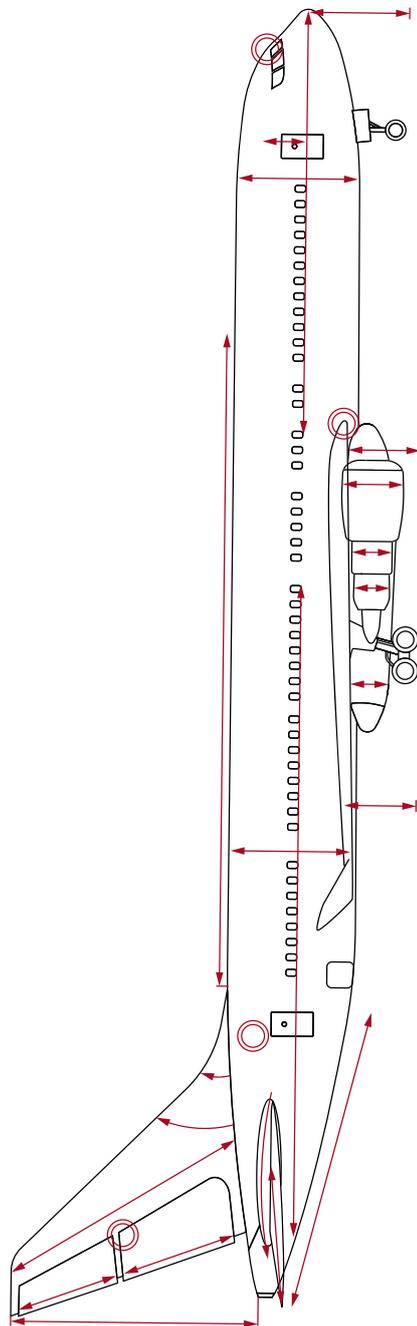


1. HALF-YEAR 2019

# PERSPECTIVE AVIATION MARKETS



# AIRCRAFT FUNDS ARE ESG-COMPLIANT



As recently as a few years ago, sustainability was not a major issue in the aviation sector. But since passenger numbers began to double every 15 years, the aviation industry has increasingly become a focus of worldwide economic growth. At the same time, institutional investors are increasingly focussing on sustainability when it comes to their investment portfolios. Against this backdrop, investments in aircraft are perhaps not the first thing that comes to mind. It is therefore something of a revelation to discover that when it comes to environmental, social and governance (ESG) considerations, aircraft have quite a lot in their favour. First of all, it is necessary to clarify widely held misapprehensions about pollution: it is true that the aviation industry is growing exponentially – and yes, this development is reaching its limits. However, it does not follow that aircraft are the main culprits when it comes to carbon dioxide emissions, as in fact aviation only causes 2.5% of CO<sub>2</sub> emissions worldwide. The contribution made by air travel to connecting people from all over the world is almost taken for granted. Furthermore, the transport of people and goods facilitates economical development of emerging market countries. The aviation industry has made a commitment to sustainability and has initiated a number of measures.

The aviation industry is aiming for climate-neutral growth from 2020 onwards, and the International Civil Aviation Organisation (ICAO) is hoping to introduce global emissions trading to support this aim while also further reducing



**JOCHEN HÖRGER,  
MANAGING DIRECTOR  
OF AVIATION  
KGAL INVESTMENT  
MANAGEMENT**

CO<sub>2</sub> emissions. New design developments are making this possible, including lighter materials such as carbon fibre, and modern engine technologies that make aircraft more efficient and ensure they consume less fuel. The Airbus A320neo is one example of where this approach has been very successful, with this aircraft type consuming 15% less fuel than the Airbus A320ceo. There are also significant strides being made in terms of noise pollution, thanks to manufacturer and industry initiatives arising from the ICAO's support of the United Nations sustainability principles.

