

FUTURE SCENARIOS

for the European Airline Industry

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1. FOREWORD

"Trying to predict the future is like trying to drive down a country road at night with no lights while looking out the back window." Peter Drucker

Rarely has the outlook for the European airline industry been so bleak and dominated by so much uncertainty as today. What are the economic and social effects of the Covid-19 pandemic? How does the Ukraine war further aggravate these effects? How can air travel deal with the challenges of environmental protection and sustainability? Can airlines emerge stronger from the crisis? In this study, we try to provide answers to these questions and offer “food for thought” not only for airline managers today.

Today’s business environments are becoming more and more complex, volatile and uncertain. Changes arrive faster than ever and many developments are impossible to forecast. Particularly, linear projections from the past are not helpful. Nevertheless, managers need to take decisions and commit resources. This is only possible if uncertainty is accepted and made an integral part of strategic considerations. Conventional strategic planning tools tend to be inadequate under these conditions because they do not sufficiently take uncertainty into account. Scenario planning differs fundamentally from conventional strategy tools in this respect. It is a strategic planning tool that attempts to capture a broad range of alternative developments, thus encouraging strategic decision makers to consider influence factors they might otherwise ignore.

Our scenario study on the European airline industry supports managers in this endeavor. We have developed four scenarios for the industry in 2030 based on several key uncertainties and important industry trends. We hope that these scenarios will inspire you and help you manage the opportunities and threats in this dynamic industry.

We wish you an insightful journey through the current situation and the potential futures of the European airline industry.

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2. EXECUTIVE SUMMARY

The Covid-19 pandemic has demonstrated with all its severity the downside of an interconnected, globalized world. Complex supply chains around the globe collapsed at an unprecedented pace, production was interrupted and delivery times strongly increased. These economic effects are currently aggravated by the disruptions that the Ukraine war brings.

As a consequence of these developments, the airline industry is experiencing its darkest hours to date. Following extended international flight bans, European air traffic was down by 92.8% in April 2020 compared to April 2019 (Eurocontrol, 2021). Even ten months into the pandemic, the Lufthansa Group, Europe's largest aviation group by revenue, experienced a cash outflow of €1 million every 90 minutes and suffered a 63% drop in revenues in 2020 (Financial Times, 2020; Lufthansa Group, 2021a). This is primarily due to the fact that the aviation industry has benefited from globalization more than any other industry and is therefore particularly affected by disruptions of international trade flows.

The effects of the Covid-19 pandemic as well as the Ukraine war amplify a transformation process that has been ongoing in the European airline industry for many years already. Specifically, European low-cost carriers such as Ryanair and easyJet are gaining market share and compete more directly with established network carriers such as the Lufthansa Group, Air France-KLM or the International Airline Group (IAG), which for their part are facing high price and margin pressures. The sudden drop in business travel, the popularity of digital video conferencing, and the tendency to work from home, which the pandemic brought along, increase the danger that important revenue streams might erode permanently.

However, not only the competitive landscape is changing, but also customer expectations and preferences. As customers are becoming more demanding and informed, new services and new ways of interacting with customers are required. In this regard, the industry is highly dependent on technological progress, particularly the development of innovative aircraft technologies and alternative fuels (Willms, 2021). As the growing importance of sustainability considerations and carbon-footprint reduction has deteriorated the "image of flying," airlines will be forced to rethink their activities from regulatory, social as well as economic perspectives.

To address these challenges and help managers in the industry plan for the future, we created this study using our innovative approach to scenario-based strategic planning, jointly developed by HHL and the strategy consultancy Roland Berger. Our scenarios are based on extensive research, expert workshops and industry-wide surveys considering various stakeholder groups. This has helped us gain a holistic picture of the relevant trends and influence factors in the industry and ensures the quality of the scenarios.

The four scenarios we have created evolve around two critical uncertainties identified in our survey of industry experts and a subsequent scenario workshop. These two critical uncertainties, that form our scenario dimensions, are:

- **Development of the demand for air travel**
- **Speed of the shift towards sustainable air transportation**

Based on these critical uncertainties as well as additional trends and influence factors, four plausible scenarios emerge on how the European aviation industry could fare until 2030. These four scenarios are the following:

Figure 1: Scenarios for the European Airline Industry in 2030



Green Age of Growth describes a future state of the industry in 2030 in which, due to rapid recovery from the Covid-19 pandemic and a quick resolution of the Ukraine war, the overall demand for air travel returned to pre-crisis levels already in 2024. However, demand from business travelers recovered more slowly than expected due to the

continued use of videoconferencing technology. At the same time, a strong increase in M&A activity accelerated the market consolidation in the European airline industry – the top five airlines in Europe account for 68% of the flight offerings by 2030 – a 24 percentage point increase compared to 2021. Higher environmental awareness, especially among European customers, is putting additional pressure on airlines to act in a more environmentally friendly way. Due to strong demand growth in the leisure segment and high average profitability in the industry, however, airlines are able to proactively invest in new flight equipment and sustainable aviation fuel.

Innovative regression describes a world in 2030 in which the consequences of the Covid-19 pandemic as well as the Ukraine war have been felt in Europe longer than expected. Supply chain disruptions, drastically increased energy prices and an increase in the ECB's key interest rate to fight high inflation rates slowed down economic growth in Europe. Shrinking budgets for business travel and an increasing use of video conferencing technology led to a decline in demand and simultaneously resulted in an increase in the market share of low-cost carriers. A shift toward a more sustainable aviation sector has been and continues to be enforced by legislation through an increase in the aviation tax and a higher minimum blend of sustainable aviation fuel. Thus, network carriers face strong pressures.

Unsustainable Step Back describes a scenario in 2030 characterized by strong geopolitical instability as a result of the Covid-19 pandemic, the Ukraine war, and the conflict between the USA and China. Economic growth not only came to a standstill, but markets faced a sharp downturn. As a result, the demand for air travel declined. Within Europe, the strong rise of LCC's in both the business and leisure travel segments put pressure on network carriers. Additionally, European network carriers face additional competition from Gulf airlines, leading to market shifts and a new competitive situation. Although the effects of man-made global warming are becoming more severe, the negative economic development tears the attention of the regulators away from sustainability issues and the airlines lack financial means to proactively drive this change.

Unsustainable Upswing describes a picture of the future of the European airline industry that is characterized by strong economic growth, after the Covid-19 pandemic as well as the Ukraine war have been resolved. This growth was accompanied by an

increase in demand for air travel in Europe. Airlines that had used the crises for restructuring initiatives drove the market consolidation which resulted in high profitability for these airlines as their pricing power increased. Regulators were reluctant to impose regulations that enforce sustainability measures as they did not want to endanger the competitiveness of the industry, and airlines have seen this era of profitability as an opportunity to compensate investors with dividends for the crisis years instead of investing in more sustainable aviation.

Each of these scenarios describes a realistic picture of the future of the European airline industry in the year 2030. They are, however, not intended to predict the future. Rather, they are meant to stimulate reflection on potential developments and important drivers of these developments. This reflection might broaden the field of vision of industry leaders and help them prepare for the opportunities and challenges ahead.

3. THE EUROPEAN PASSENGER AIRLINE INDUSTRY

Comparison of Business Models

Whilst the competitive pressures for established players in the European airline industry have increased, especially through new players entering the market, different approaches to market positioning and related business models have evolved over time. The most common differentiation for airline business models is between network carriers and low-cost carriers (LCC). Further differentiations, including hybrid forms of business models have also emerged, but will not be further discussed here.

Network carriers, also known as full-service carriers (FSCs), such as the Lufthansa Group, IAG led by British Airways, or Air France-KLM, offer a high level of service and an extensive route network based on a so-called hub-and-spoke system (Conrady et al., 2013). They primarily target business travelers, who are generally showing a higher willingness to pay than leisure travelers (Conrady et al., 2013).

LCCs, such as easyJet and Ryanair, on the other hand compete on price or cost and are mostly operating in a point-to-point system. Their focus is on providing low prices with a single-class offering and often with direct ticket sales to bypass agency fees. Unified fleet structures, short turnaround times, the use of second-tier airports, a higher seat density, and mostly basic service offerings with optional, fee-based services are further characteristics of these carriers, enabling them to operate at lower costs.

According to an airline cost comparison (Wulf & Maul, 2010), which analyzed the cost per available seat kilometer (CASK) of selected LCCs and network carriers, LCCs are able to operate far below network carriers' CASKs. These cost advantages are driven by less complex cost structures and a reduced service offering, leaving a high cost gap for network carriers to close. On the other hand, network carriers generate a higher revenue per available seat kilometer (RASK) through higher ticket prices (Wulf & Maul, 2010). Since 2009 the market share of LCCs in Europe has increased from 24% to 37% in 2019, showing the fundamental shift in the European airline industry (OAG, 2020).

Industry Characteristics

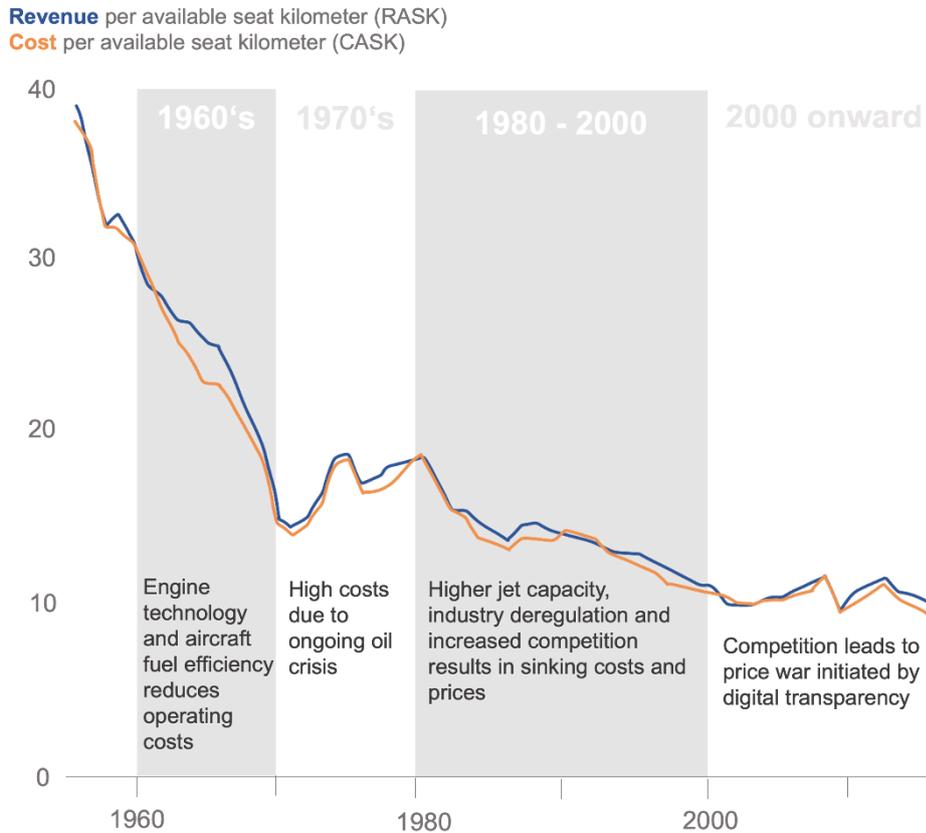
The airline industry has distinctive characteristics and dynamics that make it unique compared to other industries. Despite negative effects of the Covid-19 pandemic, the airline industry is currently projected to return to its stable pre-crisis growth rates and show annual growth of 3.1% in Europe and 4% worldwide in the years to come (Boeing, 2021).

