen* (debenture loan) of €500.00 million in the business year. At an extraordinary shareholder meeting in January 2021, the Shareholder of DFS decided to increase the share capital by €300.00 million in return for the issue of 3.00 million shares. At the beginning of 2021, the Group received an income tax refund of €64.46 million, which also safeguards liquidity. In addition, the carry-over from traffic risk sharing will have a positive effect on liquidity from 2023.

In addition, the Executive Board decided on further measures for 2021 to reduce costs, optimise cash flows and maintain liquidity:

- Investment projects are being carried out restrictively. Non-essential investments are being reduced and expenditures postponed or cancelled.
- An efficiency improvement programme is being set up for the human resources area.
- Natural separations are to be utilised and the hiring of new staff is to be suspended for the time being.

- New technologies, innovation and digitalisation are being promoted within the framework of the newly introduced Sprint2024 programme (such as strengthening and expanding the use of cloud technology, realignment of the system strategy, targeted and cost-conscious investments in new technologies).
- The Executive Board and the air navigation services union GdF agreed on a comprehensive package of collective bargaining agreements. Thus, a new collective agreement relating to remuneration was concluded for the years 2021 to 2024, the expired corona collective agreement was extended with slight modifications, an additional partial retirement model was introduced and the training obligation from the collective agreement on capacity planning (KapaTV) was adjusted to reflect current developments in air transport for the period 2021 to 2023.

Based on these factors and the commitment of the German Federal Government to provide further financial resources as necessary, the Executive Board maintains the realistic expectation that the DFS Group has adequate resources and sufficient room for manoeuvre in terms of the required liquidity.

4.2 New and amended International Financial Reporting Standards and Interpretations

Revisions to accounting policies resulting from new and revised standards and interpretations are applied retrospectively, unless otherwise regulated. The prior-year statement of comprehensive income and the opening balance sheet for the prior-year period are adjusted as if the new accounting policies had always applied.

4.2.1 Mandatory standards and interpretations

The DFS Group used the following revised standards that were mandatory for the first time for the business year 2020. The endorsement by the European Union was made with the publication of the standard in the Official Journal of the European Union.

Standard	Title	EU endorsement	Mandatory application for financial years beginning on or after
Amendments to existing standards			
Conceptual framework	Amendments to references to the conceptual framework in IFRS standards	29 Nov 2019	1 Jan 2020
IAS 1 / IAS 8	Presentation of financial statements / Accounting policies, changes in accounting estimates and errors (definition of 'material')	29 Nov 2019	1 Jan 2020
IFRS 9 / IFRS 7 / IAS 39	Financial instruments / Financial instruments: Disclosures / Financial instruments: Recognition and measurement (interest rate benchmark reform)	15 Jan 2020	1 Jan 2020
IFRS 3	Business combinations	21 Apr 2020	1 Jan 2020
IFRS 16	Leases (COVID-19-related rent concessions)	9 Oct 2020	1 Jan 2020

The standards that are mandatory for the first time from 1 January 2020 had no impact on the results and financial position of the Group. Thus, there was no need for retroactive adjustments.

On 29 November 2019, the EU adopted amendments to the conceptual framework and to the standards IAS 1 and IAS 8 into European law. With the amendments to the conceptual framework, the references to previous conceptual frameworks currently contained in several standards and interpretations have been replaced with references to the revised conceptual framework. The amendments to IAS 1 and IAS 8 created a uniform and clearly defined definition of materiality of financial statement information in the standards.

The amendments to the standards IFRS 7, IFRS 9 and IAS 39 provide for certain relief in hedge accounting in connection with the reform of interest rate benchmarks (IBOR reform). They clarify the impact of the reform on financial reporting in the reporting period before the replacement of an existing interest rate benchmark by an alternative interest rate. In addition, further disclosures are required in the notes.

The amendments to IFRS 3 redefine the term 'business' and thus facilitate the practical application of the standard. A business is an integrated set of activities and assets that is managed for the purpose of providing goods or services to customers, generating investment income or generating other income from ordinary activities. A business is made up of inputs and processes applied to those inputs that have the ability to create the outputs of a business. The new regulations contain an optional test for determining the concentration of the fair value, which enables a simplified assessment of the existence of a business.

The amendments to IFRS 16 allow the lessee temporary relief in accounting for lease payment holidays granted (such as deferral of lease instalments, rent reductions) that are directly related to the COVID-19 pandemic. This allows the lessee to forego a reassessment of whether the lease concession qualifies as a lease modification. However, the relief only applies to reduced lease payments due until 30 June 2021.

4.2.2 Voluntary standards and interpretations

The IASB published the following revised standards. The standards have already been incorporated into European law as part of the endorsement procedure. They become effective from the point in time given and early application is permitted.

The Group is currently examining the impact of the amended standards on the Group's results and financial position. However, it assumes that there will be no significant impact. The DFS Group applies the standards when they become effective and early voluntary application will not be availed of.

Standard	Title	EU endorsement	Mandatory application for financial years beginning on or after
Amendments to existing standards			
IFRS 4	Insurance contracts	15 Dec 2020	1 Jan 2021
IFRS 9 / IAS 39 / IFRS 7 / IFRS 4 / IFRS 16	Financial instruments / Financial instruments: Recognition and measurement / Financial instrument: Disclosures / Insurance contracts / Leases (reform of the reference interest rate – phase 2)	13 Jan 2021	1 Jan 2021

4.2.3 Published, though not yet mandatory, standards and interpretations

The IASB has issued the following standards which are not yet mandatory. Before these can be applied, they have to be recognised and endorsed by the EU. They become effective from the point of time given.

The Group is currently examining the possible impact on the consolidated financial statements. The DFS Group does not avail itself of the right of early application of new or amended standards.

Standard	Title	Anticipated impact	Mandatory application for financial years beginning on or after
New standards and interpretations			
IFRS 14	Regulatory deferral accounts	None	Not endorsed by EU
IFRS 17	Insurance contracts including changes	None	1 Jan 2023 1 Jan 2023
Amendments to existing standards and interpretations			
IAS 1	Presentation of the financial statements (classification of liabilities as current or non-current)	No material impact	1 Jan 2023
IFRS 3	Business combinations	No material impact	1 Jan 2022
IAS 16	Property, plant and equipment	No material impact	1 Jan 2022
IAS 37	Provisions, contingent liabilities and contingent assets	No material impact	1 Jan 2022
Catalogue	Improvements to International Financial Reporting Standards (2018-2020 cycle)	No material impact	1 Jan 2022

4.3 Use of assumptions and discretionary decisions

At the balance sheet date, the DFS Group makes annual forecasts of future developments for accounting and measurement purposes. The comprehensive set of assumptions, estimates as well as judgements and discretionary decisions made may have a considerable influence on the representation of the results and financial position of the DFS Group. They are based on historical experience and expectations about the occurrence of future events which appear commercially reasonable in the given circumstances. The Group continuously verifies its estimates and prognoses. If external conditions develop differently than expected, the actual amounts may vary from the estimates. Any variances from the actual circumstances are recognised in profit or loss when they occur. The discretionary decisions on assumptions concerning the future and other key sources of estimation uncertainty at the balance sheet date which have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next business year are described in the respective accounting policies.

4.4 Use of assumptions and discretionary decisions

In addition to the impairment tests for individual assets, an impairment test was carried out at the level of the cash-generating unit due to the existence of a triggering event for one business unit. The updated business plans formed the basis for this. These assume discernible liquidity bottlenecks and a business environment that is only slowly recovering in the coming years.

The result was an impairment loss of €1.58 million being recognised on the Investment in UNIFLY.

4.5 Items in the statement of comprehensive income

4.5.1 Revenues

The DFS Group recognises revenues if it satisfies its performance obligations through the transfer of the contracted goods and contracted services to the customer. Assets are deemed to have been transferred when the customers have obtained control over the good or service either at a point in time or over time. Revenue is recognised over time if the customer obtains control or receives the benefits as the asset is created or provided, or the asset created does not have an alternative use and there is an enforceable right to payment for performance.

The amount to be recognised is based on the transaction price which can be allocated to the performance obligation. The transaction price can have fixed and/or variable elements and is the consideration to which the DFS Group expects to be entitled in exchange for the transfer of the contracted goods and services to the customer. In the case of multiple performance obligations, the Group allocates the transaction price to the performance obligations in the contract by reference to their relative standalone selling prices. The standalone selling prices are estimated at contract inception on the basis of observable prices of promised products and services supplied under similar circumstances and to similar customers.

The DFS Group determines the level of revenue for revenues recognised over time and fixed-price contracts based on the degree of progress. The Group determines the degree of progress using input methods and uses the cost-to-cost method, by which the costs incurred are compared to the total estimated costs required to satisfy the performance obligation. To determine performance progress, estimates are required of the material influencing factors, such as the overall costs incurred, contract income or contract risks. The expert departments responsible constantly review all the estimates and make any necessary adjustments. The resulting increase or decrease in the estimated revenues and costs are recognised by the Group in the period in which the correction is required.

4.5.2 Impairments

At each balance sheet date, the DFS Group uses the general approach to recognise a risk provision for expected credit losses either on the basis of a 12-month expected credit loss or a lifetime expected credit loss. The general approach has to be applied to financial assets which are either measured at amortised cost or at fair value through other comprehensive income (debt instruments). The expected credit losses are determined from the probability-weighted estimates of the present value of the defaults and are to be discounted at the effective interest rate for financial assets.

Measurement stages of the general approach

Stage 1 12-month expected credit losses

To be used for all financial assets whose credit quality has not significantly deteriorated since initial recognition. 12-month expected credit losses are the expected credit losses that result from default events that are possible within 12 months.

Stages 2/3 Lifetime expected credit losses

These stages are to be used if there has been a significant increase in credit risk for individual financial instruments or for a group of same. Lifetime expected credit losses result from all possible default events over the expected lifetime.

The Group assumes that the credit risk of a financial asset has increased significantly or there is objective evidence of impairment if the debtor has significant financial difficulties, there is a possibility of payments being in default or arrears or the assets of the debtor are subject to insolvency proceedings. If there is such evidence on initial recognition, these assets are allocated to stage 3 from the beginning. The DFS Group views the assets measured at amortised cost or at fair value through other comprehensive income as having a low credit risk as it considers the risk of non-performance to be low and the debtor is always in a position to meet its contractual payment obligations at short notice.

Under the simplified approach, the DFS Group recognises a loss allowance based on lifetime expected credit losses both on initial recognition and at each reporting date. The Group uses this approach for trade receivables, contract assets and lease receivables. The determination is based on the analyses of the age structure and due dates, information on insolvencies or the use of a provision matrix based on historically observed default rates. As further security, the Group demands security deposits from customers with relevant sales volumes when defined warning thresholds are exceeded. The Group recognises the allowances for doubtful accounts in a separate allowance account. Such allowances are reversed through the income statement should the reasons for the impairment no longer apply in subsequent periods. The Group views a receivable as being in default if, in its reasonable opinion, it will no longer be paid and the debtor is unlikely to be able to settle its credit obligations in full.

All other assets (goodwill; intangible assets; property, plant and equipment; and investment property; financial assets) are reviewed on each balance sheet date to see if there are indications for an impairment under IAS 36. This involves comparing the carrying amount with the recoverable amount of the asset.

An impairment loss is recognised for the amount by which the recoverable amount exceeds the carrying amount of the asset. The recoverable amount is the higher of the net realisable value and the value in use. The net realisable value is equal to the fair value less costs to sell. Value in use is the present value of the future cash flows expected to be derived from the continuing use of an asset. The Group calculates the present value with a discount rate before tax that reflects market conditions, calculated using the estimated zero-coupon curves of the German Bundesbank (the Svensson method is used). No risk premium in accordance with IAS 36.55(b) is used, as the assets are not exposed to any special risks. If a recoverable amount cannot be determined for an individual asset, the Group brings together the assets into cash-generating units, the smallest identifiable group of assets.

If, at a later date, the reasons for impairments made in previous years no longer apply, either in full or in part, the impairment loss is reversed accordingly. The reversal is limited to the carrying amount which would have applied if the impairments from the past were excluded and it is recognised in the income statement. A reversal of impaired goodwill is not permitted.

4.5.3 Operating expenses

Operating expenses are recognised in the income statement when the service is used or at the time the expenses are incurred.

4.5.4 Interest income and expenses

Interest income and expenses are recognised on an accrual basis using the effective interest rate method.

4.6 Items in the balance sheet

4.6.1 Goodwill

The DFS Group recognises goodwill from business combinations in accordance with IFRS 3 as an asset at cost at the acquisition date. Cost is the difference between the purchase price for the shares and the proportionate net assets acquired. The net assets are the difference between the fair values of the identifiable assets acquired and the liabilities assumed as well as the contingent liabilities. Acquisition-related costs are expensed.

There is no scheduled amortisation for goodwill. Goodwill is reviewed at every balance sheet date to determine if there are indications of impairment. Impairment testing involves comparing the carrying amount with the recoverable amount of the asset. The tests are conducted at the level of the cash-generating unit. The recoverable amount is determined using recognised discounted cash flow methods. If the recoverable amount is lower than the carrying amount, an impairment loss is recognised down to the recoverable amount in accordance with IAS 36. Once goodwill has been impaired, it is not permitted to reverse the impairment in subsequent periods.

4.6.2 Intangible assets

Assets acquired for valuable consideration are capitalised at cost when it is probable that the asset will generate future economic benefits for the company and the costs can be measured reliably.

Intangible assets that arose from own development activities are capitalised at cost. This presupposes that future economic benefits will be generated from the products. Production costs comprise all direct costs and an appropriate share of development-related overhead. Borrowing costs are capitalised as part of production costs in accordance with the requirements of IAS 23. Impairment tests are carried out on internally generated intangible assets to determine the present value of expected future cash flows if there are objective indications of impairment. The Group evaluates current requirements due to changing market conditions as well as the progress of new intangible assets that are already in the development process.

Prepayments are measured at cost. The prepayments are allocated to the respective intangible assets at the time of commissioning and written off over their useful life.

Intangible assets have a limited useful life. They are written off on a straight-line basis from the beginning of use as follows:

Intangible assets	Useful life
Concessions, industrial and similar property rights and assets as well as licences in such rights and assets	3 to 8 years
Internally generated intangible assets	8 years
Prepayments	Only after commissioning

Research expenses and associated government grants are recognised in profit or loss. Grants from airports, other air navigation service providers or the Paul Ehrlich Institute are deducted from cost. EU grant funding from the Connecting Europe Facility (CEF) programme is recognised as accruals and recorded in profit or loss over the useful lives of the underlying intangible assets.

4.6.3 Property, plant and equipment

Tangible assets acquired for valuable consideration are capitalised at cost when it is probable that the asset will generate future economic benefits for the company and the costs can be measured reliably.

Costs include the purchase price as well as all directly attributable costs required to bring the asset to the site and get it into the working condition as intended by management.

The DFS Group divides property, plant and equipment (in particular buildings) into the material economic components and reports them separately. Costs for the replacement of components and general overhaul are capitalised separately.

Production costs for internally generated property, plant and equipment comprise direct production costs (prime costs), an appropriate share of manufacturing overhead as well as the borrowing costs that are directly attributable up to the time of completion in accordance with IAS 23.

Government grants are deducted from the carrying amount of the grant-funded asset. Grants from airports, other air navigation service providers or the Paul Ehrlich Institute are deducted from cost. EU grants from the CEF programme are recognised as accruals and recorded in profit or loss over the useful lives of the underlying property, plant and equipment.

All assets (except for land) have a limited useful life and are written off on a straight-line basis from the beginning of use. The DFS Group estimates the useful lives of property, plant and equipment based on their probable usability. As an orientation, it uses the official tax depreciation table (*AfA-Tabelle*) for general purpose assets (see letter from the German Federal Ministry of Finance (BMF) dated 15 December 2000 in the Federal Tax Gazette (*Bundessteuerblatt*) I 2000, p. 1,532). Adjustments are made, as necessary, based on historical experience.

Property, plant and equipment	Useful life
Building – Structure	40 years
Building – Façade	25 to 30 years
Building – Interior finishing	25 years
Building – Heating, ventilation, water	15 years
Building – Electronics	15 years
Outside facilities	5 to 19 years
Technical equipment	3 to 20 years
Operating and office equipment	3 to 15 years

Costs for repairs and ongoing maintenance of property, plant and equipment that have not led to an extension or material improvement are recognised under other operating expenses in the income statement.

When property, plant and equipment are sold, decommissioned or scrapped, any gains or losses from the difference between the net disposal proceeds and the amortised cost are recognised in other operating income or expenses.

4.6.4 Financial assets accounted for using the equity method

The DFS Group recognises associated companies at cost at the acquisition date using the equity method. In subsequent periods, the carrying amount is adjusted to account for the associated changes in equity in profit or loss, or in other comprehensive income. The dividends received from associated companies are accounted for by lowering the carrying amount of the investment. If there are indications for an impairment of investments, the lower recoverable amount is used for the carrying amount as required by the regulations of IAS 36.

4.6.5 Leases

As a lessee, the DFS Group measures the rights of use granted to it for leased assets at cost on initial recognition on the commencement date. These are calculated as the present value of future lease payments. Subsequently, the rights of use are measured using the cost method and amortised on a straight-line basis over the shorter of the useful life and the expected term of the lease agreement. If there is a remeasurement of the lease liabilities, the rights of use are adjusted accordingly. Rights of use are reviewed at every balance sheet date to determine if there are indications of impairment under IAS 36.

As a lessee, the Group determines the lease liabilities on initial recognition on the commencement date from the present value of the lease payments not yet made at that date. These payments primarily comprise fixed and variable payments, expected residual value payments and exercise payments for purchase options. The lease payments are discounted at an incremental borrowing rate. This discount rate is based on the yields on debt securities outstanding issued by residents, public debt securities and listed Federal securities corresponding to their remaining term as published by the German Bundesbank. An internal company credit risk premium of 0.25 percent is added. On subsequent measurement, the lease liabilities are increased by the interest expense passed through the income statement and reduced by the principal repayment portion, which does not pass through the income statement. Each lease payment is divided into principal repayment and financing expenses. If there are changes in the lease payments (e.g. due to index-linked charges, changes in the term of the lease or reassessments of contractual options), the DFS Group remeasures the

lease liabilities. Adjustments to the new carrying amounts are generally made without going through profit and loss by making corresponding corrections to the capitalised rights of use.

As a lessee, the group shows the rights of use under "Property, plant and equipment" and the lease liabilities under "Financial liabilities". The rights of use and associated depreciation, as well as lease liabilities and corresponding interest expenses, are presented in a separate item in the Notes.

Lease transactions where the DFS Group, as lessor, transfers basically all the risks and rewards of ownership of a leased asset to the lessee are treated as finance leases. At the beginning of the lease, the group derecognises the leased asset. At the same time, as lessor, it recognises a lease receivable in the amount of the net investment in the lease on the commencement date. The net investment comprises the present value of the lease payments, the present value of the expected residual value at the end of the lease and the initial direct costs. Subsequently, finance income is recognised over the lease term as a constant periodic rate of return on the net investment. The lease payments received reduce the lease receivable.

All other lease agreements where the Group is a lessor are treated as operating leases. The lease instalments received and the depreciation of the leased asset are recognised in the income statement on a straight-line basis over the term of the lease.

The DFS Group makes use of simplifications and waives the application of IFRS 16 for short-term leases (especially vehicle leases) and for leases where the underlying asset is of minor value. The Group set a threshold of five thousand euro. The lease payments for these transactions continue to be recognised in the income statement on a straight-line basis over the term of the lease. In addition, the Group generally separates leasing and non-leasing components and recognises the latter in the income statement.

The DFS Group applied IFRS 16 retrospectively, but decided not to adjust the prior-year figures. Until 1 January 2019, the Group valued the rental and lease agreements in accordance with IAS 17 and assessed them as regards their accounting treatment (finance leases through the balance sheet and operating leases through the income statement).

4.6.6 Investment property

Property and buildings that the DFS Group does not use operationally and are exclusively held either for rental income or capital gains are classified as investment property. The amortised cost is used for measurement. Buildings are depreciated using the straight-line method.

4.6.7 Financial instruments – Financial assets

The DFS Group determines the classification and measurement of financial assets based on the business model by which the portfolio of financial assets is managed and on the characteristics of the contractual terms of the cash flows.

- Category: Amortised cost

The Group classifies financial assets under this category when the objective is to hold the asset to maturity and collect the contractual cash flows. The cash flows occur at fixed points in time and represent exclusively repayments of principal and interest on the outstanding principal amount. Initial recognition occurs at fair value at the time of settlement (plus direct transaction costs). Receivables denominated in a foreign currency are translated using the rate at the reporting date and recognised in the income statement. Subsequently, the assets are carried at amortised cost using the effective interest rate method. Due to the predominantly short-term nature of trade receivables, other receivables and assets as well as liquid funds, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The Group therefore assumes that these assets can be sold for at least their carrying amounts in the short term and sets their fair values at the same level. Interest income and exchange rate gains and losses are presented in the financial result. Gains and losses from impairments, derecognitions and modifications are recognised in the operating result.

