# EURES

## EURES Report on labour shortages and surpluses 2024

## Sector analysis on air transport

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# Executive summary

- This sector analysis on the air transport sector (NACE Class 51) Passenger air transport; Freight air transport and space transport) accompanies the EURES Report on labour shortages and surpluses 2024. This analysis focuses on the main determinants and causes of labour market imbalances in the air transport sector.
- In 2024, the air transport sector was made up of approximately 7 000 enterprises directly employing around 390 000 individuals. At the EU level the air transport sector does not appear to show major labour market imbalances. While more countries report a surplus of travel attendants and travel stewards (i.e. cabin crew), the same number of countries report shortages or surpluses of pilots.
- The air transport sector has a higher share of female employees than other transport sectors, though women remain underrepresented in high-paying roles like pilots and senior management. The sector attracts a young workforce. Although the share of the older workforce (aged 50-64) increased in the past 10 years, experienced workers are retiring, leading to concerns about service quality and safety.
- The air transport sector relies predominantly on EU nationals with a growing presence of Eastern European workers due to the use of wet-lease agreements. The sector's transnational nature complicates the application and enforcement of labour laws, especially regarding the Posting of Workers Directive, leaving workers vulnerable to substandard conditions and unclear rights.
- In recent years, the air transport sector has undergone significant technological changes and a reshaping of the competitive landscape, while also suffering disruptions due to the COVID-19 pandemic. The consequent changes in the air transport sector's demand for specific labour skills, along with deteriorating employment practices and working conditions, might lead to labour shortages and skills gaps in the long term if left unaddressed.
- The deregulation of the European aviation market has heightened competition, leading to cost-cutting measures, lower wages, and worse working conditions. While the sector has created new jobs, these often come with less favourable terms. Additionally, European airlines face competition from fast-growing carriers in Asia and the Middle East, which offer higher salaries attracting skilled workers and exacerbating the shortage of senior pilots in Europe.
- Among the less favourable employment practices introduced by the liberalisation of the air transport sector is an increased use of temporary and atypical employment contracts (e.g. wet-leasing, bogus self-employment), and temporary staffing through agencies, particularly among low-cost carriers. These practices, aimed at reducing operational costs, result in reduced job security and fewer benefits for workers, such as parental leave, sick pay, and social security contributions. This has contributed to negative impacts on workers' well-being, including fatigue and mental health issues.
- The sector faces challenges with fragmented union representation, particularly between legacy airlines and low-cost carriers. This division hampers coordinated efforts to address issues like working hours, safety, and mental health support, and complicates the negotiation of consistent labour protection across the EU.
- Technological advancements such as automation, sustainable aviation fuels, and digital tools are reshaping the skill requirements for pilots and aircrew, creating a need for updated training programmes. However, many (private) flight schools prioritise quantity over quality in pilot training, resulting in graduates who may not meet industry standards.
- Recruitment methods such as pay-to-fly schemes and zero-hours contracts exacerbate precarious working conditions in the sector. Pay-to-fly schemes place financial burdens on young pilots, while zero-hours contracts, which require workers to be available but do not guarantee work, lead to unstable income and a lack of social protection benefits. These arrangements and others often used by airlines to circumvent direct employment contracts, contribute to inconsistent working conditions, raise concerns about worker exploitation, and compromise safety and welfare.
- Efforts to address and improve working conditions have involved legislative actions focused on tackling bogus self-employment and enhancing the enforcement of labour laws. Key measures include targeted inspections, legal amendments, and support for verifying employment status, all aimed at reducing exploitation and ensuring fair treatment of workers. Additionally, airlines have introduced training programmes to address skill mismatches and enhance the sector's attractiveness.

# 1.0 Introduction

This sector analysis accompanies the EURES Report on labour shortages and surpluses 2024, with this year's edition focusing on the transport sector. The purpose of this analysis is to investigate labour market imbalances in the air transport sector, with a particular focus on understanding their determinants and causes.

Based on the NACE classification (Class H51), the air transport sector encompasses passenger air transport, freight air transport and space transport. Passenger air transport involves the movement of individuals by air through regular routes and schedules, as well as charter flights, scenic and sightseeing flights (NACE, 2024). Freight air transport focuses on the movement of goods. Space transport includes the launching of satellites, and the transport of goods and passengers in outer space. This includes scheduled and non-scheduled freight transport by air as well as renting air transport equipment with an operator for freight transport. The occupations considered in this study are commercial pilots and cabin crew. The term aircrew is the common term for 'flight crew' and 'cabin crew' (EASA, 2024a).

An overview of the sector is provided in Chapter 2. The labour market imbalances in the air transport sector were analysed in relation to the following macro topics:

- Influence of sectoral trends on labour market imbalances (Chapter 3)
- Recent global crises: implications for the labour market (Chapter 4)
- Workforce demographic and related issues (Chapter 5)
- Labour migration and mobility (Chapter 6)
- Recruitment practices to fill labour and skill gaps (Chapter 6)
- Working conditions and impact on industry's reputation and the role of social dialogue (Chapter 7)
- Skills and qualifications gaps (Chapter 8)
- Recruitment practices to fill labour and skill gaps (Chapter 9)
- Measures to tackle labour market imbalances (Chapter 10)

The study draws on a comprehensive literature review conducted at both EU and national levels, supplemented by insights from a focus group (held on 26 November 2024) comprising key stakeholders, including representatives from trade unions[1]. Further data were provided by EURES National Coordination Offices (NCOs) who identified occupations within the sector experiencing shortages and surpluses. Additionally, Eurostat data were used to highlight key indicators related to workforce profiles.

[1] Although contact was made with them, employers and employer organisations did not participate in the focus group.

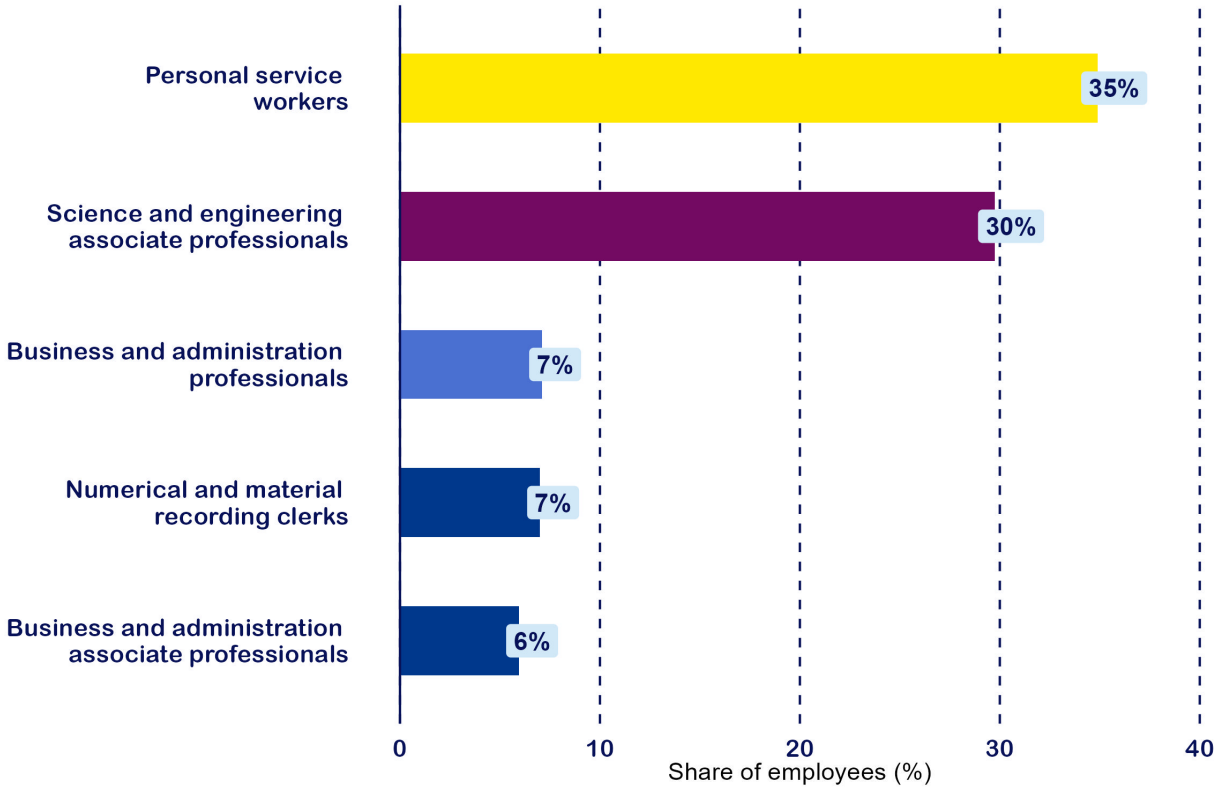
# 2.0 Overview of the air transport sector

At the end of 2023, the European air transport sector directly employed approximately 390 thousand individuals and created much more indirect and induced employment (Eurostat, 2024c).

With around 7 000 enterprises, the sector is mainly composed of micro enterprises (0-9 employees) (90%) (Eurostat, 2024b). However, large enterprises (250 or more employees) dominate employment, accounting for 88% of jobs, despite representing only 2% of companies.

In terms of most common occupations, personal service workers as well as science and engineering associate professionals together make up 65% of the sector's employment (Figure 1).

## Figure 1 - Share of employment represented by the five most common broad occupations in the air transport sector, 2023




*Source: Eurostat (2024). Labour Force Survey special extractions.*

Table 1 gives an overview of the countries reporting shortages and surpluses in relation to travel attendants and travel stewards (i.e. cabin crew), as well as aircraft pilots and related associated professionals. The number of countries reporting surpluses and shortages for pilots are balanced, while travel attendants and stewards the number of countries reporting surpluses is slightly higher than those reporting shortages

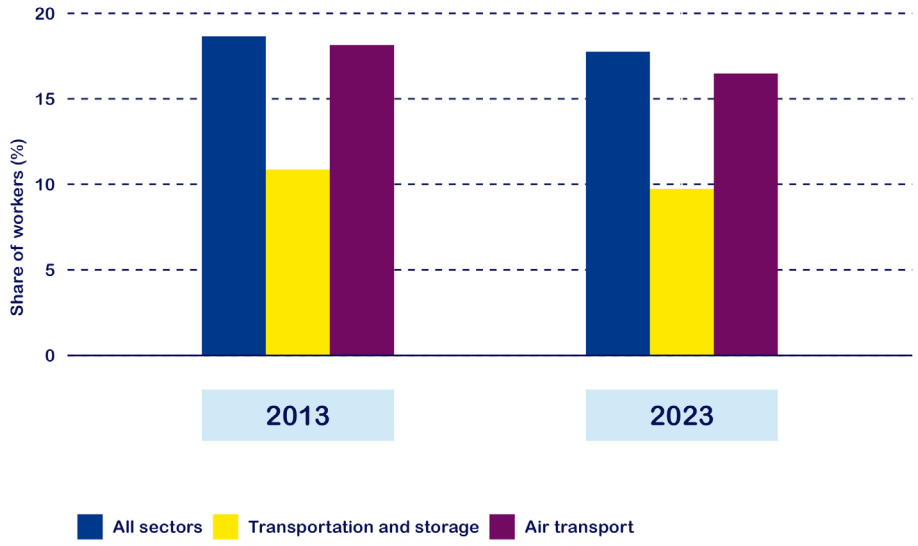
## Table 1 Countries reporting labour shortages and surpluses for selected air transport occupations, 2024

| Occupation | Countries reporting shortages | Countries reporting surpluses |
|---|---|---|
| Travel attendants and travel stewards | 5 countries (DK, HU, IT, MT, SK) | 7 countries (BG, ES, FR, LV, AT, PT, RO) |
| Aircraft pilots and related associate professionals | 4 countries (DE, DK, LV, MT) | 4 countries (CZ, ES, AT, RO) |

*Source: NCO data. NCOs may report both a shortage and a surplus for a given occupation due to differences at regional level.*

Part-time work in the air transport sector is significantly higher compared to the transportation and storage sector (Figure 2). From 2013 to 2023, the share of part-time work in the air transport sector has slightly decreased, mirroring the trends observed across all sectors and within the transportation and storage sector. In the air transport sector, 'part-time' employment for aircrew differs from its typical meaning in other industries. It does not usually refer to reduced weekly or monthly hours, but rather to working only during certain months of the year. This form of part-time work is traditionally used to align with the seasonal nature of aviation demand. Flight hours during active months are often comparable to those of full-time staff. For this reason, the comparison with part-time employment trends in other sectors shown in Figure 2 should be interpreted with care. Indeed, the stakeholders consulted in the focus groups shared that part-time work on a weekly or monthly basis in the air transport sector could also be greater than the general transport sector. They explained that air crew resort to working part-time because working conditions make it difficult to work full time in the long term.