The airline industry as such is closely linked to economic cycles. A study by the EU Commission even sees economic growth as the main driving force for the airline industry. According to this, an increase in GDP leads to a disproportionate increase in traffic volume in the airline industry and vice versa. Since the demand elasticity of the airline industry is high, fluctuations in the economic development lead to even greater fluctuations in the airline industry (Commission of the European Communities, 1999). This contributes to the cyclical character of growth and profitability in the industry.

Responding to these changing market conditions requires from an airline's management the ability to optimize costs, utilization, and prices (Commission of the European Communities, 1999). This is particularly true as ticket prices have been falling across the industry. As a matter of fact, over the past two decades, prices dropped by an average of 2 percent per year (see Figure 2) (McKinsey&Company, 2017). From 2013 to 2019, the YoY passenger traffic growth of commercial airlines in Europe was at 6.1%, with a net profit of 4.67€ per passenger transported in 2019 (IATA, 2021a).

Figure 2: History of the airlines revenues and costs

[2015 in US ct]



Source: McKinsey&Company (2017)

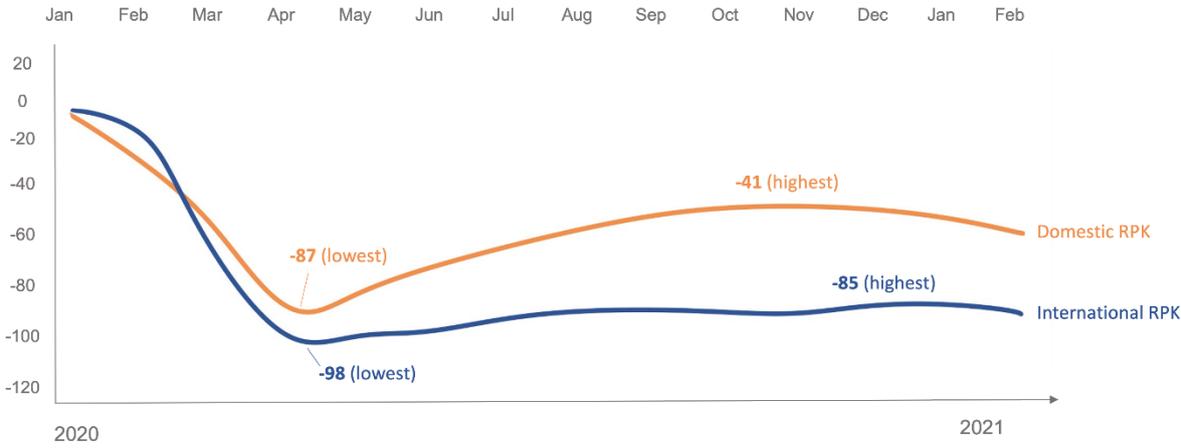
Market Overview

The air transport industry contributes 2.1% or €300 billion to the European GDP (European Commission, 2021a). On a revenue basis, the world market share of European commercial airlines amounts to about 19%. If we compare the global air kilometers flown by paying passengers, the Asia-Pacific region accounts for 34%, closely followed by Europe and North America, both with 23% (JADC, 2021).

Also regarding growth rates by region, a new global footprint emerges. By 2037, Asia-Pacific is expected to account for 46% of the total passenger air traffic (up \approx 12% from 2018). While North America's relative share of total passenger air traffic is expected to decline to 16% by 2037, Europe's share will remain stable at about 22.6%, which would make Europe the number two in the world after the Asia-Pacific region. Overall, growth in established regions such as Europe and North America will slow down. In contrast, accelerated growth is expected in the regions of Africa, the Middle East, and Asia-Pacific in particular, shifting the overall distribution of global passenger traffic.

In 2021, the effects of the Covid-19 pandemic are still felt by the airline industry. A study by the consultancy Roland Berger (2021) shows that monthly passenger kilometers flown worldwide are still 33% below the pre-pandemic level (as of February 2021). While in domestic travel a noticeable recovery from the rock bottom in April 2020 can be observed, international traffic remains on a low level (see Figure 3). Through efficient fleet management, most airlines have been able to increase load factors from a low of 37% in April 2020 to the current level of 62% in March 2021.

Figure 3: Global passenger traffic development - RPK, 2020
[YoY & change in km]



Source: Roland Berger (2021)

Competition

The European airline industry has faced a massive change in the competitive landscape for many years, which becomes particularly apparent in the ranking of European airlines according to passengers carried in the year 2020. The first and second place are held by the LCCs Ryanair with around 52 million and easyJet with around 51 million passengers. They are followed by network airlines, namely the Lufthansa Group (36.5 million), Air-France KLM (34 million) and the International Airlines Group (IAG) (31 million).

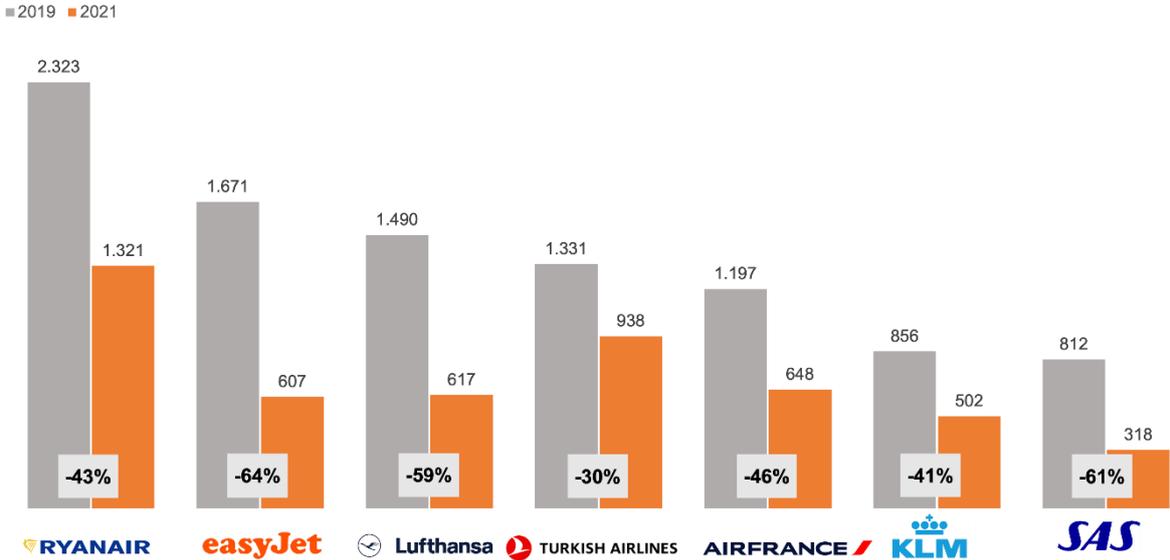
While Ryanair and easyJet are individual airlines without relevant subsidiaries, the three largest European network airlines have affiliated numerous subsidiaries under their parent companies.

The Lufthansa Group's major network airlines include Lufthansa, SWISS, Austrian Airlines, and Brussels Airlines, while Eurowings focuses on short-haul and point-to-point traffic (Lufthansa Group, 2021b). In 2020, the Lufthansa Group has shown revenues of €13.59 billion, a 63% decrease compared to 2019 (Lufthansa Group, 2020b).

Air-France KLM is a holding company that has been created through the merger of the two network airlines Air-France and KLM in 2014. It also owns and manages the low-cost airline Transavia. In 2020, Air-France KLM generated revenue of €11 billion, a decline of about 59% compared with 2019 as a result of the Covid-19 pandemic (Air-France KLM Group, 2021).

IAG was formed by the 2011 merger of two network carriers British Airways and Iberia, which operate under their own names as part of IAG. Meanwhile, LCCs Vueling and Level are part of IAG, as is its so-called "value carrier" Aer Lingus (IAG, 2021). IAG generated revenues of €7.80 billion in 2020, a 69% decrease from the previous year (IAG, 2021b).

Figure 4: Top European Aircraft Operator
[Average amount of daily flights and deviation in 2021 compared to 2019]



Source: Eurocontrol (2022)

Generally, a fundamental convergence of business models can be observed in the European airline industry. Three key changes are worth mentioning here: First, convergence of cost structures, i.e., cost pressure for network carriers due to

competitive pressure from LCCs entering the market; second, convergence of network structures, i.e., airlines increasingly fighting for the same routes; and finally, fighting for the same customer groups (Conrady et al., 2013). LCCs already lead the list of average flights per day in a European comparison (see Figure 4). Formerly separate playing fields, where network carriers dominated hub network types across the entire route length from short-haul to long-haul and LCCs operated only in P2P networks with a short-haul route length, are now increasingly overlapping. LCCs are beginning to enter the P2P long-haul business, as demonstrated by the recent release of "Eurowings Discover," and are moving closer to the hub network form as they increasingly use feeders to fill their aircraft (Lufthansa Group, 2021c). In addition, network carriers are beginning to operate with P2P network types on short- and long-haul routes (Willms, 2021).

