MESSAGE FROM JOHN SLATTERY

President & CEO of Embraer Commercial Aviation

The airline industry has transported over four billion passengers in 2018 and over one billion are estimated to have flown on an aircraft in the sub 150-seat sector. This segment connects more than 15,000 markets (~60% of all markets directly linked) and it is the single service provider in around half of them.

Impressive figures like these show the relevance of the up to 150-seat segment which – we believe – will be strengthened by the current pursuit for profitability.

Despite great results that have been shown by the industry since 2015, when the EBIT Margin touched the unprecedented level of 8.6%, we have seen those margins falling, systematically – 2016: 8.5%, 2017: 7.5%, 2018: 5.8%. For sure, those numbers are still strong, but it’s quite reasonable to consider that the peak of this great cycle is behind us. In every region we see similar impacts on the airlines’ margins.

Meanwhile, we have seen some very important movements from the airline industry highlighting the relevance of our segment. Last year, for instance, we had a book-to-bill of 2.3 versus 1.0 (the industry’s average).

The up to 150-seat segment represents a very adaptable alternative to sustainable growth for the airline industry as it can serve multiple missions, with a very low risk and now – following the arrival of the E2 Family – with the most efficient single-aisle platform.

After 50 years of existence, we are more prepared than ever to continue serving and helping to shape the future of this great industry.
AIR TRANSPORT DEMAND FORECAST: RPK GROWTH RATES BY REGION

World passenger traffic is expected to grow by 4.4% (CAGR) over the next two decades. Despite external shocks to the system, air travel has proven to be resilient, always keeping its historical trend in the long term.

By 2038, the Middle East and Asia-Pacific will be the fastest growing markets, with an annual RPK growth rate of 5.4% and 5.5%, respectively. Followed by Latin America with 5.1%, Africa with 4.7%, Europe with 3.7%, the Commonwealth of Independent States (CIS) with 3.4% and North America with 2.7%.

World air transport demand will more than double by 2038, reaching almost 18 trillion RPKs for all commercial aircraft segments.

Asia-Pacific will be the largest market, accounting for 38% of world RPKs. Combined, Europe and North America will generate 37% of total air transport demand.
UP TO 150-SEAT MARKET

Embraer foresees world demand for 10,550 new aircraft with up to 150-seats over the next 20 years, representing a total market value of US$600 billion. Replacement of aging aircraft will represent 45% of new deliveries with 55% comprising market growth.

UP TO 150 SEATS – PROJECTED DELIVERIES BY REGION 2019–2038

THE JET SEGMENT
UP TO 150-SEATS

Connectivity on mid-size cities and operation on long-thin routes will drive a worldwide demand for 8,230 jets with up to 150-seats. Of these, 57% will support market growth and the remaining 43% will replace aging aircraft.

JETS UP TO 150 SEATS – PROJECTED DELIVERIES BY REGION 2019–2038
**THE TURBOPROP SEGMENT**

Short-haul operation will drive a worldwide demand for 2,320 turboprops. Of these, 49% will support market growth and the remaining 51% will replace aging aircraft.

**TURBOPROPS – PROJECTED DELIVERIES 2019–2038**

![Worldwide Turboprop Deliveries Map]

- **Worldwide**: 2,320
  - **North America**: 260 (11%)
  - **Latin America**: 290 (13%)
  - **Africa**: 140 (6%)
  - **Europe**: 810 (22%)
  - **Middle East**: 70 (3%)
  - **C.I.S.**: 90 (4%)
  - **Asia-Pacific**: 960 (41%)

**New deliveries**: % = Share of total

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**THE 150 TO 210-SEAT SEGMENT**

By 2038, 20,500 150 to 210-seat narrow-body aircraft will be delivered worldwide, as jets at the mid-range of the capacity spectrum will continue to have strong demand.

**JETS 150-210 SEATS – PROJECTED DELIVERIES 2019–2038**

![Worldwide Jet Deliveries Map]

- **Worldwide**: 20,500
  - **North America**: 4,120 (20%)
  - **Latin America**: 1,630 (8%)
  - **Africa**: 300 (1%)
  - **Europe**: 3,820 (19%)
  - **Middle East**: 820 (4%)
  - **C.I.S.**: 1,900 (9%)
  - **Asia-Pacific**: 7,910 (39%)

**New deliveries**: % = Share of total
ECONOMIC SCENARIO

2018 introduced and reinforced several challenges to the global economy. The escalation of issues like the global trade war and Brexit brought tension to markets in every region of the globe. After a strong period of optimism (specially in US), the stock market starts to accommodate and regional economies will likely slow their pace of growth to the following years.

Cuts to corporate and income taxes in the US, combined with one of the lowest unemployment rates in their history, resulted in GDP growth of 2.9% and and expectations from 2.5 to 3% of growth for 2019. In the long term, US GDP is expected to be limited at 1.9% (CAGR).

China, impacted mostly by trade tensions with the US, showed growth of 6.6% in 2018 and in the long term its growth is expected to reach 4.7% (CAGR), heralding the arrival of a new level of economic maturity.

As mentioned – for Europe – the biggest reason for uncertainty lies with Brexit. The high stability of both European and British society indicates that, despite some impacts, in the long term, their economies should accommodate the new geopolitical situation.