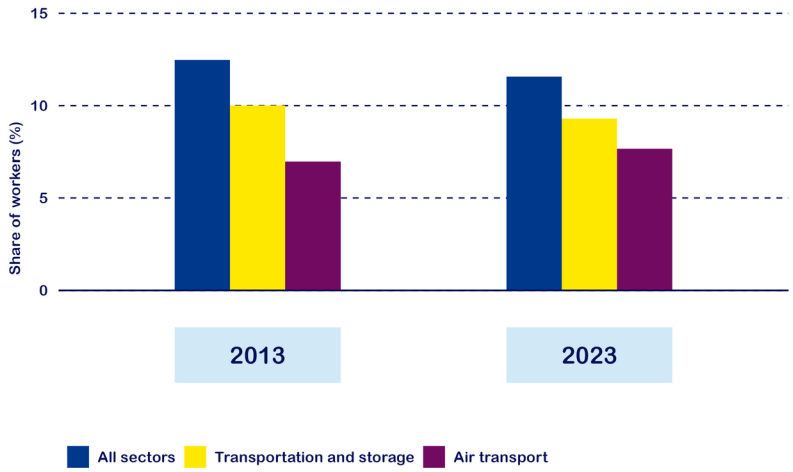
## Figure 2 - Part-time employment in the air transport sector, the transportation and storage sector and the overall economy in the EU-27, 2013 and 2023




*Source: Eurostat (2024). Labour Force Survey special extractions.*

Despite the seasonal nature of work in the air transport industry, the share of temporary employment in this sector remains significantly lower compared to the transportation and storage industry and all sectors combined (Figure 3). As noted by the stakeholders consulted in the focus groups, this difference occurs because seasonality in the air transport sector has traditionally been managed through part-time contracts rather than temporary contracts. However, from 2013 to 2023, there has been a slight increase in the share of temporary employment within the air transport industry. Stakeholders comment that this is an emerging cost-cutting approach contributing to increased job insecurity and deteriorating working conditions.

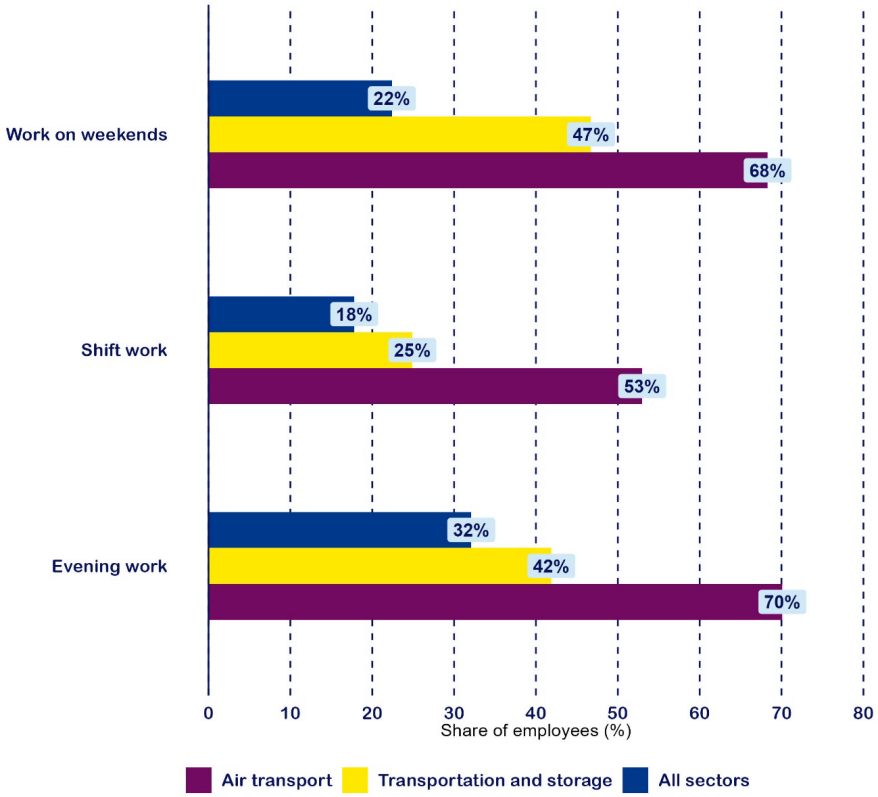
## Figure 3 - Temporary employment in the air transport sector, the transportation and storage sector and the overall economy in the EU-27, 2013 and 2023




*Source: Eurostat (2024). Labour Force Survey special extractions.*

Employees in the air transport sector are significantly more likely to have non-standard work schedules compared to those in the transportation and storage sector and all sectors combined (Figure 4). Approximately 70% of such employees work on weekends and evenings, and over half work in shift work. However, the current data does not differentiate between flight, standby, and duty hours, limiting the ability to accurately reflect the distribution of non-standard work schedules specific to the air transport sector. The stakeholders consulted in the focus groups highlighted the existence of stark differences in flight and duty hour patterns between short-haul and long-haul aircrew.

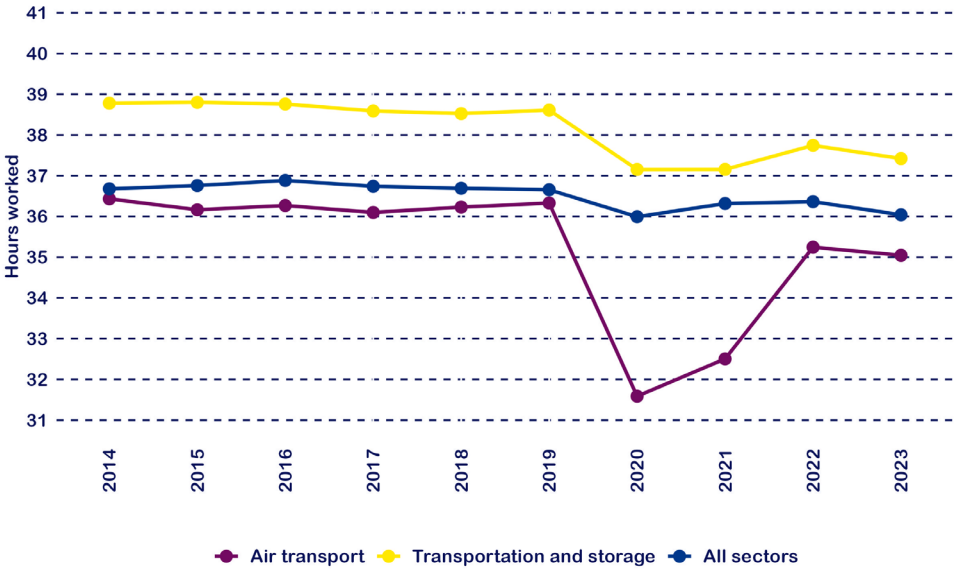
## Figure 4 – Non-standard work schedules in the air transport sector, the transportation and storage sector, and the overall economy in the EU-27, 2023




*Source: Eurostat (2024). Labour Force Survey special extractions.*

Since 2014, there has been a slight decline in working hours in all three employment sectors represented in Figure 5. The large drop in the hours worked per week in 2020 by air transport employees is explained by travel restrictions related to the COVID-19 pandemic. Compared to the other sectors, air transport employees appear to work just under the average of all sectors combined (Figure 5). This observation is based on data collected in a similar way across all sectors. Stakeholders consulted in the focus groups noted that several nuances of working patterns can make it difficult to form general conclusions about overall working time in the air transport sector. For example, date would capture 'standby hours' where employees are not paid but must be available. Similarly, aircrew working hours often do not account pre-flight preparation, safety checks and boarding. Stakeholders also stressed that short-haul crew may operate up to four flights in a day, combining complex flight and standby hours, whereas long-haul crew can spend an entire duty period on a single flight.

## Figure 5 - Hours worked per week in the air transport sector, the transportation and storage sector, and the overall economy in the EU-27, 2014 - 2023




*Source: Eurostat (2024). Labour Force Survey special extractions.*

# 3.0 Influence of sectoral trends on labour market imbalances

**Key determinants of labour market imbalances in relation to sectoral trends:**

- The liberalisation of Europe's aviation market has intensified competition, driving airlines to reduce personnel costs, which negatively impacts working conditions and wages, and intensifies the loss of experienced staff, and high turnover, all contributing to labour shortages.
- Expanding Middle Eastern airlines are offering significantly higher salaries and benefits, are attracting experienced European pilots, exacerbating the shortage of pilots in some European countries.
- The transition to sustainable aviation fuels (SAFs) and other green technologies increases operational costs, placing further strain on wages and working conditions, which could deter new workers from entering the sector.
- Exploitation of differences in labour laws across Europe, such as those related to social dumping and subcontracting, weakens labour protections, discouraging workers from staying in or entering the air transport sector.

## Liberalisation of civil aviation in Europe: workforce challenges

The European Union deregulated its domestic air transport market in the late 1980s - 1990s, and in 2005, it started exporting open market policies to neighbours and strategic partners (Abate and Christidis, 2020). This turned protected monopolistic national aviation markets into a single air transport market in Europe. Liberalisation lowered barriers of entry into the market for European airlines by relaxing or removing rules on fares, capacities, and commercial restrictions (European Parliament, 2024). As a result, airlines became more efficient, passenger flows increased and employment rose (Abate and Christidis, 2020). However, the emergence of new competition prompted traditional national carriers to restructure in order to reduce costs. Over time, this has led to a convergence of the traditional business models of national carriers and low-cost carriers, blurring the lines between the two. Many airlines now adopt hybrid business models that combine elements of both low-fare and network strategies (Eurofound, 2022).