- Category: Debt instruments at fair value through other comprehensive income

For debt instruments in this category, the Group's objective is either to hold the asset to maturity and collect the contractual cash flows, or to sell. The cash flows occur at fixed points in time and represent exclusively repayments of principal and interest on the outstanding principal amount. At the time of settlement, initial recognition occurs at fair value (plus direct transaction costs). Subsequently, the DFS Group measures the financial assets at fair value through other comprehensive income, with changes to the carrying amount being booked in other comprehensive income. On disposal, accumulated other comprehensive income is reclassified to profit or loss. Interest income and exchange rate gains and losses calculated using the effective interest rate method are recognised directly in the financial result, while impairment losses are recognised in a separate item in the operating result.

- Category: Equity instruments at fair value through other comprehensive income

For investments in equity instruments, the Group's objective is also either to hold these to maturity and collect the contractual cash flows, or to sell. The cash flows occur at fixed points in time and represent exclusively repayments of principal and interest on the outstanding capital amount. On initial recognition of an equity investment that is not held for trading, the Group may irrevocably elect to measure it at fair value through other comprehensive income. This choice is made on a case-by-case basis for each investment. Initial recognition occurs at fair value (plus direct transaction costs). Subsequently, the investment is measured at fair value. The Group recognises all changes to the fair value directly in other comprehensive income. On derecognition of the investment, there is no reclassification of the cumulative other comprehensive income in the operating result. Dividends are considered in the financial result.

- Category: Assets at fair value through profit or loss

The DFS Group recognises all financial assets at fair value through profit or loss (excluding transaction costs) on initial recognition as long as they are not measured at amortised cost or at fair value through other comprehensive income. Subsequently, these assets are measured at fair value through profit or loss. All net gains and losses are recognised directly in other comprehensive income. Interest and dividend income are considered in the financial result.

Derivatives also belong to this category unless they qualify as hedging instruments. The DFS Group exclusively employs effective derivatives to hedge existing and future interest rate and currency risks under a hedging policy defined by the Executive Board and monitored by the Treasury department. While interest rate swaps are used to manage interest risk, cross-currency interest rate swaps hedge both interest rate risk and currency risk from financing in foreign currencies.

A reclassification is only carried out if the business model objective for the financial assets is changed.

The Group recognises expected credit losses under IFRS 9. The impairment method depends on whether there is a significant rise in the credit risk (see Note 4.5.2). The simplified approach is used for trade receivables, contract assets and lease receivables.

The Group derecognises financial assets as soon as the contractual right to the cash flows expires or the asset is transferred as part of a qualified transfer.

4.6.8 Fair value

The fair value of financial instruments is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (exit price). The fair value is measured based on the assumptions that knowledgeable market participants who are independent of each other and who are willing and able to enter into a transaction would make while acting in their economic best interest. Fair value is a market-based measurement, not an entity-specific measurement.

The fair value measurement assumes that the transaction is made in the principal market for the asset or liability. In the absence of such a market, the most advantageous market is to be used. This is the market that would maximise the amount that would be received to sell an asset or minimise the amount that would be paid to transfer a liability, taking into consideration transport and transaction costs. However, fair value measurements are not adjusted for transaction costs.

The DFS Group uses valuation techniques to determine fair value that are appropriate under the given circumstances and for which sufficient data are available. The techniques maximise the use of relevant observable inputs and minimise the use of unobservable inputs.

Inputs**Level 1 Directly observable inputs**

Observable (unadjusted) quoted prices in accessible active markets for identical assets or liabilities.

Level 2 Indirectly observable inputs

Inputs that are observable for assets or liabilities either directly or indirectly.

- a) Quoted prices for similar assets or liabilities in active markets.
- b) Quoted prices for identical or similar assets or liabilities in markets that are not active.
- c) Inputs other than quoted market prices that are observable.
- d) Market-corroborated inputs (values derived from market data using statistical methods).

Level 3 Unobservable inputs

Entity's own assumptions on the behaviour of a typical market participant.

The DFS Group undertakes reclassifications within the hierarchy at the end of the business year in which the changes took place.

Valuation techniques**Market approach**

This approach derives market multiples from a set of identical or comparable assets (matrix pricing).

Cost approach

This approach is based on the amount required to replace the service capacity of an asset (the current replacement cost).

Income approach

This method discounts future cash flows to a current amount (present value techniques, option pricing models, residual income method).

Further information on the determination of the fair value can be found in Notes 19 and 36.

4.6.9 Trade receivables

Initial recognition occurs at fair value at the time of settlement (plus direct transaction costs). The transaction price is the consideration to which the DFS Group expects to be entitled in exchange for the transfer of the contracted goods and services to the customer. Subsequently, trade receivables are measured at amortised cost using the effective interest rate method taking impairments into consideration (see Note 4.5.2). Due to their predominantly short-term nature, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The DFS Group therefore assumes that trade receivables can be sold for at least their carrying amounts in the short term and sets the fair value at the same level.

Trade receivables denominated in a foreign currency are translated using the rate at the reporting date and recognised in the income statement.

4.6.10 Contractual net values

Contract assets relate to a right that the Group has to consideration in exchange for goods or services that, at the balance sheet date, have been transferred but not invoiced for contracts over time.

The Group capitalises the additional costs for obtaining contracts with a customer as an asset when it can assume that the costs will be recovered. The costs of fulfilling contracts are also capitalised under certain conditions.

Contract liabilities relate to customer payments already made (security deposits of airspace users) where the DFS Group still has to provide the contracted good or service. The DFS Group presents amounts received or that will be received that are expected to be refunded to the customer (expected volume discounts or product returns) as refund liabilities. This is based on empirical values relating to return percentages and periods.

4.6.11 Other receivables and assets

Initial recognition occurs at fair value at the time of settlement (plus direct transaction costs). The transaction price is the consideration to which the DFS Group expects to be entitled in exchange for the transfer of the contracted goods and services to the customer. Subsequently, other receivables and assets are measured at amortised cost using the effective interest rate method taking impairments into consideration (see Note 4.5.2). Due to their predominantly short-term nature, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The DFS Group therefore assumes that the receivables can be sold for at least their carrying amounts in the short term and sets the fair value at the same level.

Other receivables and assets in foreign currencies are measured at the reporting date and recognised in the income statement.

4.6.12 Deferred taxes

IAS 12 regulates the treatment of deferred taxes using the liability method. Deferred tax assets and liabilities are recognised by the DFS Group for all temporary differences between the tax base of assets and liabilities and their carrying amounts in the Group balance sheet according to IFRS as well as for consolidation adjustments recognised in profit or loss. The differences are limited to those items whose changes influence taxable earnings.

Issues related to the calculation of charges are excluded (see Section 31b(3)(3) of the German Aviation Act (LuftVG)).

Deferred tax assets are also recognised for future claims to tax reductions resulting from tax loss carryforwards. Deferred tax assets for deductible temporary differences and for tax loss carryforwards are only recognised to the extent that there are future taxable profits which either the temporary differences or unused taxable losses can offset.

The computation of deferred taxes is based on the existing or applicable income tax rates in each country at the date of valuation. The income tax rate of 29.83 percent (previous year: 29.83%) is made up of a corporate income tax of 15.00 percent, a solidarity surcharge of 5.50 percent and a weighted average German municipal trade tax multiplier rate of 400.00 percent on a tax rate (*Steuermessbetrag*) of 3.50 percent. The effect of changes in tax rates on deferred tax assets and liabilities is reflected in the income tax expense for the period in which the law was changed.

Deferred tax assets and liabilities are netted if permitted under law and the receivables and payables are against the same tax authority.

Deferred tax assets and liabilities are not discounted.

4.6.13 Liquid funds

Liquid funds include cash, cash accounts as well as short-term money market investments and certificates of deposit at credit institutions. Initial recognition occurs at fair value at the time of settlement (plus direct transaction costs). Subsequently, liquid funds are measured at amortised cost. Due to the predominantly short-term nature of cash and cash equivalents, they are only subject to immaterial changes in value. The Group therefore sets the fair values at the same level as the carrying amounts.

Liquid funds in foreign currencies are converted at the closing rate.

Overdrafts taken up are reported by the DFS Group in the balance sheet as liabilities to credit institutions under current financial liabilities.

4.6.14 Inventories

Inventories are carried at cost based on the weighted average method or at production cost.

Production costs comprise direct production costs (especially direct materials and direct labour) as well as an appropriate share of the necessary material and manufacturing overhead. Administrative expenses and costs of employee assistance programmes are included to the extent they can be allocated to production. Financing costs are not recognised as part of production costs.

Subsequent measurement occurs at the lower of deemed cost and net realisable value. Inventory risks resulting from the duration of storage or impaired usability led to write-downs upon determination of the net realisable value. If the reasons for a write-down no longer apply, the write-down is reversed. Lower values at the reporting date due to lower prices on sales and purchase markets were taken into account.

4.6.15 Other comprehensive income

This item relates to changes recognised directly in equity, provided they are not based on capital transactions with the Shareholder. This includes remeasurement components of the net defined benefit liability, unrealised gains and losses from the fair valuation of available-for-sale financial assets, measurement differences from currency translation and the associated tax effects. In equity, these items are disclosed under revaluation reserves.

4.6.16 Provisions for pensions and similar obligations

Defined benefit plans are measured in accordance with IAS 19 using the projected unit credit method on the basis of actuarial reports at the balance sheet date. This requires, in particular, assumptions to be made about long-term salary trends and average life expectancy, which are made at the beginning of the business year. The premises on salary trends are based on historical trends and take into account country-specific interest and inflation levels. Biometric data serve as the basis for the estimates of average life expectancy (mortality tables taken from Heubeck-Richttafeln 2018 G).

The discount rate is an actuarial assumption and is set at the beginning of each business year. The rate used to discount pension obligations is determined by reference to market yields at the end of the reporting period on high-quality fixed-rate corporate and treasury bonds with good creditworthiness and an average rating of AA using the standardised approach. The DFS Group used bonds that are measured in euro. The term of the corporate bonds corresponds to the term of the obligation. With the help of the interest rate, the Group calculates the net interest result, for which the net pension obligation or net defined benefit liability is multiplied by the interest rate. The net pension obligation results from the deduction of plan assets with their fair value from the gross pension obligation and is therefore a net amount. In the event of an asset surplus (i.e. a net defined benefit asset), a corresponding procedure is applied. The interest rate for the expected return on plan assets therefore corresponds to the discount rate. Before offsetting, the DFS Group reports the net interest result in the financial result under financial income and financial expenses.

Remeasurements of the net defined benefit liability are recognised directly in equity in other comprehensive income. This includes in particular the actuarial gains and losses resulting from changes in expectations as regards the estimates made at the beginning of the year compared with the actual development during the business year. In addition, a portion of the actual return on plan assets at the end of the year in excess of the expected return on plan assets at the beginning of the year is recognised directly in equity. The remeasurements recognised in equity cannot be recognised in profit or loss in the following periods.

The service cost is made up of the current and past service costs. The latter reflects the change in pension obligations as a consequence of plan adjustments and plan curtailments. It is recognised directly in profit or loss when incurred in the statement of comprehensive income and reported under employee expenses.

The development of plan assets is made up of the contributions, payments and income from a matched reinsurance contract. The reinsurance contract requires an investment in line with the investment guidelines under the general cover fund of the insurer as well as a separate fund-based investment. This fund-based investment allows the DFS Group's contract with the insurer to have a higher equity ratio to gain a long-term increase in return compared with the return provided by the general cover fund of the insurance consortium. The fund investment is restricted to a maximum of half of the whole capital reserve of the reinsurance contract. The expectations placed on the fund investment are formulated by a strategy commission. It considers the latest expectations for the capital markets and risk issues. Pension obligations for which there are plan assets are netted against the fair value of these plan assets.

No provisions are recognised for defined contribution plans. The level of contributions at the DFS Group is dependent on the income relevant to pension calculations. The payments for defined contribution plans are expensed when due and reported as part of employee expenses.

4.6.17 Other provisions

The DFS Group recognises other provisions for past events that result in present obligations to third parties. These provisions must be capable of being estimated reliably and must lead to an outflow of resources with economic benefits in the future with a probability of at least 50.00 percent. The provisions are recognised with the settlement amount, which represents the highest probability of occurrence based on best estimates and under consideration of all discernible risks. In addition, the measurement of other provisions requires judgements on estimated costs, expected cash flows and their maturities. The provisions relate primarily to contracts, collective agreements, legal provisions or other obligations. They are recognised based on financial and actuarial calculations or historical experience using prudent commercial judgement. The premises underlying other provisions are reviewed annually and adjusted to current circumstances as necessary.

The DFS Group expects the majority of the other provisions to fall due in the next one to five years. Some of the individual provisions may involve a time period up to 2041. Therefore, uncertainties remain as to the timing and concrete amount of the expenses. Nevertheless, the Group expects to utilise the full amount of the provisions (100.00%) and expects that the outflow of economic benefits will equal the amount set aside in the provisions.

Provisions for obligations which in all probability will not lead to a reduction in assets in the subsequent year are discounted at prevailing market rates and carried at the present value of the expected outflow of resources, provided the interest effect is material. The discount rates are based on the yields on debt securities outstanding issued by residents, public debt securities and listed Federal securities corresponding to their remaining term as published by the German Bundesbank. In addition to these yields, a company-internal risk premium of 0.25 percent is added. The discount rates for non-current provisions are adjusted to the development of interest rates in the business year.

If a change in an estimate results in a reduction of the obligation, then the provision is reversed proportionally and the income reported under other operating income.

4.6.18 Financial instruments – Financial liabilities

Financial liabilities generally give rise to a claim for repayment in cash or in the form of another financial asset.

- Category: Liabilities at fair value through profit or loss

The DFS Group recognises derivative financial instruments with negative market values and financial liabilities at fair value on initial recognition if they are held for trading with the intention of sale in the short term. Subsequently, financial debt is measured at fair value. All gains and losses are directly included in the operating result and interest expenses in the financial result.

- Category: Amortised cost

The category contains all financial liabilities which cannot be allocated to another category. Initial recognition occurs at fair value (plus direct transaction costs). Subsequently, the DFS Group measures financial liabilities at amortised cost using the effective interest rate method. Interest income and exchange rate gains and losses are presented in the financial result. Gains and losses from derecognitions are recognised in the operating result.

For financial liabilities with maturities up to one year, the carrying amounts at the balance sheet date do not differ significantly from their fair values. If the maturity is longer than one year, the fair value is calculated by discounting the settlement value at a risk-free rate using the effective interest rate method.

The Group derecognises financial liabilities when they are discharged or when the contractual obligations are met, cancelled or they expire.

Liabilities denominated in a foreign currency are converted using the rate at the reporting date.

4.7 Currency translation

The DFS Group presents its consolidated financial statements in the reporting currency euro. Unless otherwise stated, all amounts are given in thousands of euro (€'000) and rounded using the common method.

The Group translates foreign currency transactions into the functional currency of the individual unit using the rate prevailing at the date of the transaction. After initial recognition, foreign currency fluctuations for monetary items (liquid funds, receivables, liabilities) are recorded in profit or loss and non-monetary items (intangible assets; property, plant and equipment; inventories) are carried at historical cost using the exchange rate at the date of the transaction.

The DFS Group translates the financial statements of foreign subsidiaries (as well as the hidden reserves and obligations identified in purchase price allocations) using the concept of a functional currency under IAS 21. The current rate method (mean exchange rate at the balance sheet date) is used to translate assets, liabilities, contingent liabilities and other financial obligations. The translation of items for the income statement, however, uses a rate that approximates the exchange rate at the date of the transaction (average exchange rate). The exchange difference from the translation of equity and the differences from the translation into the presentation currency are recognised directly in other comprehensive income by the DFS Group.

Currencies	ISO code 1 euro =	Standard conversion Mean exchange rate 31 Dec 2020	EMU conversion Asked price 31 Dec 2020	Standard conversion Mean exchange rate 31 Dec 2019	EMU conversion Asked price 31 Dec 2019
US dollar	USD (\$)	1.22710	1.23010	1.12340	1.12640
Pound sterling	GBP (£)	0.89903	0.90103	0.85080	0.85280
Bahraini dinar	BHD	0.46280	0.47580	0.42330	0.43630
Swiss franc	CHF	1.08020	1.08220	1.08540	1.08740

Notes to the statement of comprehensive income

5 Revenues

	2020	2019
	€'000	€'000
Revenues from air navigation services	1,016,333	1,007,404
Other revenues	94,933	102,313
	1,111,266	1,109,717

Breakdown of revenues from contracts with customers

	Regulated business	Commercial business	Total
31 Dec 2020	€'000	€'000	€'000
Revenues from contracts with customers	1,031,685	79,581	1,111,266
Time point of revenue recognition			
Recognised at a specific point in time	1,029,431	77,748	1,107,179
Recognised over a period of time	2,254	1,833	4,087
31 Dec 2019	€'000	€'000	€'000
Revenues from contracts with customers	1,022,667	87,050	1,109,717
Time point of revenue recognition			
Recognised at a specific point in time	1,018,551	75,608	1,094,159
Recognised over a period of time	4,116	11,442	15,558

Transaction price assigned to performance obligations not (or only partially) satisfied at the year end

	2020	2019
	€'000	€'000
Outstanding transaction price	17,236	9,439
of which expected to be recognised as revenue in 2021 (2020)	8,602	6,164
of which expected to be recognised as revenue in 2022 (2021)	5,003	2,738
of which expected to be recognised as revenue in 2023 (2022)	3,318	307
of which expected to be recognised as revenue in 2024 (2023)	236	77
of which expected to be recognised as revenue in 2025 (2024)	77	77
of which expected to be recognised as revenue in 2026 (2025)	0	76

Type of service	Type and time of satisfying the performance obligation and material payment conditions	Revenue recognition under IFRS 15
Air navigation services	<p>The air navigation services and the directly associated support activities derive from the sovereign task from Section 27c of the German Aviation Act (LuftVG). Airspace users obtain control in the accounting sense of the air navigation services as soon as they enter the airspace controlled by DFS and make use of the associated services.</p> <p>For terminal services, the Group issues statutory notifications of charges (<i>Gebührenbescheide</i>) to airspace users three times per month, for short cycles. The notifications are immediately due in full within five days of the due date. However, the Group grants airspace users a period of one month to appeal against notifications.</p> <p>For en-route services, the invoices are issued by EUROCONTROL in arrears in the middle of the subsequent month. The notifications are due within 30 days. Airspace users are granted a period of one month to appeal.</p>	Revenue is recognised when the airspace users make use of the air navigation services.
Production and service contracts	<p>In the commercial business, the Group markets air navigation services and air traffic control systems that are often offered in combination with hardware and software, consultancy, training as well as analysis, simulation and project management activities worldwide. Therefore, these contracts contain several performance components. The DFS Group views the contracts as one performance obligation each as it is responsible for the complete project management and has contractually promised to provide the goods or services to the customer. The development, installation and maintenance of the customer-specific air traffic control software can only be carried out by the Group.</p> <p>Some of the projects extend over a longer period of time. Some customers make advance payments. The final invoice is issued on acceptance and the associated transfer of control to the customer. The production and service contracts do not contain a significant financing component as the customary 30-day payment period for invoices and advance payments has been agreed.</p>	<p>The revenues from consultancy services are recognised in the period in which the services are rendered.</p> <p>For fixed-price contracts and the recognition of revenue over time, the amount is calculated using the cost-to-cost method. The degree of progress is determined by comparing the costs incurred to the total estimated costs required to satisfy the performance obligation. Estimates of revenues, costs and contract progress are corrected when conditions change. The resulting increase or decrease in the estimated revenues and costs are recognised by the Group in the period in which the correction becomes known. Fixed-price contracts have a payment plan with fixed deadlines and amounts. If the services rendered exceed the payment amount, the Group recognises a contract asset, or a contract liability in the opposite case. Advance payments received are presented as contract liabilities.</p> <p>The costs are expensed as they occur.</p>

6 Changes in inventory and other own work capitalised

	2020	2019
	€'000	€'000
Changes in inventory of finished goods and work in progress	362	-1,737
Other own work capitalised (primarily internally generated IT systems)	22,912	20,325
	23,274	18,588

7 Other operating income

	2020	2019
	€'000	€'000
R&D project funding by the European Commission and German Federal and regional ministries recognised in the income statement	20,841	26,658
Income from QTE transaction (exchange rate gains)	10,298	8,801
Income from derecognition of liabilities	3,197	4,488
Income from reversal of provisions	920	6,224
Remaining	4,195	6,581
	39,451	52,752

8 Material expenses

	2020	2019
	€'000	€'000
Raw materials, consumables used and purchased goods	6,726	4,438
Purchased services (flight inspection and consulting services)	5,943	6,495
	12,669	10,933

9 Employee expenses

	2020	2019
	€'000	€'000
Wages and salaries ⁵⁾	643,248	660,291
Expenses for IFRS pensions	247,588	195,916
Social security costs and expenses for assistance	74,274	70,489
Cost of personnel belonging to the Federal Aviation Office (LBA)	7,943	8,531
	973,053	935,227

⁵⁾ See Note 46.1 for the remuneration of the Executive Board

In addition to the usual outlays for wages, salaries and social security expenses for DFS personnel, this item also includes the costs charged by the Federal Aviation Office (LBA) for personnel belonging to the LBA.