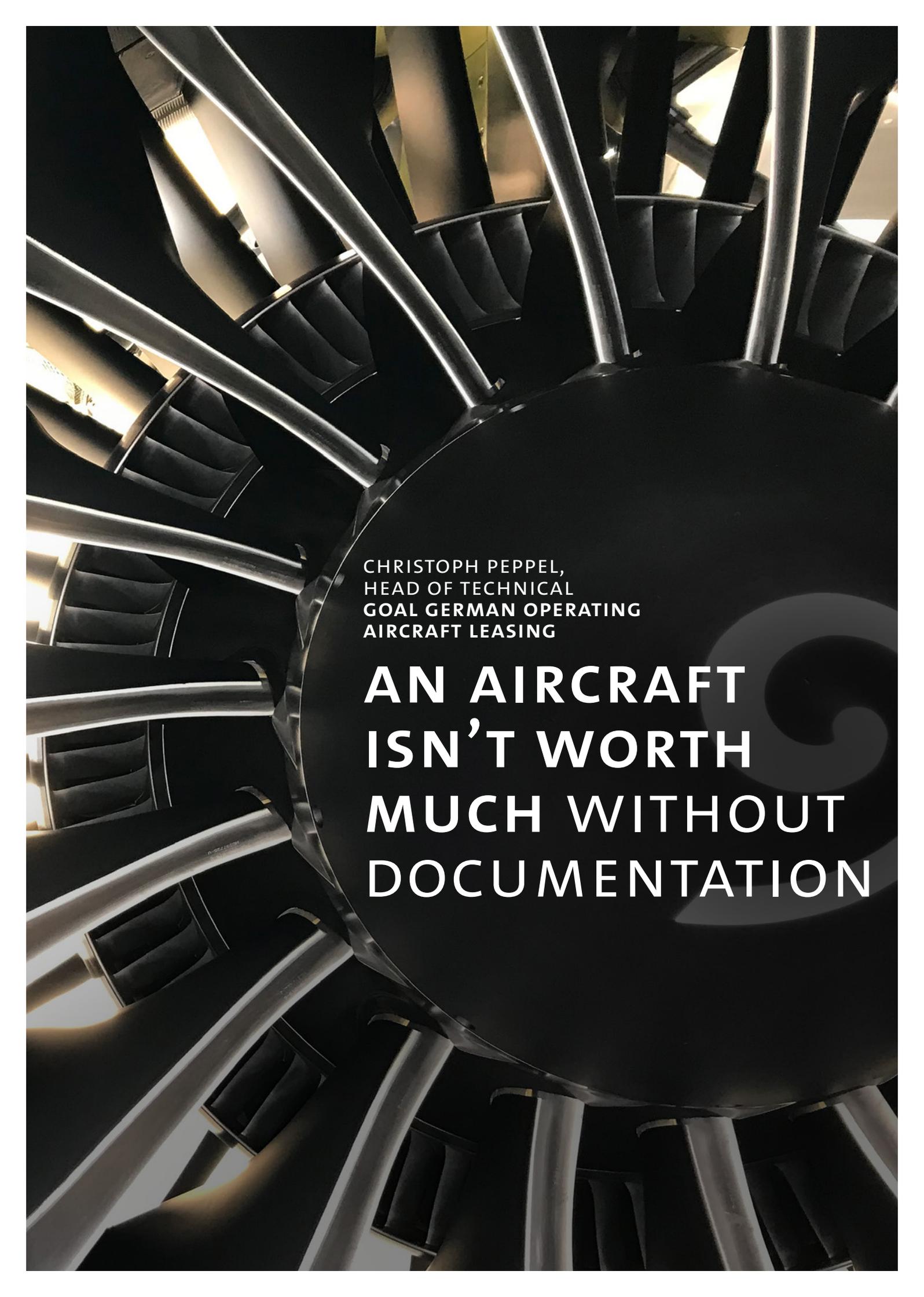
As an asset management company, KGAL Group can also contribute to sustainability. We have set up three core aircraft portfolio funds over the past five years. Our investors are expecting solid investments – which we are able to offer, if we concentrate on future-proof aircraft types that will still be in demand ten or fifteen years from now. This strategy means modern aircraft will benefit from a stable residual value, which contributes significantly to the level of return in the case of operating leasing.