While liberalisation has provided consumer benefits such as lower fares and increased connectivity for passengers, its effects on aviation workers have been more complex. Liberalisation has increased competitive pressure with companies needing to minimise costs, including personnel costs (Broughton et al., 2024). Working conditions and terms of employment have seen notable declines, with cost competition driven by low-cost carriers influencing other airlines to reduce standards to remain competitive (Harvey et al., 2021; Staunton, 2022). Wage growth for aviation employees has been slow, contributing to an increase in labour strikes across Europe (Ydersbond, 2022). For example, in France and Switzerland, the nominal earnings of pilots, and cabin crew in 2022 were 4-5% lower than in 2013. (Achkar, 2024). Although the expansion of the air transport sector has created new job opportunities, these are often accompanied by lower-quality terms and conditions (Harvey et al., 2021). Additionally, differences in labour and social legislation across the European Economic Area (EEA) are exploited to gain competitiveness. These have enabled airlines to utilise practices such as social dumping and subcontracting, creating challenges in ensuring consistent labour protections (Jorens et al., 2015). This reflects a broader trend of balancing market liberalisation with worker welfare. Stakeholders emphasized that the impacts of the sector's liberalisation are the increased precariousness of aircrew employment, the loss of experienced personnel, and high staff turnover rather than genuine labour shortages.

## Global market dynamics and competitive pressures

The evolving global market poses competitive challenges for European aviation, particularly due to economic growth shifting towards Asia. New competitors from this region benefit from rapid economic growth and strategic aviation policies in their home countries (Abate and Christidis, 2020). Factors such as infrastructure availability, economic and regulatory regimes, and historical and cultural links influence competition. State-sponsored airlines from Asia and the Middle East are impacting competition for European carriers. These airlines benefit from favourable conditions such as cheaper infrastructure, capital, fuel, and state backing (Financial Times, 2024). Governments in these regions support their airlines' expansion into Europe, shifting international flight connections and increasing their market presence. The major Middle Eastern airlines - Emirates, Etihad, and Qatar Airways - are expanding operations and hiring significantly (AGBI, 2024). In parallel, European airlines are reducing their range of destinations in the Middle East (AGBI, 2023). Middle Eastern airline companies face a competitive advantage compared to European airlines, and were the first ones to recover after COVID-19, in part due to European airlines facing constraints such as more regulation (Reuters, 2025)

Participants in the focus group conducted for this study also raised concerns on the consequences of the competition for European workers. They argued that airlines in the Middle East, such as Riyadh Air, are offering highly attractive compensation packages (EUR 500 000 per year, tax free), with salaries significantly higher than those in Europe. Fast growing Middle Eastern airlines have been paying above average salaries for experienced flight crews (OAG and INFARE, 2024). This has created a competitive environment that is drawing experienced pilots away from Europe, where average salaries range between EUR 42 000 to EUR 60 000 per year. Although there is currently no widespread pilot shortage in the EU, such practices show there is demand for senior pilots. As a result, shortages of senior pilots in the European market are expected to arrive, as senior pilots may opt for these more attractive opportunities. Stakeholders describe the European air transport sector as a 'training ground' for pilots, where individuals often have little choice but to accept unfavourable terms and conditions in order to gain experience before ultimately seeking more stable, long-term career opportunities with non-European carriers. Another issue contributing to the potentially growing imbalance for this demographic groups is the retirement and non-return to work of many senior pilots after the COVID-19 pandemic. The combined effect of these factors on the shortage of senior pilots is a concerning threat to the safety of the air transport sector.

## Greening in the air transport sector

The move towards environmental sustainability has introduced new challenges for the aviation workforce. The adoption of sustainable aviation fuel (SAF) will increase operational costs, potentially influencing ticket prices and demand, with implications for economic stability in the sector (industriAll, 2023a and industriAll, 2023b). The transition to SAFs and new technologies also requires updated training to address emerging health and safety risks (ETF, 2023). Stakeholders consulted in the focus groups also emphasised the additional costs imposed by environmental regulations. According to them, the pressure to minimise fuel usage, driven by SAF costs, could potentially compromise safety, especially in critical situations. Other potential safety implications of using SAFs are related to the lack of knowledge about these new fuels.

Additionally, European airlines face competitive pressures from regions with less stringent environmental regulations, which could further negatively impact wages and labour conditions (EASA, 2024b). There is broad concern that the decarbonisation of the EU's economy could erode the competitiveness of European businesses (ECA, 2015; Airlines for Europe, 2024).

# 4.0 Recent global crises: implications for the labour market

**Key determinants of labour market imbalances in relation to the recent global crises:**

- The COVID-19 pandemic led to significant workforce losses, and many experienced workers have not returned due to lower salaries and unstable contracts.
- The COVID-19 pandemic has contributed to the shift towards unstable employment and deteriorating working conditions.
- The ongoing Russian war of aggression against Ukraine has increased operational costs for airlines, making certain routes less viable and impacting job opportunities.

## Lingering impacts of the COVID-19 pandemic on the labour market

The air transport sector is recovering fairly well economically from the COVID-19 pandemic with 2024 flight levels showing similar levels to pre-pandemic periods: 198 million air passengers between January and March 2024, just 0.81% less than the same period in 2019 (Eurostat, 2024a and ACI Europe, 2024). However, the impact on the workforce is longer lasting (ETF, 2023). Due to massive job loss during the crisis, taking the form of layoffs, early retirement schemes or bankruptcies, the sector lost around 45% of its workforce (EU-OSHA, 2024 and Eurofound, 2022). Throughout the COVID-19 pandemic, pilots and cabin crew faced significant negative changes in their working conditions, health, and safety. Organisational challenges such as furloughs, position changes, layoffs, and payment adjustments were prevalent, with financial changes being the most impactful. While the effects of layoffs or furloughs might have eased as operations resumed, salary cuts appear to have left a lasting impact. Financial uncertainty, closely linked to job insecurity, worse working conditions and lower levels of perceived safety have been associated with negative self-reported health outcomes, a trend noted among cabin crew post the COVID-19 pandemic (Folke and Melin, 2024). The overall impact of COVID-19 on the sector varied across countries, depending on the measures taken by airlines, the extent of government aid, and short-time work schemes (Eurofound, 2022)

Recovery efforts have been complicated by workforce attrition, as many cabin crew having transitioned to other industries. Companies have responded by adopting more resilient, future-oriented business models, often involving restructuring through cost cutting (Ydersbond, 2022). These adjustments have led to further deterioration in employee pay and working conditions, including a higher reliance on staff from subsidiaries in different forms. Employees returning to the sector often faced significantly lower salaries than before the pandemic, deterring many experienced workers from rejoining the workforce (Strategic Risk Global, 2024). Indeed, stakeholders consulted through the focus group also expressed concerns in the sharp rise of precarious work for aircrew as a result of the COVID-19 pandemic. Many experienced pilots and crew members opted not to return as operations resumed, deterred by reduced salaries and unfavourable contracts. Companies benefiting from government and sector-specific support measures were better positioned to mitigate job losses and recover more rapidly. Those that secured agreements to protect laid-off workers managed to resume normal operations more quickly than those unable to do so (Broughton et al., 2024).

## Russia's war of aggression against Ukraine

The conflict has profoundly disrupted business operations and labour supply in the air transport sector. Sanctions and retaliatory measures, such as the closure of Russian airspace, have increased flight times, fuel costs, operational costs and air cargo rates (European Parliament, 2022a and European Parliament, 2022b). Russia's closure of airspace to airlines from 36 countries has caused rerouted flights, increasing travel time and CO2 emissions on 80% of Asia-Europe routes. This has disrupted 3.3% of European air passenger traffic and 5.7% of traffic between Russia and Europe in 2021 (Broughton et al., 2024).

The Russian war of aggression against Ukraine drove jet fuel prices up to USD 141 per barrel in March 2022, a 27% increase compared to February 2022, raising flight costs (Broughton et al., 2024). The additional cost of an extra hour of flight ranges from EUR 3 600 to EUR 15 000, (Broughton et al., 2024). As European carriers faced a ban on Russian airspace, their flight times were increased making some routes financially unviable. As a result, multiple European airlines have had to reduce their flights to mainland China, whilst Chinese airlines are expanding their operations (Casey, 2024). This differs for Chinese, Gulf and Turkish airlines which can still fly over Russia (Casey, 2024). Stakeholders consulted through the focus group confirmed these concerns about the impact of the ongoing conflict, particularly on the competitiveness of European airlines. For instance, they reported how important carriers in the sector, such as Lufthansa, announced a reduction in flights to China, flagging a worrying trend of declining direct links between Europe and key global markets. According to stakeholders, these disruptions not only weaken the competitive position of European airlines but also threaten jobs and economic stability in the sector.

The Russian aggression's impact on the EU air transport labour market is uncertain, but significant challenges remain. Rising labour and fuel costs could affect job opportunities for pilots, cabin crews, and ground staff. EU sanctions banning the sale of aircraft and parts to Russian airlines have affected around 777 jets, mostly leased by Russia from Ireland. This was a significant share of the total 6 037 commercial aircrafts operated by EU countries in 2023 (Eurostat, 2025). There are also over 500 other stranded commercial aircrafts owned by western companies and leased to Russia. This underscores the war's broader impact on the EU aviation workforce and the maintenance and supply chain sectors (Broughton et al., 2024).

# 5.0 Workforce demographic and related issues

**Key determinants of labour market imbalances in relation to workforce demographic:**

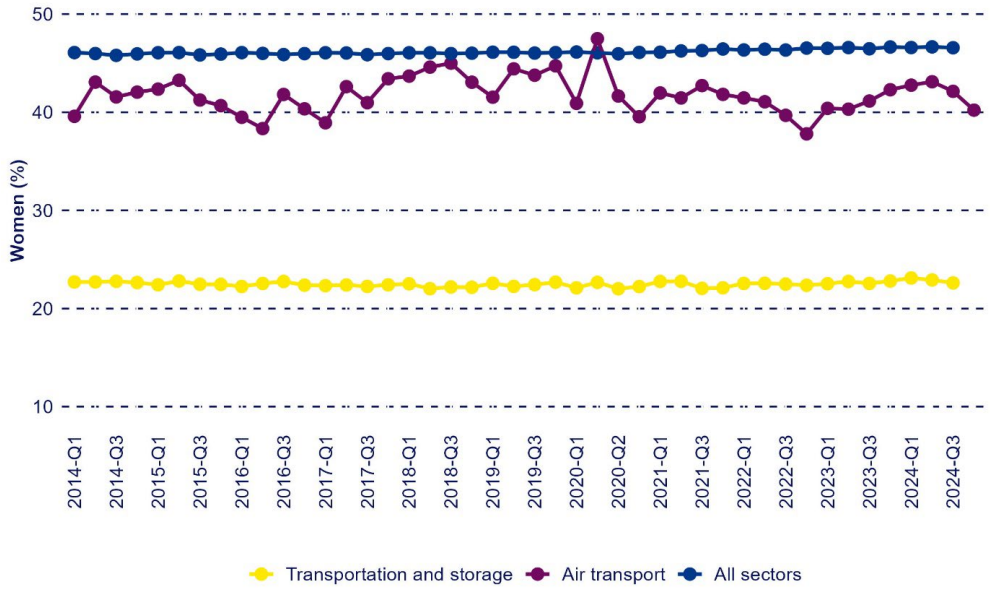
- Gender inequality in high-paying roles is driven by persistent gender stereotypes that limit women's access to certain positions.
- Low women's labour market participation is exacerbated by the insecurity of temporary or shift-based contracts, where maternity rights and a challenging work-life balance often lead to job loss or non-renewal of contracts after pregnancy.
- Labour shortages in the sector are driven by the retirement or departure of experienced cabin crew post-pandemic, leading to a growing reliance on younger, less experienced workers.