Average annual number of employees		
	2020	2019
Salaried staff	5,521	5,396
Soldiers released from regular service	142	155
Wage-earners	16	20
Technical and commercial students and apprentices	312	244
DFS Group staff	5,991	5,815
Employees covered by the collective agreement for the public service (TVöD)	20	25
Established civil servants	101	109
Personnel belonging to the Federal Aviation Office (LBA), Directorate Air Navigation Services	121	134
	6,112	5,949

10 Depreciation and amortisation

	2020	2019
	€'000	€'000
Intangible assets	28,208	29,568
Property, plant and equipment	72,211	74,539
Investment property	30	30
Financial assets	1,579	0
	102,028	104,137

The result of conducting an impairment test led to an impairment loss of €1.58 million on the carrying amount of the investment in UNIFLY.

Beyond that, the impairment tests carried out in the business year resulted in no additional impairment charges being recognised for intangible assets; property, plant and equipment; investment property and financial assets.

11 Impairment losses on financial assets and contract assets

	2020	2019
	€'000	€'000
Financial assets	966	4,811
Contract assets	0	0
	966	4,811

12 Other operating expenses

	2020	2019
	€'000	€'000
Spare parts and maintenance	55,241	54,020
Occupancy costs	14,380	14,924
Rent and leasing costs	2,609	2,453
Reimbursement of expenses at cost price	3,943	4,182
Costs of external personnel	12,808	13,417
Other employee expenses	7,456	12,948
Legal and consultancy costs	6,139	7,308
Travel costs	3,346	8,120
Telecommunication	10,205	9,419
Costs from previous years	1,749	1,162
Vehicle costs	2,961	3,307
Asset disposals	1,739	1,974
Insurance policies	4,157	3,774
Magazines, journals, stationery	1,674	1,358
Advertising costs	2,852	2,705
Entertainment expenses	470	1,266
Costs of monetary transactions	4,233	3,691
Expenses from QTE transaction (exchange rate losses)	10,288	8,805
Remaining	1,504	2,048
	147,754	156,881

13 Financial result

	2020	2019
	€'000	€'000
Gains from the financial assets of the investment entity	117,537	161,601
Income from fund assets to finance retirement obligations	35,683	51,892
Interest income from QTE transaction	633	836
Income from investments	602	551
Interest income of the investments accounted for using the equity method	209	229
Other interest income	139	357
Interest income from operating taxes	10	2
Income from foreign currency translation	0	3
Financial income	154,813	215,471
Expenses from the financial assets of the investment entity	-119,351	-57,222
Expenses from discounting provisions	-64,886	-88,566
Other interest expense	-3,884	-3,649
Interest expense from QTE transaction	-508	-672
Financial expenses	-188,629	-150,109
Financial result	-33,816	65,362

Additional disclosures on the financial result

	2020	2019
	€'000	€'000
Interest result from financial instruments determined using the effective interest rate method not classified in the category "At fair value through profit or loss"	5,062	4,033
Interest income from impaired financial assets	139	356
Losses recognised directly in equity (-) / gains (+) from the measurement of financial assets	0	0

14 Income taxes

	2020	2019
		€'000
Current income taxes	0	1,819
Deferred income taxes	-2,310	-2,176
	-2,310	-357

Effective income taxes relate to corporation taxes, including the solidarity surcharge, and German municipal trade taxes. The computation of income taxes at DFS is based on applicable tax regulations in connection with Section 31b(3)(3) of the German Aviation Act (LuftVG). For the other Group subsidiaries, the trade and corporation tax laws and regulations are of relevance.

Breakdown of effective income taxes

	2020	2019
	€'000	€'000
Corporation tax	0	912
Solidarity surcharge	0	50
Municipal trade tax	0	857
Foreign taxes	0	0
	0	1,819

In addition to the tax liabilities from the current business year, possible estimated additional tax demands are also included to the extent that they might result from the current tax audit.

DFS owes taxes as the dominant enterprise for the dependent enterprise DFS Energy. Therefore, the deferred taxes of the dependent enterprise are reflected in the dominant enterprise. The spin-off of the energy plant, which is assigned to the areas relevant to air navigation charges, into DFS Energy led to a continuation of the tax measurement for this legal entity. Therefore, in determining taxes, the special situation as regards air navigation charges at DFS is also taken into consideration at DFS Energy. This does not lead to taxable temporary differences in value between the IFRS and the tax accounts.

In the Group, the tax groups are DFS, DFS International Business Services and Air Navigation Solutions. DFS International Business Services is the dominant enterprise for the dependent enterprises DFS Aviation Services, R. Eisenschmidt and Kaufbeuren ATM Training, and therefore owes the taxes. Hence, the deferred taxes of the subordinated companies are reflected in the dominant enterprise (DFS International Business Services). The sum of the results of the two groups and Air Navigation Solutions differ from the consolidated Group result as the expenses and income among the individual Group companies are eliminated in a different manner than that used for the groups for tax purposes.

Reconciliation from expected to effective income tax expense		
	2020	2019
	€'000	€'000
Net income before income taxes	-96,295	35,278
Expected tax rate (in %)	29.83	29.83
Expected income tax expense	0	10,520
Tax expense not relating to the period under review	0	0
Reduction in the tax base under Section 31b German Aviation Act (LuftVG)	0	-6,902
Deferred tax expense	-2,310	-2,176
Variances from consolidation	0	1,819
Effective income tax expense	-2,310	-357
Effective tax rate (in %)	2.40	-1.07

Deferred taxes by balance sheet item				
	Deferred tax assets		Deferred tax liabilities	
	2020	2019	2020	2019
	€'000	€'000	€'000	€'000
Intangible assets	0	0	27,001	21,928
Property, plant and equipment	263	846	3,028	2,921
Financial assets	1,054	0	18,447	19,810
Receivables and other assets	151	175	156,078	1,672
Provisions for pensions and similar obligations	1,314,447	1,085,573	0	0
Other provisions	20,572	20,959	718	513
Liabilities	7,729	9,443	446	494
	1,344,216	1,116,996	205,718	47,338
Impact of Section 31b LuftVG				
Intangible assets	0	0	-27,001	-21,928
Property, plant and equipment	0	0	-2,666	-2,646
Financial assets	0	0	-18,447	-19,810
Receivables and other assets	0	0	-155,452	0
Provisions for pensions and similar obligations	-1,277,193	-1,053,652	0	0
Other provisions	-20,388	-20,803	-718	-513
Liabilities	-3,805	-4,340	-226	-179
	-1,301,386	-1,078,795	-204,510	-45,076
Other allowances	-24,831	-21,276	0	0
Netting	-1,208	-2,262	-1,208	-2,262
Air Navigation Solutions	0	-14	0	0
Kaufbeuren ATM Training	39	35	0	0
DFS Aviation Services	1,309	1,130	0	0
	18,139	15,814	0	0

The DFS Group does not recognise any deferred tax assets for tax loss carryforwards as there is no potential to offset them in the foreseeable future. In addition, there are no issues which result in deferred tax assets not being recognised.

Notes to the balance sheet

15 Goodwill

	Cost				As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	
2020	€'000	€'000	€'000	€'000	€'000
R. Eisenschmidt GmbH	80	0	0	0	80
	80	0	0	0	80
2019	€'000	€'000	€'000	€'000	€'000
R. Eisenschmidt GmbH	80	0	0	0	80
	80	0	0	0	80

	Amortisation				As at 31 Dec	Carrying amount As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers		
2020	€'000	€'000	€'000	€'000	€'000	€'000
R. Eisenschmidt GmbH	0	0	0	0	0	80
	0	0	0	0	0	80
2019	€'000	€'000	€'000	€'000	€'000	€'000
R. Eisenschmidt GmbH	0	0	0	0	0	80
	0	0	0	0	0	80

The goodwill from the acquisition of R. Eisenschmidt GmbH results from the difference between the purchase price and the fair value of the net assets at the acquisition date.

The regular impairment tests of goodwill showed no indications that an impairment loss under IAS 36 had to be recognised.

Underlying assumptions for the conduct of impairment tests for goodwill

	31 Dec 2020	31 Dec 2019
R. Eisenschmidt GmbH		
Planning period	2021 to 2024 ⁶⁾	2020 to 2024 ⁷⁾
Planned revenues in €'000	4,315 to 4,615	4,426 to 4,526
Revenue growth in %	+2.20 to +2.50	0.00 to +1.13
EBT development in %	+16.40 to +18.20	-4.12 to +7.35

⁶⁾ From Annual Plan 2021 of the shareholder meeting on 19 August 2020

⁷⁾ From Annual Plan 2020 of the shareholder meeting on 13 August 2019

16 Intangible assets

	Cost				As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	
2020	€'000	€'000	€'000	€'000	€'000
Concessions, rights and licences	693,115	5,431	-268	1,427	699,705
Internally generated intangible assets	119,272	23,914	-566	0	142,620
Assets under construction (AUC)	33,129	8,923	0	-1,238	40,814
	845,516	38,268	-834	189	883,139
2019	€'000	€'000	€'000	€'000	€'000
Concessions, rights and licences	683,574	8,581	-760	1,720	693,115
Internally generated intangible assets	98,512	20,760	0	0	119,272
Assets under construction (AUC)	19,772	14,968	0	-1,611	33,129
	801,858	44,309	-760	109	845,516

	Amortisation					Carrying amount As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	As at 31 Dec	
2020	€'000	€'000	€'000	€'000	€'000	€'000
Concessions, rights and licences	586,809	21,959	-208	0	608,560	91,145
Internally generated intangible assets	52,408	6,249	0	0	58,657	83,963
Assets under construction (AUC)	0	0	0	0	0	40,814
	639,217	28,208	-208	0	667,217	215,922
2019	€'000	€'000	€'000	€'000	€'000	€'000
Concessions, rights and licences	563,957	23,379	-530	3	586,809	106,306
Internally generated intangible assets	46,219	6,189	0	0	52,408	66,864
Assets under construction (AUC)	0	0	0	0	0	33,129
	610,176	29,568	-530	3	639,217	206,299

The regular impairment tests of intangible assets showed no indications that an impairment loss under IAS 36 had to be recognised.

Intangible assets for which there is a contractual obligation to accept but which do not yet come under the economic power of disposition of the DFS Group are shown in Note 40.2.

The DFS Group has not assigned any intangible assets nor pledged them as collateral. It freely controls these assets.

Individual material intangible assets			
	Carrying amount	Remaining useful life	Share of total carrying amount
31 Dec 2020	€'000	in years	in percent
iCAS software	66,492	4-6	30.79
P1/ATCAS software including release	21,298	4	9.86
Realisation of iCWP	2,214	4	1.03
PSS software	1,882	4	0.87
Remote tower control (RTC)	1,605	5	0.74
Total carrying amount of intangible assets	215,922		100.00

Capitalisation of borrowing costs for intangible assets		
	31 Dec 2020	31 Dec 2019
Borrowing costs in €'000	2,021	1,291
Capitalisation rate in %	2.62	2.67

17 Property, plant and equipment

	Cost					As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	Currency differences	
	€'000	€'000	€'000	€'000	€'000	
2020	€'000	€'000	€'000	€'000	€'000	€'000
Land and buildings	698,947	2,317	-987	200	0	700,477
Technical equipment (plant) and machinery	1,073,353	25,372	-22,751	4,702	-9	1,080,667
Operating and office equipment	87,878	4,201	-2,177	5	0	89,907
Assets under construction (AUC)	12,339	12,080	0	-5,096	0	19,323
	1,872,517	43,970	-25,915	-189	-9	1,890,374
2019	€'000	€'000	€'000	€'000	€'000	€'000
Land and buildings	673,968	20,590	-7,895	12,284	0	698,947
Technical equipment (plant) and machinery	1,060,397	41,391	-35,319	6,884	0	1,073,353
Operating and office equipment	85,942	5,686	-3,759	9	0	87,878
Assets under construction (AUC)	23,228	8,397	0	-19,286	0	12,339
	1,843,535	76,064	-46,973	-109	0	1,872,517

	Depreciation					Carrying amount	
	As at 1 Jan	Additions	Disposals	Transfers	Currency differences	As at 31 Dec	As at 31 Dec
2020	€'000	€'000	€'000	€'000	€'000	€'000	€'000
Land and buildings	438,489	18,041	-651	3	-5	455,877	244,600
Technical equipment (plant) and machinery	866,034	48,930	-21,311	0	-8	893,645	187,022
Operating and office equipment	68,680	5,240	-2,147	-3	-6	71,764	18,143
Assets under construction (AUC)	0	0	0	0	0	0	19,323
	1,373,203	72,211	-24,109	0	-19	1,421,286	469,088
2019	€'000	€'000	€'000	€'000	€'000	€'000	€'000
Land and buildings	427,906	18,190	-7,607	0	0	438,489	260,458
Technical equipment (plant) and machinery	849,365	50,541	-33,875	-2	5	866,034	207,319
Operating and office equipment	66,406	5,808	-3,547	-1	14	68,680	19,198
Assets under construction (AUC)	0	0	0	0	0	0	12,339
	1,343,677	74,539	-45,029	-3	19	1,373,203	499,314

Capitalisation of borrowing costs for property, plant and equipment

	31 Dec 2020	31 Dec 2019
Borrowing costs in €'000	254	397
Capitalisation rate in %	2.62	2.67

Research and development costs

	31 Dec 2020	31 Dec 2019
	€'000	€'000
Expenses for research and development	50,803	51,739
- of which research costs recognised in the income statement	27,985	31,546
- of which capitalised additions in assets under construction	22,818	20,193
Total capitalised borrowing costs on development costs as at 31 Dec	1,096	568
Development costs in assets under construction as at 31 December	53,528	31,257
Scheduled depreciation of development costs based on the degree of completion notified	6,249	6,189
R&D project funding by the European Commission and German federal and regional ministries deducted from cost	0	0

Property, plant and equipment for which there is a contractual obligation to accept but which do not yet come under the economic power of disposition of the Group are shown in Note 40.2.

The DFS Group has not assigned any property, plant and equipment nor pledged them as collateral. It freely controls these assets.

The regular impairment tests of property, plant and equipment showed no indications that an impairment loss under IAS 36 had to be recognised.

Compensation of €44 thousand (previous year: €36 thousand) for third parties for property, plant and equipment that was impaired, irrecoverably lost or decommissioned was recognised in the income statement.

18 Leases

The leases entered into by the DFS Group as lessee only have a supporting function for business operations. They mainly relate to the rental of land, office space and vehicles for selected employees.

Disclosures on rights of use							
	Cost						
	As at 1 Jan	Additions	Disposals	Transfers	As at 31 Dec		
	€'000	€'000	€'000	€'000	€'000	€'000	
2020							
Buildings	13,336	540	-150	0	13,726		
Vehicles	236	1,268	0	0	1,504		
	13,572	1,808	-150	0	15,230		
2019							
Buildings	0	13,336	0	0	13,336		
Vehicles	0	236	0	0	236		
	0	13,572	0	0	13,572		
	Depreciation					Carrying amount	
	As at 1 Jan	Additions	Disposals	Transfers	Currency differences	As at 31 Dec	As at 31 Dec
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
2020							
Buildings	1,914	1,936	-15	0	-5	3,830	9,896
Vehicles	155	307	0	0	0	462	1,042
	2,069	2,243	-15	0	-5	4,292	10,938
2019							
Buildings	0	1,914	0	0	0	1,914	11,422
Vehicles	0	155	0	0	0	155	81
	0	2,069	0	0	0	2,069	11,503

Disclosures on lease liabilities		
	31 Dec 2020	31 Dec 2019
	€'000	€'000
As at 1 Jan	23,053	25,305
Increase due to index adjustments	512	225
Additions	1,304	0
Disposals	-137	0
Principal repayments	-2,829	-2,645
Interest expense	162	168
Currency translation	-3	0
As at 31 Dec	22,062	23,053

Aged list of lease liabilities				
	Up to 1 year	2 to 5 years	More than 5 years	Total
	€'000	€'000	€'000	€'000
31 Dec 2020				
Undiscounted lease liabilities	3,034	6,304	14,478	23,816
Discounted lease liabilities	2,826	5,787	13,449	22,062
Interest component	208	517	1,029	1,754
31 Dec 2019	€'000	€'000	€'000	€'000
Undiscounted lease liabilities	2,682	6,694	15,517	24,893
Discounted lease liabilities	2,522	6,142	14,389	23,053
Interest component	160	552	1,128	1,840

Aged list of expected payments for short-term leases and leases on low-value assets				
	Up to 1 year	2 to 5 years	More than 5 years	Total
	€'000	€'000	€'000	€'000
31 Dec 2020				
Non-discounted lease payments	1,822	1,285	143	3,250
31 Dec 2019	€'000	€'000	€'000	€'000
Non-discounted lease payments	1,584	1,476	1,310	4,370

Amounts for leases recognised in the statement of comprehensive income		
	2020	2019
	€'000	€'000
Depreciation	2,244	2,069
Interest expense	162	168
Expense for short-term leases	449	445
Expenses for leases on low-value assets	2,160	2,008

Total cash outflows for leases recognised in the cash flow statement		
	2020	2019
	€'000	€'000
Payments for short-term leases and leases on low-value assets	2,609	2,453
Taking on lease liabilities	1,816	25,530
Disposals and currency translation from lease liabilities	140	0
Principal repayment of lease liabilities	2,829	2,645
Interest expense	162	168

The DFS Group also acts as lessor. In this context, it leases air traffic control systems, areas and land and provides connections and air navigation services data. The Group classified the property with a heritable building right (*Erbbaurechtsgrundstück*) in Braunschweig as "Investment property". Additional information can be found in Note 19.

In the case of all other lettings, provisions or transfers of use, essentially all risks and rewards associated with the economic ownership remain with the DFS Group. Options were not transferred to the respective lessees. The Group classified these leases as operating leases and recognised the corresponding income in the income statement.

Amounts for operating leases recognised in the statement of comprehensive income		
	2020	2019
	€'000	€'000
Leasing income from operating leases	3,748	5,517

Breakdown between owned and leased property, plant and equipment for operating leases		
	2020	2019
Buildings	€'000	€'000
Owned property, plant and equipment	244,600	260,458
Leased property, plant and equipment (property with a heritable building right (<i>Erbbaurechtsgrundstück</i>) in Berlin)	0	0
	244,600	260,458

19 Investment property

	Cost				As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	
2020	€'000	€'000	€'000	€'000	€'000
Property in Braunschweig	1,210	0	0	0	1,210
	1,210	0	0	0	1,210
2019	€'000	€'000	€'000	€'000	€'000
Property in Braunschweig	1,210	0	0	0	1,210
	1,210	0	0	0	1,210

	Depreciation					Carrying amount As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	As at 31 Dec	
2020	€'000	€'000	€'000	€'000	€'000	€'000
Property in Braunschweig	548	30	0	0	578	632
	548	30	0	0	578	632
2019	€'000	€'000	€'000	€'000	€'000	€'000
Property in Braunschweig	518	30	0	0	548	662
	518	30	0	0	548	662

The DFS Group rents a building, including the land, in Braunschweig, Germany, to FCS Flight Calibration Services, which uses this land for its own operational purposes.

The DFS Group is not contractually obliged to conduct repairs, maintenance or improvements. However, it is authorised to make material changes to the premises and the rental object as well as necessary repairs and maintenance without the approval of FCS Flight Calibration Services. There are no other contractual obligations or restraints on disposition.

Expenses and income recognised in the statement of comprehensive income		
	2020	2019
	€'000	€'000
Rental income	122	123
Depreciation	30	30
Repairs	0	0

The property is depreciated over the useful life of 40 years using the straight-line method. The land reference value for the area in question has increased by around 8.33 percent since 2017, according to recent research. There were no indications of a need to impair as required by IAS 36. In the opinion of the DFS Group, the results of the appraisal dated 10 October 2017 are still usable and demonstrate the recoverability of the carrying amounts.

Appraisal on the value of the property

Date of appraisal	10 October 2017	3 December 2012
Date to which appraisal applies	1 October 2017	1 December 2012
Procedure	DCF method	DCF method
Market value / fair value	€815 thousand	€980 thousand
Property yield (<i>Liegenschaftszinssatz</i>) of the city of Braunschweig	5.60%	7.60%
Initial discount rate	7.50%	8.25%

The fair value of investment property is determined by an external independent property valuer who possesses the relevant professional qualification and up-to-date experience with the location and type of property to be valued.

Valuation technique

Discounted cash flow (DCF) method: The calculation of the fair value is based on current rental rates considering various factors such as the standard land values, property yield, other operating expenses, risk of default on rents, remaining useful life of the building, maintenance risk as well as current property developments.