Key Trends Impacting the European Airline Industry

Sustainability and Technology

Before the start of the Covid-19 pandemic, the International Civil Aviation Organization (ICAO) predicted that emissions from aviation could triple by 2050 compared to 2015 (European Commission, 2021b).

The environmental impact of (civil) aviation is unmistakable and has become a central issue in shaping our future understanding of air transport. In general, civil aviation has a major impact on pollution through emissions and affects global climate change. It also manifests itself in the form of noise pollution from aircraft, particularly at and around airports (Conrady et al., 2013). This has serious consequences for the health of many residents.

Sustainability in the context of aviation is a comprehensive topic that primarily encompasses social, political, legal and technological aspects. From a social perspective, there is a decreasing acceptance of air travel and a switch to alternative means of transport, especially in domestic traffic (Gössling et al., 2020). The growing awareness of sustainability also increases the pressure on politicians and legislators: in order to achieve climate neutrality by 2050, the European Green Deal sets a binding

target to reduce emissions by 90% compared to 1990 levels (European Commission, 2021b).

In this context, technological progress plays a central role in addressing the sustainability challenges described above. Between 2005 and 2017, the amount of emissions per passenger fell by a quarter, while air travel increased by 60% over the same period (European Commission, 2021b). Therefore, alternatives are required to further reduce the negative environmental externalities of flying: Reductions in fuel consumption and noise emissions will be made possible primarily by newly developed engines, improved aerodynamics, and the use of lighter composite materials on newer generations of aircraft (Lufthansa Group, 2020).

Liberalization and Centralization

From a legal perspective, one central topic for airlines in the EU is the liberalization of the EU aviation market. Before the EU-internal air transport market regulations became effective at the beginning of 1993, air routes within the EU were mostly controlled by the state carriers of each country. The intra-European aviation network was controlled by bilateral air-service agreements between countries. While this protected the carriers from foreign airlines entering the market, it limited at the same time the access to other markets (Burghouwt et al., 2015). Since this scheme was not in line with the EU principles of an open market with free competition, these barriers were gradually removed (Burghouwt et al., 2015).

Still today, traffic rights are a relevant issue. As the European airspace is still fragmented and not managed centrally, the EU Commission is trying to restructure and thereby dissolve fragmentation of the airspace through the so-called Single European Sky (SES) legislation. Today, as a consequence of this fragmentation, an average flight within the EU is 49 km longer than the direct option. The average cost of this fragmentation is currently estimated to amount to €4 billion annually (European Commission, 2021d). Further centralization and increased efficiency of air traffic management (ATM) would lower costs for airlines and operators, reduce delays and improve safety. In addition, route savings could also reduce aviation emissions in the EU by up to 10% if the Single European Sky is successfully implemented (European Commission, 2021c).

The current competitive environment in the European airline market fosters a market consolidation. As a consequence of the constant undercutting of prices and an increasing cost basis for airlines, managers such as Lufthansa CEO Carsten Spohr or the founder of Ryanair Michael O’Leary have been predicting a consolidation of the market for a long time (Metz, 2019). While in the U.S. the five largest airline groups control 85% of air travel and thus effectively established an oligopoly in the airline industry, further market consolidation is still to come in the EU. Here, the five largest airline groups control only about 44% of air travel (Willms, 2021). For the larger European airlines, which are financially capable of carrying out mergers and acquisitions within the industry, the development of EU competition law is of great importance in this regard (Metz, 2019).

Changing Customer Behavior

Not only the societal role and social norms regarding air travel, but also customer preferences and consumer behavior are changing, posing major challenges for the industry. According to a study performed by the consultancy Oliver Wyman, the main factor influencing air travel decisions (in the aftermath of the Covid-19 pandemic) is the price point of the fare. As a matter of fact, 73% of respondents have stated that the price will be the most decisive factor for them (Oliver Wyman, 2020). In light of the ongoing convergence of business models and the rising dominance of LCCs, this puts established network carriers under increased (cost) pressure and drives the trend towards bookable options and the creation of revenue from ancillary products and services.

Furthermore, the degree of personalization and customer-centricity is likely to increase, and airlines will have to better understand the customer journey and to offer more targeted services (BCG, 2020). For this, they need to join or create their own travel ecosystems, in which the flight component just forms one of many pieces of the puzzle. Additionally, an increased usage of data, e.g. with the help of loyalty programs, a reshaping of (online) distribution channels, and a leveling of products to a digital maturity level sufficient to satisfy the modern generation of travelers, seems necessary.

Finally, and different from the global financial crisis in 2008-09, that primarily had an impact on the spending power of customers, the Covid-19 pandemic is expected to

result in changing customer behavior, also in the airline industry (McKinsey&Company, 2021). This especially accounts for business travelers: As a consequence of the work-from-anywhere options that companies continue to offer to their employees, business trips are expected to recover more slowly than leisure trips, reaching only 80% of the pre-pandemic levels by 2024 (McKinsey&Company, 2021). Considering that the contribution margin of business travelers for airlines is, on average, around double that of leisure travelers, this leads to a negative effect on profitability for airlines (Semuels, 2021).

Rethinking the Business

Until today, hubs are dominating internationally in the airline industry. The recent opening of the Istanbul International Airport with a projected capacity of up to 200 million passengers by 2025 underscores this (Istanbul International Airport, 2022). Recently however, a shift towards point-to-point connections can be observed, which goes along with a growth of both longer-range-single-aisle jets, such as the Airbus A321neoLR and the Boeing 737 MAX, and smaller twin-aisle jets, such as the Airbus A350 and the Boeing 787 (BCG, 2020). By serving lower volume routes and connecting smaller, often secondary airports, airlines reduce their revenue risks as well as competitive pressures.

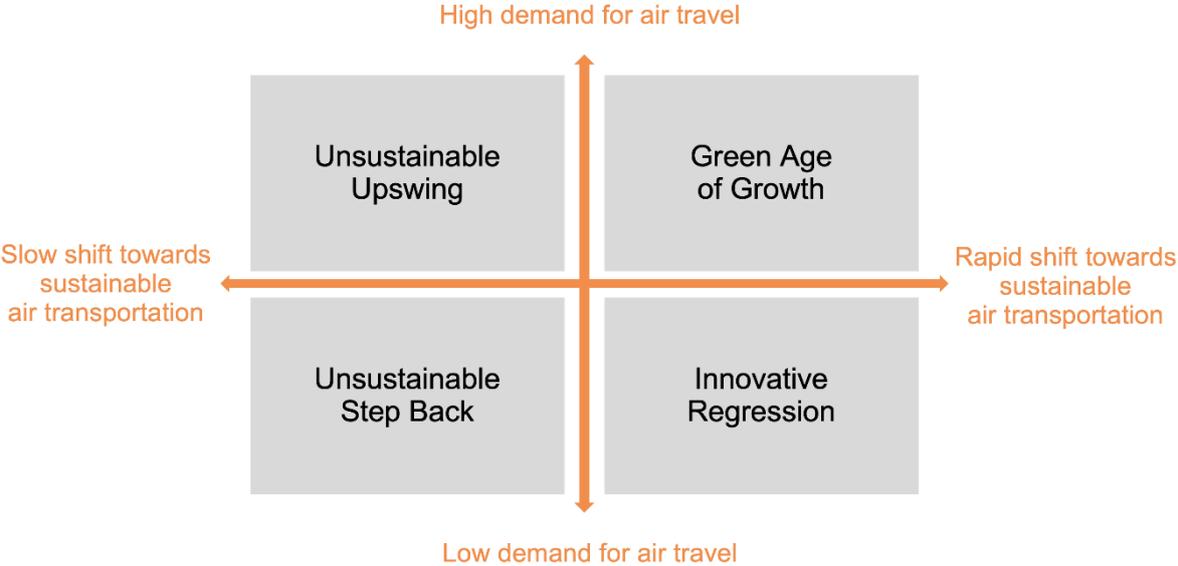
Finally, before the beginning of the Covid-19 pandemic, many airports faced capacity bottlenecks, as the demand for air travel was increasing faster than airport capacity. As a solution, the European Commission has taken efforts to improve air-rail intermodality by gradually transferring short-haul flights to the railway system (European Commission, 2021e). Given the increased environmental awareness of customers, intermodal transport as well as other substitutes, such as air cabs or drones that can carry passengers without a driver, become relevant for airlines.

As a matter of fact, network carriers, such as the Lufthansa Group, are dependent on short-haul flights as feeders for their hubs, even though most of their revenues and profits are generated with long-haul flights. Hence, the trend towards intermodal transportation ecosystems needs to be monitored (Willms, 2021). Nevertheless, it could even become an opportunity, if airlines manage to integrate these feeder connections well into their existing networks (Willms, 2021).

4. SCENARIOS FOR THE EUROPEAN AIRLINE-INDUSTRY IN 2030

Based on the market situation and the various trends in the European airline industry described above, we have developed four scenarios that present different possible pictures for the future of European airlines in 2030. These scenarios are determined primarily by the two critical uncertainties, that form the dimensions of our scenario matrix – *the development of the demand for air transportation* and *the speed of the shift toward sustainable air transportation*. We have named the resulting scenarios "Green Age of Growth", "Innovative Regression", "Unsustainable Step Back" and "Unsustainable Upswing" (see Figure 5). They are described in the following, first briefly and then in more detail.

Figure 5: Scenarios for the European Airline Industry in 2030



Overview

Green Age of Growth describes a future in which, due to rapid recovery from the Covid-19 pandemic and a quick resolution of the Ukraine war, the overall demand for air travel returned to pre-crisis levels already in 2024. However, demand from business travelers recovered more slowly than expected due to the continued use of videoconferencing technology. At the same time, a strong increase in M&A activity accelerated the market consolidation in the European airline industry. Higher environmental awareness, especially among European customers, put additional pressure on airlines to act in a more environmentally friendly way. Due to strong

demand growth in the leisure segment and high industry profitability, however, airlines were able to proactively invest in new flight equipment and sustainable aviation fuel.

Innovative regression describes a world in which the consequences of the Covid-19 pandemic as well as the Ukraine war have been felt in Europe longer than expected. Supply chain disruptions, drastically increased energy prices and an increase in the ECB's key interest rate to fight high inflation rates slowed down economic growth in Europe. Shrinking budgets for business travel and an increasing use of video conferencing technology led to a decline in demand and simultaneously resulted in an increase in the market share of low-cost carriers. A shift toward a more sustainable aviation sector has been and continues to be enforced by legislation through an increase in the aviation tax and a higher minimum blend of sustainable aviation fuel. Thus, network carriers face strong pressures.