The air transport sector has a higher share of female employment compared to other transport sectors, though this share is volatile. In Q3 of 2024, 40% of workers in the sector were women, which is eighteen percentage points higher than in the overall transport sector (Figure 6.) This represents a six-percentage points difference compared to the overall economy, where women account for 46% of the workforce in the EU (European Parliament, 2024).

Gender inequality presents significant challenges for women's labour supply, particularly in high-paying roles such as senior management, pilots, and air traffic controllers (ATCOs). In Europe, fewer than 5% of pilots are women (ECA, 2018a). According to the International Air Transport Association (IATA), only 3% of leadership positions in the sector were held by women in 2019, largely due to gender stereotypes that prevent their entry into these roles (ETF, 2023). There is much progress to be made in gender equality in the sector. Positive success stories may help progress. A recent study indicates that airlines with greater gender diversity at the board and executive levels demonstrated higher operational efficiency both before and after the COVID-19 crisis (Suau-Sanchez et al., 2025).

Women in atypical employment forms, such as temporary or shift-based contracts, face additional challenges, especially in relation to maternity rights and the balancing of work and family life. The risk of losing employment, as contracts are often not renewed after pregnancy, is a significant issue that is exacerbated by these employment practices (European Commission: Directorate-General for Mobility and Transport et al., 2019).

## Figure 6 - Share of female employment in the air transport sector, the transport and storage sector and the overall economy in the EU-27, 2014 Q1 to 2024 Q4

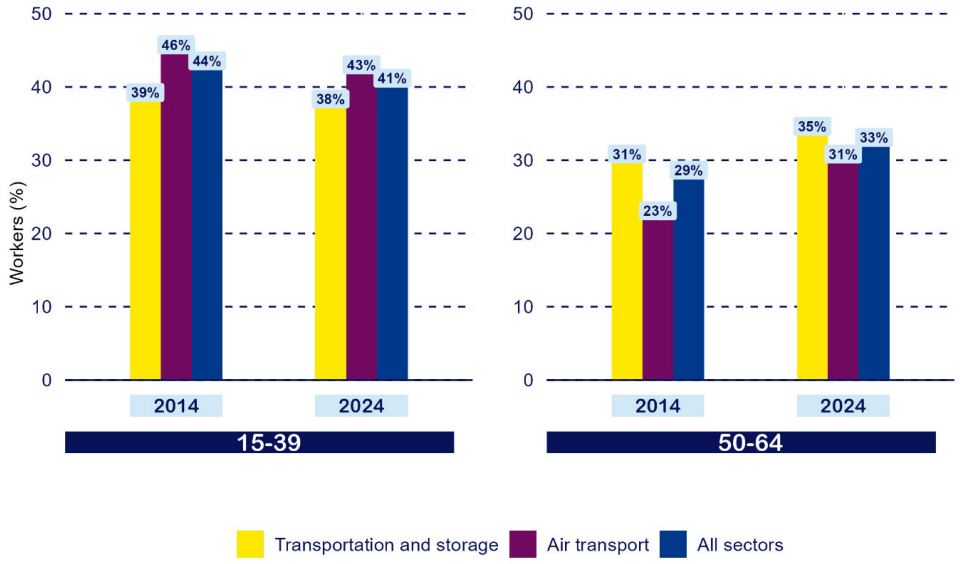



*Source: Eurostat [lfsq_egan2, lfsq_egan22d]*

Air transport jobs attract relatively more younger workers than in the overall economy or the transportation and storage sector. In 2024, workers aged 15-39 years accounted for 43% of air transport workers, two percentage points more than in the overall economy and five percentage points more than the transport sector on average (Figure 7). On the other hand, the share of workers aged 50-64 years increased much faster in the sector than in the rest of the economy, from 23% to 31% between 2014 and 2024. This is indicative of an ageing sector, that is still able to attract younger workers.

Stakeholders consulted through the focus group have expressed concerns about the changes in the workforce, particularly after the COVID-19 pandemic. One key issue is the visible decline of older, experienced cabin crew, with many opting for early retirement or simply not returning after the pandemic. This, according to stakeholders, has led to a growing presence of younger workers with minimal experience, which has raised concerns about the quality of services and safety in the industry.

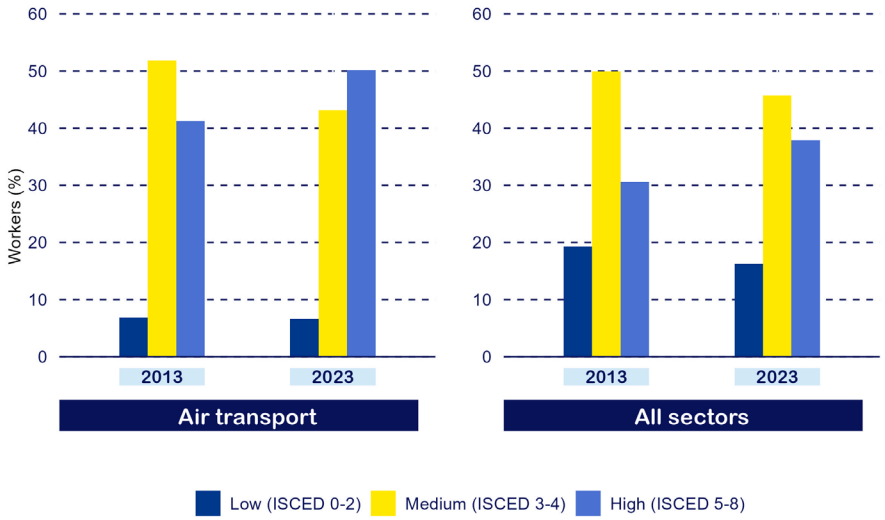
## Figure 7 - Employment age structure in the air transport sector, the transport and storage sector and the overall economy in the EU-27, 2014 and 2024




*Source: Eurostat [lfsq_egan2, lfsq_egan22d]*

The qualification profile of employees in the air transport sector highlights its reliance on high skilled workers (Figure 8) which represented 50% of all workers in the sector in 2023 (left pane) compared to 38% across all sectors in 2023 (right pane). In 2023, the air transport sector employed relatively fewer medium-skilled worker (43%) than the in all sectors combined (46%. Over time, there has been little variation in the share of low-skilled air transport workers, which remained at around 6% from 2013 to 2023. Nevertheless, the proportion of medium-skilled workers in the air transport sector diminished by eight percentage points (from 52% to 44%) between 2013 and 2023, while the share of high-skilled workers went up by nine percentage points (from 41% to 50%).

## Figure 8 - Education structure in the air transport sector and the overall economy in the EU-27, 2013 and 2023




*Source: Eurostat (2024). Labour Force Survey special extractions.*

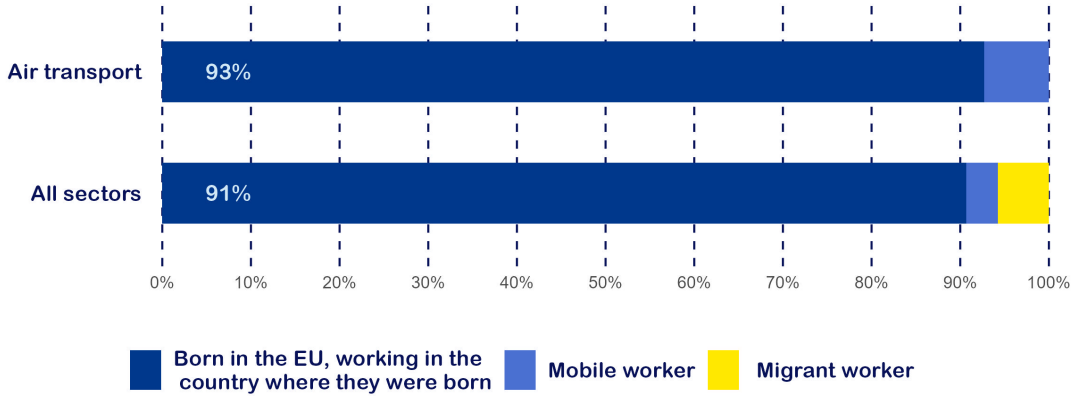
# 6.0 Labour migration and mobility

**Key determinants of labour market imbalances in relation to labour migration and mobility:**

- Differences in employment laws and social security systems across EU Member States allow airlines to exploit regulatory disparities, shaping their hiring practices depending on the country.
- Workers from regions with lower wages and weaker protections, such as Eastern Europe, are increasingly employed under less favourable conditions.
- Growing reliance on wet-leasing is linked to social dumping, as some European nationals, third-country nationals (TCNs) and self-employed are often employed under lower working conditions.

Figure 9 below compares the composition of workers in the air transport sector, by country of birth. More than 90% of workers are EU nationals working in the country where they were born, a slightly higher proportion than in the EU-27 overall economy. In the sector, there is an absence of non-EU foreign workers, indicating that it relies almost exclusively on EU national workers. The slightly larger share of mobile workers is related to the transnational nature of the sector and employment practices such as attributing 'home bases' to EU employees in another EU country.

## Figure 9 - Overall employed by country of origin in the air transport sector and in all sectors, EU-27, 2023




*Source: Eurostat (2024). Labour Force Survey special extractions.*

Labour migration in the European air transport sector reveals a more nuanced picture than in other sectors. In general, due to the high mobility of crew in the industry, individuals will not migrate to or within the EU for employment in this sector. Instead, it is airline companies that can select in which countries to register their business, where the airplanes they fly are based and where the crew they hire are based. This practice is shaped by differences in employment laws and social security systems across countries, allowing airlines to engage in 'regulatory shopping', a practice where companies exploit differences in national regulations to reduce costs or avoid stricter labour protections. Airline companies also have great flexibility in moving their air crew based on routes that need more or less crew based on seasonality or other trends.

However, there is some evidence on sectoral practices where third-country nationals (TCNs) have been employed. Traditionally, EEA-licensed carriers employed TCNs on specific routes to ensure language coverage and accommodate cultural considerations (European Commission: Directorate-General for Mobility and Transport et al., 2019). This practice is more common for international routes than intra-EEA flights, though it remains unclear whether third-country aircrew are based in third countries or in the EU (European Commission: Directorate-General for Mobility and Transport et al., 2019).

Some sources report an increasing presence of workers from Eastern Europe in the air transport sector in the EU, where pay and working conditions are typically lower than in Western Europe (Ydersbond, 2022). This stems from the increased use of wet-lease agreements with Eastern European companies. Wet-leasing, also referred to as ACMI (Aircraft, Crew, Maintenance, and Insurance) leasing, is a widespread industry practice in which airlines rent both aircraft and crew from other operators (ECA, 2024b). Wet leases typically involve an airline leasing an aircraft, along with maintenance and insurance, for at least two weeks. Wet-leasing practices allow airlines to bypass EU agreements and EU labour protections, such as the Temporary Agency Work Directive which mandates that temporary workers receive working conditions comparable to those of permanent employees (Ydersbond, 2022). By wet leasing in countries with lower working conditions, airlines can reduce operations in countries with stricter regulations and stronger workforce protection. Further, workers from countries with high unemployment often accept less favourable conditions due to limited options, which can contribute to a downward pressure on wages and working conditions. This dynamic has been described as a 'race to the bottom', with companied adopting such practices to remain competitive (Ydersbond, 2022).