Unobservable inputs

Discount rate, risk of default on rents, other operating expenses

Level

3

Relationship between inputs and fair value

The estimated fair value would increase if

- the risk-adjusted discount rate was lower
 - the risk of default on rents was lower
 - other operating costs were lower
-

20 Financial assets

	Cost				As at 31 Dec
	As at 1 Jan	Additions	Disposals	Remea- surement	
2020	€'000	€'000	€'000	€'000	€'000
Financial assets accounted for using the equity method	14,438	24	0	0	14,462
Investments	2,660	0	-56	0	2,604
Loans to associated companies	7,338	0	-837	0	6,501
	24,436	24	-893	0	23,567
2019	€'000	€'000	€'000	€'000	€'000
Financial assets accounted for using the equity method	14,359	79	0	0	14,438
Investments	2,717	0	-57	0	2,660
Loans to associated companies	7,869	0	-531	0	7,338
	24,945	79	-588	0	24,436

	Impairments					Carrying amount
	As at 1 Jan	Additions	Disposals	Transfers	As at 31 Dec	As at 31 Dec
2020	€'000	€'000	€'000	€'000	€'000	€'000
Financial assets accounted for using the equity method	0	1,579	0	0	1,579	12,883
Investments	0	0	0	0	0	2,604
Loans to associated companies	0	0	0	0	0	6,501
	0	1,579	0	0	1,579	21,988
2019	€'000	€'000	€'000	€'000	€'000	€'000
Financial assets accounted for using the equity method	0	0	0	0	0	14,438
Investments	0	0	0	0	0	2,660
Loans to associated companies	0	0	0	0	0	7,338
	0	0	0	0	0	24,436

The DFS Group made a contribution to AEROSENSE in the form of an uncommitted capital reserve.

The result of carrying out an impairment test led to an impairment of €1.58 million in the carrying amount of the investment in UNIFLY. Beyond that, there were no further indications of a need to impair as required by IAS 36.

Associated companies accounted for using the equity method

	31 Dec 2020 €'000	31 Dec 2019 €'000
As at 1 Jan	14,438	14,359
Additions	24	79
Impairments	-1,579	0
Proportionate net income	0	0
Dividends received	0	0
As at 31 Dec	12,883	14,438

The Group holds 30.00 percent of the shares in FREQUENTIS DFS AEROSENSE and 22.80 percent of the shares in Unify. In both cases, the Group assumes material influence and accounts for the shares under the equity method.

Investments	GroupEAD	BILSODA	ESSP SAS	TATS	Total
	€'000	€'000	€'000	€'000	€'000
Shareholding in %	36.00	24.90	16.67	50.00	
Share capital	360	0	167	500	1,027
Liabe capital (<i>Haftelagen</i>)	0	2	0	0	2
Other contributions	0	1,575	0	0	1,575
As at 31 Dec 2020	360	1,577	167	500	2,604

Loans to associated companies					
	Term	Nominal value €'000	Nominal interest rate in %	31 Dec 2020 €'000	31 Dec 2019 €'000
FCS					
Loan: Hawker Beechcraft Super King Air FL-626 D-CFME	2009-2025	4,300	5.25	1,686	1,976
Loan: Hawker Beechcraft Super King Air FL-1156	2018-2033	5,560	2.10	4,815	5,362
		10,760		6,501	7,338

21 Trade receivables

Due dates of trade receivables				
	Up to 1 year	2 to 5 years	More than 5 years	Total
	€'000	€'000	€'000	€'000
2020	115,698	34	0	115,732
2019	152,194	51	0	152,245

Aged list		
	31 Dec 2020	31 Dec 2019
	€'000	€'000
Carrying amount	115,732	152,245
of which not impaired and		
- not yet overdue	56,827	142,319
- up to 30 days overdue	5,017	4,753
- 31 to 60 days overdue	478	2,554
- 61 to 180 days overdue	10,154	1,911
- more than 180 days overdue	43,256 ⁸⁾	708
of which impaired	0	0

⁸⁾ These are mainly receivables from the en-route area for the flight months February to May 2020, which were deferred by EUROCONTROL and will be settled in the business year 2021.

Trade receivables were written down to the amount that could be recovered as soon as information on the insolvency of customers was available. There are no indications that the debtors whose receivables were overdue will not be able to fulfil their obligations.

Development of allowances		
	31 Dec 2020	31 Dec 2019
	€'000	€'000
As at 1 Jan	13,921	10,393
Additions	1,704	5,007
Utilisation	0	0
Reversal	-1,541	-1,479
As at 31 Dec	14,084	13,921

Expenses (-) and income (+) recognised in the statement of comprehensive income		
	2020	2019
	€'000	€'000
Derecognition and write-off of receivables	-825	-1,424
Income from payment of receivables previously written off	1	62
Income from other derecognitions	21	79
Additions to specific allowances	-1,704	-5,007
Income from reversal of specific allowances	1,541	1,479

At the balance sheet date, there were no trade receivables in foreign currencies (previous year: none).

The DFS Group did not pledge any receivables as securities for loans.

22 Contractual net values

Contract assets	31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
Consulting services and service contracts	2,487	0	1,784	0
Software developments	860	0	78	0
Miscellaneous	1,747	0	569	0
	5,094	0	2,431	0

Revenues and costs from contracts with customers		
	2020	2019
	€'000	€'000
Contract revenue recognised	9,124	9,034
Depreciation, amortisation and impairments	1	57
Costs incurred	6,703	6,967
Capitalised costs	0	0
Profit earned for ongoing projects	2,420	2,010

Development of contract liabilities		
	2020	2019
	€'000	€'000
As at 1 Jan	2,321	1,408
Additions	4,111	21,679
Revenues recognised in the business year that were included under contract liabilities at the beginning of the period	-441	-1,037
Revenues recognised in the business year that were not included under contract liabilities at the beginning of the period	-2,844	-19,729
As at 31 Dec	3,147	2,321

Contract liabilities result from security deposits of airspace users for air navigation services and customer payments for air traffic control systems and further services.

23 Other receivables and assets

	31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
Under-recovery	521,127	521,127		
Receivables from EU grant funding	50,532	50,532	49,011	49,011
QTE transaction	19,989	19,010	29,371	21,834
Receivables from employees	19,011	0	15	0
Trusteeship (<i>Treuhandverein</i>)	7,214	50	14,531	50
Capitalised value	6,096	6,096	5,675	5,675
Interest receivables	915	0	1,274	0
Receivables from investments	45	0	55	0
Creditors with debit balances	0	0	0	0
Remaining	2,230	0	1,907	0
Other receivables and assets (financial)	627,159	596,815	101,839	76,570
Remaining other receivables and assets (non-financial)	3,755	0	7,173	0
Prepayments	342	0	279	0
	631,256	596,815	109,291	76,570

Receivables from employees result from the corona collective agreement and include the shortfall in working hours built up in the corona time account during the business year.

Aged list	31 Dec 2020	31 Dec 2019
	€'000	€'000
Carrying amount	631,256	109,291
of which not impaired and		
- not yet overdue	631,256	109,291
- up to 30 days overdue	0	0
- 31 to 60 days overdue	0	0
- 61 to 180 days overdue	0	0
- more than 180 days overdue	0	0
of which impaired	0	0

No receivables served as securities for loans or as collateral for other liabilities.

The qualified technological equipment (QTE) transaction with foreign investors was basically terminated in 2012. The DFS Group agreed with the remaining contracting parties to keep up the domestic cash flows. The restructuring of the contractual relationships allowed financial drawbacks to be avoided. The remaining purely inner-German shell structure comprises a claim against NORD/LB and a liability against KfW Kreditanstalt für Wiederaufbau (see Note 30). The new loan contracts concluded have fixed interest and principal repayments and a term until 2 January 2022. The Group receives the claims from the ongoing rent from NORD/LB without having to provide a consideration. The Group bears the default risk of NORD/LB during the term. For the liability, temporally limited collateral was pledged to KfW in the form of the assignment of the receivables against NORD/LB. This hedge was dissolved in 2013 after a one-off payment. The termination of the QTE transaction led to a significant improvement in the risk position for the creditors of the DFS Group.

24 Inventories

	31 Dec 2020	31 Dec 2019
	€'000	€'000
Goods in stock	5,679	5,492
Emission rights	624	704
	6,303	6,196

Expenses and income recognised in the statement of comprehensive income

	2020	2019
	€'000	€'000
Raw materials and consumables used	2,780	2,887
Cost of purchased products	3,946	1,551
Impairment of raw materials and consumables used	49	4
Impairment of finished goods and goods for resale	0	0

25 Financial assets

	31 Dec 2020	31 Dec 2019
	€'000	€'000
Securities (at fair value through profit or loss)	783,686	755,607
Derivatives (at fair value through profit or loss)	6,491	3,341
	790,177	758,948

The DFS Group invested in a fund (legal name: ATCP-UI-FONDS) through an investment entity. Management decided to hold the financial assets for trading to actively realise cash flows from the purchase and sale of assets. The capital investments relate primarily to securities, which the Group measured at fair value through profit or loss. There are active markets with published market prices. The capital investments made were distributed in the consolidated financial statements over the corresponding financial assets and liabilities.

In 2018, the part of the fund assets that had qualified as plan assets and had been transferred to the DFS Treuhandverein (trusteeship) was transferred to a fund (PEGASUS-UI-FONDS) (see Note 28.1). Since then, DFS has been the sole shareholder in this fund (ATCP-UI-FONDS).

The Group's overall investment goal is to reduce the risk of loss on a yearly basis compared with the strategic asset allocation while earning a return consistent with the allocation over the market cycle. The DFS Group expects an annual return on the whole portfolio of 0.80 percent on average over the investment horizon of three to five years.

The DFS Group defined asset allocation bands for the minimum and maximum exposure for each asset class: cash, government bonds, corporate bonds and equities.

The Group also classified various risk categories:

- Market risk (beta risk) is defined as the loss in value from the change in value of the asset class.
- Hedge error is defined as the loss resulting if the assigned benchmark cannot be replicated exactly in the asset class.
- Tracking error is the risk that there might be a divergence between the behaviour of the underlying portfolio and the behaviour of the benchmark.

The risk manager reviews these risks constantly. The exposures are adjusted at least once a month as needed and managed using derivatives, futures or options.

26 Liquid funds

	31 Dec 2020	31 Dec 2019
	€'000	€'000
Cash in hand and cheques	46	31
Cash at bank	251,965	366,567
	252,011	366,598

27 Equity

	31 Dec 2020	31 Dec 2019
	€'000	€'000
Subscribed capital	755,288	755,288
Capital reserve	74,296	74,296
Remeasurement reserves	-3,094,991	-2,345,964
Retained earnings	415	93,081
Share of equity attributable to Shareholder of parent company	-2,264,992	-1,423,299
Minority interest	2,733	4,052
	-2,262,259	-1,419,247

The registered capital of the DFS Group amounts to €755,287,500.00 (seven hundred and fifty-five million two hundred and eighty-seven thousand five hundred euro). There are 7,552,875 shares with a nominal value of €100.00 each held by the sole Shareholder, the Federal Republic of Germany, represented by the Federal Ministry of Transport and Digital Infrastructure (BMVI). The shares may not be sold or encumbered. Additional shareholders may not be admitted.

The capital reserves consist of other payments of the Shareholder (Section 272(2)(4) German Commercial Code, HGB) and serve to strengthen the share capital.

Other reserves are used for changes recognised directly in equity that are not based on capital transactions with the Shareholder.

By resolution no. 173 dated 4 May 2020, the shareholder' meeting adopted the consolidated financial statements and the group management report as at 31 December 2019 and resolved not to distribute a dividend to the Shareholder.

Other comprehensive income after taxes contained in the reserves			
	Remeasurement reserves	Other reserves	Other comprehensive income
31 Dec 2020	€'000	€'000	€'000
Remeasurement of the net defined benefit liability	-748,802	0	-748,802
Changes in the fair value of debt instruments at fair value through other comprehensive income	0	0	0
Currency differences from the conversion of foreign operations or investments	-225	0	-225
	-749,027	0	-749,027
31 Dec 2019	€'000	€'000	€'000
Remeasurement of the net defined benefit liability	-793,522	0	-793,522
Changes in the fair value of debt instruments at fair value through other comprehensive income	0	0	0
Currency differences from the conversion of foreign operations or investments	95	0	95
	-793,427	0	-793,427

28 Provisions for pensions and similar obligations

Provisions for pensions are recognised exclusively for defined benefit plans for active and former employees.

The level of detail presented in the numbers reported in the following sections is based on the collective agreements and individual contracts relevant to the DFS Group:

Acronym	Contents
VersTV (Pensions) ⁹⁾	This collective agreement relates to the pensions for the staff employed at the DFS Group.
ÜVersTV (Transitional payments)	This collective agreement relates to the transitional payments for air traffic controllers and flight data assistants employed at the DFS Group.
KTV (Insurance)	This collective agreement covers the health and long-term care insurance for the staff employed at the DFS Group.
Miscellaneous	The accessory obligations for death grants and the deferred compensation scheme for pensions (old) are grouped under "Miscellaneous".

⁹⁾ In Note 28.6, the defined benefit obligations under the VersTV are further split between final salary benefits and benefits linked to average career earnings.

28.1 Pension plans

There are various forms of pension provision available to the employees of the DFS Group, which are largely governed by collective agreements.

Under the collective agreement covering pensions (VersTV), employees who began employment at the company by 31 December 2004 receive old-age, disability and surviving dependant's benefits (defined benefit plans) linked to the respective final salary of the employee (Plan A). However, employees who entered service after 1 January 2005 receive benefits under the collective agreement covering pensions which are linked to average career earnings (Plan B). Thereafter, a pension component is calculated annually depending on the respective income. Thus, the retirement benefit is calculated from the sum of the annual components.

Air traffic controllers and flight data assistants receive a transitional retirement benefit linked to their final salary (ÜVersTV). This is to cover the period from the end of their active duty at DFS until they can draw the retirement pension from the statutory pension scheme.

DFS pays an increased employer contribution for health insurance for the employees who were previously employed as established civil servants with the former Federal Administration of Air Navigation Services (BFS) and the Federal Aviation Office (LBA). This is regulated in the collective agreement relating to health and long-term care insurance (KTV). This compensates over the entire active period of employment and in retirement for the fact that these staff are no longer covered by the German civil service welfare provisions for healthcare.

The DFS Group pays death grants to qualifying next of kin of active employees. The grants are equal to the previous remuneration and are paid for two and half months from the month following the month in which the employee passed away.

In addition, there are individual contractual benefits approved in 2005 which are based on the salary conversion model for exempt employees. The amount of the pension capital underlying the benefit is based on the converted salary with a return of 6.00 percent.

The DFS Group decided to adjust the financing of pension obligations in the business year 2018. It is gradually phasing out the current insurance-based reinsurance and will in future only refinance itself by means of a fund solution. To this end, the Group transferred the fund (PEGASUS-UI-FONDS) from the insurance consortium to the Treuhandverein (trusteeship) and cancelled the risk insurance policies. In addition, the Group transferred the portion of the fund (ATCP-UI-FONDS) assigned for these purposes to the PEGASUS-UI-FONDS. In the future, the DFS Group will cover claims from the still existing reinsurance policies and funds. The plan assets can be allocated to the obligations from the collective agreement relating to pensions and the transitional retirement. After its assignment, the PEGASUS-UI-FONDS serves to finance the pension obligations, while the ATCP-UI-FONDS was separated out for the long-term financing of the Group.

In addition to defined benefit benefits, the DFS Group also grants defined contribution benefits.

There were no changes, curtailments or settlements to the pension plans in the business year.

28.2 Actuarial assumptions

In %	31 Dec 2020	31 Dec 2019
Discount rate	0.60	1.10
Projected return on plan assets	0.60	1.10
Salary trend (including career trend)	2.50	2.50
Projected increase in benefits ¹⁰⁾	1.25-2.00	1.25-2.00

¹⁰⁾ 1.25 percent for the guaranteed adjustment for staff with benefits under VersTV 2009
2.00 percent for staff with benefits under VersTV 1993 (static reference)

28.3 Sensitivity analysis

The sensitivity analysis takes into account the respective change of one individual assumption compared to the reference value, which is made up of the sum of the individual present values of the pension obligations from the VersTV (Pensions), ÜVersTV (Transitional payments) and KTV (Insurance). The remaining parameters of the original calculations remain unchanged. This ensures that potential correlation effects are excluded.

		Impact on the defined benefit obligations	
		€'000	In %
Changes to the actuarial assumptions			
Present value of defined benefit obligations at 31 Dec 2020		6,760,669	
Discount rate	Increase by 0.5 percentage points	-730,659	-10.81
	Decrease by 0.5 percentage points	870,877	12.88
Salary trend	Increase by 0.5 percentage points	292,497	4.33
	Decrease by 0.5 percentage points	-270,530	-4.00
Present value of defined benefit obligations at 31 Dec 2019		5,891,321	
Discount rate	Increase by 0.5 percentage points	-606,327	-10.29
	Decrease by 0.5 percentage points	717,772	12.18
Salary trend	Increase by 0.5 percentage points	257,953	4.38
	Decrease by 0.5 percentage points	-238,306	-4.05

The VersTV dated 21 August 2009 sets out a fixed annual adjustment of 1.25 percent. This means there is no sensitivity calculation for the pension progression.

For a specific group of people, the adjustment logic is set out in the VersTV 2005. This collective agreement has an adjustment of 2.00 percent per year as well as a lagging correction for inflation that follows a three-year rhythm. As this represents an immaterial portion of the overall obligation, the DFS Group does not conduct a sensitivity calculation for the pension progression.

28.4 Risks

The pension obligations and the plan assets are subject to fluctuations over time. The reasons for these fluctuations and the associated risks arise from the usual actuarial risks and the financial risks in connection with the plan assets.

28.4.1 Demographic risks

As a large part of the defined benefit obligations are paid for the whole life and also include survivor's pensions, earlier entitlement and longer periods of benefit payment can lead to higher pension obligations, expenses and higher retirement benefits than expected.

28.4.2 Market price risks

The amount of the net obligation from occupational pensions is exposed to interest rate risk and is particularly influenced by the discount rate. The rate is determined by reference to market yields at the reporting date on high-quality fixed-rate corporate and treasury bonds. The current low level of interest rates has resulted in a comparatively high obligation. Potential fluctuations in the pension obligations are considered when managing the plan assets. However, the rise in the pension obligations can only be partly offset by the rise in the market values of plan assets. The low interest rate level makes it difficult to earn substantial returns, which reduces the speed at which the assets for occupational pensions may grow.

The investment form chosen by DFS Aviation Services (DAS) for the transitional retirement obligations offers a balanced mix of risk and return. The insurance contracts have a guaranteed rate of 2.25 percent for old contracts and 0.90 percent for new contracts, including the grant of a terminal bonus. However, DFS Aviation Services expects a reduction in the overall return as interest rates remain low.

28.4.3 Liquidity risks

The daily liquidity of the DFS Group is monitored by the Treasury department and is managed with the help of short-term (< year) and medium-term liquidity plans.

28.4.4 Inflation risks

The Group distinguishes in its pension plans between benefits that are based on the respective final salary of the employee and benefits based on the career average plan. With the latter, the pension component is directly tied to the respective income. A rise in salaries tied to inflation would therefore lead to a rise in the pension obligations.

28.5 Duration and expected pension and contribution payments

Expected due date of undiscounted payments	Up to 1 year	2 to 5 years	6 to 15 years
	€'000	€'000	€'000
Estimated pension payments ¹⁾	142,575	631,370	1,883,746
- of which reinsured with the insurance consortium	133,129	594,003	1,804,215
Expected employer contributions to plan assets	506,561	928,520	2,133,044

¹⁾ From the H²B detailed forecast 2020 to 2035 dated 5 June 2020

The weighted duration of the pension obligations amounts to 23.7 years (previous year: 22.6 years) as at 31 December 2020.