**» ONLY THE AVIATION SECTOR CAN OFFER HELP QUICKLY AFTER A NATURAL DISASTER.**

**» AVIATION IS RESPONSIBLE FOR JUST 2.5% OF ALL CARBON DIOXIDE EMISSIONS WORLD-WIDE.**

**» AS AN INVESTOR, WE ARE IN A POSITION TO CONTRIBUTE TO SUSTAINABILITY.**



CHRISTOPH PEPPPEL,  
HEAD OF TECHNICAL  
GOAL GERMAN OPERATING  
AIRCRAFT LEASING

**AN AIRCRAFT  
ISN'T WORTH  
MUCH WITHOUT  
DOCUMENTATION**

**GOAL acquires aircraft for the KGAL portfolio to be leased by airlines worldwide. At handover and return, aircraft engineer Christoph Peppel and his four colleagues check the condition of the aircraft – from engine to oxygen masks. An aircraft is a complex piece of engineering, and its technical condition also determines the yield. It can only be accepted into the KGAL portfolio after the engineers have given the go-ahead.**

***Mr Peppel, there have been several malfunctions in planes belonging to the federal government of Germany at the start of January this year, it was a defective valve. Isn't that quick to replace?***

The safety and maintenance regulations are extremely strict for good reason and include specifications about who is allowed to do what. Although I am an aircraft engineer, I'm not allowed to change any part on the aircraft because I don't have a current, valid aircraft mechanic's licence. What's more, you can't just use any valve that might fit: certain quality criteria must be met and certified. That's how even a small part, like a single valve, can keep a plane from flying. I think that's how it should be because an aircraft breakdown can't be compared to a flat tyre on a car. There's far more to it than meets the eye. It's also why flying is so safe.

***When you pick up a new aircraft, is it the same as when you collect a new car?***

Yes and no. If there's a scratch in the paint on a car, that's a cosmetic issue. With an aircraft, there's always the question of whether the scratch might have damaged the underlying structure and, if it has, whether there has been any cracking. A microscopically small crack in the metal of the aircraft's outer skin can lead to a fatigue fracture after many thousands of flights, and that could mean the failure of the pressurised cabin. At altitudes of 10 to 15 kilometres, that would be fatal.

***I've heard that airlines even check for creases in the carpet?***

That does happen. About ten airline employees come to the acceptance to check whether there are creases in the leather of the seat backrest covers, for example. There might be more than 300 "findings". I'm a bit more pragmatic. If a plane has five or more take-offs a day, carrying several thousand people in the first week after delivery, there will very quickly be normal wear-and-tear that has little impact on the value of the aircraft. We do repair any obvious damage of course. At the end of 2018, I picked up an Airbus A320neo for our lessee Frontier Airlines in the USA, and I had about 20 major concerns before I would accept the plane.

***That doesn't seem like so many in comparison to 300 findings.***

The number isn't significant. What we are concerned about are production discrepancies that could give rise to the need for an additional inspection later on. For example, an aircraft has thousands of rivets. Someone might drill too big a hole when putting one in or slip with the tool and tear the metal. This wouldn't stop the airline from using the aircraft, but these kinds of defects could lead to more expensive maintenance later on, resulting in a longer downtime. The next airline won't accept this and will demand a lower purchase price. Of course we support the airlines even when the findings are not particularly significant for us because we want both them and the fund investors to end up with a perfect aircraft.



#### **GOAL**

*The company is a globally active aircraft lessor in commercial aircraft leasing, providing aircraft leasing, aircraft financing and asset management services as well as aircraft trading and aircraft marketing.*

#### **Stall**

*A stall describes a situation in which an aircraft has no sufficient lift anymore. This occurs when the ratio of the airspeed and angle of attack of the wings is no longer correct which mostly happens when the aircraft moves to slow. When this happens, there is a risk that the airplane will crash.*



### 100

GOAL delivered an Airbus A320neo to Frontier Airlines in December 2018. This aircraft was also the 100th one produced at the Airbus production plant in Mobile (Alabama, USA).