Unsustainable Step Back describes a scenario characterized by strong geopolitical instability as a result of the Covid-19 pandemic, the Ukraine war, and the conflict between the USA and China. Economic growth not only came to a standstill, but markets faced a sharp downturn. As a result, the demand for air travel declined. Within Europe, the strong rise of LCC's in both the business and leisure travel segments put high pressure on network carriers. Additionally, European network carriers faced international competition. Although the effects of man-made global warming were becoming more severe, the negative economic development has torn the attention of the regulators away from sustainability issues and the airlines lacked financial means to proactively drive the change in an overall declining market.

Unsustainable Upswing describes a picture of the future of the European airline industry that is characterized by strong economic growth after the Covid-19 pandemic as well as the Ukraine war had been resolved. This growth was accompanied by an increase in demand for air travel in Europe. Airlines that had used the crises for restructuring initiatives drove the market consolidation which resulted in high profitability for these airlines as their pricing power increased. Regulators were reluctant in imposing regulations that might have enforced sustainability measures as they did not want to endanger the competitiveness of the industry, and airlines have seen the era of profitability as an opportunity to compensate investors with dividends for the crisis years instead of investing in sustainability.

Scenario A - Green Age of Growth

The European Passenger Airline Industry in 2030

Figure 6: Green Age of Growth Scenario

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INNOVATIVE PLAYERS DOMINATING THE MARKET

European Airline

The European Passenger Airline Industry announced record revenues and profits. According to industry experts, this growth was primarily driven by the strong economic development in the past decade and the disappearance of the COVID-19 crisis that had a strong impact on the societal life at the beginning of the decade. Rising environmental consciousness of customers and increasing legal requirements are now met by significant investments into technological innovations. Accelerating market consolidation and prosperous growth in the industry enabled large financial investments into modern flight equipment and sustainable jet fuels.

“Efforts from politics on European as well as country level and from the airline industry itself made it possible to contribute to a sustainable growth through a mix of fleet renewal, the increase in the admixture of sustainable fuel blending and the improvement of inter-modality”, says the CEO of a major European airline group. The quick resolution of the Ukraine war and the return to a multilateral world also contributed to this development.



CENTER FOR STRATEGY AND SCENARIO PLANNING

Developments between 2021 and 2030

Consequent vaccination strategies and the continuous renewal of Corona immunizations have successfully saved Europe from additional Covid-19 infection waves and prevented further extensive lockdowns. A loose monetary policy from the European Central Bank (ECB), combined with continuously low interest rates have further fostered economic growth and led to average GDP growth rates of 5 % in the years between 2021 and 2030. A flattening of the growth curve in 2022 and 2023 was caused by the Ukraine war and increasing geopolitical tensions between the USA and China. Due to the quick resolution of the war in 2023 as well as new trade agreements with China backed by the re-election of President Biden in 2024, however, this has not led to a recession and the market shakeout that some economic experts had predicted.

Protectionist movements and nationalistic tendencies that could be observed in the beginning of the decade in many European countries still exist, but could be

successfully contained – so that today, democratic parties and parties with an environmental focus dominate across Europe. The political influence of the European Commission has increased steadily, thereby strengthening the EU.

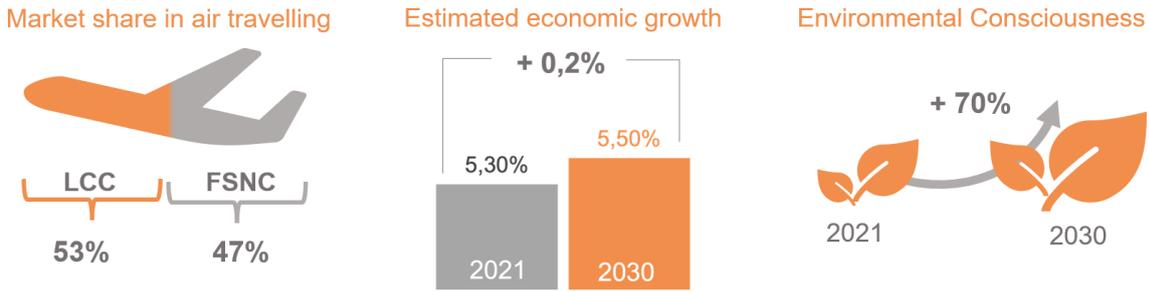
Both the restoration of geopolitical stability as well as the positive economic development fostered demand for air travel within Europe. Most recent numbers show that between 2021 and 2030 an additional 1.2 billion passengers annually were recorded in Europe, leading to a CAGR of 3.9% for the industry. However, this growth was not solely realized by existing European network carriers. Rather, according to the IATA, around 60% of the increase in demand can be allocated to LCCs that strongly increased their market share in Europe. Within six years, from 2021 to 2025, the market share of LCCs in Europe rose by 6.7 percentage points, from 44.5% to 51.2%, setting traditional network carriers under increasing pressure. Additionally, a certain customer churn, especially for domestic air travel, could be registered due to the improvement of the train network, a result of the political efforts towards increased intermodal transportation. Contrary to expectations, however, aircraft substitutes, such as (electric) air taxis, have not reached a relevant position on the short-haul market yet.

Initially triggered by the Covid-19 pandemic and the corresponding shutdown of the entire social life, the revenue from the most profitable customer segment, namely business travelers, has slightly decreased. Even after the pandemic, the number of business travelers has not fully recovered to pre-pandemic levels, reaching around 80% in 2025, adjusted for growth. Additionally, the rising dominance of low cost carriers, also in the business traveler segment, slowed down growth, impacting profitability for traditional network carriers, that have to compensate for losses in this customer segment. Compared to the US airline market, the European airline industry was more fragmented in 2021, with the five largest airline players in Europe accounting for 44% of air travel, whereas the five largest players in the US made up around 85% of air travel. Since 2021, however, this has changed. A strong increase in M&A activities led to a wave of market consolidation. The five largest European players are now, in the year 2030, offering 68% of the entire air travel. This change in the market position has improved the bargaining power of existing players, increasing their average EBIT margin to 7.1% in 2030. This not only enabled all major European airlines to repay their governmental liabilities by 2025, but also offered the financial basis to invest into sustainable technological innovations.

With global warming and its consequences still being a prevailing issue for the world population, the environmental consciousness of customers has increased. However, the awareness of customers towards environmentally friendly behavior differs significantly in the global comparison. Following recent studies conducted in the year 2030 with European customers, around 42% of (leisure) travellers are willing to pay a price premium for a more sustainable flight product. 30% would even accept inconveniences regarding travel time, e.g. through the usage of trains as a feeder, to decrease the negative impact of their journey on the environment. This surely puts increasing pressure on existing players, who are trying to meet both customer expectations as well as governmental regulations by heavy investments into fleet renewal and an increase in the admixture of sustainable jet fuel.

Looking back at the development of the airline industry in the past decade, both industry representatives as well as climate activists are satisfied, as a positive economic development in Europe between 2021 and 2030, supported by the successful containment of the Covid-19 pandemic, the relatively quick resolution of the Ukraine war and the return to a multilateral world, has boosted demand for air travel, despite an only moderate recovery in business travel. The strong growth and market consolidation within the European airline industry had a positive impact on the financial position of many European airlines and enabled strong investments in sustainable technologies - a truly positive outcome for all stakeholders involved.

Figure 7: Scenario fact sheet: Green Age of Growth



- Scenario Description**
- Quick corona pandemic recovery and a stable economic upswing triggered demand for air transportation
 - Return to enhanced multilateralism and fast resolution of the Ukraine war
 - Due to increased diffusion of video conferencing technology, demand from business travelers recovered slower
 - Increasing pressure to act more environmentally friendly due to the rise of environmental awareness
 - Proactive new flight and sustainable air fuel investments
 - Increase in M&A activities accelerates market consolidation within European airline industry

Scenario B – Innovative Regression

The European Passenger Airline Industry in 2030

Figure 8: Innovation Regression Scenario

Dezember, 2030 The Economist

INNOVATION DILEMMA

Airlines complaining about an unfair sharing of the burden towards sustainability



“In light of the inevitable consequences the man-made climate change has on our earth, we do see the urgent need for the industry to act now, however, the (financial) burden has to be split fairly.”, says a representative of a major European airline-association.

In the year 2030, the industry is faced with a double-edged challenge: Due to the difficult geopolitical and economic situation and decreasing demand for air travel, European airlines face a profitability crisis. At the same time, social movements and governments demand stronger efforts to environmental protection from the airlines. Currently, strong regulations, such as the increase in air travel taxation and the ban of short-haul flights, are the new reality for airlines, that increases the financial strain and has forced first airlines to file for bankruptcy.

Developments between 2021 and 2030

The covid-19 crisis stayed with Europe longer than expected. Continuous virus mutations and a decreasing societal willingness for booster immunizations accelerated the development of new infection waves through 2023. This resulted in further partial corona lockdowns in the fall of 2022 and the winter of 2023. Additionally, lockdowns in China further deteriorated international supply chains and led to shortages in Europe. These developments were enforced by the Ukraine war as well as rising geopolitical tensions between Western countries and China.

The flooding of the markets with money during the first corona waves in 2020 and 2021 had stabilized the European economy. Constantly low interest rates and strong quantitative easing by the European Central Bank in combination with supply chain disruptions and the Ukraine war, however, led to supply shortages and price increases not only of raw materials but also of groceries and consumer products. This has

inevitably resulted in skyrocketing inflation rates, reaching a peak of almost 10% in October 2023. The high inflation as well as strongly increased government spending forced the ECB to increase the key interest rate and cut back the bond purchasing programs. In combination with supply chain disruptions and rising energy prices this has slowed down the economic recovery in Europe. Consequently, GDP growth rates only reached 2.5% in 2022 and 2023 and slightly increased in the following years to about 3.5% - a rather low growth in view of the high inflation rates. Thereafter the economy recovered more strongly, reaching growth rates of 3.9% in 2029 and 4.2% in 2030.