28.6 Defined benefit obligations

	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2020	€'000	€'000	€'000	€'000	€'000
As at 1 Jan 2020	4,318,998	1,391,958	180,808	5,167	5,896,931
Current service cost	157,360	66,384	1,025	117	224,886
Interest expense	47,165	14,984	1,946	54	64,149
Retirement benefits paid	-62,089	-53,478	-7,769	-604	-123,940
Actuarial gains (-) and losses (+)	605,618	78,155	20,195	199	704,167
- of which changed parameters	623,102	94,688	14,249	170	732,209
- of which experience-based adjustments	-17,484	-16,533	5,946	29	-28,042
Present value of defined benefit obligations	5,067,052	1,498,003	196,205	4,933	6,766,193
- of which benefits based on final salary					
Retirement payments	3,999,495				
One-time payments	75,101				
- of which benefits based on career average plan					
Retirement payments	992,456				
One-time payments	0				
31 Dec 2019	€'000	€'000	€'000	€'000	€'000
As at 1 Jan 2019	3,449,221	1,167,502	208,291	4,882	4,829,896
Current service cost	116,302	54,512	1,560	102	172,476
Interest expense	61,573	20,601	3,678	85	85,937
Retirement benefits paid	-55,062	-46,030	-7,725	-290	-109,107
Acquisitions/disposals of businesses	0	1,527	0	0	1,527
Actuarial gains (-) and losses (+)	746,964	193,846	-24,996	388	916,202
- of which changed parameters	688,619	118,294	-17,517	237	789,633
- of which experience-based adjustments	58,345	75,552	-7,479	151	126,569
Present value of defined benefit obligations	4,318,998	1,391,958	180,808	5,167	5,896,931
- of which benefits based on final salary					
Retirement payments	3,550,613				
One-time payments	59,940				
- of which benefits based on career average plan					
Retirement payments	708,445				
One-time payments	0				

28.7 Plan assets

	31 Dec 2020	31 Dec 2019
	€'000	€'000
As at 1 Jan	3,145,175	2,813,296
Projected return on plan assets	35,528	51,776
Employer contributions and payments	180,000	239,170
Retirement benefits paid	-99,829	-81,747
Actuarial gains (+) and losses (-)	-44,635	122,680
Market values of plan assets	3,216,239	3,145,175
Actual return on plan assets	-9,108	174,456

Composition of plan assets

	31 Dec 2020	31 Dec 2019
	€'000	€'000
Capital investment in the general cover fund of the insurer	1,399,589	1,451,771
Capital investment in PEGASUS-UI-FONDS	1,816,650	1,693,404
Market value of plan assets	3,216,239	3,145,175

28.8 Remeasurement of the net defined benefit liability in equity

	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
2020	€'000	€'000	€'000	€'000	€'000	€'000
As at 1 Jan	123,098	-1,939,899	-469,678	-65,655	-1,577	-2,353,711
Remeasurement of the net liability in equity = actuarial gains (+) and losses (-) of the ongoing business year	-44,408	-605,618	-78,155	-20,422	-199	-748,802
As at 31 Dec	78,690	-2,545,517	-547,833	-86,077	-1,776	-3,102,513

	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
2019	€'000	€'000	€'000	€'000	€'000	€'000
As at 1 Jan	0	-1,192,935	-275,832	-90,233	-1,189	-1,560,189
Remeasurement of the net liability in equity = actuarial gains (+) and losses (-) of the ongoing business year	123,098	-746,964	-193,846	24,578	-388	-793,522
As at 31 Dec	123,098	-1,939,899	-469,678	-65,655	-1,577	-2,353,711

28.9 Net defined benefit liability

	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
2020	€'000	€'000	€'000	€'000	€'000	€'000
As at 1 Jan	-3,126,989	4,318,998	1,391,958	162,622	5,167	2,751,756
Expenses in income statement	-35,332	204,526	81,368	2,775	170	253,507
Retirement benefits paid	98,962	-62,089	-53,479	-6,902	-603	-24,111
Employer contributions	-180,000	0	0	0	0	-180,000
Remeasurement of the net liability in equity = actuarial gains (-) and losses (+) of the ongoing business year	44,408	605,618	78,155	20,422	199	748,802
As at 31 Dec	-3,198,951	5,067,053	1,498,002	178,917	4,933	3,549,954
2019	€'000	€'000	€'000	€'000	€'000	€'000
As at 1 Jan	-2,794,173	3,449,221	1,167,502	189,168	4,882	2,016,600
Expenses in income statement	-51,439	177,875	75,113	4,901	187	206,637
Retirement benefits paid	80,891	-55,062	-46,030	-6,869	-290	-27,360
Employer contributions	-239,170	0	0	0	0	-239,170
Remeasurement of the net liability in equity = actuarial gains (-) and losses (+) of the ongoing business year	-123,098	746,964	193,846	-24,578	388	793,522
Transfers/reconciliation	0	0	1,527	0	0	1,527
As at 31 Dec	-3,126,989	4,318,998	1,391,958	162,622	5,167	2,751,756

28.10 Balance sheet amounts

	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2020	€'000	€'000	€'000	€'000	€'000	€'000
Present value of defined benefit obligations	0	5,067,053	1,498,002	196,205	4,933	6,766,193
Fair value of plan assets	3,198,951	0	0	-17,288	0	-3,216,239
Funding status obligation (+) and asset (-)	-3,198,951	5,067,053	1,498,002	178,917	4,933	3,549,954
Amount not recognised as assets	0	0	0	0	0	0
Net amount of debt items (+) and asset items (-) in the balance sheet	-3,198,951	5,067,053	1,498,002	178,917	4,933	3,549,954
31 Dec 2019	€'000	€'000	€'000	€'000	€'000	€'000
Present value of defined benefit obligations	0	4,318,998	1,391,958	180,808	5,167	5,896,931
Fair value of plan assets	3,126,989	0	0	18,186	0	3,145,175
Funding status obligation (+) and asset (-)	-3,126,989	4,318,998	1,391,958	162,622	5,167	2,751,756
Amount not recognised as assets	0	0	0	0	0	0
Net amount of debt items (+) and asset items (-) in the balance sheet	-3,126,989	4,318,998	1,391,958	162,622	5,167	2,751,756

28.11 Expenses and income recognised in the statement of comprehensive income

	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2020	€'000	€'000	€'000	€'000	€'000	€'000
Interest expense	0	47,165	14,984	1,946	54	64,149
Projected return on plan assets	-35,332	0	0	-195	0	-35,527
Net interest expense	-35,332	47,165	14,984	1,751	54	28,622
Current service cost	0	157,360	66,384	1,025	117	224,886
Expenses in income statement	-35,332	204,525	81,368	2,776	170	253,508
Reversal of the provision for past service cost						-6,065
Interest income from capitalised value						-155
Contributions to the German mutual insurance association						6,298
Payments to defined contribution plans						40,399
- of which contributions to pension insurance						37,517
						293,985
31 Dec 2019		€'000	€'000	€'000	€'000	€'000
Interest expense	0	61,573	20,601	3,678	85	85,937
Projected return on plan assets	-51,439	0	0	-337	0	-51,776
Net interest expense	-51,439	61,573	20,601	3,341	85	34,161
Current service cost	0	116,302	54,512	1,560	102	172,476
Expenses in income statement	-51,439	177,875	75,113	4,901	187	206,637
Reversal of the provision for past service cost						-6,065
Interest income from capitalised value						-116
Contributions to the German mutual insurance association						4,299
Payments to defined contribution plans						38,625
- of which contributions to pension insurance						35,612
						243,380

29 Other provisions

	As at 1 Jan 2020	Utilisation	Reversal	Discounting	Additions	As at 31 Dec 2020	Remaining term more than 1 year
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
Over-recovery of charges	358,544	-145,042	0	0	155,675	369,177	153,100
Personnel	60,228	-8,902	0	696	14,908	66,930	55,346
Re-conversion	18,734	-215	-101	31	80	18,529	15,139
Preserving records	10,820	-943	-723	11	0	9,165	8,375
Miscellaneous	3,570	-1,031	-96	0	1,488	3,931	0
	451,896	-156,133	-920	738	172,151	467,732	231,960

The provision for over-recovery of charges relates to the over-recovery for the past service cost still to be allocated over four years.

For the en-route cost unit, a regulated procedure for determining charges has been in force since 2012. Across Europe, the respective national supervisory authorities lay down binding unit rates according to EU regulations. Consequently, traffic volume and cost changes impact profit and loss. If the values fall short, the DFS Group is authorised and obliged to demand any under-recovery and if the values exceed the relevant thresholds, it is authorised and obliged to return any over-recovery (carry-over). In 2015, the terminal services cost unit was shifted to a performance-based form of regulation. The charges are set by means of a statutory instrument of the Federal Government. For the en-route cost unit, the chances and risks resulting from the differences between planned and actual traffic volume are split between the airspace users and the Group.

The DFS Group participated in several bidding rounds in targeted investments in air traffic management under one of the EU funding programmes. From these grant programmes of the Connecting Europe Facility, the Group acquired grant funding to foster SESAR implementation projects over various terms until 2023. The DFS Group plans to use the grant funding to reduce air navigation services charges and includes the funding in the over-recovery of charges. Grant funding is recognised as accruals and recorded in profit or loss over the useful lives of the underlying property, plant and equipment.

Personnel provisions comprise provisions for early retirement, partial retirement, anniversary payments and recuperation cures (treatments) for air traffic controllers. Actuarial reports are available for early retirement, partial retirement and anniversary obligations.

Up until now, partial retirement obligations were recognised based on individual contractual agreements. The contributions were placed in a fiduciary account. With effect from 1 April 2017, DFS concluded a new collective agreement covering partial retirement with the air navigation services union (GdF) based on the so-called 'block model'. The work to be done over the entire period of the employment relationship under partial retirement is split in such a way that it is carried out in the first half, or block (working phase, *Beschäftigungsphase*). In the second half, or block, the employee is released from work and paid proportionally. The DFS Group recognises provisions for the release phase. Partial retirement obligations are based on a discount rate as at 1 January 2021 of 0.60 percent (previous year: 1.10 percent) and a salary trend of 2.50 percent (previous year: 2.50 percent).

Due dates of future non-discounted settlement values						
	2021	2022	2023	2024	2025	From 2026
	€'000	€'000	€'000	€'000	€'000	€'000
Over-recovery of charges	216,077	17,172	17,150	50,178	17,150	51,450
Personnel	11,584	7,208	5,867	3,139	1,014	38,118
Re-conversion	3,390	0	0	0	0	15,139
Preserving records	790	808	815	820	827	5,105
Miscellaneous	3,931	0	0	0	0	0
	235,772	25,188	23,832	54,137	18,991	109,812

Discount rates (in %) distributed over the respective remaining terms in years						
	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7
2020	-0.44	-0.46	-0.46	-0.42	-0.40	-0.41
2019	-0.35	-0.35	-0.25	-0.25	-0.15	-0.15
	7 to 8	8 to 9	9 to 10	10 to 15	15 to 30	
2020	-0.37	-0.34	-0.27	-0.31	-0.04	
2019	-0.03	0.01	0.10	-0.05	0.42	

Effects of the changes to the discount rate			
	Computation with the interest rate as at 31 Dec 2020	Computation with the interest rate as at 31 Dec 2019	Effects
	€'000	€'000	€'000
Discounted provisions	54,059	54,021	+38
Interest expense	42	1	+41

30 Financial liabilities

	31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
<i>Schuldscheindarlehen</i> (debenture loan)	610,000	610,000	197,500	110,000
Finance lease liabilities	22,062	19,336	23,053	20,695
QTE transaction	20,215	19,121	29,785	22,081
Derivative financial instruments	586	0	705	0
Financial debt from the capital investments of the investment entity	493	0	270	0
	653,356	648,457	251,313	152,776

<i>Schuldscheindarlehen</i> (debenture loan)					
Term	Currency	Nominal value	Nominal interest rate	31 Dec 2020	31 Dec 2019
		€'000		€'000	€'000
2010 to 2020	EUR	87,500	3.007%	0	87,500
2013 to 2023	EUR	110,000	2.308%	110,000	110,000
2020 to 2025	EUR	85,500	0.500%	85,500	0
2020 to 2027	EUR	78,500	0.650%	78,500	0
2020 to 2030	EUR	248,500	0.850%	248,500	0
2020 to 2025	EUR	14,000	0.500%	14,000	0
2020 to 2027	EUR	53,500	0.650%	53,500	0
2020 to 2030	EUR	20,000	0.850%	20,000	0
		697,500		610,000	197,500

The DFS Group issued new *Schuldscheindarlehen* (debenture loan) with a total volume of €500.00 million in August and October 2020. The loans have a term of five, seven and ten years.

In October 2020, the DFS Group repaid a bullet *Schuldscheindarlehen* of €87.50 million.

The QTE transaction with foreign investors was basically terminated. DFS agreed with the remaining contracting parties to keep up the domestic cash flows (for additional disclosures on the QTE transaction see Note 23).

31 Trade payables

	31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
Germany	20,329	0	21,028	0
Abroad	5,795	0	4,064	0
Creditors with debit balances	343	0	184	0
Amounts withheld	605	310	757	332
	27,072	310	26,033	332

Trade payables in foreign currencies amount to €267 thousand (previous year: €139 thousand) on the balance sheet date. Due to the low impact on the results (approx. €3 thousand), there was no currency valuation. Trade payables are regularly secured by means of reservation of title clauses until payment is made in full.

32 Other liabilities

	31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
Staff costs	21,732	0	24,258	0
Outstanding invoices	8,451	0	8,057	0
Amounts owed to Shareholder	7,075	0	9,451	0
Interest payable	3,914	0	3,446	0
Liabilities to investments	1,260	0	1,483	0
Share of en-route charges: German Meteorological Service	678	0	967	0
Liabilities from the capital investments of the investment entity	464	0	1,790	0
Remaining	1,305	0	638	0
Other liabilities (financial)	44,879	0	50,090	0
Staff costs	37,758	0	33,234	0
Amounts owed to tax authorities	15,938	0	16,648	0
Remaining	33,110	14,810	27,128	25,689
Other liabilities (non-financial)	86,806	14,810	77,010	25,689
	131,685	14,810	127,100	25,689

Offsetting of financial assets and liabilities			
	Financial assets (+)	Financial liabilities (-)	Assets (+) and liabilities (-) as reported on the balance sheet
31 Dec 2020	€'000	€'000	€'000
Shareholder	924	-7,999	-7,075
Associated companies			
FCS	6	-1,251	-1,245
Unify	45	0	45
Investments			
GroupEAD	0	-15	-15
31 Dec 2019	€'000	€'000	€'000
Shareholder	622	-10,073	-9,451
Associated companies			
FCS	106	-1,589	-1,483
AEROSENSE	7	0	7
Investments			
GroupEAD	77	-29	48

The fair values of the offset financial assets and liabilities correspond to their carrying amounts. The DFS Group did not receive collateral for the financial assets nor did it provide collateral for the financial liabilities.

33 Tax assets and obligations

	Tax assets		Income tax obligations	
	31 Dec 2020	31 Dec 2019	31 Dec 2020	31 Dec 2019
	€'000	€'000	€'000	€'000
Non-current				
Corporation tax	0	0	11,629	18,092
Trade tax	0	0	7,394	12,777
Foreign taxes	0	0	0	0
Current				
Corporation tax	63,880	73,624	0	0
Trade tax	0	6,076	717	0
Foreign taxes	0	46	0	100
Other taxes	126	81	0	0
	64,006	79,827	19,740	30,969

Additional disclosures

34 Segment reporting

Segment reporting is based on the internal management and reporting systems. Commercial management and reporting have been based on cost units and contribution margins since the start of economic regulation. This enhances the transparency as well as the planning and control of the individual divisions.

Within the scope of segment reporting, the Executive Board as the chief operating decision-maker allocates company funds and assesses the performance of the operating segments. The operating result (operating EBIT) is an important performance indicator for the DFS Group. EBIT is used for resource allocation and to measure the profitability of the segments. Further data are neither collected nor communicated to the chief operating decision-makers.

Regulated business

The main business of the DFS Group (see section 1.2 in the Group management report) is the provision of air navigation services and the directly associated support activities. The DFS Group defines these activities as the 'regulated business'. This is divided into the Control Centre and Tower divisions.

Commercial business

The commercial business comprises all Group activities that are not allocated to the regulated business. The focus is on products and services offered internationally on the free market, namely air navigation services, consultancy services, the sale of air traffic control systems, as well as analysis, simulation and project management activities, and the sale of publications and energy. DFS International Business Services bundles the commercial business and ensures its successive expansion through its investments where it holds a controlling interest directly or indirectly, namely DFS Aviation Services, Air Navigation Solutions, R. Eisenschmidt and Kaufbeuren ATM Training.

The determination of segment data is based on the following premises:

- The assets and liabilities of DFS Energy are included as part of the operating assets in the cost-base for determining charges. Consequently, in the reconciliation to the Group results, the expenses and income of DFS Energy are disclosed separately.
- Financial indicators (IFRS and HGB) are used for the planning and control of the commercial business.

Information on the business segments by cost type			
	Regulated business	Commercial business	Group earnings
2020	€'000	€'000	€'000
Revenues	1,031,451	79,815	1,111,266
Changes in inventory and other own work capitalised	22,829	445	23,274
Other operating income	38,983	468	39,451
Total operating revenues and income	1,093,263	80,728	1,173,991
Material expenses	-6,795	-5,874	-12,669
Employee expenses	-909,693	-63,360	-973,053
Other operating expenses	-134,768	-12,986	-147,754
Depreciation, amortisation and impairments	-96,571	-6,423	-102,994
Total costs	-1,147,827	-88,643	-1,236,470
Earnings before interest and taxes (EBIT)	-54,564	-7,915	-62,479
Financial income	154,656	157	154,813
Of which interest income of the investments accounted for using the equity method	0	209	209
Financial expenses	-188,410	-219	-188,629
Financial result	-33,754	-62	-33,816
Profit (loss) before income taxes	-88,318	-7,977	-96,295
Income taxes	1,768	542	2,310
Earnings for the period (continuing operations)	-86,550	-7,435	-93,985
Shareholder of the parent company	-86,550	-6,116	-92,666
Earnings attributable to minority interests	0	-1,319	-1,319

Information on the business segments by cost type			
	Regulated business	Commercial business	Group earnings
2019	€'000	€'000	€'000
Revenues	1,022,667	87,050	1,109,717
Changes in inventory and other own work capitalised	20,325	-1,737	18,588
Other operating income	46,954	5,798	52,752
Total operating revenues and income	1,089,946	91,111	1,181,057
Material expenses	-6,565	-4,368	-10,933
Employee expenses	-872,535	-62,692	-935,227
Other operating expenses	-139,171	-17,710	-156,881
Depreciation, amortisation and impairments	-104,530	-4,418	-108,948
Total costs	-1,122,801	-89,188	-1,211,989
Earnings before interest and taxes (EBIT)	-32,855	1,923	-30,932
Financial income	212,252	3,219	215,471
Of which interest income of the investments accounted for using the equity method	0	229	229
Financial expenses	-148,645	-1,464	-150,109
Financial result	63,607	1,755	65,362
Profit (loss) before income taxes	30,752	3,678	34,430
Income taxes	3,003	-2,646	357
Earnings for the period (continuing operations)	33,755	1,032	34,787
Shareholder of the parent company	33,755	1,880	35,635
Earnings attributable to minority interests	0	-848	-848

Reconciliation from charges-related result before interest and taxes to IFRS Group earnings before interest and taxes

	31 Dec 2020	31 Dec 2019
	€'000	€'000
Terminal services	-101,233	-76,418
En-route services	68,679	46,128
Commercial business	-3,027	-3,131
Other regulated and commercial business	4,020	4,550
Charges-related earnings before interest and taxes (EBIT)	-31,561	-28,871
Occupational pensions from a charges-related perspective	576,248	211,998
Occupational pensions under IFRS	-229,062	-178,548
Change in equity relevant to charges (closing deficit)	-374,064	-40,564
Minority interest	-2,167	4,052
Consolidation/reconciliation	-1,873	1,001
Group earnings before interest and taxes under IFRS	-62,479	-30,932

Information on important external customers

	2020	2020	2019	2019
	€'000	In %	€'000	In %
DFS total revenues ¹²⁾	519,377	100.00	1,082,941	100.00
Deutsche Lufthansa	57,103	10.99	166,638	15.39
Federal Ministry of Defence (BMVg)	52,000	10.01	52,902	4.89
Ryanair	27,473	5.29	65,649	6.06
Eurowings	23,836	4.59	70,012	6.46
Federal Ministry of Transport and Digital Infrastructure (BMVI)	22,436	4.32	23,117	2.13
EAT Leipzig	16,472	3.17	15,350	1.42
KLM Royal Dutch Airlines	15,809	3.04	29,744	2.75
Wizz Air Hungary	14,924	2.87	25,905	2.39
Qatar Airways	13,914	2.68	16,347	1.51
Turkish Airlines	12,656	2.44	23,595	2.18

¹²⁾ Comprising terminal and en-route revenues as well as revenues from military operational air traffic

35 Cash flow statement

The cash flow statement shows the change in liquid funds between two balance sheet dates to show the movements in cash and cash equivalents for the DFS Group. Cash inflows and outflows are divided into operating, investing and financing activities and only show cash flows from continuing operations. There are no discontinued operations.

Short overview of the consolidated cash flow statement		
	31 Dec 2020	31 Dec 2019
	€'000	€'000
Cash outflow/inflow from operating activities	-416,068	77,239
Cash outflow from investing activities	-80,595	-118,029
Cash inflow from financing activities	413,305	34,081
Changes to cash in the business year	-83,358	-6,709
Cash and cash equivalents at the beginning of the year	1,125,546	1,132,255
Cash and cash equivalents at the end of the year	1,042,188	1,125,546

Cash inflow from operating activities was calculated using the indirect method by adjusting net income for changes in inventory, receivables, other assets and borrowings as well as depreciation and amortisation and other non-cash income and expenses. The cash flows from income taxes relate to all three of the above areas of activity. However, owing to the time that would be involved in assigning the cash flows from income taxes to the individual activities, for the purpose of the cash flow statement they were allocated to operating activities.

The DFS Group does not present the cash flows from operating activities according to the direct method (IAS 7.19).