### Lift

The lift of an aircraft is created by the curved contours of the wings. The distance an air particle has to travel above the wing is greater than the distance below it. As a result, air particles travelling over the wing must travel at a faster speed than those travelling under it. This creates negative pressure above the wing, which pulls the wing – and with it the entire aircraft – upward, and also generates overpressure below the wing that lifts the aircraft.

### *Do you take a test drive like when buying a car?*

Yes, there is always an acceptance flight. The pilots fly a couple of extreme manoeuvres with the airplane – the kind you don't get during a normal passenger flight. They pull up steeply or push the nose right down and tilt the aircraft through its longitudinal axis. The pilot also checks whether the emergency landing gear extension system works and whether it drops and locks into place under its own weight. And they fly the aircraft so that it almost stalls ...

### *What are they checking for?*

The aircraft needs to be going at a certain speed in order to stay in the air. In every flight state this is ensured by the air that streams over and under the wings generating a lift that is always equal to or greater than the aircraft's weight force. The plane has systems to prevent stalling, so when you fly within a critical area, the safety mechanisms come into effect: the aircraft accelerates or lowers its nose. So we check that those systems are working perfectly.

### *That's the physical inspection. There's also the documentation, which, for a 20-year-old plane, can amount to 40 boxes full of files. How come?*

Every tyre change generates at least two sheets of paper: the job card and the release certificate of the tyre. It's the same for all the other parts. For a "C" check, with a duration of around two weeks, there are several hundred routine work steps as well as defects and repairs that need attention. The documentation makes it possible to track all the things that have happened over the entire life of the aircraft. An airplane is worth very little without this history because you can't fly without documentation.

### *You accompany the aircraft from handover to return. How does your work influence the yield?*

I was recently supposed to accept a new plane from a manufacturer which had installed an engine with an older build standard. If it were sold at the end of the leasing period, a buyer would probably want a very big discount on the purchase price, which would lower the yield. So the engine was rejected and replaced.