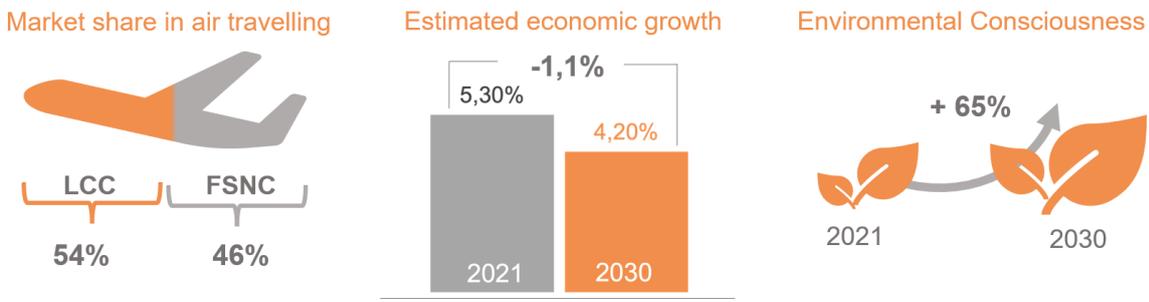
A small catch-up effect after the loosening of corona restrictions led to a rise in demand for air transportation in the years 2021 and 2022. From 2022 to 2030, however, demand was continuously lower than expected, with annual growth rates of around 2,75%. The corona pandemic itself has forced the majority of the professional world to switch to virtual working; whilst business trips were replaced by Zoom meetings and conventions were held online, demand for air transportation further decreased. A recent study among business travelers found that the majority of respondents is expecting their own flight behavior in the upcoming years to amount to a level of only 60% compared to the pre-covid situation. The decrease in the market for business travelers has led to an increase in the market share of LCCs. Average EBIT margins of European network carriers in 2027 amounted to 2.8%, a decrease by 2.5 percentage points compared to pre-covid levels.

Numbers from a recent industry report have shown a decrease in the absolute amount of investments into fleet renewal as airlines lack financial reserves. Also, efforts to increasingly use sustainable jet fuel are deprioritized by airlines. At the same time, global warming remains one of the most pressing topics, further increased by numerous natural disasters that have occurred in the 2020s. Based on current projections, the legally binding climate goals, set as part of the Paris Climate Agreement, will not be reached if carbon emissions continue to rise as they did in the 2020s. The European public and European governments have meanwhile realized the necessity to act and to tighten environmental regulations to force the airline industry to act more sustainably. In February 2025, a bill initiated by the European Commission led to an increase in air travel taxation. Critics, however, complained that these taxes were economically inefficient, complicated, and fundamentally imbalanced and

threaten the survival of airlines. At the same time, EU governments have started to ban short-haul flights. Even though these short-haul flights themselves are not very profitable for airlines, they fear heavy revenue losses as, without these feeder flights, customers might switch more easily to other airlines for long-haul flights. Further regulatory initiatives with the goal of reducing the environmental footprint have been initiated by the European Commission. The so-called five step plan, which was recently presented, is raising the minimum admixture of biomass-based aviation fuels to 20% until 2035 and 32% until 2040. By 2050, at least 63% of the entire fuel is required to be biomass-based.

In summary, airlines see the need to move towards sustainability but are faced with slow growth and low profitability. Limited financial resources are the main reason why airlines do not invest proactively in sustainable technologies. At the same time, to meet internationally set environmental targets, the European Commission and local governments have tightened regulations and introduced bans – to the disadvantage of airlines. This is causing anger among airline managers who accuse regulators of an unfair distribution of the externalities of the shift to sustainability and of threatening the future of airlines.

Figure 9: Scenario fact sheet: Innovative Regression



Scenario Description

- Slow corona pandemic recovery forced the industry to regularly cut back supply of air travel until 2025
- Strong geopolitical tension between Western countries and China, with ongoing conflicts in Ukraine
- Lower demand for business travel of network carriers led to the rise in market share of LCC's
- Increasing legal forces such as taxation and an increase in the minimum admixture of sustainable air fuel leads to demand in sustainable alternatives
- Reduction of the key interest rate by the ECB due to the fear of an economic overheating slowed down economic growth within Europe

Scenario C – Unsustainable Step Back

The European Passenger Airline Industry in 2030

Figure 10: Unsustainable Step Back Scenario



Developments between 2021 and 2030

The 2020s have been a decade of constant crisis. Even after the end of the Covid-19 pandemic with last lockdowns in the fall and winter of 2022 and 2023, Europe remained unstable as the confrontation with Russia extended beyond the war in Ukraine. Even after a cease-fire was reached in Ukraine in 2023, especially smaller countries in Eastern Europe were constantly threatened and destabilized. The unity among EU and Western countries, that brought hope after the outbreak of the Ukraine war, saw first cracks already in 2022. More and more EU member states started to follow an anti-European course, whilst the trade conflicts between China and the USA increased. Until 2030, things got even worse. While the Ukraine war remained unresolved, the conflict in the South China Sea between the USA and China began to escalate, which further destabilized international trade. Also, European unity deteriorated, with several countries conducting plebiscites about a withdrawal from the European Union and many others being unsatisfied with the unfair carrying of obligations. Those developments unsettled the markets and confronted world politics with new challenges.

Not only (geo-)political instabilities were a source of uncertainty, but also economic indicators were mostly pointing into a negative direction, as a severe recession was looming. Political tensions, collapsing supply chains, rising energy prices, and the increase of interest rate by the ECB due to high inflation firstly led to a recession already in 2022. As a consequence, companies decreased their investments, the overheated stock market began to decline and finally “crashed”. Real estate prices dropped massively.

As a consequence of the economic downturn, purchasing power from 2022 to 2024 reduced by 12% in a year-on-year comparison – demand for air travel in 2024 was even 20% lower than expected. This hit the airline industry hard, as it was just in the process of recovering from the Covid-19 pandemic. Nevertheless, not only the airline industry faced negative development, but also several other industry sectors were fundamentally impacted. Consequently, tax revenues decreased heavily: Eurostat, the statistical office of the European Union, estimated the decrease in tax revenues from 2023 to 2024 to amount to 8.2%. These negative economic developments increased the pressure on companies to cut costs, leading to decreasing travel budgets and a lower overall travel volume. Many trips were again replaced by virtual meetings, and an essential part of the remaining business trips was shifted to low-cost carriers. The rising price sensitivity of all customer groups (business and leisure travelers) led to an increase of 18 percentage points in the market share of European LCCs, now amounting to 62.5% (compared to 44.5% in 2020).

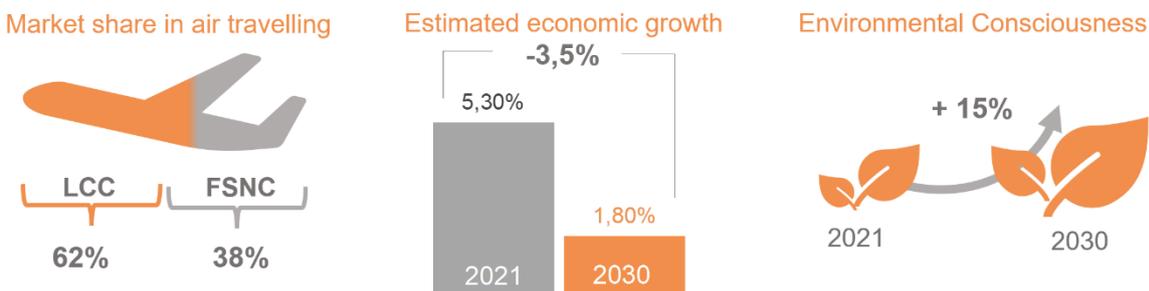
However, European network carriers were not only concerned by the loss in market share to LCCs, but also by growing international competition. Since the European Commission constantly granted additional landing rights to foreign airlines, the market dominance of Gulf airlines, such as Emirates and Qatar, but also of Asian Airlines increased. This increased the pressure on established European network carriers also in the long-haul segment and initiated a major shakeout in the market.

Even though the effects of climate change prevailed and environmental disasters were becoming even more severe, social and political pressures for investments in more sustainable technologies and a change in behavior have significantly decreased as fear of economic decline and reduced prosperity were looming. As a matter of fact, most airline passengers regarded price as the most important buying criterion.

Similarly, environmental regulations were not very tight. The European Commission, for example, has only mandated fuel suppliers to blend a minimum volume percentage of sustainable aviation fuel of 2% from 2025 and of 5% from 2030 onwards into the aviation fuel supply. Simultaneously, the admixture rate of synthetic fuels should be steadily increased – without setting a fixed percentage. Other initiatives, such as the harmonization of air traffic control or the restriction of operations, two solutions that experts regarded as highly effective, have not been further pursued by the regulators. The economic decline has also reduced governmental commitment to infrastructure development. Especially the expansion of the European railway network has been slowed down, with major connections estimated to be finalized two to three years later than expected.

Overall, geopolitical instability and an economic recession resulted in strongly declining demand for air transport. Shrinking corporate travel budgets and increased customer price sensitivity have led to high losses for airlines, which was exacerbated by increasing international competition. As a consequence, airlines fight for survival and are neither willing nor able to invest in sustainable aviation technologies. Legislative stimuli that enforce these investments are largely absent. Technological progress and infrastructure improvements are delayed by the difficult economic situation. Particularly, the recovery of the network airlines is affected and first airlines had to file for bankruptcy.

Figure 11: Scenario fact sheet: Unsustainable Step Back



Scenario Description

- Geopolitical instability characterized by trade conflicts and an increase in protectionistic situations unsettled the markets
- Ukraine war still unresolved, threat of escalation in the South China Sea is destabilizing international trade
- Not driving the shift toward sustainability proactively, actions are limited to a few legal regulations
- Economic growth came to an end and led to market crash, thus purchasing power and likewise the demand for air travel declined significantly
- Rise of LCC's put network carriers and increasing demand from golf airlines put network carriers under pressure and leads to market shifts and a new competitive landscape

Scenario D – Unsustainable Upswing

The European Passenger Airline Industry in 2030

Figure 12: Unsustainable Upswing Scenario



Developments between 2021 and 2030

Between 2021 and 2023, the world economy faced various problems. Disruptions in supply chains, that had occurred from the beginning of the Covid-19 pandemic, were aggravated by the sharp lockdowns in major Chinese cities in 2022. Strongly rising energy prices following the start of the Ukraine war in 2022 deteriorated this situation. For many European companies this led to interrupted production processes as well as supply shortages, strongly increased prices and long waiting times for customers. However, in view of the Ukraine war, the EU presented itself more unified than ever. Stimulus packages, that had been introduced during the Covid-19 pandemic already, were further enhanced. Particularly, the Ukraine war initiated high investments in infrastructure and the military across Europe. These stimuli laid the basis for strong economic growth in Europe which was further strengthened by high investments in the rebuilding of infrastructure in Ukraine after the war ended in 2023.