Cash outflows from investing and financing activities are presented using the direct method.

Cash and cash equivalents at the end of the year are made up as follows:

	31 Dec 2020	31 Dec 2019
	€'000	€'000
Financial assets	790,177	758,948
Cash in hand and cheques	46	31
Cash at bank	251,965	366,567
Cash and cash equivalents at the end of the year	1,042,188	1,125,546

36 Financial instruments

Financial assets by measurement category						
	Carrying amount	Amortised cost	Assets at fair value through profit or loss	Equity instruments at fair value through other comprehensive income	Fair value	Level
31 Dec 2020	€'000	€'000	€'000	€'000	€'000	
Financial assets at fair value						
Financial assets	790,177		790,177		790,177	2
Investments	15,487			15,487	15,487	3
Financial assets not at fair value						
Loans	6,501	6,501			6,501	3
Trade receivables	115,732	115,732			115,732	3
Under-recovery	521,127	521,127			521,127	3
Receivables from EU grant funding	50,532	50,532			50,532	3
QTE transaction	19,989	19,989			19,989	2
Receivables from employees	19,011	19,011			19,011	3
Trusteeship (Treuhandverein)	7,214	7,214			7,214	2
Capitalised value	6,096	6,096			6,096	2
Interest receivables	915	915			915	2
Receivables from investments	45	45			45	3
Other financial assets – Level 3	2,230	2,230			2,230	3
Liquid funds	252,011	252,011			252,011	2
	1,807,067	1,001,403	790,177	15,487	1,807,067	

Financial assets by measurement category						
	Carrying amount	Amortised cost	Assets at fair value through profit or loss	Equity instruments at fair value through other comprehensive income	Fair value	Level
31 Dec 2019	€'000	€'000	€'000	€'000	€'000	
Financial assets at fair value						
Financial assets	758,948		758,948		758,948	2
Investments	17,098			17,098	17,098	3
Financial assets not at fair value						
Loans	7,338	7,338			7,338	3
Trade receivables	152,245	152,245			152,245	3
QTE transaction	29,371	29,371			29,371	2
Receivables from EU grant funding	49,011	49,011			49,011	3
Capitalised value	5,675	5,675			5,675	2
Trusteeship (<i>Treuhandverein</i>)	14,531	14,531			14,531	2
Interest receivables	1,274	1,274			1,274	2
Receivables from investments	55	55			55	3
Other financial assets – Level 3	1,922	1,922			1,922	3
Liquid funds	366,598	366,598			366,598	2
	1,404,066	628,020	758,948	17,098	1,404,066	

Valuation technique

Cost approach: For loans to investments, the DFS Group assumes they can be sold for at least their carrying amounts in the short term and sets their fair values at the same level. The fair values of the investments can be calculated reliably and backed up with financial calculations. The Group values the stake in FCS Flight Calibration Services using the equity method, with the total carrying amount reflecting the proportionate changes in equity.

Due to the predominantly short-term nature of trade receivables, other receivables and assets as well as of liquid funds, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The Group therefore assumes that these assets can be sold for at least their carrying amounts in the short term and sets their fair values at the same level.

Market approach: The fair values of securities and financial assets are determined completely or partially using recognised valuation models or the valuations of third parties based on the market conditions prevailing at the balance sheet date (interest and exchange rates) using external sources or market prices. In determining the fair value of derivatives, compensating effects from the primary transaction (pending business or anticipated transactions) are excluded.

Present value method: The fair value of the QTE transaction is determined based on discounting future expected cash flows.

Unobservable inputs

Discount rate, nominal value of investments as well as other receivables and assets

Observable inputs

Security prices, market interest rates

Relationship between inputs and fair value

The estimated fair value would increase if

- the risk-adjusted discount rate was lower
- the nominal values were higher
- the security prices were higher
- the market interest rates were higher

Reconciliation of the fair values of level 2 and 3

	Level 2	Level 3	Level 2	Level 3
	31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
	€'000	€'000	€'000	€'000
As at 1 Jan	1,176,397	227,669	1,179,624	233,919
Ongoing gains (+) and losses (-)	8,874	-2,541	88,966	-6,432
Gains (+) and losses (-) recognised in other comprehensive income	0	0	0	0
Additions (+) and disposals (-)	-108,869	505,537	-92,193	182
Transfers in and out of levels	0	0	0	0
As at 31 Dec	1,076,402	730,665	1,176,397	227,669

Financial liabilities by measurement category					
	Carrying amount	Amortised cost	Liabilities at fair value through profit or loss	Fair value	Level
31 Dec 2020	€'000	€'000	€'000	€'000	
Financial liabilities at fair value					
Derivative financial instruments	586		586	586	2
Financial liabilities not at fair value					
<i>Schuldscheindarlehen</i> (debenture loan)	610,000	610,000		661,646	2
Finance lease liabilities	22,062	22,062		22,062	3
QTE transaction	20,215	20,215		20,215	2
Financial debt from the capital investments of the investment entity	493	493		493	2
Trade payables	27,072	27,072		27,072	3
Staff costs	21,732	21,732		21,732	3
Outstanding invoices	8,451	8,451		8,451	3
Amounts owed to Shareholder	7,075	7,075		7,075	3
Interest payable	3,914	3,914		3,914	2
Liabilities to investments	1,260	1,260		1,260	3
Share of en-route charges: German Meteorological Service	678	678		678	3
Liabilities from the capital investments of the investment entity	464	464		464	3
Other financial liabilities – Level 3	1,305	1,305		1,305	3
	725,307	724,721	586	776,953	

Financial liabilities by measurement category					
	Carrying amount	Amortised cost	Liabilities at fair value through profit or loss	Fair value	Level
31 Dec 2019	€'000	€'000	€'000	€'000	
Financial liabilities at fair value					
Derivative financial instruments	705		705	705	2
Financial liabilities not at fair value					
<i>Schuldscheindarlehen</i> (debenture loan)	197,500	197,500		208,836	2
QTE transaction	29,785	29,785		29,785	2
Financial debt from the capital investments of the investment entity	270	270		270	2
Finance lease liabilities	23,053	23,053		23,053	3
Trade payables	26,033	26,033		26,033	3
Staff costs	24,258	24,258		24,258	3
Amounts owed to Shareholder	9,451	9,451		9,451	3
Liabilities to investments	1,483	1,483		1,483	3
Outstanding invoices	8,057	8,057		8,057	3
Interest payable	3,446	3,446		3,446	2
Liabilities from the capital investments of the investment entity	1,790	1,790		1,790	3
Share of en-route charges: German Meteorological Service	967	967		967	3
Other financial liabilities – Level 3	638	638		638	3
	327,436	326,731	705	338,772	

Valuation technique

Cost approach: Due to the predominantly short-term nature of trade payables and other liabilities, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The DFS Group assumes that the fair values of these liabilities are at least equal to the settlement value from a current obligation.

Market approach: The fair values of debenture loans and financial debt are determined completely or partially using recognised valuation models or the valuations of third parties based on the market conditions prevailing at the balance sheet date (interest and exchange rates) using external sources or market prices. In determining the fair value of derivatives, compensating effects from the primary transaction (pending business or anticipated transactions) are excluded. The fair value of the bonds is determined using market listings on public markets.

Present value method: The fair value of finance leases and the QTE transaction is determined by discounting future expected cash flows using prevailing market interest rates.

Unobservable inputs

Discount rate, settlement value of other liabilities and liabilities

Observable inputs

Exchange prices, exchange rates, market interest rates

Relationship between inputs and fair value

The estimated fair value would increase if

- the risk-adjusted discount rate was lower
- the settlement values were higher
- the exchange prices were higher
- the exchange rates were higher
- the market interest rates were higher

Reconciliation of the fair values of level 2 and 3

	Level 2	Level 3	Level 2	Level 3
	31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
	€'000	€'000	€'000	€'000
As at 1 Jan	243,042	95,730	255,599	78,003
Ongoing gains (+) and losses (-)	0	0	0	0
Gains (+) and losses (-) recognised in other comprehensive income	0	0	0	0
Additions (+) and disposals (-)	443,812	-5,631	-12,557	17,727
Transfers in and out of levels	0	0	0	0
As at 31 Dec	686,854	90,099	243,042	95,730

Net results of financial instruments by measurement category				
	Financial assets			Financial liabilities
	Amortised cost	At fair value through profit or loss	At fair value through other comprehensive income	Amortised cost
31 Dec 2020	€'000	€'000	€'000	€'000
Income (+) from investments			602	
Losses (-) from foreign currency translation	-699	-16,492		
Gains (+) from remeasurement	332	6,735		
Expenses (-) from impairments	-2,529			
Interest income (+)	1,345	8,510		
Interest expense (-)	-23	-543		-6,655
Other financial expenses (-)	-3,104	-1,040		-87
Gains (+) and losses (-)	-4,678	-2,830	602	-6,742
Recognised directly in other comprehensive income	0	0	0	0
31 Dec 2019	€'000	€'000	€'000	€'000
Income (+) from investments			551	
Gains (+) from foreign currency translation	838	8,440		
Gains (+) from remeasurement	7,172	73,830		
Expenses (-) from impairments	-6,432			
Interest income (+)	2,761	13,520		
Interest expense (-)	-68	-687		-6,009
Other financial expenses (-)	-1,703	-1,905		-80
Gains (+) and losses (-)	2,568	93,198	551	-6,089
Recognised directly in other comprehensive income	0	0	0	0

37 Derivative financial instruments

The DFS Group is exposed to market risks in the form of interest and currency fluctuations. The Group uses derivative financial instruments to manage these risks.

In addition, the DFS Group is exposed to default risk. To minimise this risk, it concludes derivative transactions exclusively with its core bankers, who have good credit ratings.

Speculative transactions with derivative instruments where there is no underlying transaction are forbidden.

Derivative financial instruments					
	Remaining term	Nominal volume	Fair value	Nominal volume	Fair value
		31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
		€'000	€'000	€'000	€'000
Positive fair value					
Futures	Up to 1 year	6,491	6,491	3,341	3,341
		6,491	6,491	3,341	3,341
Negative fair value					
Futures	Up to 1 year	-586	-586	-705	-705
		-586	-586	-705	-705

The futures were concluded as part of the capital investments through the investment entity and are due within six months.

38 Financial risks

Financial risks arise in the form of liquidity risks, default risks and market price risks. The DFS Group provides disclosures in the Group management report in section 6.2.2 on the required qualitative disclosures under IFRS 7 about the type and means by which risks from financial instruments arise as well as the procedures for the management of these risks. The objective is to avoid new, and minimise existing, risks. The Group continuously monitors and analyses the events on the financial markets in a critical dialogue with its core banks and the rating agency to reassess existing strategies and develop new strategies.

The assessment of the consolidated financial risks of the DFS Group is given by the rating awarded by the rating agencies.

Ratings			
	Long-term	Short-term	Outlook
Standard & Poor's	AAA	A-1+	Stable

38.1 Liquidity risks

Liquidity risk describes the risk that the DFS Group may not be in the position to settle its financial liabilities as contractually required through the delivery of cash or other financial assets. The Group's objective in managing liquidity is to ensure that, under both normal and adverse conditions, sufficient cash and cash equivalents are available to meet payment obligations as they fall due without incurring unacceptable losses or damaging the reputation of the Group.

The DFS Group aims to maintain a level of cash and cash equivalents that exceeds the expected cash outflows from financial liabilities over the next 90 days. The Group has cash and cash equivalents of €251.01 million at the end of the business year, which it can use to service current financial liabilities of approximately €45.21 million. It also regularly monitors the expected cash inflows from trade receivables together with the expected cash outflows from trade payables over the next 90 days. Accordingly, the DFS group expects to receive payments of €115.77 million in the next three months from the receivables portfolio as at 31 December 2020. This also includes receivables from the en-route area for the flight months February to May 2020, which were deferred by EUROCONTROL and will be settled by airspace users in the business year 2021. The Group expects to make payments of approximately €26.69 million for trade payables in the first quarter of 2021.

The DFS Group initiated the following measures to address potential future liquidity constraints that could arise from the COVID-19 pandemic:

- In August and October 2020, the Group issued new *Schuldscheindarlehen* (debenture loan) with a total volume of €500.00 million. They have terms of five, seven and ten years respectively and are subject to fixed interest rates of 0.50, 0.65 and 0.85 percent.
- At an extraordinary shareholder meeting in January 2021, the Shareholder of DFS decided to increase the share capital by €300.00 million in return for the issue of 3.00 million shares.

In addition, the Group has a guaranteed credit line of €15.00 million, of which €4.15 million was utilised in the business year.

The Standard & Poor's rating remains unchanged with a rating of AAA (long term) and A-1+ (short term). Accordingly, the DFS Group assumes that, if necessary, it will be able to obtain additional financing from existing lenders at market interest rates comparable to those of loans already taken out.

Maturities of undiscounted principal and interest payments from financial liabilities					
	Up to 3 months	4 to 12 months	2 to 5 years	More than 5 years	Total
31 Dec 2020	€'000	€'000	€'000	€'000	€'000
Non-derivative financial liabilities					
<i>Schuldscheindarlehen</i> (debenture loan)	0	0	209,500	400,500	610,000
Interest	2,539	3,638	23,266	14,551	43,994
Finance lease liabilities	2,726	0	0	19,336	22,062
QTE transaction	1,094	0	19,121	0	20,215
Financial debt from the capital investments of the investment entity	493	0	0	0	493
Trade payables	26,695	67	309	1	27,072
Other liabilities	37,879	7,000	0	0	44,879
Derivative financial liabilities					
Derivatives	586	0	0	0	586
	72,012	10,705	252,196	434,388	769,301
31 Dec 2019	€'000	€'000	€'000	€'000	€'000
Non-derivative financial liabilities					
<i>Schuldscheindarlehen</i> (debenture loan)	0	87,500	110,000	0	197,500
Interest	2,538	2,631	7,617	0	12,786
QTE transaction	7,704	0	22,081	0	29,785
Finance lease liabilities	2,334	24	24	20,671	23,053
Financial debt from the capital investments of the investment entity	270	0	0	0	270
Trade payables	25,584	117	332	0	26,033
Other liabilities	42,912	7,178	0	0	50,090
Derivative financial liabilities					
Derivatives	705	0	0	0	705
	82,047	97,450	140,054	20,671	340,222

38.2 Default risks

The DFS Group is exposed to default risks from financial receivables that result from the possible default on the obligations of a party to a contract. The maximum value equals the positive fair value or market value of the financial instrument.

Default risk by category	31 Dec 2020 €'000	31 Dec 2019 €'000
Amortised cost	1,001,403	628,020
At fair value through profit or loss	790,177	758,948
At fair value through other comprehensive income	15,487	17,098
	1,807,067	1,404,066

With the exception of trade receivables, there are no financial assets that were overdue or impaired. Trade receivables are continuously monitored and are written down as necessary to the amount that could be recovered as soon as information on the insolvency of customers became available. The Group demands security deposits from customers with relevant sales volumes when defined warning thresholds are exceeded. In addition, there are no indications that the debtors whose receivables are overdue will not be able to fulfil their obligations.

As regards financial investing, the Group only enters into transactions with counterparties who either have a long-term rating of at least A+ (Standard & Poor's) or A1 (Moody's), short-term A-2 (Standard & Poor's) or P-2 (Moody's), or a correspondingly high creditworthiness or other form of collateral.

Business dealings with a select group of core banks are conducted using uniform standards and existing reciprocal cash flows are continuously improved.

38.3 Market risks

Market risk is defined as the risk that the fair values or future cash flows of a primary or derivative financial instrument change due to fluctuations in market prices (interest rate risk and currency risk). Interest rate risk arises primarily when refinancing with variable rates. Currency risks result from exchange rate fluctuations for transactions in foreign currencies.

Interest rate risk results mainly from the sensitivity of financial instruments. Liquidity is ensured by means of the money market and capital market programme with short maturities and fixed and variable interest rates as well as from fund assets not protected against insolvency. The use of derivative financial instruments, such as interest rate swaps and cross-currency interest rate swaps, secures fixed interest rates and thus limits interest rate risk. The changes in interest rates therefore have no material impact on the result or equity.

The obligation and plan assets for DFS Group occupational pensions are exposed to interest rate risk. The discount rate for pensions and similar obligations is based on the market yields for high-quality fixed-rate corporate bonds. The continued decline in the level of interest rates would lead to a further increase in the obligation. The low returns that can currently be earned on the market mean that the pension plan assets cannot yield substantial income, which reduces the speed at which the assets for occupational pensions may grow.

Interest rate risk for financial liabilities			
	31 Dec 2020	31 Dec 2019	
	€'000	€'000	
Fixed-rate debenture loans	610,000	197,500	
	610,000	197,500	

Foreign exchange risks that impact the balance sheet arise due to monetary items that are not in the functional currency. As the primary monetary financial instruments are held mainly in the functional currency or converted into the functional currency by means of derivatives, changes in exchange rates therefore have no material impact on the result or equity.

Net risk by currency				
	31 Dec 2020	31 Dec 2020	31 Dec 2019	31 Dec 2019
	Nominal	Value at	Nominal	Value at
	value	reporting date	value	reporting date
	\$'000	€'000	\$'000	€'000
Primary transactions	430	352	259	232
Derivative financial instruments	0	0	0	0
Planned hedges	0	0	0	0
	S\$'000	€'000	S\$'000	€'000
Primary transactions	0 ¹³⁾	0	0	0
Derivative financial instruments	0	0	0	0
Planned hedges	0	0	0	0
	£'000	€'000	£'000	€'000
Primary transactions	0	0	1	2
Derivative financial instruments	0	0	0	0
Planned hedges	0	0	0	0
¹³⁾ Under S\$1 thousand				

The value-at-risk analysis conducted determines the currency and interest risk, which is based on a sensitivity model used for internal planning and control. Through historical simulations of statistical time series on relevant past financial market data, scenarios are extrapolated into the future and used to compute simulated changes in market values for financial instruments. The analysis shows the absolute decline which will not be exceeded with a probability of 95.00 percent when the holding period is ten days.

Value-at-risk				
	31 Dec 2020 Foreign exchange risk €'000	31 Dec 2020 Interest rate risk €'000	31 Dec 2019 Foreign exchange risk €'000	31 Dec 2019 Interest rate risk €'000
By currency				
USD (\$)	8	0	14	0
EUR (€)	0	0	0	2,067
By line item				
Money market	0	0	0	19
Capital market	0	0	0	2,089
Hedge	8	0	14	3
Overall risk	Value at year end €'000	Highest value €'000	Lowest value €'000	Annual average €'000
2020	8	2,100	8	275
2019	2,078	2,319	23	616

39 Capital management

As regards commercial considerations, the capital of the Group is managed first of all from a charges-related/regulatory perspective. This perspective takes additional elements into account when contrasted with the accounting principles under IFRS:

- Consideration of the catch-up effects from the conversion to IFRS not included in the financial statements
- Inclusion of the model to finance occupational pensions approved by the regulatory authority
- Law on the Implementation of the Mutual Assistance Directive as well as on the Change to Tax Regulations (*Amtshilferichtlinie-Umsetzungsgesetz*)
- Integration of DFS Energy
- Integration of the commercial business
- Consideration of uncontrollable costs

The integration of the commercial business improves the quality of the information about intra-Group relationships and allows a transparent separation between the regulated and commercial business. The commercial business should make an above-average contribution to net income as its profits are not subject to regulation. The aim of capital management is to maintain operational effectiveness, maintain financial liquidity and, in connection with this, to build up or stabilise equity. To this end, the DFS Group aligns its planning and control with the regulatory requirements of the European Commission.

The 'regulated' perspective includes the future flow of charges approved by the supervisory authorities and delivers a clear picture of the capital structure, debts and cash flows. Assets and liabilities that are subject in full or in part to economic regulation are transferred to a regulatory asset base, i.e. an accounting of the results and financial position from the perspective of economic regulation.

This view of the DFS Group is supported by the supplement to Section 31b(3) of the German Aviation Act (LuftVG). This regulation obliges the Group to determine its taxes based on the charges-related result.

Reconciliation and indicators of the regulated business		
	31 Dec 2020	31 Dec 2019
	€'000	€'000
Group equity recognised on the balance sheet	-2,262,259	-1,419,247
Catch-up effects not yet accounted for	69,061	136,137
Deferred taxes on this amount	-7,178	-6,542
Occupational pensions from a charges-related perspective	2,523,631	2,213,664
Change in equity relevant to charges (closing deficit)	888,838	410,810
Consolidation/reconciliation	-13,566	-17,599
Regulated equity	1,198,527	1,317,223
Equity ratio	19.81%	26.56%
Return on equity	-7.84%	2.64%
Net loss/income	-93,985	34,787
EBIT	-62,479	-30,932
Borrowings	4,852,686	3,641,388
Debt ratio	80.19%	73.44%
Return on total assets	-1.55%	0.70%
Leverage ratio ¹⁴⁾	-6.43%	-17.63%
Liquid funds	252,011	366,598
Financial assets	790,177	758,948
Non-current financial liabilities	648,457	152,776
of which QTE transaction	[19,121]	[22,081]
Current financial liabilities	4,899	98,537
of which QTE transaction	[1,094]	[7,704]
Financial net assets (+)	388,832	874,233

¹⁴⁾ If the sign is negative, there is overcompensation by liquid funds.