### **And what about the return?**

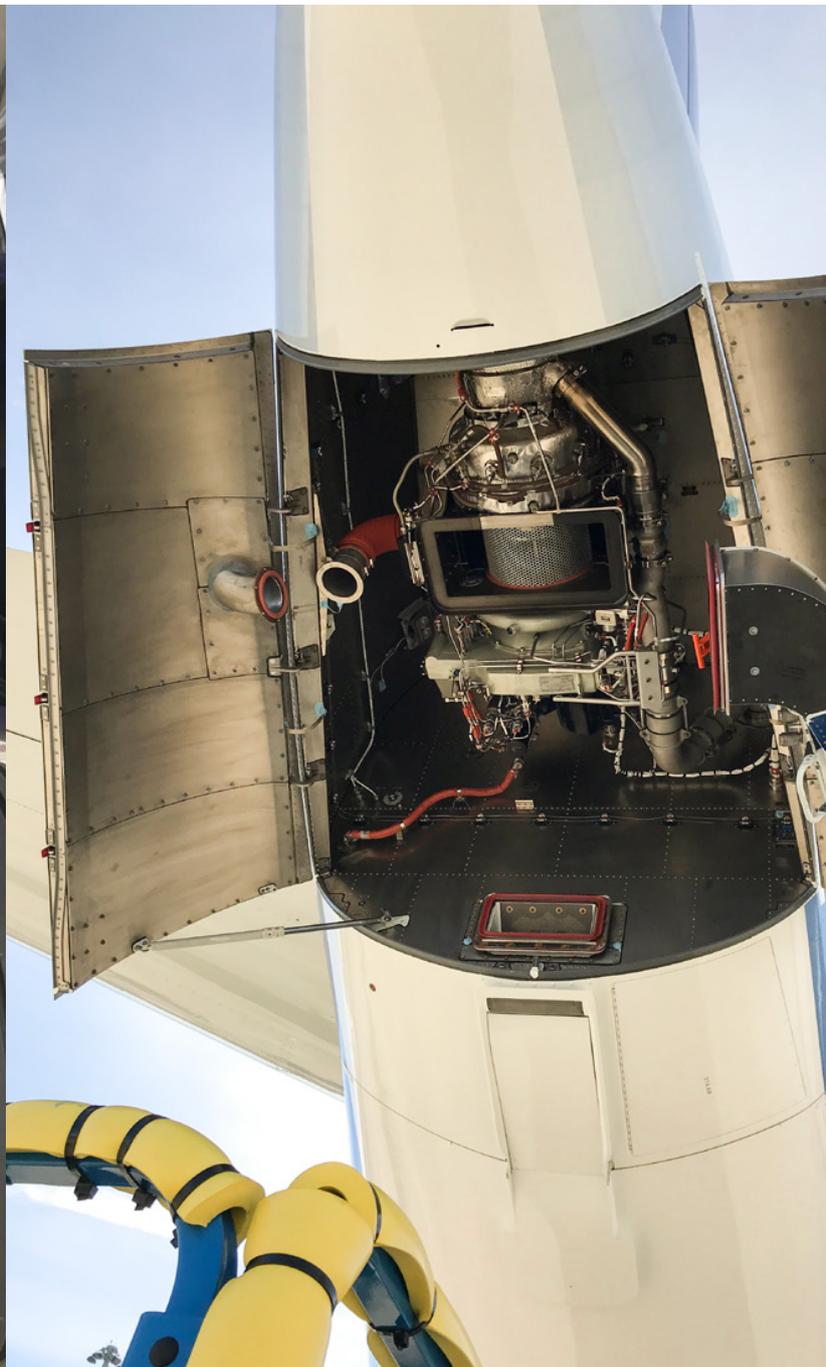
The return is very critical because there are always issues you end up discussing. It's all about the aircraft's condition and "remaining maintenance life" because the airline has to pay compensation for the "consumed life". My colleagues and I get to know our airplanes from the very first day and we develop a relationship both with the customer and with the aircraft. That's incredibly helpful when returning the asset.