The strong economic growth in the years after 2023 came along with an increase in the growth rates of the passenger airline industry. Both, demand for leisure as well as for business travel rose – business travel demand, however, only returned to the pre-covid levels by 2029.

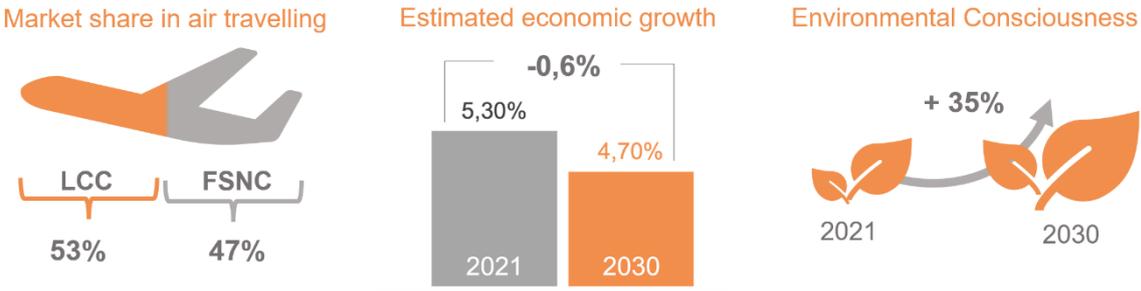
An abrupt decrease of revenues during the Covid-19 crisis combined with an inflexible cost structure had confronted the airlines with high pressures to reduce cost. Some airlines used the pandemic situation to initiate restructuring programs, to phase out old and inefficient aircraft, and to optimize processes. These restructuring efforts could even be intensified, when demand rose again after 2024. As a consequence of these actions, several airlines had a more efficient organizational set up and emerged even stronger from the crisis whilst struggling players had difficulties in keeping up. This situation resulted in a further push to market consolidation. Many players that were not well-positioned were acquired – thereby increasing the market dominance and the pricing power for those who were strong anyways. As a consequence, the average profit margin of the three leading European network carrier groups reached 6.4% between 2025 and 2030 - the highest consecutive profitability phase ever in this industry.

Despite the rising number of environmental disasters and an omnipresence of the climate crisis, airlines face only moderate pressure to increase their efforts towards more sustainability. As a matter of fact, the regulators in the EU and on national levels are reluctant to enforce further environmental restrictions as they fear negative consequences for the international competitiveness of European airlines. This increased attention to the international competitiveness of European companies represents a change in the EU policy. In view of the conflict with Russia, but also increasing tensions with China and the USA after the reelection of Donald Trump as president in 2024, the EU has moved away from merely creating a level playing field on European markets to pursue active industrial policy with the aim of protecting European companies against international competition. In that spirit, several ambitious environmental initiatives, such as the reduction of carbon dioxide emissions emitted by aircrafts through the increase in the taxation of air travel, have been initiated, but not fully executed.

In view of geopolitical tensions, sustainability pressures from customers were also lower than projected at the beginning of the decade. In a 2030 survey, a majority of customers was expecting investments in more sustainable air travel from the airlines, but only 35% of the participants were willing to tolerate higher prices in return. Thus, the airlines concentrated on those sustainability measures that also had an economic benefit. For example, when capacity had to be adjusted during the Covid-19 pandemic, several airlines phased out less efficient aircraft, such as the four-engine Boeing 747-400 or the Airbus A340-600. This move reduced emissions and cost per flight kilometer. However, airlines did not use a substantial amount of their profits for investments into sustainability measures, such as the increase of the admixture of sustainable aviation fuel, as this would have increased cost. This did not mean that airline managers were not aware of the responsibility that they bear for the environment and for the climate crisis. Rather, they felt an even stronger obligation towards their shareholders, who finally demanded (higher) dividends after years of crisis.

In summary, despite a strong increase in demand for air travel due to a thriving economy, airlines did not see investment in sustainable technologies as a key priority, partly due to a lack of pressure from legislators. As customer expectations did not seem to be strong enough for sustainable behavior change, breakthrough innovations were missing, slowing down the shift towards sustainable air travel in the European airline industry.

Figure 13: Scenario fact sheet: Unsustainable Upswing



Scenario Description

- After a small dip in economic development, a full economic recovery is achieved due to a strong increase in demand for air travelling
- Ukraine war united the EU more than ever, resulting in Europe-wide high investments in infrastructure and military
- These incentives laid the foundation for strong economic growth in Europe, which was reinforced after the war ended in 2023
- Bureaucratic inefficiencies resulted in the failure to carry out major legislative initiatives for the environment
- Consolidation of the market as well as efficiency enhancement measures undertaken to combat the negative effects of the pandemic led to high level of profitability thus positive financial effects

5. STRATEGIC IMPLICATIONS FOR EUROPEAN AIRLINES

The four scenarios are not meant to predict the future development of the airline industry. Instead, they provide realistic alternative pictures of the state of the industry in Europe in 2030. Common to all scenarios is the far-reaching scope of changes to be expected. It is therefore essential for European network carriers to start preparing today. In this chapter we thus highlight a few strategy implications for respective players. Detailed strategy recommendations, however, can always only be derived in the light of the specific situation of each individual company.

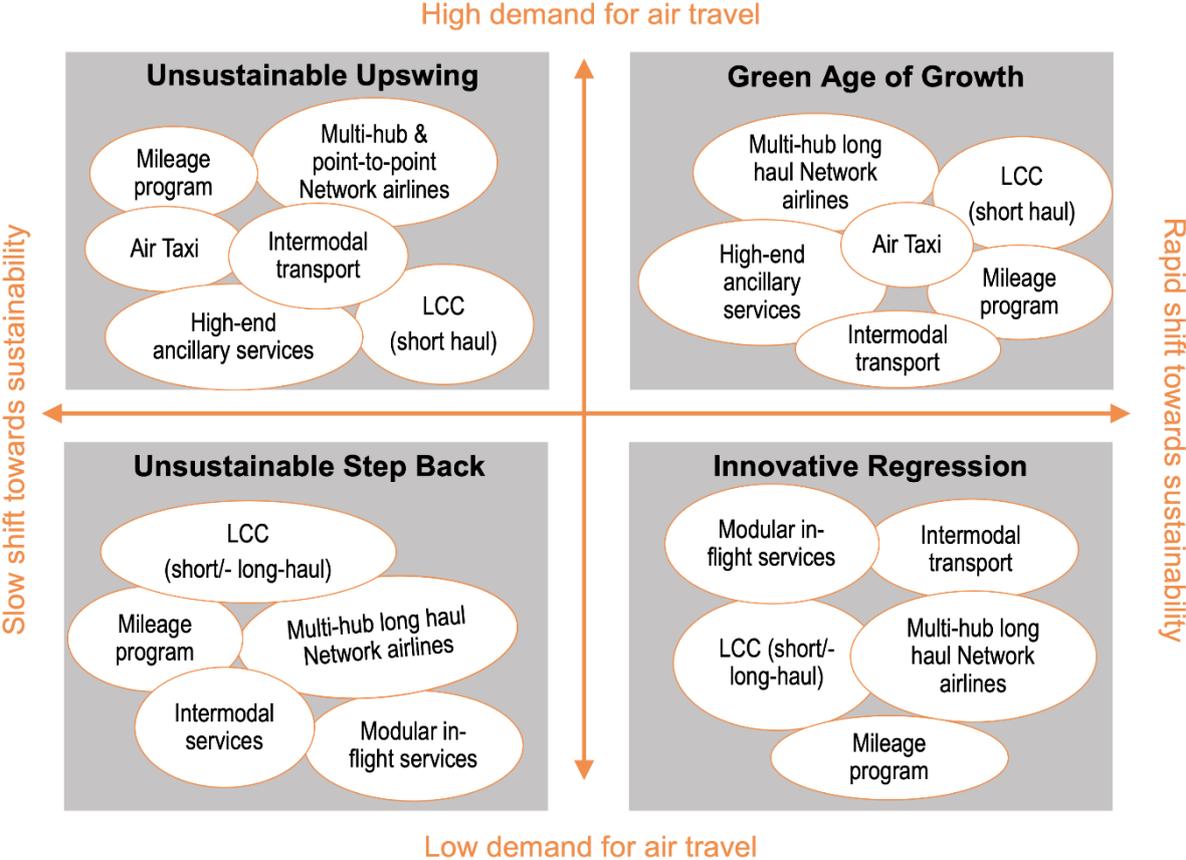
At the level of airline groups, strategy recommendations relate to the future design of the group's portfolio of businesses, products or services. To develop such a portfolio from the scenarios, managers should start out by asking two questions for each of the four scenarios:

(1) Which of our current businesses, products or services seem particularly promising under the conditions of this scenario?

(2) Which new businesses, products or services are promising under the conditions of this scenario?

The answers to these two questions yield one ideal portfolio of businesses, products or services for each of the four scenarios, which together form a scenario-based portfolio matrix. Some businesses, products or services will appear in more than one scenario and deserve particular attention. In the case of the European airline industry low-cost businesses, intermodal offerings and ancillary services, such as modular in-flight services, for example, offer particularly promising growth and profitability prospects in all four scenarios, while positive prospects for a new air taxi services business, for instance, might only show in the scenarios "Green age of growth" or "Unsustainable upswing". Figure 14 shows an example of such a simplified scenario-based portfolio matrix for a European airline group.

Figure 14: Simplified scenario-based portfolio matrix for a European passenger airline group



The scenario-based portfolio matrix provides an overview of promising businesses, products or services in each of the four scenarios. As figure 14 highlights, the four portfolios are not fundamentally different from each other – because, in the end, in all four scenarios they reflect a (passenger) airline group. Nevertheless, the size as well as the specific orientation of the single businesses, products, or services differ in all four cases. Certainly, an airline group is not able (and it does not make sense) to invest in all four portfolios at the same time. Therefore, in a second step managers need to ask themselves which of the four scenarios seems most likely to become reality in order to decide which of the four scenario-based portfolios to commit the majority of the resources to. For this, we use the scenario cockpit as well as scenario-based portfolio management as tools.