Stakeholders consulted through the focus group also discussed the growing trend of wet-leasing and noted how particularly TCN workers and self-employed cabin crew are often hired under lower working conditions. They emphasised that the air transport sector's inherently transnational nature sets it apart from other industries, complicating labour practices as employees frequently work across borders. This poses challenges for the application and enforcement of labour laws, exacerbating issues related to working conditions, social protections, and the regulatory landscape. Stakeholders also mentioned that airlines are using a 'shortage' narrative to justify brining in TNCs with lower wages, thus contributing to social dumping.

Stakeholders pointed to ambiguities in the application of the Posting of Workers Directive to the air transport sector. They note that current legislation does not adequately clarify whether or how the directive applies to transnational aviation activities. For example, the concept of 'home bases[2]' and the use of mobile crew may create uncertainty about which labour laws, including minimum wage standards, are to be applied. In fact, airlines often assign employees to work across various countries without clearly defining whether these assignments qualify as 'postings' under the directive. The consequent unclarity leaves workers vulnerable and unable to fully understand their rights (ECA, 2023).

[2] "Home base" refers to the location assigned by the operator where a crew member typically begins and ends their work shifts. Under normal circumstances, the operator is not responsible for providing accommodation for the crew member at this location. This is also where all parties must pay social security contributions (EURLex, 2025).

# 7.0 Working conditions and the role of social dialogue

**Key determinants of labour market imbalances in relation to working conditions:**

- Fatigue, burnout, low wages, and inflexible schedules drive aircrew to leave the profession or seek better opportunities in other sectors.
- Exposure to risks such as poor cabin air quality and cosmic radiation impacts both worker well-being and the attractiveness of aviation careers.
- Limited support for family-friendly policies, inflexible schedules, and discriminatory practices against women, such as employment termination during pregnancy, exacerbate the loss of talent.
- Older aircrew with secure contracts and benefits contrast sharply with younger workers facing instability and poor conditions, undermining long-term workforce stability.

## Atypical work arrangements

The liberalisation and structural reform of Europe's air transport sector have led to lower wages and a rise in precarious employment conditions and exploitative business models (EU-OSHA, 2024 and EurECCA, 2024a).

Many airlines hire aircrew employees through temporary work agencies, intermediaries, or ask individuals to be self-employed. Intermediary staffing agencies include temporary work agencies or other types of intermediaries. Such atypical employment contracts are often linked to less favourable working conditions and a more demanding daily work environment. In a study on the air transport sector, workers in atypical forms of employment reported less satisfaction with their working conditions, limited access to training, and had reduced trade union representation compared to those in standard employment arrangements (European Commission: Directorate-General for Mobility and Transport et al., 2019). Aircrew associations have expressed concerns that such precarious employment conditions can increase fatigue and impair professional judgment, posing potential risks to safety in high-stakes operational environments (European Commission: Directorate-General for Mobility and Transport et al., 2019). Furthermore, workers in atypical employment can be more easily denied rights such as healthcare, sick leave, unemployment, or parental/maternity leave (ACP, 2020).

Atypical work arrangements are likely impacted by employee experience, seniority and job role rather than gender (European Commission: Directorate-General for Mobility and Transport et al., 2019). The 2019 EU study on the employment and working conditions in the EU found young people and those entering the workforce for the first time were more likely to have atypical employment situations. It also found that both male cabin crew and pilots are more likely to be atypically employed than women. However, a 2015 study by Steer Davies Gleave finds that women are more likely to be on temporary or fixed-term contracts than their male counterparts (Steer Davis Gleave, 2015 as cited in European Commission: Directorate-General for Mobility and Transport et al., 2019). In both cases, atypical employment arrangements act as an additional barrier to women becoming pilots because they further deteriorate work-life balance and reduce financial security (European Commission: Directorate-General for Mobility and Transport et al., 2019).

## Retention

Employee retention is a significant challenge in the aviation industry. Approximately one in five pilots and one in three cabin crew members plan to leave the industry for better opportunities, citing poor conditions and work-life balance (Ydersbond, 2022).

Physically demanding working conditions combined with short-term and atypical employment conditions are a major barrier to retention (ETF, 2023). Aviation workers are impacted by fatigue driven by job attributes such as night shifts, early start times, jet lag, unpredictable schedules, and disruptions to the circadian rhythm. Studies have found widespread aircrew physical and mental exhaustion with crew feeling physically exhausted and not getting rest and relaxation other than necessary sleep (Civil Aviation Authority, 2016 and Underthun and Ingelsrud, 2019, as cited in Ydersbond, 2022). Aircrew face a range of health and safety concerns beyond fatigue, including cabin air quality, exposure to cosmic radiation, dealing with unruly passengers and the difficulties of living away from home, often in shared accommodations (Staunton, 2022). Within the EEA, aircrew are generally allowed to work up to a maximum of 14 hours a day, or 16 hours in special circumstances (Ydersbond, 2022).

The EU have harmonised minimum Flight Time Limitations for pilots which outline specific rules and exceptions to work and rest time (ECA, 2008). Stakeholders shared that Flight Time Limitations were initially welcomed as a key step in protecting aircrew by setting minimum standards for flight, duty, and rest periods. However, these minimum thresholds have increasingly become the default across the industry. While the rules are based on scientific understanding of performance limits, they stakeholder argue that are incompatible with a healthy work-life balance. Thus, relying solely on Flight Time Limitations may not provide sufficient protection for aircrew well-being. This trend raises concerns not only about work-life balance and mental health, but also about operational safety. Stakeholder also raised the lack of a European legislation ensuring aircrew the right to a proper break during duty, even on shifts up to 14 hours. Existing provisions on 'nutritional opportunities' are vague, often resulting in no practical break time. Stakeholders shared that most cabin crew rarely take breaks during service and stressed that increased pressure on productivity is negatively impacting the attractiveness of the sector.

Stakeholders highlight that the high levels of part-time work in the industry may be related to working conditions and the intensity of full-time schedules. Although working conditions align with the minimum standards of Flight Time Limitations, they are incompatible with a healthy work-life balance. For some, reducing working hours to 75% or 50% is the only viable way to remain in the profession.

Stakeholders also argue that current employment and business models in the sector appear to anticipate and accommodate high turnover. As an example, cabin crew jobs are cited as being often idealised by young people, providing employers a continuous supply young workers eager to enter the industry. While workers get disillusioned, quickly burnt out and exit jobs, employers can rely on a steady influx of new candidates ensuring workforce continuity.

In sum, the business model of low-cost carriers, characterised by cost-cutting measures and atypical employment practices, drives high turnover and poor retention among aircrew. Workers often assess the working conditions and opportunities available in their region or sector and conclude they would be better off pursuing another aviation role, or transitioning to a different industry, and pilots sometimes relocating outside Europe. Attracting and retaining skilled professionals, particularly pilots, heavily relies on the quality of the working environment and employment structures offered by airlines (ECA, 2018b). This trend has reduced the industry's full-time workforce capacity, creating tangible challenges for experienced aircrew availability and on a lesser scale, overall supply (ECA, 2018b). With high turnover, there is also less incentive for workers to fight for the improvement of working conditions.

## Two-tiered system

Stakeholders consulted through the focus group argue that wages for cabin crew have also decreased, negatively impacting the overall job stability. This has contributed to a divide in the workforce: an ageing generation with long-term contracts and more secure positions, particularly within legacy airlines, and a younger, more precarious workforce facing poor working conditions. Stakeholders have pointed out that this 'two-tier' system of employment - where older generations have better contracts and younger workers face instability - poses a real concern for the future quality of employment of the industry. Alongside these challenges, according to stakeholders, there is a growing focus on workplace issues such as diversity, inclusion, and gender equality. Younger workers, in particular, have been vocal about these concerns, bringing attention to the gender imbalance in cabin crew roles and the rising instances of gender-based aggression. Working conditions in low-cost carriers differ significantly from those in legacy airlines, directly impacting aircrew job satisfaction and well-being. Cabin crew in low-cost carriers report lower satisfaction with training and overall conditions compared to those in traditional airlines, a disparity heightened for those employed through intermediary staffing agencies (temporary work agencies or other intermediaries) who experience even worse outcomes regardless of the carrier type, as opposed to those directly employed by airlines (European Commission: Directorate-General for Mobility and Transport et al., 2019). Low-cost carrier pilots also face greater challenges, including lower incomes, less job stability, demanding schedules, and heightened fatigue and anxiety due to insecure contractual arrangements (Wild, 2022).

Although some countries are experiencing shortages in the air transport sector, it does not suffer from the same severity in labour shortage as engineers and ground-staff (European Commission: Directorate-General for Mobility and Transport, 2024). Airbus projects a growing demand for pilots, estimating a need for 5 840 new pilots annually until 2042 (European Commission: Directorate-General for Mobility and Transport, 2024). However, the ECA argues there is no shortage of pilots, and this topic is being used to lower market standards (ECA, 2024c). Stakeholders in the focus groups expressed there is currently no widespread shortage of pilots, but they predict there will be one soon if employment conditions do not change. Focus group members argued the current shortage is mainly relevant to companies unwilling to compensate fairly, in line with the quality of pilot training.

## The role of social dialogue

The transnational nature of the aviation industry complicates the application of national labour laws and the coordinated negotiation of collective agreements. Therefore, social dialogue in the air transport sector often requires the involvement of European-level trade unions and employer organisations. EU-wide cooperation is particularly vital in aligning practices related to safety regulations, working conditions, and labour rights for flight crews working across various jurisdictions.

Eurofound (2022) identifies 72 trade unions across 22 European Member States that specifically organise pilots or cabin crew. These unions engage in collective bargaining and social dialogue to varying extents. While most EU countries have national level trade unions representing aircrew, there is no representation for air transport employees in Bulgaria, Cyprus, Lithuania, Slovakia, and Slovenia.

A significant trend in the civil air transport sector is the fragmentation of union representation which has become more pronounced as the industry evolves. This fragmentation primarily stems from the differing type of employment contracts (direct employment vs. intermediaries) and operational structures between legacy airlines and low-cost carriers.

Employer organisations representing aircrew are less prevalent than trade unions. Only 13 Member States, have employer organisations for aircrew. Where they do exist, legacy airlines are more common members, while low-cost carriers often engage less with employer organisations. Only six low-cost carriers are engaged in single-employer collective bargaining in seven Member States (Eurofound, 2022).

air transport sector. A common concern expressed in this sector' focus group is the lack of alignment and coordination between social partners. This makes it difficult to make progress on critical issues such as working hours, safety regulations, and mental health support for aviation workers. Stakeholders argued that a more unified approach to social dialogue is needed, especially at the European level, where regulatory bodies can help harmonise standards across the sector, ensuring consistent protection for workers and better alignment with industry-wide safety and welfare goals. Currently, the main European trade unions in the sector, that are part of the European sectoral social dialogue committee (ESSDC), are the European Transport Workers' Federation (ETF), European Cockpit Association (ECA). There are seven employer organisations participating in the civil aviation ESSDC (Eurofound, 2022).