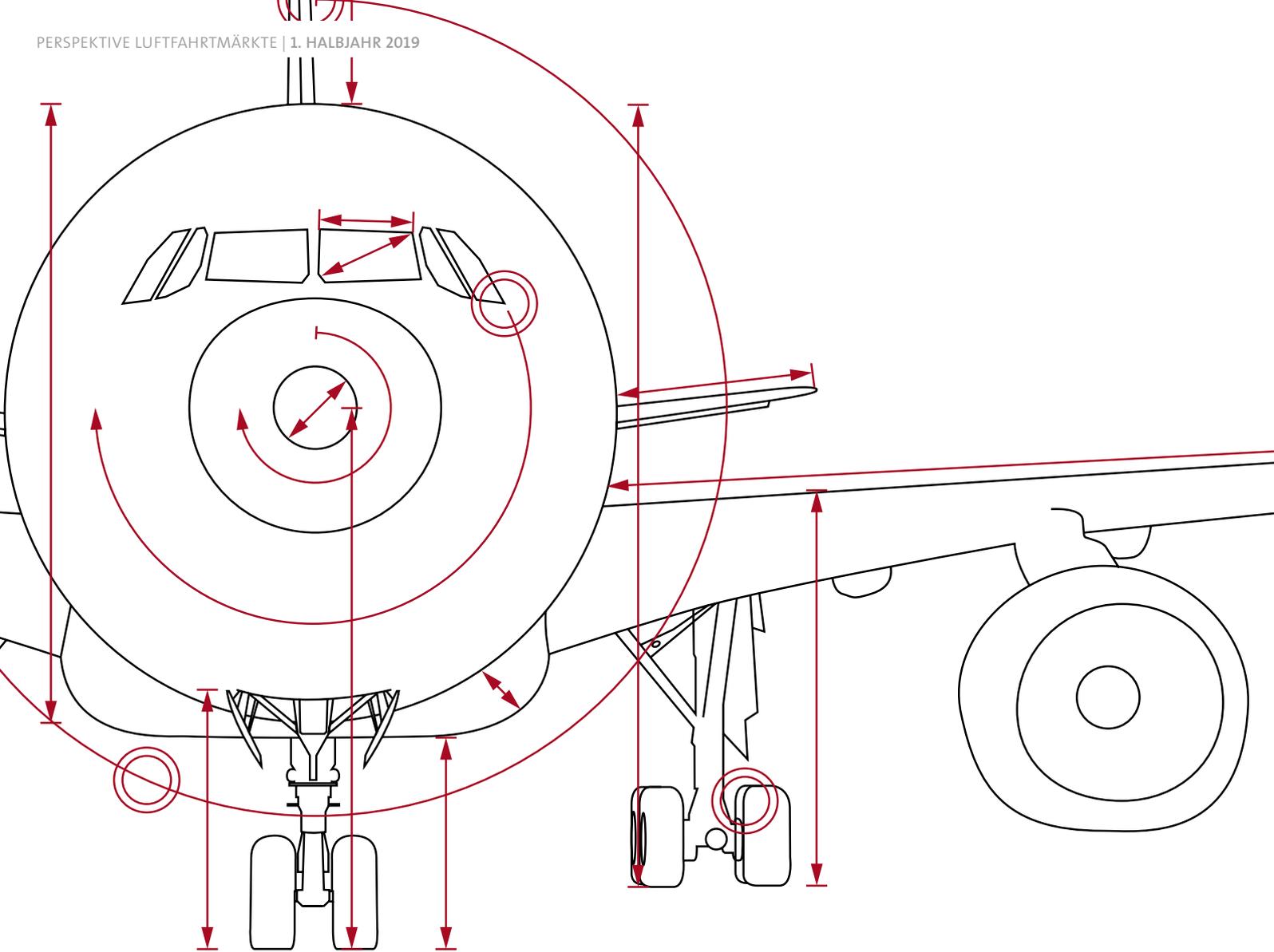
### **You once said that working in the aviation industry is like being infected with a disease?**

An aircraft brings people together from all over the world. Anyone who has flown just once, going on holiday, for example, associates it with something positive. As an engineer, it fascinates me to know how up to 300 tonnes of metal, parts and engineering work lifts-off and how individual engine components withstand temperatures exceeding 1,000 degrees Celsius for twelve hours at a time on a long-distance flight. Quite simply, an aircraft is a technical masterpiece.