The scenario cockpit is a strategic controlling tool that makes the scenario dimensions measurable. For developing the scenario cockpit, airline managers need to proceed in three steps:

(1) First, they need to define quantitative measures for the two scenario dimensions. The dimension “Development of the demand for air travel” can, for example, be measured on the basis of the “number of passengers at European airports” or “GDP growth in the EU”. For the dimension “Speed of the shift towards sustainability” the “price per ton of CO₂” might serve as a measure.

(2) Secondly, they need to define “tipping points”, that is: values or value ranges of a measure, that might signal a transition from one scenario to another. An increase of the value of the “GDP growth in the EU” beyond 4%, for example, might indicate a move towards higher demand for air travel. Thus, it signals a transition towards the scenarios “Unsustainable upswing” or “Green age of growth”.

(3) Finally, a traffic light system needs to be applied to the data to clearly indicate for each scenario how likely it is to occur. This helps to determine and constantly monitor the dominant, i.e. the most likely, scenario.

Based on the scenario cockpit, airline managers can decide, which of these scenario-based portfolios the group should actually focus on, that is: how resources should be allocated to different businesses, products or services as part of the scenario-based portfolio management. If our scenario cockpit indicates, for example, that “Innovative regression” is the dominant scenario, airline groups should invest in their own LCCs, as the market share of this segment of the airline industry is likely to increase. Additionally, they might seek additional intermodal offerings, e.g. through alliances or joint ventures with train operators. Furthermore, they should invest in businesses, products and services, that reduce cost and the carbon footprint at the same time, such as fleet renewal (e.g., more energy-efficient engines to reduce emissions) or modular services (e.g., paid in-flight meals to reduce waste).

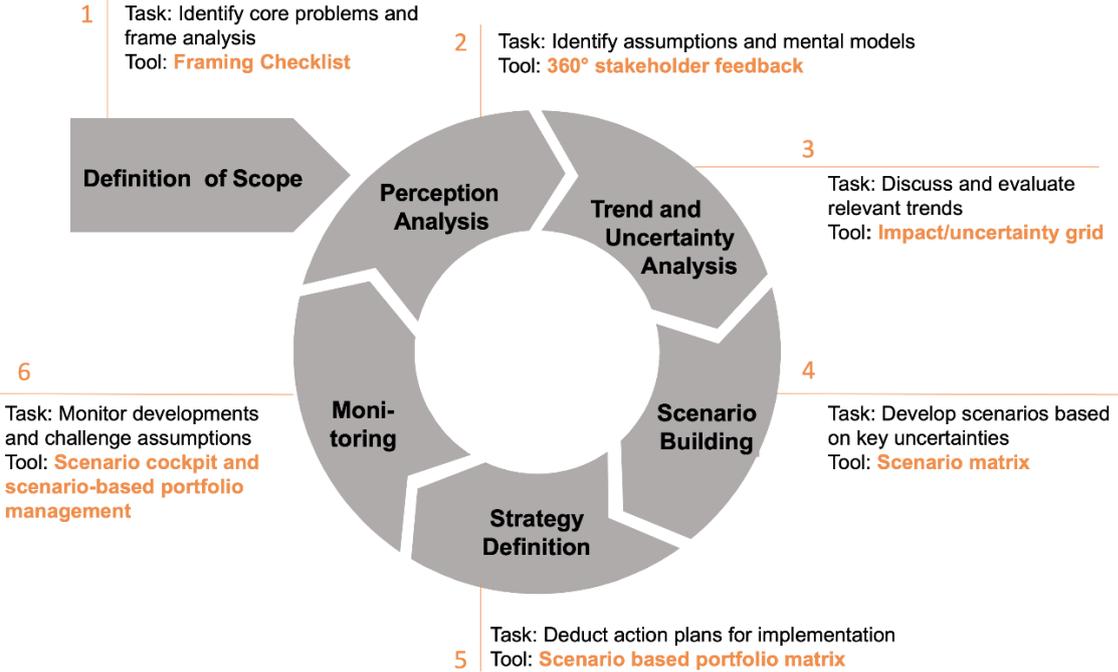
6. METHODOLOGY

HHL-Roland Berger approach to scenario-based strategic planning

Our scenario study is based upon the approach to scenario-based strategic planning that was jointly developed by HHL and Roland Berger. The approach does not only allow creating scenarios but also enables companies to integrate scenarios into their strategic planning processes.

Our approach consists of six consecutive process steps for each of which we have created a specific tool that eases strategic planning with scenarios in practice. The approach thus enables managers to plan for multiple options. At the same time, it allows managers to integrate and align external and internal perspectives to challenge existing assumptions and mindsets (Schwenker & Wulf, 2013).

Figure 15: HHL-Roland Berger approach to scenario-based strategic planning



Source: Schwenker, Wulf (2013)

Description of process steps

Definition of scope

In step 1 of our scenario development process, we define the project scope. Experts of our Center for Strategy and Scenario Planning and project partners meet to agree upon the core goal of the project. This includes identifying core problems and framing the analysis. Our Framing Checklist tool makes sure that every important aspect is covered and that all project partners share a common understanding of the steps ahead.

In order to create the four scenarios for the European airline industry we applied this Framing Checklist. We defined the goal of the analysis to be the development of scenarios for the European airline industry until 2030. The industry itself is very diverse and companies vary significantly with regard to their business model. Therefore, this study specifically focuses on the passenger transportation segment of traditional network carriers and established low-cost airlines. Cargo airlines are excluded from the scenario analysis.

Perception analysis

In step 2 of our scenario development process, we apply our 360° Stakeholder Feedback tool to identify assumptions and underlying mental models of different players in the industry as well as of external stakeholders. This reveals important influence factors, but also possible blind spots and weak signals.

In order to identify important influence factors for the future development of the European airline industry, we sent out two questionnaires to managers of major airlines in Europe as well as to external industry experts from research institutions, to consulting companies and to customers to get an overview on their assumptions as well as the trends and factors they considered important for the future of the industry.

After conducting the 360° stakeholder feedback, all factors were consolidated and analyzed. The aim of the so-called trend and uncertainty analysis is to identify the most important driving forces affecting the industry and the corresponding uncertainties

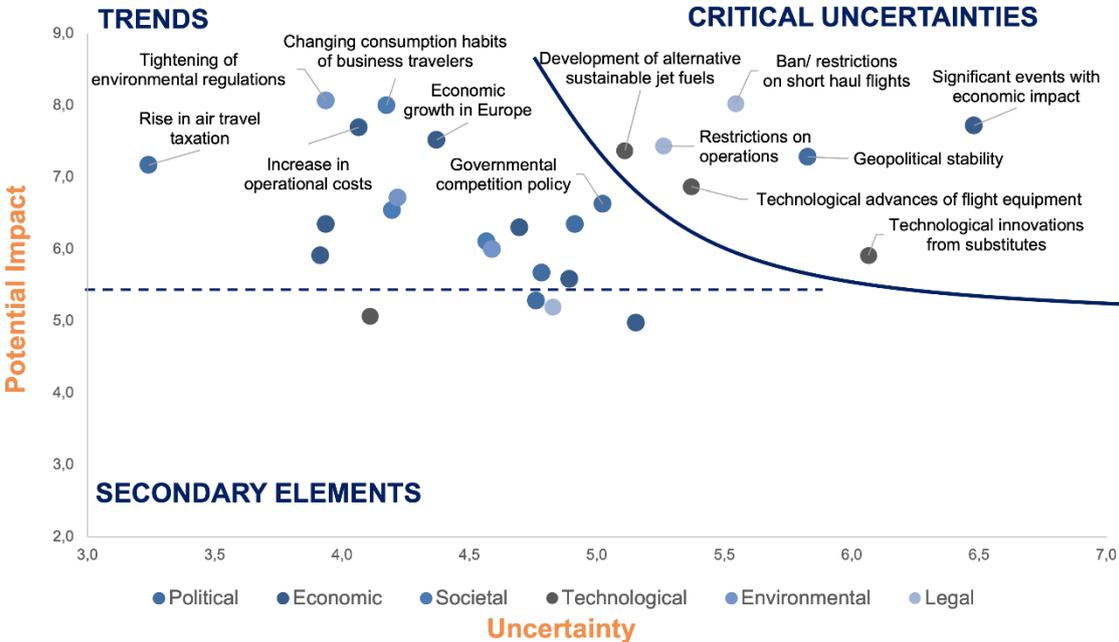
behind these factors. These factors were mapped on an impact/uncertainty grid to identify the critical uncertainties.

Trend and uncertainty analysis

In step 3 of our scenario development process, we determine and analyze trends that are likely to impact the project partner in the future. With the help of our Impact/Uncertainty Grid tool, we cluster the trends according to their degree of impact and their level of uncertainty. Factors which score high on both dimensions are then transformed into 'key uncertainties', the basis of the next step in our scenario development process.

For the scenario generation in the European airline Industry a workshop with specialists from the HHL Center for Strategy and Scenario Planning was conducted. In this workshop, different influence factors that were gathered and rated by the experts in the previous process step were transferred into the Impact/Uncertainty Grid and clustered into critical uncertainties, trends and secondary elements (Figure 16).

Figure 16: Impact/uncertainty grid for the European airline industry



An important task of this workshop was the identification of two key uncertainties which built the basis for the scenario development in the next process step. For this we clustered two and five factors respectively into two meta-categories, which we call

critical uncertainties or scenario dimensions. The first meta-category/ scenario dimension is a cluster consisting of two critical uncertainties. These are:

- Geopolitical stability (political)
- Significant events with economic impact (political)

Geopolitical stability is relating to events/ trends, such as protectionism, terrorism, or war, whereas significant events with economic impact can be defined as one-time events, such as diseases, an economic crash, or trade wars. Changes in each of these factors have a significant impact on the (geo)-political situation which in turn has a direct impact on the economic situation and vice versa. As described in the chapter before, the demand for air travel is highly dependent on the economic situation due to the high elasticity of demand. Thus, together they form the scenario dimension "**Development of the demand for air travel**".