The complexity of the air transport sector also poses challenges, as the implementation and enforcement of labour laws and regulations can vary greatly by Member State, creating loopholes and country-specific variances. This regulatory fragmentation not only complicates the enforcement of safety standards and working conditions but also enables certain airlines to bypass labour protections and avoid standardising employment practices across the board. As a result, stakeholders stress the importance of European-level cooperation to ensure that regulations are applied consistently, closing loopholes, and providing a level playing field for workers and employers alike.

# 8.0 Skills and qualifications gaps

**Key determinants of labour market imbalances in relation to skills and qualifications gaps:**

- Rigid seniority structure discourages pilots from moving between companies, hindering career progression. This makes the profession less attractive to new entrants as advancements only depends on years of service with one airline.
- Emerging technologies, automation, and sustainable aviation fuels require workers to upskill, posing challenges for training systems to keep pace with industry demands.
- Stakeholders identify a pilot skills mismatch. This is related to profit-driven flight schools prioritising quantity over quality leaving employers concerned about the competency of newly licensed pilots.
- Aspiring pilots face financial hurdles, deterring talent from diverse backgrounds and limiting the pool of potential candidates.
- Current pilot training programmes emphasise predefined task performance over the development of critical manual, intellectual, and leadership skills needed for dynamic operational environments.

The aviation industry is undergoing significant transformations driven by technological advancements, evolving business models, and increasing regulatory pressures. As the sector adapts to these changes, the challenges surrounding skills, qualifications, and workforce management remain central concerns.

For pilots, the application of seniority systems plays a significant role in regulating employment relationships, determining annual leave, rosters, and base placement based on rank (Eurofound, 2019). Stakeholders consulted through the focus group also highlight several concerns related to this system that, inherited from military traditions, still dominates the industry. Pilots face a challenge when moving between companies, as they have to start at the bottom of the hierarchy, which discourages career mobility. This issue is compounded by the industry's shift from prioritising people and safety to focusing more on aircraft performance and operational efficiency, particularly after the events of 9/11. As a result, safety standards are becoming more closely linked to technological advancements, which in turn require the development of new skill sets.

Technological innovations, such as automation and digitalisation, are expected to significantly impact the skill sets needed in the industry (European Commission: Directorate-General for Mobility and Transport, 2024). One area of concern is the use of sustainable aviation fuels which will require upskilling workers to ensure safe handling (ETF, 2023). Pilots and aircrew will also have to adapt to new technologies and digital tools which will require the acquisition of new, specialised skills. These shifts will create challenges, primarily around the need for effective training systems to meet the evolving demands of the industry (ETF, 2023).

While there is no recognised shortage of licensed pilots in most European countries, focus group stakeholders shared employers are increasingly concerned about the level of experience in the workforce. Due to new salary conditions, experienced pilots did not come back to the workforce after the COVID-19 pandemic and new pilots are not always as qualified as airlines would like. Stakeholders mentioned concerns over the quality of pilots graduating from flight schools (ECA, 2018b). They noted that these schools, driven by profit purposes, often focus on training as many pilots as possible rather than ensuring the quality of their training. Aspiring pilots are required to invest around EUR 150 000 in flight school programmes, with no guarantee of a job afterward. Indeed, the Aircrew Training Policy Group has noticed young pilot school graduates not meeting some airline's basic requirements (European Commission: Directorate-General for Mobility and Transport, 2019).

The main challenges include attracting, selecting, and training candidates to meet industry standards (ECA, 2018b). Despite advancements in training tools like simulators, current programmes focus on proficiency in predetermined tasks rather than preparing trainees for the dynamic challenges of operational airline environments (ECA, 2018a). To address this, pilot training should shift to a competency-based model that enhances manual, intellectual, and managerial skills, with an emphasis on basic flying skills and a comprehensive education in management, economics, leadership, and people skills (ECA, 2018a). Stakeholders in the focus groups explained that although companies are recruiting, there is no pilot shortage, but sometimes qualification issues and lack of experienced pilots. As an example, French stakeholders argued there is no shortage because French airlines continue to require that all pilots should speak French, and this requirement would be the first to be removed in case of shortages.

The 'pilot shortage' debate often masks deeper structural issues within the industry. Some stakeholders may use this narrative to push for weaker safety regulations and lower costs, aiming to unlock pilot supply at a reduced expense for certain airlines and to increase enrolment in training organisations (ECA, 2018a). Although airlines and Approved Training Organisations (ATOs) should focus on producing high-quality pilots, commercial motivations often influence their approach to pilot training (ECA, 2018a). In the same vein, airlines and airplane manufacturers and other special interest groups are advocating for reducing the number of pilots in the cockpit from two to one, using the narrative of a pilot shortage to justify this change (Air Line Pilots Association, 2024). Companies like Airbus and Dassault are particularly interested in this shift as it could enhance their competitive edge in the market by lowering costs and according to the ECA, cutting safety corners (Air Line Pilots Association, 2024). However, the reliance on a single pilot raises concerns about safety, likening it to pilotless flights. While this move aligns with the commercial interests of airlines by potentially cutting personnel costs and increasing profits, it is unlikely to result in cheaper flights for passengers (ECA, 2024d).

# 9.0 Recruitment practices to fill labour and skill gaps

**Key determinants of labour market imbalances in relation to recruitment practices:**

- Recruitment through agencies allows airlines to bypass direct employment obligations, leading to inconsistencies in pay, benefits and working conditions between agency and directly employed staff.
- Young pilots face exploitative pay-to-fly schemes which prioritise gaining flight hours over fair compensation and job security, potentially impacting safety culture.
- Bogus self-employment enables carriers to achieve cost advantages over competitors that provide stable employment contracts.
- Stakeholders reported that many cabin crew undergo rushed training, resulting in fewer staff being fully prepared for all duties than official figures suggest.

The liberalisation of the aviation market has led to an increase in atypical forms of employment. Although most aircrew have permanent contracts in the air transport sector, atypical ones are on the rise (Eurofund, 2022). In particular, low-cost carriers in Europe often rely on time-limited and part-time contracts and utilise staffing agencies to reduce costs, giving them a competitive advantage over large national legacy carriers (Ydersbond, 2022).

One atypical employment practice often used to meet peak demand or for cost savings is wet-leasing. As introduced in Chapter 6, wet-leasing allows airlines to rent aircrafts and crews in countries with lower salaries and social protection laws, effectively bypassing EU labour protection laws by indirectly employing workers (Ydersbond, 2022). Although its use among EEA carriers is relatively limited, it has increased in recent years, with more airlines and countries engaging in such agreements (European Commission: Directorate-General for Mobility and Transport et al., 2019). Some airlines, like Finnair and AirBaltic, lease aircrafts without specifying registration numbers, which complicates the tracking of their operations. The European Cockpit Association (ECA) has highlighted concerns about the growing use of self-employed pilots through staffing agencies in these leases, which often blur the lines between self-employment and traditional employment relationships. Additionally, wet-leasing has been used during industrial conflicts, such as the case with Volotea during a strike in France, raising concerns about its potential role in strike-breaking (ECA, 2024b). Research has also shown that pilots on atypical contracts, including those hired through wet leases, are less likely to engage with support programmes, negatively affecting both occupational health and flight safety (ECA, 2024b). Other variations of this practice include damp leasing which is an agreement similar to wet-leasing without including cabin crew. Dry leasing is another practice where an airline leases an aircraft from a lessor without crew, maintenance or support. Depending on regulatory contexts, some airlines might prefer the option without crew as they can negotiate crew salaries independently.

Bogus self-employment[3] is a recruitment practice particularly prevalent for hiring pilots, who often face less stable contracts than directly employed staff. Airlines that hire self-employed pilots can legally offer fewer benefits, such as parental leave, sick pay, and social security contributions, gaining a competitive advantage over those that employ pilots directly (ECA, 2024a). The varying definitions and approaches to monitoring of (bogus) self-employment across EU Member States have led to uneven competition, with some carriers using these contracts to achieve cost advantages over others (European Commission: Directorate-General for Mobility and Transport et al., 2019).

[3] Arrangements where workers are classified as self-employed but perform roles very similar to regular employees (Eurofound, 2024)

Such practices are particularly common among low-cost carriers like Ryanair and Wizz Air, especially in Eastern Europe. Most pilots who identify as self-employed do not fulfil the criteria for true self-employment, as they typically lack the flexibility to work for multiple airlines or set their own working hours (Ydersbond, 2022). Trade unions argue that self-employment is largely inapplicable for the structured nature of passenger air services (European Commission: Directorate-General for Mobility and Transport et al., 2019). Indeed, many self-employed pilots often work exclusively for a single airline, making them similar to direct employees but without the same benefits (European Commission: Directorate-General for Mobility and Transport et al., 2019).
Other atypical recruitment practices and employment characteristics include:

- Temporary work agencies and brokers play a role in the air transport sector, by employing pilots and cabin crew who are then assigned to aircrafts or airlines. The agency is responsible for paying wages, taxes and social security obligations (European Commission: Directorate-General for Mobility and Transport et al., 2019), while the airline oversees worker supervision, health and safety. This system can lead to differences in working conditions between workers employed through intermediaries and those with direct contracts with airlines. Airlines such as Ryanair and Wizz Air employ different strategies to circumvent direct employment contracts. For instance, Ryanair recruits staff through agencies like Crewlink and Workforce, both of which it owns, and these workers are then subcontracted exclusively to Ryanair (Staunton, 2022). Air carriers are sometimes accused of 'rule shopping' by choosing agencies in countries with more favourable regulations for temporary agency work. This can sometimes allow airlines to avoid upholding trade union agreements (Ydersbond, 2022).
- Pay-to-fly schemes[4] that primarily target young pilots seeking to accumulate flight hours. An EU study estimates that around 6% of European pilots have been involved in such schemes (European Commission: Directorate-General for Mobility and Transport et al., 2019). Pay-to-fly schemes in the air transport sector raise concerns about pilots' working conditions, including low pay, job insecurity, and potential impacts on safety culture and employment rights (ECA, 2017).
- Zero-hours contracts[5] obligate workers to be available when needed, but employers are not required to provide work, and employees are only paid for the hours worked. Many EU countries have banned zero-hour contracts (ECA, 2017). Flight crew under such contracts do not receive benefits like paid annual leave, maternity leave, or sick leave (European Parliament, 2016). These contracts are often associated with issues like bogus self-employment and raise concerns about access to unemployment benefits, social security, and compensation for travel time or short assignments. Zero-hours contracts may also undermine regulations on working hours and rest periods, affecting workers' work-life balance. Furthermore, this practice gives employers full decision making over scheduling, potentially penalising workers for not accepting work.
- The use of trainees as cabin crew is illegal yet has been reported in at least once case by Transavia. The Dutch labour inspectorate found trainees from vocational schools were treated as full employees. They were paid internship wages for the same responsibilities and work hours as regular cabin crew (Ministerie van Sociale Zaken en Werkgelegenheid, 2023).
- Aircrew interoperability allows the exchange of aircrews between different airlines that are part of the same airline group in Europe (EurECCA, 2024b). Currently, airlines with multiple operating licences and/or multiple air operator certificates can exchange their crews. There is a push from the EASA for increased aircrew operability framed as an adaptation to new business models in air operations. Social actors argue this crosses legal lines as crew interoperability impacts the social conditions of workers and raises security concerns. In terms of social and employment matters, by fragmenting the workforce across many different airlines, it could erode collective labour agreements, weaken union representation, and result in precarious employment conditions for aircrews (EurECCA, 2024b). In terms of safety, interoperability could lead to increased fatigue due to fragmented scheduling. Working across different airlines can also create safety issues with aircrew needing to adapt to different safety procedures.