40 Contingent liabilities and other financial obligations

40.1 Contingent liabilities

Maturities of sureties					
	Up to 1 year	2 to 5 years	More than 5 years	Indefinite term	Total
	€'000	€'000	€'000	€'000	€'000
2020	2,262	265	0	1,626	4,153
2019	1,974	366	0	434	2,774

No provisions were recognised for the obligations shown because the risk of use was deemed to have a low probability. There are no uncertainties as regards the amount or maturity of the contingent liabilities.

Sureties relate to guarantees for prepayments, warranties, contract fulfilment and tender guarantees for simulation, radar data and air navigation facilities. At the end of the business year, there were no obligations for the issuance or endorsement of guarantees covering bills of exchange and cheques.

40.2 Other financial obligations

Due dates of other financial obligations				
	Up to 1 year	2 to 5 years	More than 5 years	Total
31 Dec 2020	€'000	€'000	€'000	€'000
Intercompany credit lines to associated companies	1,500	0	0	1,500
of which taken up	0	0	0	0
Capital expenditure commitments for				
- intangible assets	16,805	19,732	0	36,537
- property, plant and equipment	48,090	18,981	2,814	69,885
- material costs	61,466	44,852	616	106,934
- rental, leasing, tenancy	1,822	1,285	143	3,250
Bank guarantee	0	10,000	0	10,000
	129,683	94,850	3,573	228,106
31 Dec 2019	€'000	€'000	€'000	€'000
Intercompany credit lines to associated companies	1,500	0	0	1,500
of which taken up	0	0	0	0
Capital expenditure commitments for				
- intangible assets	27,045	18,740	0	45,785
- property, plant and equipment	28,188	28,094	3,978	60,260
- material costs	71,240	48,896	1,168	121,304
- rental, leasing, tenancy	1,584	1,476	1,310	4,370
Bank guarantee	0	10,000	0	10,000
	129,557	107,206	6,456	243,219

No provisions were recognised for the obligations shown because the risk of use was deemed to have a low probability. No uncertainties exist as regards the amount or maturity of the other financial obligations.

To cover liquidity needs, the associated company was granted an intercompany credit line which can be taken up daily as part of the cash pool. By doing so, the Group optimises its conditions for cash investments and loans and exploits the advantages of a central, systematic financial planning.

Capital expenditure obligations relate to the contractual obligations for the purchase of intangible assets as well as property, plant and equipment.

41 Contingent assets

There are three separate abstract acknowledgements of debt (*abstrakte Schuldanerkenntnisse* – a standard German law acknowledgement of a borrower’s indebtedness) between DFS and FCS:

Effective from	26 April 2006	29 September 2008 and 6 October 2008, respectively	21 August 2018 / 24 September 2018, respectively
Collateral	Registration of a charge The grant for cancellation of the registered charge was notarised at the beginning of 2020.	Registration of a charge	Registration of a charge
Legal basis	Section 1 LuftFzgG (Law on Rights regarding Aircraft – <i>Gesetz über Rechte an Luftfahrzeugen</i>)	Section 1 LuftFzgG (Law on Rights regarding Aircraft – <i>Gesetz über Rechte an Luftfahrzeugen</i>)	Section 1 LuftFzgG (Law on Rights regarding Aircraft – <i>Gesetz über Rechte an Luftfahrzeugen</i>)
Beneficiary	DFS	DFS	DFS
Object	Hawker Beechcraft Super King Air	Hawker Beechcraft Super King Air	Hawker Beechcraft Super King Air
Serial number	FL-473 D-CFMD	FL-626 D-CFME	FL-1156 D-CFMF
Local Court	Braunschweig	Braunschweig	Braunschweig
Registration	22 August 2006	16 September 2009	29 October 2019
Deletion	14 April 2020	--	--
Basis	Loan agreement dated March 2006	Loan agreement dated September 2008 / October 2008	Loan agreement dated August 2018 / September 2018
Contract partner(s)	DFS IBS and FCS	DFS IBS and FCS	DFS IBS and FCS
Loan 1	€5.50 million for the aeroplane FL-473 D-CFMD with a term until 31 December 2022	€4.30 million for the aeroplane FL-626 D- CFME with a term until 31 December 2025	€5.56 million for the aeroplane FL-1156 with a term until 31 December 2033
Loan 2	€3.00 million for the flight inspection system (type Aerodata AeroFIS) with a term until 31 December 2016	€1.70 million for the flight inspection system (type Aerodata AeroFIS) with a term until 30 December 2019	
Miscellaneous	The loan for the aeroplane is collateralised over its entire maturity by an abstract acknowledgement of debt in favour of DFS by means of a liability of €8.50 million. €7.10 million of the volume of the loan have been taken up.	The loan for the aeroplane is collateralised over its entire maturity by an abstract acknowledgement of debt in favour of DFS by means of a liability of €6.00 million. €5.20 million of the volume of the loan have been taken up.	The loan for the aeroplane is collateralised over its entire maturity by an abstract acknowledgement of debt in favour of DFS by means of a liability of €5.56 million. The loan sum has been called up in full.

42 Post-balance-sheet-date events

- After eight years as Chairperson of the Executive Board of DFS, Prof Klaus-Dieter Scheurle left the company on 31 December 2020. His successor is Mr Arndt Schoenemann. He joins DFS from the aircraft supplier Liebherr-Aerospace Lindenberg GmbH.
- At an extraordinary shareholder meeting on 22 January 2021, the Shareholder of DFS resolved to increase the share capital by €300.00 million from €755.28 million to €1,055.28 million in return for the issue of 3.00 million shares with a nominal value of €100.00 each and undertook to make the payment. This payment was made in February 2021.
- The Executive Board and the air navigation services union GdF were able to agree on a comprehensive package of measures valid from 2021 under the conditions of the COVID-19 pandemic. Thus, a new collective agreement relating to remuneration was concluded for the years 2021 to 2024, the expired corona collective agreement was extended with slight modifications, an additional partial retirement model was introduced and the training obligation from the collective agreement on capacity planning (KapaTV) was adjusted to reflect current developments in air transport for the period 2021 to 2023.
- Due to the progressive spread of the coronavirus, increasingly restrictive countermeasures are being taken both nationally and globally, which have impacted nearly all sectors.

The DFS Group saw no additional post-balance-sheet-date events of material importance, whether individually or as a group, which impact the results and financial position of the Group.

43 Independent auditor's fees

Total fees of the auditor under Section 314(1)(9) of the German Commercial Code (HGB)		
	31 Dec 2020	31 Dec 2019
	€'000	€'000
Audit of the annual financial statements	165	197
Other assurance services	97	37
Tax advice	9	6
Other services	8	370
	279	610

44 Service concession arrangements

Under Section 27c of the German Aviation Act (LuftVG), the DFS Group is obliged to perform its sovereign tasks (see section 1.2 in the Group management report). The details of these tasks are regulated by an indefinite framework agreement with the Federal Republic of Germany.

The law and the framework agreement authorise the Group as the current entrusted air navigation service provider to require the airport operators under Section 27d of the German Aviation Act (LuftVG) to:

- establish and maintain the necessary facilities and take the necessary structural measures in these facilities; make the necessary facilities available and allow cables to be laid, connected and maintained on the premises.
- enable the air navigation services personnel to use the infrastructure at aerodromes.
- ensure that the buildings and rooms made available by the aerodrome operator are provided with power, thermal energy, heating and air-conditioning as well as perform other utility services and ensure that waste disposal services are rendered.

In return, the Group reimburses the airport operators for these costs.

Under Section 31b(1) of the German Aviation Act (LuftVG), the DFS Group is alone entrusted with the performance of the services outlined in Section 27c(2)(1)(1) LuftVG (supplemented by the German Ordinance on Terminal Charges of the Air Navigation Services (FSAAKV)). If another air navigation service provider is entrusted with the services outlined in Section 27c(2)(1)(2)-(5) LuftVG, the legal and contractual rights and obligations transfer to this air navigation service provider.

Charges levied are the main source of revenues at the DFS Group and they should cover the planned costs.

44.1 Control Centre division

Since 1 January 2012, the European Commission has regulated en-route services by means of a performance scheme for air navigation services and network functions. It has laid down performance targets and alert thresholds for the whole European Union for the areas of safety, environment, capacity and cost-efficiency for one reference period. Each reference period comprises five years. To gather experience in the introductory phase, the first reference period was limited to three years (2012-2014).

The national supervisory authority, the Federal Supervisory Authority for Air Navigation Services (BAF), then draws up a performance plan at the national or functional airspace block level that is aligned with the performance targets of the European Union. Upon proposal of the national supervisory authorities, Member States adopt their performance plans and communicate them to the Commission. The Commission evaluates the performance plans and suggests, or takes, corrective measures.

With the start of economic regulation, the business risk for the DFS Group has risen. The cost risks that arise within a reference period impact the profits of the Group directly. However, the traffic risk is spread between the Group and the airspace users. Section 3.1.3 in the Group management report contains information on the split of risks stemming from variances in traffic volume.

The variances are determined by the Federal Supervisory Authority for Air Navigation Services (BAF) and reported to the European Commission and EUROCONTROL. EUROCONTROL checks the differences and submits the adjustments to the representatives of the Member States in the Enlarged Committee for Route Charges. This Committee prepares the adjusted unit rates for en-route services after consultation with the airspace users. These are submitted to the enlarged Commission for final approval.

The Federal Ministry of Transport and Digital Infrastructure (BMVI) publishes the unit rate for en-route services in the Federal Law Gazette on the basis of the German Ordinance on Route Charges of the Air Navigation Services (FSStrKV) and taking into consideration the EU Regulations on a common charging scheme for air navigation services.

44.2 Tower division

Since 2015, terminal services have also been subject to a regime of economic regulation. The Federal Ministry of Transport and Digital Infrastructure (BMVI) lays down a unit rate each year on the basis of the German Ordinance on Terminal Charges of the Air Navigation Services (FSAAKV) and taking into consideration the EU Regulations on a common charging scheme for air navigation services.

To this end, the DFS Group sends the national supervisory authority, the Federal Supervisory Authority for Air Navigation Services (BAF), a preliminary cost estimate for the coming year. The cost estimate is based on the costs of the last business year and the estimates of the cost development in the current and following business year. The unit rate is calculated from the quotient between the planned costs and the planned traffic volume.

45 Related party disclosures

45.1 Related parties – entities

In the normal course of business, services are also rendered to related entities. Group companies render services to the DFS Group as well. Within the Group, there are some billing agreements with reciprocal service provision charged as cost allocations. These extensive delivery and service relationships are conducted at market prices or using the cost-plus method and are no different from the business relationships with other companies.

During consolidation, the DFS Group eliminates the balances and transactions between the ultimate parent company and the consolidated subsidiaries (related parties). These are not disclosed in the Notes.

Outstanding balances			
	Shareholder	Associated companies	Investments
2020	€'000	€'000	€'000
Financial assets		19,384	2,604
Other assets	924	51	0
Other liabilities	-7,999	-1,251	-15
2019	€'000	€'000	€'000
Financial assets		21,776	2,660
Other assets	622	113	77
Other liabilities	-10,073	-1,589	-29

Income (+) and expenses (-)	Shareholder	Associated companies	Investments
2020	€'000	€'000	€'000
Revenues	72,869	326	249
Purchased services		-4,052	
Employee expenses	-7,943		
Other operating expenses		-4,195	-140
Interest income		209	
Income from investments			602
2019	€'000	€'000	€'000
Revenues	73,416	326	206
Purchased services		-3,679	
Employee expenses	-8,531		
Other operating expenses		-3,595	-254
Interest income		229	
Income from investments			551

The DFS Group maintains business relations with the sole controlling Shareholder, the Federal Republic of Germany, and with other companies controlled by it as part of the entrusted sovereign functions for air navigation services. These transactions are conducted at arm's length and are no different from the delivery and service relationships with other companies. DFS avails itself of the exemption in IAS 24.25 and does not disclose information on outstanding balances and transactions with government-related entities.

The DFS Group aims to exert material influence on the Single European Sky (SES) initiative of the European Commission as part of its strategic orientation. To this end, the Group has been an active member of the SESAR Joint Undertaking (SJU) since June 2009, along with other leading organisations. This initiative developed and updated the requirements on air traffic management networks, the most suitable technologies and procedures. Since 2014, the SESAR development process has moved to the long-term phase of technical implementation and the setting up of air traffic management (ATM) procedures (deployment management). As part of a cross-industry partnership, the DFS Group won the contract to plan, coordinate and implement a comprehensive modernisation of European airspace within the scope of the deployment management for the time period 2014 to 2020. The task is financed out of the European funding programme, where a total of roughly €3 billion is earmarked for deployment management. The Group is thus able to influence the introduction of new technologies and benefits from the considerable funding, as well as from the avoidance of incorrect cost allocation and flawed capital expenditures.

45.2 Related parties – persons

Related parties (persons) cover primarily the Executive Board, Level 1 managers, the Supervisory Board and their family members. There were no material or, in their form or character, atypical reportable transactions between the DFS Group and people in key positions of management and their close families that go beyond existing employment, service or purchasing relationships and their contractual compensation. The following contains disclosures on the emoluments of the Executive Board and the Supervisory Board.

46 Organs of the parent company

46.1 Executive Board

Prof Klaus-Dieter Scheurle,
Chairperson and CEO
(until 31 December 2020)

Dirk Mahns,
Chief Operating Officer
(from 1 February 2020)

Friedrich-Wilhelm Menge,
Chief Technology Officer
(from 1 March 2020)

Dr Kerstin Böcker,
Chief Human Resources Officer & Labour Director
(from 15 August 2020)

See section 1.3 in the Group management report for the distribution of responsibilities of the Executive Board.

Payments due in the short term for members of the Executive Board			
	Fixed components (including benefits in kind)	Performance- related components	Total emoluments
2020	€'000	€'000	€'000
Prof Klaus-Dieter Scheurle (Chairperson until 31 December 2020)	343	166	509
Dirk Mahns (from 1 February 2020)	233	0	233
Friedrich-Wilhelm Menge (from 1 March 2020)	210	0	210
Dr Kerstin Böcker (from 15 August 2020)	104	0	104
Robert Schickling (until 31 January 2020)	24	145	169
Dr Michael Hann (until 13 February 2020)	37	0	37
	951	311	1,262

Payments due in the short term for members of the Executive Board			
	Fixed components (including benefits in kind)	Performance- related components	Total emoluments
2019	€'000	€'000	€'000
Prof Klaus-Dieter Scheurle (Chairman)	340	157	497
Robert Schickling	292	136	428
Dr Michael Hann	299	136	435
	931	429	1,360

Post-employment benefits			
	Pension benefits	Pension payments	Expenses for pension benefits earned in the current year¹⁵⁾
2020	€'000	€'000	€'000
Prof Klaus-Dieter Scheurle (Chairman)	2,704	0	345
Dirk Mahns	1,949	0	0
Friedrich-Wilhelm Menge	209	0	0
Dr Kerstin Böcker	62	0	0
Former Managing Directors	22,322	1,003	616
	27,246	1,003	961
2019	€'000	€'000	€'000
Prof Klaus-Dieter Scheurle (Chairman)	2,240	0	315
Robert Schickling	3,096	0	148
Dr Michael Hann	1,996	0	265
Former Managing Directors	15,938	796	264
	23,270	796	992

¹⁵⁾ Service cost and interest cost

The DFS Group did not grant any advance payments, loans or benefits to members of the Executive Board or former Managing Directors on their termination. In addition, it paid no remuneration from consultancy or service contracts. There were no other long-term benefits due or share-based compensation.

46.2 Supervisory Board

Shareholder representatives

Dr Tamara Zieschang

Chairperson

State Secretary

Federal Ministry of Transport and Digital Infrastructure (BMVI)

(Supervisory Board member from 26 February 2020, Chairperson from 28 April 2020)

Dr Martina Hinricher

Ministerialdirektorin (retired)

(Supervisory Board member and Chairperson until 25 February 2020)

Frank Best

Colonel (G.S.)

Federal Ministry of Defence (BMVg)

(Supervisory Board member until 17 March 2020)

Carmen von Bornstaedt-Radbruch

Ministerialrätin (retired)

Antje Geese

Ministerialdirigentin

Federal Ministry of Transport and Digital Infrastructure (BMVI)

Armin Havenith

Colonel (G.S.)

Federal Ministry of Defence (BMVg)

(Supervisory Board member from 18 March 2020)

Dr Angelika Kreppein

Regierungsdirektorin

Federal Ministry of Finance (BMF)

Dr Carl-Stefan Neumann

Managing Director

Carl-Stefan Neumann Advisory & Investments GmbH

Staff representatives

Sabrina Leitzbach

Deputy Chairperson

Air traffic controller

(Deputy Chairperson from 17 December 2020)

Markus Siebers

Air traffic controller

(Deputy Chairperson until 16 December 2020)

Oktay Kaya

Chairperson Central Staff Council

(Supervisory Board member from 18 January 2020)

Peter Schaaf

Chairperson Central Staff Council

Air traffic controller

(Supervisory Board member until 17 January 2020)

André Vöcking

Air navigation services engineer

Andrea Wächter

Head of Hamburg Tower

Jörg Waldhorst

Senior expert aviation

In the business year, there were four scheduled ordinary meetings and two extraordinary meetings.

Remuneration of the Supervisory Board	31 Dec 2020 €'000	31 Dec 2019 €'000
Frank Best	0.00	3.10
Carmen von Bornstaedt-Radbruch	4.00	2.40
Antje Geese	5.10	3.10
Armin Havenith	4.30	0.00
Dr Martina Hinricher	1.00	3.50
Okday Kaya	4.00	0.00
Dr Angelika Kreppein	4.20	2.80
Sabrina Leitzbach	4.10	2.70
Dr Carl-Stefan Neumann	5.20	3.20
Peter Schaaf	0.30	2.20
Markus Siebers	5.00	3.20
André Vöcking	4.10	2.60
Andrea Wächter	4.20	2.40
Jörg Waldhorst	4.10	2.40
Dr Tamara Zieschang ¹⁶⁾	4.50	0.00
	54.10	33.60

¹⁶⁾ The payment was made directly to the Federal Ministry of Transport and Digital Infrastructure (BMVI).

The remuneration of the members of the Supervisory Board is regulated by shareholder resolutions. The members of the Supervisory Board receive an annual remuneration of €4,000.00. This annual remuneration amounts to €5,000.00 for the chairpersons of the committees and the deputy chairperson of the Supervisory Board and €6,000.00 for the chairperson of the Supervisory Board.

The members of the Supervisory Board received no advances, loans or remuneration from consultancy or service contracts.

47 Disclosures on the Public Corporate Governance Code (PCGK)

The DFS Group is subject to the Public Corporate Governance Code of the Federation (PCGK). The Executive Board and the Supervisory Board jointly issue a compliance statement each year and publish the corporate governance report on the website of the company.

Langen, 26 February March 2021

Dr Kerstin Böcker
Chief Human Resources Officer

Dirk Mahns
Chief Operating Officer

Friedrich-Wilhelm Menge
Chief Technology Officer

We issue this unqualified auditor's report as follows:

Independent Auditor's Report*

To DFS Deutsche Flugsicherung GmbH, Langen

Opinions

We have audited the consolidated financial statements of DFS Deutsche Flugsicherung GmbH, Langen, and its subsidiaries (the Group), comprising the consolidated balance sheet as at 31 December 2020, the statement of comprehensive income from 1 January to 31 December 2020, the consolidated statement of changes in equity and the consolidated cash flow statement for the business year from 1 January to 31 December 2020 and the Notes to the consolidated financial statements including a summary of significant accounting policies. In addition, we have audited the group management report of DFS Deutsche Flugsicherung GmbH for the business year from 1 January to 31 December 2020.

In accordance with German legal requirements, we have not audited the contents of the declaration of the legal representatives (Executive Board) under Section 289(f)(4) of the German Commercial Code (HGB) on the proportion of women in the upper executive levels.

In our opinion, on the basis of the findings obtained in the audit,

- the attached consolidated financial statements comply, in all material respects, with IFRS as endorsed by the EU, the additional legal requirements of the German Commercial Code under Section 315(e)(1) and, in compliance with these requirements, give a true and fair view of the results and financial position of the Group as at 31 December 2020 and the earnings for the business year from 1 January to 31 December 2020 and
- the attached group management report as a whole provides an appropriate view of the Group's position. This group management report is consistent in all material respects with the consolidated financial statements, complies with German legal requirements and suitably presents the opportunities and risks of future development. Our audit opinion on the group management report does not cover the non-financial group statement and the group governance declaration (including any other statements) as well as the following disclosures not related to the management report.

Pursuant to Section 322(3)(1) HGB, we declare that our audit has not led to any reservations relating to the legal compliance of the consolidated financial statements and of the group management report.