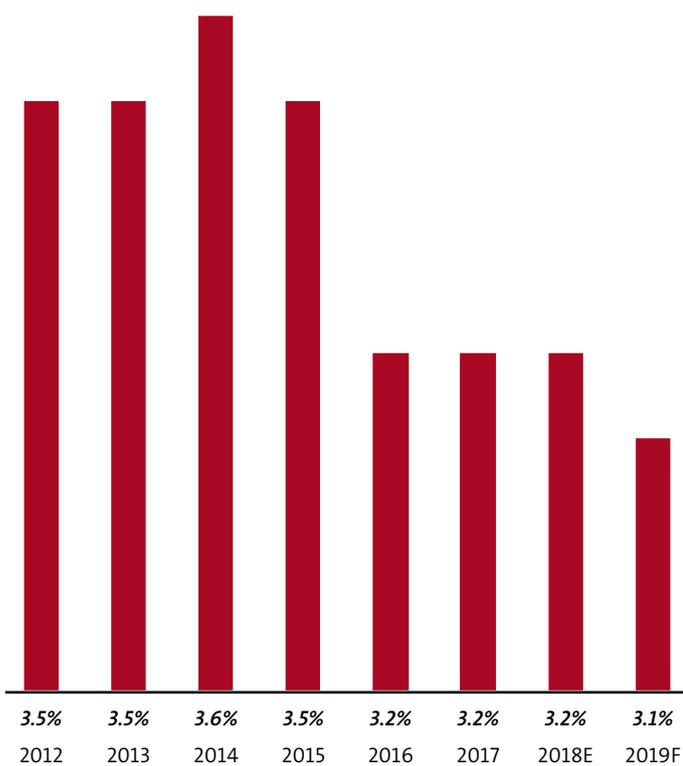
### **Aircraft lifespan**

*When used within the aviation industry, the term "aircraft lifespan" refers to the useful life of an aircraft and its components. An airframe "lives" for approximately 25 years. However, the lifespan of an aircraft and its components depends on usage, for example the number of flight hours per year. In some cases, the lifespan can be extended through appropriate maintenance and refurbishment.*





## GROSS DOMESTIC PRODUCT



## FOCUS ON MARKET DATA

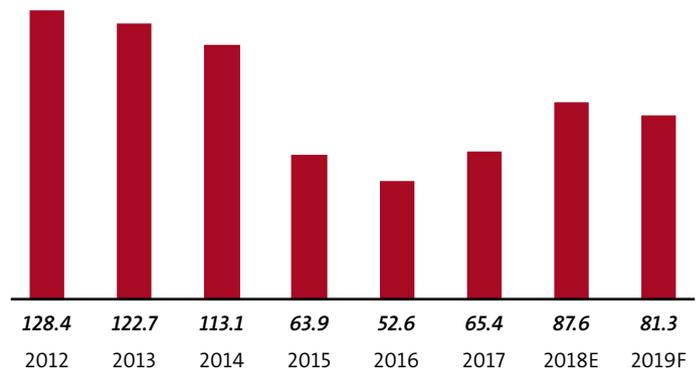
# +3.1%

**At high levels:** Although the economy is recording 3% growth worldwide, this growth is slowing down. Experts point to the pressure on financial markets and possible trade conflicts.

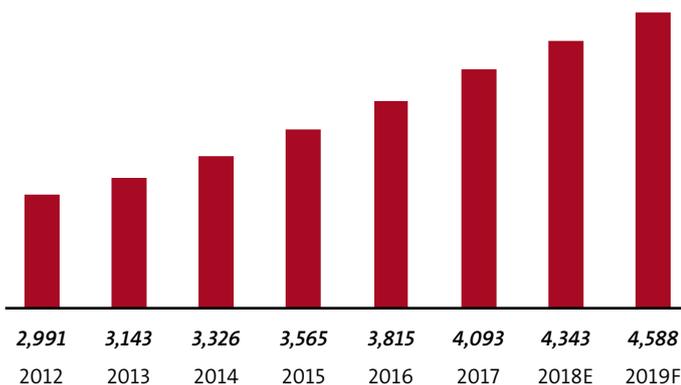
## FUEL PRICE (IN USD)

# 81.3\$

**Relaxation expected:** oil price increases seem to have stopped. After hitting an average of USD 87.6 per barrel in 2018, the IATA expects an average price of USD 81.3 per barrel in 2019.



## GROWTH IN PASSENGER FIGURES (IN MILLIONS)



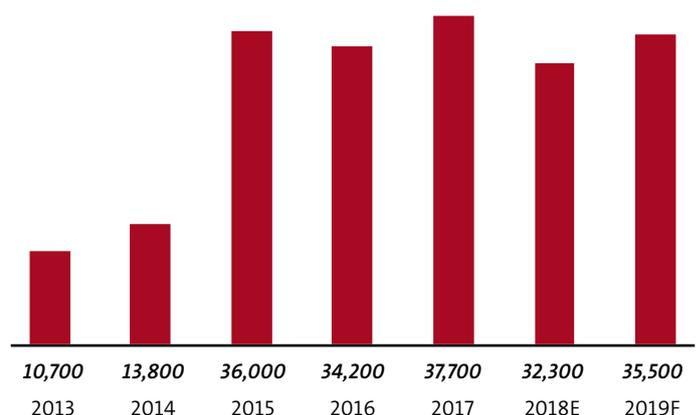
# +6%

**A constant rise:** passenger volumes continue to increase significantly. However, declining growth in the world economy puts pressure on the expected growth of the aviation industry