The second scenario dimension, "**Speed of the shift towards sustainable air transportation**", is composed of five subcomponents. These uncertainties are:

- Technological advances of flight equipment (technological)
- Development of alternative, sustainable jet fuels (technological)
- Technological innovations from substitutes (technological)
- Ban/ restriction of short-haul flights (legal)
- Restrictions on operations (legal)

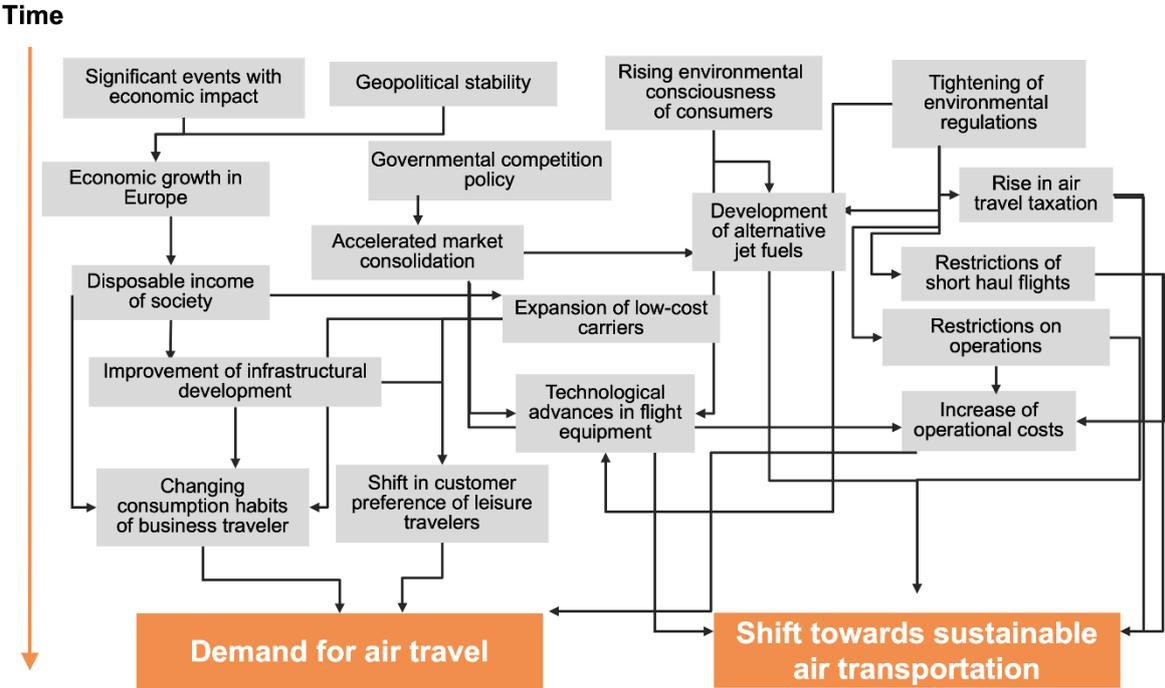
These five subcomponents mainly capture the regulatory and technological pressures that European airlines face.

Scenario building

In step 4 of our scenario development process, the scenarios themselves are created. Using the scenario dimensions determined in the previous step, we derive possible pictures of the future and describe them in detail. Typically, four plausible and distinct scenarios are developed. Our Scenario Matrix tool guides this process step. To speed up the process and to make the scenarios as accurate as possible, we also use the know-how of global scenario experts assembled in our Scenario network for this step.

In the present scenario project, the creation of the scenario matrix resulted in four scenarios for the European airline industry as described above (see Figure 1). We named these scenarios "Green Age of Growth", "Innovative Regression", "Unsustainable Step Back" and "Unsustainable Upswing". To describe these scenarios in more detail, we created an influence diagram. This diagram displays all trends and critical uncertainties as a chain of causes and effects which lead to the two scenario dimensions. This influence diagram forms the basis for the detailed description of the four scenarios presented above (Figure 17).

Figure 17: Simplified influence diagram for the European airline industry



Strategy definition

The main goal of this step is to develop ideal-typical portfolios businesses or products and services for each of the four scenarios. For the strategy definition we use the scenario-based portfolio matrix as a tool. The scenario matrix serves as a basis for the portfolio matrix. In each of the four quadrants of the scenario matrix, we now display one ideal-typical portfolio that is most adequate for this scenario. To arrive at the ideal-typical portfolios, we first list all existing businesses of the company in question. Then, we go back to the scenarios that we developed. For each scenario we ask two questions:

1. Which of our current businesses, products or services seem particularly promising under the conditions of this scenario?
2. Which new businesses, products or services are promising under the conditions of this scenario?

These two questions are discussed as part of a top management workshop and yield one ideal portfolio for each of the four scenarios. Certainly, specific businesses, products or services can also appear more than once in this portfolio matrix if they fit to different scenarios.

Monitoring

The main goal of this step is to constantly track the development of the company's environment and its influence factors and to allocate or reallocate resources to the most appropriate scenario-based portfolio. For the monitoring step we use the scenario cockpit as well as scenario-based portfolio management as tools. The scenario cockpit is a strategic controlling tool that comprises several indicators which help us to determine which scenario is most likely to occur. The scenario cockpit lays the essential basis for scenario-based portfolio management. The company's management needs to decide which of the four scenario-based portfolios, which have been defined in step 5, the company should focus on. Scenario-based portfolio management helps to take this decision by answering two questions:

1. Which scenario is the dominant one, that is: which scenario is most likely to occur?
2. How far are we from reaching certain tipping points, that is: Is the transition from the presently dominating scenario to a different one likely?

7. CONTACTS



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8. HHL CENTER FOR STRATEGY & SCENARIO PLANNING

The HHL Center for Strategy and Scenario Planning creates knowledge and acts as an impetus to change the way decision makers think about the future and organizations plan their future. We provide a platform for the exchange of ideas with leading scenario experts. The Center's activities focus on four areas:

1. Research

We advance knowledge about scenarios by developing new methods and tools for strategic planning, exploring the cognitive and behavioral implications of using scenarios in strategic decision making, and developing new scenarios across a broad range of domains.

2. Teaching

We teach scenario planning to business leaders and strategic planners in executive seminars and workshops, to graduate students in summer seminars, and to MBA and MSc students at HHL studying strategic management.

3. Consulting

We advise corporate, public, and civil organizations on establishing scenario planning structures and processes, reviewing, and adapting existing planning processes, and communicating effectively with all stakeholders in times of uncertainty.

4. Networking

We provide a platform and act as a facilitator to bring together scenario experts from around the world, bridge the gap between theory and practice, and share ideas about what the future will look like.

For more information about the Center, visit www.scenarioplanning.eu.

9. REFERENCES

- Air-France KLM Group (2021): *Results presentation*.
- Boeing (2021): *Commercial Market Outlook 2021-2040*.
- Boston Consulting Group [BCG] (2020): *Seven Trends That Will Reshape The Airline Industry*.
- Burghouwt, G., Mendes De Leon, P., & De Wit, J. (2015): *EU Air Transport Liberalisation Process, Impacts and Future Considerations*. International Transport Forum.
- Commission of the European Communities (1999): *Archive of European Integration (AEI)*.
- Conrady, R., Fichert, F., & Sterzenbach, R. (2013): *Luftverkehr (Vol. 5)*, Berlin.
- Eurocontrol (2022): *Charting the European Aviation recovery: 2021 COVID-19 impacts and 2022 outlook*.
- European Commission (2021): *Mobility and Transport. Air*.
- European Commission (2021b): *Reducing emissions from aviation*.
- European Commission (2021c): *Mobility and Transport. Air. Environment. The EU Aviation Strategy aims to improve the environmental impact of aviation*.
- European Commission (2021d): *Mobility and Transport. Air. Single European Sky*.
- European Commission (2021e): *European Regional Development Fund*.
- Financial Times (2020): *Lufthansa warns of worsening outlook after modest summer surge in demand for flights*.
- Gössling, S., Humpe, A., & Bausch, T. (2020): *Does 'flight shame' affect social norms? Changing perspectives on the desirability of air travel in Germany*. Journal of Cleaner Production.
- International Air Transport Association [IATA] (2021): *IATA Industry Statistics, Fact Sheet*.
- International Airlines Group [IAG] (2021): *Annual Report and Accounts 2020*.
- International Airlines Group [IAG] (2021b): *Our investment case*.
- Istanbul International Airport (2022): *Istanbul International Airport (IST) - The New Aviation Gem of Turkey*.
- Japan Aircraft Development Corporation [JADC] (2021): *Worldwide Market Forecast 2020-2040*.

- Lufthansa Group (2020): *Lufthansa is reducing noise and CO2 emissions on European routes from Munich.*
- Lufthansa Group (2020b): *Financial Statements 2020.*
- Lufthansa Group (2021a): *Geschäftsbericht 2020 [Annual Report 2020].*
- Lufthansa Group (2021b): *Investor Relations - Konzernstruktur.*
- Lufthansa Group (2021c): *Ready for take-off: Eurowings Discover erhält Flugbetriebsgenehmigung [Eurowings Discover receives flight operating permit].*
- McKinsey&Company (2017): *A better approach to airline costs; results based on data IATA, ICAO, Moody's, McKinsey analysis.*
- McKinsey&Company (2021): *Back to the future? Airline sector poised for change post-COVID-19.*
- Metz, D. (2019): *Konsolidierung in Europa: Wettbewerb um jeden Preis? [Consolidation in Europe: Competition at any price?].*
- Official Airline Guide [OAG] (2020): *Market share of low-cost carriers in Europe.*
- Oliver Wyman (2020): *Glimpses of Recovery - Travel sentiment survey.*
- Roland Berger Strategy Consultants (2021): *A year on from COVID-19 in the aviation and aerospace industries; results based on data from IATA.*
- Schwenker, B., & Wulf, T. (2013): *Scenario-based Strategic Planning, Wiesbaden.*
- Semuels, Alana (2021): *Business Travel's Demise Could Have Far-Reaching Consequences.* TIME Magazine.
- Willms, W. (2021): *Trends in the aviation industry; K. Schaarschmidt, Interviewer.*
- Wulf, T., & Maul, B. (2010): *Future Scenarios for the European Airline Industry, Leipzig.*

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