Basis for the audit opinions

We have conducted our audit of the consolidated financial statements and the group management report in accordance with Section 317 HGB and German generally accepted standards for the audit of financial statements promulgated by the *Institut der Wirtschaftsprüfer* [Institute of Public Auditors in Germany] (IDW). Our responsibilities under those requirements and principles are further described in the section entitled "Auditor's responsibilities for the audit of the consolidated financial statements and of the group management report" of our Auditor's Report. We are independent of the Group companies in accordance with the requirements of German commercial and professional law and have satisfied our other German professional responsibilities in accordance with these requirements. We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions on the consolidated financial statements and on the group management report.

Other information

The Executive Board is responsible for the other information. The other information comprises the declaration of compliance with the German Sustainability Code (www.deutscher-nachhaltigkeitskodex.de) provided before the date of this Auditor's Report and the Corporate Governance Report under No. 6.1 of the German Public Corporate Governance Code of the Federation (PCGK).

Our audit opinions on the consolidated financial statements and the group management report do not extend to the other information and, accordingly, we do not express either an audit opinion or any other form of audit conclusion on them.

In connection with our audit, we have the responsibility to read the other information and to assess whether the other information:

- displays material discrepancies with the consolidated financial statements, the group management report or the findings obtained during the audit.
- or otherwise appears to be materially misrepresented.

Should we conclude that there is a material misrepresentation in this other information on the basis of our work, we are required to report on this fact. We have nothing to report in this regard.

Responsibility of the Executive Board and the Supervisory Board for the consolidated financial statements and the group management report

The Executive Board is responsible for preparing consolidated financial statements that comply in all material respects with IFRS as adopted by the EU, and with the additional requirements of German law under Section 315(e)(1) HGB, as well as for ensuring that the consolidated financial statements give a true and fair view of the results and financial position of the Group while observing the German principles of proper accounting (GoB). In addition, the Executive Board is responsible for the internal controls it has deemed necessary under the German principles of proper accounting to enable the preparation of consolidated financial statements that are free from material misstatements, whether intentional or unintentional.

In preparing the consolidated financial statements, the Executive Board is responsible for assessing the Group's ability to continue as a going concern. Furthermore, it is responsible for disclosing matters relating to the going concern status, if relevant. In addition, it is responsible for financial reporting based on the going concern basis of accounting unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

Furthermore, the Executive Board is responsible for the preparation of the group management report that, as a whole, provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements, complies with German legal requirements, and appropriately presents the opportunities and risks of future development. In addition, the Executive Board is responsible for the arrangements and measures (systems) it has deemed necessary to enable the preparation of a group management report that is in accordance with the applicable German legal requirements, and to be able to provide sufficient, appropriate evidence for the assertions in the group management report.

The Supervisory Board is responsible for overseeing the Group's financial reporting process for the preparation of the consolidated financial statements and of the group management report.

Auditor's responsibilities for the audit of the consolidated financial statements and of the group management report

Our objective is to obtain reasonable assurance on whether the consolidated financial statements as a whole are free from material misstatements – whether intentional or unintentional – and whether the group management report as a whole provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements and the findings obtained in the audit, complies with German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our audit opinions on the consolidated financial statements and on the group management report.

Reasonable assurance is a high degree of assurance, but it is not a guarantee that an audit conducted in accordance with Section 317 HGB and German generally accepted standards for the audit of financial statements promulgated by the *Institut der Wirtschaftsprüfer* (IDW) will always detect a material misstatement. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of addressees taken on the basis of these consolidated financial statements and this group management report.

We exercise professional judgment and maintain an attitude of professional scepticism during the audit. In addition:

- We identify and assess the risks of material misstatements in the consolidated financial statements and in the group management report, whether intentional or unintentional, design and perform audit procedures in response to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our audit opinions. The risk of non-detection of material misstatements resulting from fraud is higher than one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the overriding of internal controls.
- We obtain an understanding of the internal control system relevant to the audit of the consolidated financial statements and of the arrangements and measures relevant to the audit of the group management report in order to design audit procedures that are appropriate in the given circumstances, but not for the objective of expressing an audit opinion on the effectiveness of the company's systems.
- We evaluate the appropriateness of accounting policies used by the Executive Board and the reasonableness of estimates and related disclosures made by the Executive Board.

- We draw conclusions on the appropriateness of the Executive Board's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in the Auditor's Report to the related disclosures in the consolidated financial statements and in the group management report or, if such disclosures are inadequate, to modify our audit opinion. Our conclusions are based on the audit evidence obtained up to the date of our Auditor's Report. However, future events or conditions may cause the Group to cease to be able to continue as a going concern.
- We evaluate the overall presentation, structure and contents of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements present the underlying transactions and events in such a way that the consolidated financial statements give a true and fair view of the results and financial position of the Group while observing the German principles of proper accounting.
- We obtain sufficient appropriate audit evidence regarding the financial information of the companies or business activities within the Group to express audit opinions on the consolidated financial statements and on the group management report. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinions.
- We evaluate the consistency of the group management report with the consolidated financial statements, its compliance with the law, and the view of the Group's position it provides.
- We perform audit procedures on the forward-looking information presented by the Executive Board in the group management report. On the basis of sufficient, appropriate audit evidence we evaluate, in particular, the significant assumptions used by the Executive Board as a basis for the forward-looking information, and evaluate the proper derivation of the forward-looking information from these assumptions. We do not express a separate audit opinion on the forward-looking information and on the assumptions used as a basis for such. There is a substantial, unavoidable risk that future events will differ materially from the forward-looking information.

We communicate with those responsible for monitoring regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in the internal control system that we identify during our audit.

Frankfurt am Main, 26 February 2021

Mazars GmbH & Co. KG
Wirtschaftsprüfungsgesellschaft
Steuerberatungsgesellschaft

Susanne Schorse
Auditor

Martin Lächele
Auditor

* Courtesy translation; see page 3

DFS Deutsche Flugsicherung GmbH

Acronyms and abbreviations

AEROSENSE	FREQUENTIS DFS AEROSENSE GmbH, Vienna, Austria
AfA	Official German Schedule for Deductions for Depreciation – <i>Absetzung für Abnutzung</i>
AFIS	Aerodrome Flight Information Service
AG	Public Limited Company – <i>Aktiengesellschaft</i>
AktG	German Stock Corporation Act – <i>Aktiengesetz</i>
AIM	Aeronautical Information Management
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
AmtshilfeRLUmsG	German Law on the Implementation of the Mutual Assistance Directive as well as on the Change to Tax Regulations – <i>Amtshilfe richtlinie-Umsetzungsgesetz</i>
ANA	Luxembourg air navigation service provider, Findel, Luxembourg – <i>L'Administration de la Navigation Aérienne du Luxembourg</i>
ANSL	Air Navigation Solutions Limited, West Sussex, United Kingdom
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
AS	Aeronautical Solutions (former division of DFS)
ATC	Air Traffic Control
ATCAS	Air Traffic Control Automation System
ATM	Air Traffic Management
ATS	Air Traffic Services
ATZ-TV	Collective Agreement on Partial Retirement at DFS – <i>Altersteilzeit-Tarifvertrag</i>
AUC	Assets under Construction
AUSTRO CONTROL	Austrian air navigation service provider Vienna, Austria – <i>Austro Control Österreichische Gesellschaft für Zivilluftfahrt mbH</i>
BAF	Federal Supervisory Authority for Air Navigation Services, Langen, Germany – <i>Bundesaufsichtsamt für Flugsicherung</i>
BARIG	Board of Airline Representatives in Germany, Frankfurt, Germany
BDF	German Airline Association, Berlin, Germany – <i>Bundesverband der Deutschen Fluggesellschaften</i>
BDL	German Aviation Association, Berlin, Germany – <i>Bundesverband der Deutschen Luftverkehrswirtschaft</i>
BFS	Federal Administration of Air Navigation Services – <i>Bundesanstalt für Flugsicherung</i> (predecessor organisation to DFS)
BGBI	German Federal Law Gazette – <i>Bundesgesetzblatt</i>
BHD	Bahraini Dinar
BilReG	German Accounting Law Reform Act – <i>Bilanzrechtsreformgesetz</i>
BILSODA	BILSODA GmbH & Co. KG, Pullach, Germany
BMF	Federal Ministry of Finance, Berlin, Germany – <i>Bundesministerium der Finanzen</i>
BMVg	Federal Ministry of Defence, Bonn, Germany – <i>Bundesministerium der Verteidigung</i>
BMVI	Federal Ministry of Transport and Digital Infrastructure, Berlin, Germany – <i>Bundesministerium für Verkehr und digitale Infrastruktur</i>
BMWi	Federal Ministry for Economic Affairs and Energy, Berlin, Germany – <i>Bundesministerium für Wirtschaft und Energie</i>
BSI	Federal Office for Information Security, Bonn, Germany – <i>Bundesamt für Sicherheit in der Informationstechnik</i>
BSI KritisV	German Ordinance defining Critical Infrastructures pursuant to the Act on the Federal Office for Information Security – <i>Verordnung zur Bestimmung Kritischer Infrastrukturen nach dem BSI-Gesetz</i>
CEF	Connecting Europe Facility
CEO	Chief Executive Officer

CHF	Swiss Franc
CHRO	Chief Human Resources Officer
CMS	Compliance Management System
CNS	Communications, Navigation and Surveillance
Co.	Compagnie
COO	Chief Operating Officer
Corona collective agreement	Collective agreement on the demand-oriented deployment of staff during the COVID-19 pandemic for the staff employed by DFS Deutsche Flugsicherung GmbH
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
Co. W. L. L.	Company with Limited Liability
CTO	Chief Technology Officer
DAIO	Departures, Arrivals, Internals and Overflights
DANS	Dubai Air Navigation Services, Dubai, UAE
DAS	DFS Aviation Services GmbH, Langen, Germany
DAS Bahrain	DFS Aviation Services Bahrain Co. W.L.L., Manama, Bahrain
DCF	Discounted Cash Flow
de	Country Code Domain for Germany
DFS	DFS Deutsche Flugsicherung GmbH, Langen, Germany
DFS Energy	DFS Energy GmbH, Langen, Germany
DFS IBS	DFS International Business Services GmbH, Langen, Germany
DFS U-Kasse	<i>DFS Unterstützungskasse GmbH</i> , Langen, Germany (benevolent fund)
DIW	German Institute for Economic Research, Berlin, Germany – <i>Deutsches Institut für Wirtschaftsforschung</i>
DLR	German Aerospace Centre, Cologne, Germany – <i>Deutsches Zentrum für Luft- und Raumfahrt e.V.</i>
DM	Deutschmark – German Mark
DRS	Dresden International Airport
DSNA	French air navigation service provider, Paris, France – <i>Direction des Services de la Navigation Aérienne</i>
Droniq	Droniq GmbH, Frankfurt, Germany
DVOR	Doppler VHF (Very High Frequency) Omnidirectional Radio Range
DWD	German Meteorological Service, Offenbach, Germany – <i>Deutscher Wetterdienst</i>
EAD	European AIS Database
EAL	Edinburgh Airport Ltd, Edinburgh, Scotland
EANPG	European Air Navigation Planning Group
EASA	European Aviation Safety Agency, Cologne, Germany
EBIT	Earnings before Interest and Taxes
EBITDA	Earnings before Interest, Taxes, Depreciation & Amortisation
EBT	Earnings before Taxes
EC	European Community
EEG	Energy Sources Act – <i>Erneuerbare-Energien-Gesetz</i>
EGNOS	European Geostationary Navigation Overlay Service
Eisenschmidt	R. Eisenschmidt GmbH, Egelsbach, Germany
EMU	Economic and Monetary Union
eNM/S19	Enhanced NM/ANSPs Network Measures for Summer 2019
ESSP SAS	<i>European Satellite Services Provider Société par Actions Simplifiée</i> , Toulouse, France
ETV	Collective Agreement on the Grading System at DFS – <i>Eingruppierungstarifvertrag</i>
EU	European Union
EUR	Euro
EUROCONTROL	European Organisation for the Safety of Air Navigation, Brussels, Belgium
EUROSTAT	Statistical Office of the European Union, Luxembourg
e.V.	Registered Association – <i>eingetragener Verein</i>

FAB(EC)	Functional Airspace Block (Europe Central)
FCS	FCS Flight Calibration Services GmbH, Braunschweig, Germany
FIR	Flight Information Region
FMC	Flughafen Magdeburg-Cochstedt GmbH, Hecklingen, Germany
FO IOP	Flight Object Interoperability
FSAAKV	German Ordinance on Terminal Charges of the Air Navigation Services – <i>Flugsicherungs-An- und Abflug-Kostenverordnung</i>
FS-AuftragsV	German Regulation concerning the Commissioning of an Air Navigation Services Enterprise – <i>Verordnung zur Beauftragung eines Flugsicherungsunternehmens</i>
FS-DiensteVO	German Service Provision Regulation – <i>Flugsicherungsdienste-Verordnung</i>
FS-DurchführungsV	German Air Navigation Services Regulation – <i>Verordnung über die Durchführung der Flugsicherung</i>
FSStrKV	German Regulation on Route Charges – <i>Flugsicherungs-Streckenkostenverordnung</i>
FührposGleichberG	German Law on the Equal Participation of Women and Men in Management Positions in the Private Sector and in Public Service – <i>Gesetz für die gleichberechtigte Teilhabe von Frauen und Männern an Führungspositionen in der Privatwirtschaft und im öffentlichen Dienst</i>
GBP	Pound Sterling (£)
GdF	Air Navigation Services Union – <i>Gewerkschaft der Flugsicherung</i>
GDP	Gross Domestic Product
GmbH	Limited Liability Company – <i>Gesellschaft mit beschränkter Haftung</i>
GmbHG	Act concerning Limited Liability Companies – <i>Gesetz betreffend die Gesellschaften mit beschränkter Haftung</i>
GoB	German Principles of Proper Accounting – <i>Grundsätze ordnungsmäßiger Buchführung</i>
GPS	Global Positioning System
GroupEAD	GroupEAD Europe S. L., Madrid, Spain
GS2 VCS	Intercom System 2 Voice Communication System
HGB	German Commercial Code – <i>Handelsgesetzbuch</i>
HRB	Commercial Register B – <i>Handelsregister Abteilung B</i>
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
iCAS	iTEC (interoperability Through European Collaboration) Centre Automation System
ICS	Internal Control System
IDW	Institute of Public Auditors in Germany, Düsseldorf, Germany – <i>Institut der Wirtschaftsprüfer in Deutschland e.V.</i>
IDW PS	Auditing Standards (<i>Prüfungsstandards</i>) laid down by the Institute of Public Auditors in Germany (IDW)
ifo	Leibniz Institute for Economic Research at the University of Munich e.V., Munich, Germany – <i>Leibniz-Institut für Wirtschaftsforschung an der Universität München e.V.</i>
IFR	Instrument Flight Rules
IFRIC	International Financial Reporting Interpretations Committee
IFRS	International Financial Reporting Standards
IfW Kiel	Kiel Institute for the World Economy; Kiel, Germany – <i>Institut für Weltwirtschaft Kiel</i>
IMC	Instrument Meteorological Conditions
ISIS-XM	Improved Speech Integrated System
ISO	International Organisation for Standardisation
IWH	Halle Institute for Economic Research, Halle, Germany – <i>Leibniz-Institut für Wirtschaftsforschung Halle</i>
KapaTV	Collective agreement on increasing operational capacities in the air traffic control service and future initiative in operational training for staff employed in operational services at DFS Deutsche Flugsicherung GmbH

KAT	Kaufbeuren ATM Training GmbH, Kaufbeuren, Germany
KfW	<i>Kreditanstalt für Wiederaufbau</i> , Frankfurt, Germany (German government-owned development bank)
KG	Partnership – <i>Kommanditgesellschaft</i>
KPA	Key Performance Area
KTV	Collective Agreement on Health and Long-term Care Insurance at DFS – <i>Kranken- und Pflegeversicherungstarifvertrag</i>
LBA Ltd.	Federal Aviation Office, Braunschweig, Germany – <i>Luftfahrt-Bundesamt</i> Limited
LTE	Long Term Evolution – a standard for wireless broadband communication
LufABw	German Military Aviation Authority, Cologne Wahn, Germany – <i>Luftfahrtamt der Bundeswehr</i>
LuftfzG	German Law on Rights regarding Aircraft – <i>Gesetz über Rechte an Luftfahrzeugen</i>
LuftVG	German Aviation Act – <i>Luftverkehrsgesetz</i>
LuftVStAbsenkV	German Ordinance on Decreasing the Air Transport Tax – <i>Luftverkehrsteuer-Absenkungsverordnung</i>
LuftVStFestV	German Law Laying Down German Air Transport Tax – <i>Luftverkehrsteuer-Festlegungsverordnung</i>
LuftVStG	German Air Transport Tax – <i>Luftverkehrsteuergesetz</i>
LZK-TV	Collective Agreement governing Long-term Time Accounts at DFS – <i>Langzeitkontentarifvertrag</i>
MaRS	Modernisation and Replacement of Surveillance Infrastructure at DFS
mFUND	Research Initiative of the German Ministry of Transport and Digital Infrastructure – <i>Modernitätsfonds</i>
MTV	Collective Framework Agreement at DFS – <i>Manteltarifvertrag</i>
MUAC	Maastricht Upper Area Control Centre, Maastricht, Netherlands
n	Represents the Current Business Year
NM	Network Manager
No.	Number
NATS	National Air Traffic Services, Whiteley, Fareham, United Kingdom (UK air navigation service provider)
NORD/LB	Landesbank of Lower Saxony and Saxony-Anhalt – <i>Norddeutsche Landesbank Girozentrale</i> , Hannover, Germany
NOTAM	Notice to Airmen
NV	<i>Naamloze Vennootschap</i> (Belgian public limited company)
OAT	Operational Air Traffic
OCI	Other Comprehensive Income
OECD	Organisation for Economic Co-operation and Development, Paris, France
OJT	On-the-Job Training
P.	Page
P1	Project 1
PCGK	German Public Corporate Governance Code – <i>Public Corporate Governance Kodex</i>
PEI	Paul Ehrlich Institute, Langen, Germany
PMV	<i>Participatiemaatschappij Vlaanderen NV</i> , Brussels, Belgium
QBIC Arkiv	QBIC Arkiv FUND NV, Ghent, Belgium
QBIC Feeder	QBIC FEEDER FUND NV, Ghent, Belgium
QTE	Qualified Technological Equipment (cross-border)
RASUM	Radio Site Upgrade and Modernisation at DFS
RMC	Risk Management Committee
RMS	Risk Management System
RP	Reference Period
RTC	Remote Tower Control
RWI	RWI-Leibniz Institute for Economic Research, Essen, Germany – <i>Leibniz-Institut für Wirtschaftsforschung e. V.</i>
S.A.	<i>Société Anonyme</i> (a type of public company)

S-ATM	Sectorless Air Traffic Management
SDA	SESAR Deployment Alliance
SES	Single European Sky
SESAR	Single European Sky Air Traffic Management Research
SGD	Singapore Dollar (S\$)
SJU	SESAR Joint Undertaking
SKYNAV S.A.	SKYNAV Société Anonyme, Awans, Belgium
S. L.	<i>Sociedad de Responsabilidad Limitada</i>
SSC	Single Sky Committee
STATFOR	Statistics and Forecast Service (at EUROCONTROL)
StrukturTV	Collective Agreement on Structural Measures and Early Retirement at DFS – <i>Tarifvertrag über Strukturmaßnahmen und Vorruhestand</i>
TATS	Tower Air Traffic Services S. L., Madrid, Spain
Terra Drone	Terra Drone Corporation, Tokyo, Japan
TranspRLG	Transparency Directive Implementation Act – <i>Transparenzrichtlinie-Umsetzungsgesetz</i>
TVöD	Collective Agreement for the Public Service – <i>Tarifvertrag für den öffentlichen Dienst</i>
UAS	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicle
UIR	Upper Flight Information Region
Unify	Unify NV, Antwerp, Belgium
USD	United States Dollar (\$)
UTM	UAS Traffic Management
ÜVersTV	Collective Agreement on Pensions and Transitional Payments at DFS – <i>Übergangsversorgungstarifvertrag</i>
VAFORIT	Very Advanced Flight Data Processing Operational Requirements Implementation
VaR	Value at Risk
VersTV	Collective Agreement on Pensions at DFS – <i>Versorgungstarifvertrag</i>
VFR	Visual Flight Rules
VHF	Very High Frequency
VITO	Flemish Institute for Technological Research – <i>Vlaamse Instelling Voor Technologisch Onderzoek</i> , Mol, Belgium
VMC	Visual Meteorological Conditions
VTV	Collective Agreement covering Remuneration at DFS – <i>Vergütungstarifvertrag</i>
VTV-A	Collective Agreement covering Remuneration for Apprentices at DFS – <i>Vergütungstarifvertrag der Auszubildenden</i>
WACC	Weighted Average Cost of Capital
WpHG	German Securities Trading Act – <i>Wertpapierhandelsgesetz</i>
ZTV	Collective Agreement covering Allowances at DFS – <i>Zulagentarifvertrag</i>

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