[4] Refers to situations where pilots are asked to pay an airline in exchange for the flight experience necessary to obtain certifications for flying specific types of aircrafts (Jorens et al., 2015).

[5] Flexible work arrangements where flight crew, including those hired through agencies or self-employment, are not guaranteed a minimum number of working hours.

Some airlines can influence the social conditions of their employees based on their choice of place of business, thus assigning 'home bases' which are different from the location where their employee technically works. Although the European Court of Justice established the 'home base' concept to determine the place where the employee habitually carries out his work, there is still great subjectivity and ambiguity because it has not been codified into EU law. Airlines are still allowed to choose which EU country they base their principal place of business. This has made many airlines choose countries with loose national regulations on temporary agency work and self-employment, restrictions on strikes and low social security. Further, some airlines have multiple operational bases outside of their principal place of business, leading to legal uncertainty as to which labour law applies to aircrew. The air transport sector faces many cases of non-compliance and incorrect application of EU legislation. The transnational nature complicates the determination of which laws are applicable to employees, and which State(s) is responsible for regulatory oversight. The literature review revealed that these business practices raise concerns about working conditions and security in the sector. Airlines can legally 'rule shop' by establishing subsidiaries, home bases, and using recruitment agencies and facilities in various countries. These arrangements help airlines benefit from lower taxes, wages, working hours, and working conditions. Additionally, differences in EU social security interpretations can cause legal issues concerning which country is responsible for social security benefits, leaving workers with poorer working conditions, lower pay, and fewer employer-paid social security and pensions compared to traditional employment (Danish Transport Authority, 2014).

Stakeholders consulted through the focus group perceive significant issues around atypical contracts in the sector, particularly concerning wet-leasing and bogus self-employment. The former is seen as a major concern, leading to social dumping, lower ages and precarious working conditions while the latter is seeing the catalyst for the rise of 'on-demand' employment models with no social rights or job security. Stakeholders noted that workers are often employed on flexible terms, without the guaranteed pay or benefits of stable employment, increasing concerns about safety, particularly when workers are expected to fly while sick. They also noted that current figures on the number of cabin crew do not reflect the real level of adequately trained cabin crew. In fact, in recent years, many workers have received accelerated training and may not be fully prepared for all required duties.

# 10.0 Measures to tackle labour market imbalances

**Key determinants of measures to tackle labour market imbalances:**

- Enhancing cooperation towards EU-level policies on working conditions can help prevent labour shortages from becoming a serious issue.
- Collaboration among national authorities across Member States is essential for enforcing social legislation and addressing intermediary work.
- Implementing stricter national measures can limit problematic employment practices, supported by raising awareness of employees' rights related to contract types and applicable national laws.
- Aligning pilot training qualifications with airline requirements can close the skills gap. Training programs from airlines and public institutions address skills mismatches and improve accessibility.

In recent years, the air transport sector has undergone significant technological changes and a reshaping of the competitive landscape, while also suffering disruptions due to the COVID-19 pandemic. The consequent changes in the air transport sector's demand for specific labour skills, along with deteriorating employment practices and working conditions, might lead to labour shortages and skills gaps in the long term if left unaddressed.

Addressing these challenges the aviation industry necessitates a collaborative approach involving various stakeholders, including government and regulatory bodies, airlines, trade unions, industry associations, academic institutions, international organisations, and passenger groups. The cooperation of national authorities across different Member States is crucial to tackle the transnational nature of issues such as the enforcement of social legislation, posting of workers, and work through intermediaries. Legislation must also address the reality of the practices in the sector to assure equal treatment of workers based on the fair labour mobility and posting rules in the EU. To effectively mitigate the risk of labour shortages and skills shortages, it is essential to implement targeted solutions through concerted efforts (European Commission: Directorate-General for Mobility and Transport, 2024).

As elaborated in previous chapters, the challenges characterising the air transport sector are mostly related to low attractiveness of the sector, which are predicted to lead to real shortages if conditions do not change. Most sources attribute this to poor working conditions related to employment practices in this very competitive sector. The European Union has approached this issue with the goal to 'ensure healthy and fair competition and to prevent social dumping in Europe's aviation market' (European Commission: Sub-group on social matters related to aircrews, 2020a). It subsequently created a subgroup on social matters related to aircrews which, through various meetings and papers, reported on measures and good practices Member States had in place related to issues of self-employment and labour law enforcement. The issue requires holistic approaches combining multiple authorities within each Member State and across them.

Regarding bogus self-employment, measures already taken by Member States includes France reminding airlines of risks of hiring self-employed aircrew and the penalties applied for concealed work. Indeed, national case law in France states self-employment in the air transport sector is not possible (European Commission: Sub-group on social matters related to aircrews, 2020b). Ireland helps workers to raise queries and check the validity of their self-employment. Any worker who wants to verify their employment status can apply for statutory determination. Ireland is working on legislation to protect workers who are found to be victimised by bogus self-employment (European Commission: Sub-group on social matters related to aircrews, 2020b).

The Airline Coordination Platform gives examples of good practices related to self-employment. These include: Spain's coordinated exchange of data across labour inspection, social security treasury and the tax revenue department, also including transport companies; targeted inspections such as Germany and the UK's joint inspections; Slovenia's legal amendments to reverse the burden of proof now lying with the employer and higher fines for 'disguised employment relationships' (ACP, 2020).

Multiple examples of good measures arise at a national level to enforce applicable labour law (European Commission: Sub-group on social matters related to aircrews, 2020a). As discussed in the focus group, French law has clear definitions of the concept of an operational base, which is important because many national authorities are unclear on these matters. Stakeholder's attribute France's strict and protective regulatory framework as one of the reasons there is no shortage of pilots in France. After the 2018 strikes called by cabin crew, the Spanish Directorate-General for Labour mediated an agreement with an airline and trade unions on the application of Spanish labour legislation. Ryanair air crew had been employed under Irish contracts and legislation, although they were all living in Spain. The agreements led to contract changes, allowing crew to fall under Spanish legislation and benefit from rights such as social security and retirement in Spain, amongst other rights (El Diario, 2019). These agreements also recognise trade unions, and the disappearance of certain subcontracting agencies. Portugal enforces labour law in the air transport sector by carrying out inspections.

In addition to low attractiveness, some pilot shortages are attributed to a mismatch between candidate skills and employer requirements, or the costs of training. To solve the perceived misalignment of skills, some airlines such as Ryanair and Volotea have their own dedicated training programmes (Ryanair, 2024 and CAE, 2024). Air France also has a pilot training programme where candidates are educated free of charge and paid a modest wage (ECA, 2018a). Such programmes allow companies to train aspiring candidates to meet their standards, and offer training to candidates who would not be able to afford it otherwise. France also has its own dedicated government funded pilot training (Ecole Nationale de l'Aviation Civile). This is a positive measure allowing more training of qualified pilots as they open the door to more candidates.

To address the specific shortage of female pilots and gender pay gaps, some airlines like Easy Jet and British Airways have implemented initiatives in line with recommendations that financial grants, scholarships and leadership and mentoring programmes are effective measures (European Commission: Directorate-General for Mobility and Transport et al., 2019). British Airways in particular shows how airline companies can encourage female pilots and close gender pay gaps through targeted media campaigns, internal leadership initiatives, female pilots' visibility raising projects in schools (British Airways, 2017). The International Air Transport Association launched a pledge to increase then number of women in senior positions and underrepresented areas like pilots by 25% or up to a minimum of 25% by 2025 (IATA, 2024). Signatories include many European airlines. Stakeholders reinforced the merit of recruiting for pilots, air controllers and management positions in the existing population of female cabin crew members. They already possess industry knowledge and are accustomed to the sector's specific working conditions and lifestyle, which can support a smoother transition into other roles.

# References


Abate, M. and Christidis, P. (2020). The impact of air transport market liberalization: Evidence from EU's external aviation policy. *Economics of Transportation*, *22*, 100164. Available at: https://doi.org/10.1016/j.ecotra.2020.100164

Achkar, S. E. (2024). *Constant turbulence: Employment in civil aviation*. ILOSTAT. Available at: https://ilostat.ilo.org/blog/constant-turbulence-employment-in-civil-aviation/

ACI Europe (2024). *Air traffic finally above pre-pandemic levels in the first half of 2024*. Available at: https://www.aci-europe.org/downloads/mediaroom/24-07-31%20Air%20traffic%20finally%20above%20pre-pandemic%20levels%20in%20the%20first%20half%20of%202024%20PRESS%20RELEASE.pdf

ACP. (2020). *ACP: ECA and EurECCA joint views on self employment*. Airline Coordination Platform. Available at: https://www.eurocockpit.eu/sites/default/files/2019-12/ACP_ECA_EurECCA%20joint%20views%20on%20self%20employment_F.pdf

Airlines for Europe (2024). *Achieving a Competitive and Efficient Aviation Industry in Europe]*. Available at: https://a4e.eu/publications/achieving-a-competitive-and-efficient-aviation-industry-in-europe/

Air Line Pilots Association (2024). *LinkedIn Post*. Available at: https://www.linkedin.com/posts/alpapilots_alpa-and-eca-presidents-discuss-hot-topics-activity-7213929451892416514-Mnir/

AGBI. (2023). *Middle East airlines are taking control of their destiny*. Available at: https://www.agbi.com/opinion/aviation/2023/07/john-grant-middle-east-airlines-increase-their-networks/

AGBI. (2024). *Middle East airlines in race to recruit as pilot shortage bites*. Available at: https://www.agbi.com/analysis/aviation/2024/07/pilot-shortage-middle-east/

British Airways (2017). *British Airways Gender Pay Gap*. Available at: https://www.britishairways.com/assets/pdfs/information/about-ba/gender-pay-gap-q1-2018final.pdf

Broughton, A., Tanis, J., Brambilla M. (Ecorys), Voss, E. and Vitols K. (wmp consult), (2024). *Research for TRAN Committee – Trends, challenges and opportunities in the EU transport labour market*. European Parliament, Policy Department for Structural and Cohesion Policies. Available at: https://www.europarl.europa.eu/thinktank/en/document/IPOL_STU(2024)747266

CAE (2024). *Volotea MPL*. Available at: https://www.cae.com/volotea-mpl/

Casey, D. (2024). *Lufthansa Drops Beijing Service Amid Mounting Competition From Chinese Airlines | Aviation Week Network*. Aviation Week. Available at: https://aviationweek.com/air-transport/airlines-lessors/lufthansa-drops-beijing-service-amid-mounting-competition-chinese

Danish Transport Authority (2014). *Report of the working group on "Social dumping" in aviation*. Available at: https://www.etf-europe.org/wp-content/uploads/2018/10/social_dumping_rt_danish_transport_authority_2014.pdf

EASA. (2024a). *Aircrew*. European Union Aviation Safety Agency. Available at: https://www.easa.europa.eu/en/the-agency/faqs/aircrew

EASA. (2024b). *Fuel Management — New Rules | EASA Community*. Available at: https://www.easa.europa.eu/community/topics/fuel-management-new-rules