## AIRLINE NET PROFITS (IN MILLIONS OF USD)

# +10%

**Welcome prospects:** the oil price put airline companies under pressure in 2018. In 2019, the industry is banking on lower oil prices as well as growth in passenger and freight volume, and therefore high annual net profits.





**FLYING  
FASCINATION  
“TO BE AHEAD OF  
THE AIRPLANE”**

**Michael Kühnel studied Aviation Systems Engineering and is a qualified Airbus A320 pilot. To bridge the time before taking up his position at Lufthansa, he worked at KGAL Investment Management as a transaction manager in the aviation sector (2015-2018). As of January 2019, he has been able to fulfil a long-held dream.**

*Was flying what you wanted to do even when you were little?*

I certainly thought it was cool to sit in a plane while the world passed by outside, with a great view of the landscape below and the clouds around me. But it took a little more than that to make me want to be a pilot. An aeroplane is a high-tech piece of equipment, and as a pilot you need to have a huge amount of knowledge about the technology. It is important to understand meteorology and to be able to interpret the weather forecast. Then there's flight planning and instructions from air traffic control. All of that means teamwork, and it must always work, even under time constraints and stress. I find the whole combination fascinating.

*What matters most in the art of flying – is it ensuring a soft landing?*

When it comes to landing, the most important thing is that it doesn't just happen anywhere, but whenever possible it should be at the "aim point". The pilot wants to land the plane just there, exactly on the center line if possible, and at the right speed. It's possible to make an extremely soft landing where everything else is wrong – a gentle touchdown is really not all that important. Flying is a manual task that has a lot to do with experience – but also needs intuition and gut feeling.

*And what makes a good pilot?*

There's a concept called "situational awareness", and we also talk about the need to be "ahead of the airplane" – which is a good description of what makes a good pilot. During your first hour of flying, you are miles behind your aircraft: the plane does something, and you react to it, but you don't plan two or three moves ahead, as a skilled chess player would. A good pilot knows what's coming next. He has a plan in his head, knows what is going on and has a feel for the current situation. That is key, and something that develops over time until you get to the point where you are "ahead".

## Contact

### Jochen Hörger

Aviation Asset Class Managing Director  
KGAL Investment Management GmbH & Co. KG  
Tölzer Straße 15, 82031 Grünwald  
Germany  
Email: jochen.hoerger@kgal.de

## KGAL Group

To date, the aircraft fund investment volume realised by KGAL Group totals more than €7.4 billion. Since the initial aircraft fund in 1979, KGAL has concluded transactions for more than 800 aircraft, among others 81 private placements and other investment models, as well as 58 mutual and three institutional funds. KGAL Group is a leading, independent investment and asset manager with an investment volume of €20.5 billion. The investments focus on long-term capital investments for institutional investors in the real estate, infrastructure and aircraft asset classes.

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### Source information:

*IATA Airline Industry Economic Performance December 2018*  
*U.S. Energy Information Administration*  
*2017 Climate Protection Report*  
*Federal Association of the German Air Transport Industry*  
*International Energy Agency*  
*Please name Airbus when using the A320neo-photo and GOAL/KGAL when using one of the other photos.*

<https://www.iata.org/publications/economics/Reports/Industry-Econ-Performance/IATA-Economic-Performance-of-the-Industry-end-year-2018-report.pdf>  
<https://www.iata.org/publications/economics/Reports/Industry-Econ-Performance/Airline-Industry-Economic-Performance-December-18-Datatables.pdf>  
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