ECA. (2008). *European Flight Time Limitations*. European Cockpit Association, Brussels. https://www.eurocockpit.eu/sites/default/files/SubpartQ_Reference_Guide_07_0822_F.pdf

ECA. (2015). *The case for fair competition in EU aviation*. European Cockpit Association. Available at: https://www.eurocockpit.eu/sites/default/files/2017-04/The_case_for_fair_competition_in_EUs_aviation_14_1125_online_F.pdf

ECA. (2017). *Atypical Employment in European Aviation* [Position Paper]. European Cockpit Association. Available at: https://www.eurocockpit.eu/sites/default/files/2020-02/Atypical_Employment_ECA_Position_PP_17_1106.pdf

ECA. (2018a). *Pilot shortage in Europe: Fact or fiction?* [ Discussion Paper]. European Cockpit Association. Available at: Pilot shortage in Europe: Fact or fiction? | European Cockpit Association (ECA)

ECA. (2018b). *Pilot Supply* [Position Paper]. European Cockpit Association. Available at: Pilot Supply | European Cockpit Association (ECA)

ECA. (2020). *Enforcement of the applicable law to aircrew—ACP, ECA & EurECCA common views*. Available at: https://www.eurocockpit.eu/positions-publications/enforcement-applicable-law-aircrew-acp-eca-eurecca-common-views

ECA. (2023). *The European Labour Authority: A chance for change*. European Cockpit Association. Available at: https://www.eurocockpit.eu/news/european-labour-authority-chance-change

ECA. (2024a). *Atypical employment* [Position Paper]. European Cockpit Association. Available at: https://www.eurocockpit.eu/positions-publications/atypical-employment

ECA. (2024b). *Wet-leasing in Europe*. European Cockpit Association. Available at: https://stories.eurocockpit.be/wet-leasing-in-europe/

ECA. (2024c). *European Cockpit Association*. Instagram. Available at: https://www.instagram.com/p/C6Gtv5Fs-MQ/

ECA. (2024d). *One means none!* One Means None, European Cockpit Association. Available at:https://www.onemeansnone.eu/

El Diario. (2019). *Ocho meses de pulso a Ryanair: Los tripulantes de cabina consiguen que la aerolínea asuma la legislación laboral española*. Available at: https://www.eldiario.es/economia/tripulantes-ryanair-conflicto-empresa-marcado_1_1759926.html

ETF (2023). *Building a Just Transition Towards a Smart and Sustainable Mobility*. European Trade Union and European Transport Workers' Federation. Available at: https://agenda.industriall-europe.eu/uploads/documents/2023/9/638296712279175580_IndustriAll_JUST_TRANSITION_EN_23.pdf

EurECCA (2024a). *Participatory-Conference-on-Labour-Market-Developments-and-Labour-Shortages-in-the-EU* [Position Paper]. Available at: https://eurecca.eu/wp-content/uploads/2024/10/EurECCA-Position-Paper-on-the-Participatory-Conference-on-Labour-Market-Developments-and-Labour-Shortages-in-the-EU.pdf

EurECCA (2024b). *EurECCA Position Paper on Interoperability on commercial airlines as a cost saving business model*. Available at: https://eurecca.eu/wp-content/uploads/2024/10/EurECCA-Position-Paper-on-Interoperability-on-commercial-airlines-as-a-cost-saving-business-model.pdf

EURLex (2025). *Regulation 83/2014*. Available at: https://eur-lex.europa.eu/eli/reg/2014/83/oj/eng

Eurofound (2019). *Seniority-based entitlements: Extent, policy debates and research*. Publications Office of the European Union, Luxembourg. Available at: https://doi.org/10.2806/21758

Eurofound (2022). *Representativeness of the European social partner organisations – Civil air transport sector*. Publications Office of the European Union, Luxembourg. Available at: https://doi.org/10.2806/557176

Eurofound (2024). *Self-employment in the EU: Job quality and developments in social protection*. Publications Office of the European Union, Luxembourg. Available at: https://www.eurofound.europa.eu/sites/default/files/2024-01/ef23004en.pdf

European Agency for Safety and Health at Work (EU-OSHA) (2024). *Transportation and storage activities: Evidence from the European Survey of Enterprises on New and Emerging Risks (ESENER)*. Publications Office of the European Union, Luxembourg. Available at: https://data.europa.eu/doi/10.2802/825106

European Commission: Directorate-General for Mobility and Transport (2019). *REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Aviation Strategy for Europe: Maintaining and promoting high social standards*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019DC0120

European Commission: Directorate-General for Mobility and Transport (2024). *Participatory conference on labour market developments and labour shortages in the transport sector in the European Union:Conference report*. Publications Office of the European Union, Luxembourg. Available at: https://doi.org/10.2832/522192

European Commission: Directorate-General for Mobility and Transport, Molina, C., Levin, S., Castillo, L., Moya Izquierdo, S., Neiva, R., Brannigan, C., Amaral, S., García Fernández, C., Troncoso Ferrer, M., Tallos, J., Morgan-Price, S., Figg, H. and Thorpe, C. (2019). *Study on employment and working conditions of aircrews in the EU internal aviation market – Final report*. Publications Office of the European Union, Luxembourg. Available at: https://doi.org/10.2832/37654

European Commission: Sub-group on social matters related to aircrews (2020a). *Paper on enforcement of applicable law*. European Commission. Available at: https://ec.europa.eu/transparency/expert-groups-register/screen/meetings/consult?lang=en&meetingId=22235&fromExpertGroups=true

European Commission: Sub-group on social matters related to aircrews (2020b). *Paper on self-employment*. Available at: https://ec.europa.eu/transparency/expert-groups-register/screen/meetings/consult?lang=en&meetingId=22235&fromExpertGroups=true

European Parliament (2016). *Working conditions in EU civil aviation* (Members' Research Service) [Briefing]. European Parliamentary Research Service. Available at: https://www.europarl.europa.eu/RegData/etudes/BRIE/2016/580915/EPRS_BRI(2016)580915_EN.pdf

European Parliament (2022a). *Russia's war on Ukraine: Implications for EU transport* . European Parliamentary Research Service. Available at: https://www.europarl.europa.eu/RegData/etudes/ATAG/2022/729307/EPRS_ATA(2022)729307_EN.pdf

European Parliament (2022b). *Russia's war on Ukraine: Implications for transport* [Briefing]. European Parliamentary Research Service. Available at: https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/733536/EPRS_BRI(2022)733536_EN.pdf

European Parliament (2024). *Fact Sheets on Air transport: Market rules*. Available at: https://www.europarl.europa.eu/factsheets/en/sheet/131/air-transport-market-rules

Eurostat (2025). *Transport equipment statistics*. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Transport_equipment_statistics

Eurostat (2024a). *Air passenger transport — Data by month*. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Air_passenger_transport_-_data_by_month

Eurostat. (2024b). *Enterprise statistics by size class and NACE Rev. 2 activity (from 2021 onwards)* [Dataset]. Available at: https://doi.org/10.2908/SBS_SC_OVW

Eurostat (2024c). *Statistical classification of economic activities in the European Community (NACE Rev. 2): Air transport*. Available at: https://ec.europa.eu/eurostat/databrowser/view/LFSQ_EGAN22D__custom_15711700/default/table?lang=en

Financial Times (2024). *European airlines cut back Asia routes as Gulf carriers offer cheaper flights*. Available at: https://www.ft.com/content/9ba7a802-d161-47b3-85d0-6a2c11c229ad

Folke, F. and Melin, M. (2024). Ramp-up in the air: Impairing or repairing aviation crews' working conditions? A mixed-methods survey study on working conditions, health, and safety among cabin crew and pilots in Europe. *Journal of Air Transport Management*, *119*, 102642. Available at: https://doi.org/10.1016/j.jairtraman.2024.102642

Harvey, G., Turnbull, P. and Wintersberger, D. (2021). Has Labour Paid for the Liberalisation of European civil aviation? *Journal of Air Transport Management*, *90*, 101968. Available at: https://doi.org/10.1016/j.jairtraman.2020.101968

IATA (2024). *Advancing Diversity, Equity & Inclusion with 25by2025*. Available at: https://www.iata.org/en/about/our-commitment/25-by-2025/

IndustriAll (2023a). *Sustainable Aviation; for a greener European air transport sector with workers at its core* (No. 2023/148; Position Paper). Available at: https://news.industriall-europe.eu/documents/upload/2023/6/638216432613279517_Adopted_-_Sustainable_aviation_-_for_a_greener_European_aviation_sector_with_workers_at_its_core_-_EN.pdf

IndustriAll (2023b). *Greening Europe's air transport sector must lead to good jobs*. Available at: https://news.industriall-europe.eu/Article/928

Jorens, Y., Gillis, D., Valcke, L. and De Coninck, J. (2015). *Atypical Forms of Employment in the Air transport sector* (European Social Dialogue). European Commission. Available at: https://biblio.ugent.be/publication/6852830

Ministerie van Sociale Zaken en Werkgelegenheid. (2023). *Luchtvaartmaatschappij gebruikt stagiairs als werknemers*. Ministerie van Sociale Zaken en Werkgelegenheid. Available at: https://www.nlarbeidsinspectie.nl/actueel/nieuws/2023/06/13/luchtvaartmaatschappij-gebruikt-stagiairs-als-werknemers

NACE (2024). *Glossary: Statistical classification of economic activities in the European Community (NACE)*. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Statistical_classification_of_economic_activities_in_the_European_Community_(NACE)

OAG and INFARE (2024). *Middle East Aviation: Transformation, Growth and Future Challenges | Aviation Market Analysis*. OAG Aviation Worldwide. Available at: https://www.oag.com/middle-east-aviation-2024

Reuters (2025). *Etihad to sound out investors as Gulf carriers race towards IPOs*. Available at: https://www.reuters.com/markets/deals/etihad-sound-out-investors-gulf-carriers-race-towards-ipos-2025-01-24/

Ryanair (2024). *Ryanair Future Flyer Academy*. Available at: https://afta.ie/ryanair-future-flyer-academy/

Staunton, B. (2022). While aviation takes off again, labour standards remain low. *European Trade Union Institution Publication*, *Spring 2022*(25). Available at: https://www.etui.org/sites/default/files/2022-05/HM25_While%20aviation%20takes%20off%20again%2C%20labour%20standards%20remain%20low_2022.pdf

Strategic Risk Global (2024). *Skills shortage continues to challenge aviation — How the industry can respond*. Available at: https://www.strategic-risk-global.com/hospitality-leisure-and-travel/skills-shortage-continues-to-challenge-aviation-how-the-industry-can-respond/1453101.article

Suau-Sanchez, P., Voltes-Dorta, A., & Lamolla, L. (2025). Board and executive gender diversity as a driver of airline efficiency: A network-DEA analysis. Journal of Air Transport Management, 124, 102745. Available at: https://doi.org/10.1016/j.jairtraman.2025.102745

Wild, P. (2022). How airline business models impact working conditions of flight crew members. *Aeronautics and Aerospace Open Access Journal*, *6*(3), 101–106. Available at: https://doi.org/10.15406/aaoaj.2022.06.00147

Ydersbond, I. M. (2022). *The organisation of the Norwegian air transport sector in a European context*. Institute of Transport Economics. Norwegian Centre for Transport Research. Available at: https://www.toi.no/getfile.php?mmfileid=73817