Emerging markets will continue to present some of the best alternatives for investment and growth around the world. Structural reforms are taking place in countries like Brazil and could move the region’s economy into a new era of development in the medium/long term.

GDP GROWTH, AVERAGE ANNUAL % CHANGE

<table>
<thead>
<tr>
<th>Region</th>
<th>GDP Levels 2019</th>
<th>GDP Levels 2019-2038</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>2.8%</td>
<td>2.8%</td>
</tr>
<tr>
<td>United States</td>
<td>2.5%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Europe</td>
<td>1.3%</td>
<td>1.5%</td>
</tr>
<tr>
<td>China</td>
<td>6.3%</td>
<td>4.7%</td>
</tr>
<tr>
<td>India</td>
<td>7.1%</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

Source: IHS Markit
AIRLINE FINANCIALS

After four years of significant profits, IATA economists anticipate 2019 to be the year in which the Return On Invested Capital (ROIC) of the airlines starts to stabilize. However, the fuel price volatility could lead the industry to its break-even level once more.

AIRLINES’ RETURN ON CAPITAL SHOULD STABILIZE IN 2019

It’s still not realistic to consider that the price of oil could reach 2014’s levels in 2019, but it’s important to bear in mind that even a 10% swing in oil price could affect airline profits worldwide to the tune of +/- US $20 billion. This means that profits must outlast the fuel cycle.

Irrespective of whether the rise in fuel price is transient or structural, its volatility poses a risk. The operation of old, less-efficient aircraft will only remain economical as long as oil prices stay at low levels.

Over the long term, new generation aircraft represent a natural operating hedge against surging oil prices. Fuel efficiency represent the best approach in order to reduce the impact of oil price volatility.

The benefits of new generation aircraft go beyond fuel burn reduction, including improved range and payload capability, emission mitigation and noise reduction, enhanced passenger living and stowage space and, of course, maintenance cost reduction.

Although cost is critical for an airline’s ability to remain competitive over the long term, profit and returns are better measures of success.

The economic performance of the airline industry will mostly depend on how far costs will rise, and to what extent it can sustain a healthy revenue environment.

Profitability remains elusive for carriers facing the challenge of surplus capacity. The traditional over-reliance on large aircraft results in inefficiencies that, in turn, generally lead to deep fare discounting in order to fill excess capacity.

History might not repeat itself, but at the very least it provides a useful guide to airlines.

The newly arisen market dynamic offers a different strategic mindset that charts a bold new path, moving away from the traditional “one-size-fits-all” mindset. A more nuanced competitive positioning will be increasingly important.

With rising costs – not just jet fuel, but labor –, the line separating winners and losers in the global airline industry looks likely to be drawn along how well they manage profits. Right-sized, new generation aircraft not only maintain a low cost structure, but also catalyze revenue management.

AIRLINES BUSINESS STRATEGY

Even through brief shocks and ruptures, we have seen the pace of traffic expansion always return to the historical level and, considering the current landscape, there is no meaningful reason why it would be different this time.

Global traffic growth is expected to keep its historical level of 4.4% annually. This growth will be led by emerging markets, with 6.1%, followed by the advanced economies with 3.1%.

In this context of perennial growth, the airline industry is in constant quest for sustainability and profitability. These two pillars have always been considered by stakeholders in order to make our business adaptable to different factors in every region of the globe.

One of the key movements in the airline industry is the convergence of business models.

On top of strategies for dealing with LCC competition, several FSCs are now in restructuring mode, with US major carriers leading the course – all made possible through consolidation.

Europe and Asia-Pacific are still highly fragmented, despite several mergers and airline groupings. Persistent underperformance in airline margin terms owes much to the fragmented nature of the industry and the market share battles.
Apart from the United States, further consolidation and uses of alliances could be a defensive tool to improve the legacy airlines’ competitive position, while focusing on international expansion and reinforcing the role of regional airlines in their hub-feeder strategies.

In parallel, the LCC focus on cost reduction and the reliance on ancillary revenue in order to implement a price leadership strategy is limited. Since ticket revenue alone does not cover unit cost, ancillary revenue has been key to healthy LCC financial performance. As the growth potential of ancillary revenue is finite, the focus is now turning to increasing yields.
AFRICA JOINS FORCES

Cape Town, South Africa
The region is on the verge of realizing its huge potential with the implementation of the Single African Air Transport Market (SAATM);

As the number of mid-sized cities grows, the geographical vastness of Africa makes it imperative to improve air connectivity;

Right-sized aircraft will be key in improving airline load-factors and, consequently, bringing the industry into a more profitable status.
STATUS OF THE SAATM

The Single African Air Transport Market (SAATM) has been in the spotlight over the past few years, as a key element of the liberalization agenda of the African Union. Although this initiative has the potential to unlock passenger traffic in the region, the timeframe remains unclear, as some member states still need to overcome political hesitance before fully adhering.

It is only a matter of time, and once fully implemented the SAATM will eliminate many of the barriers that hinder air travel for Africans. Upgraded connectivity, tourism growth and higher commerce volumes will be some of the major benefits.

POTENTIAL OF MID-SIZED CITIES

Africa is set to become one of the fastest growing regions globally, with a projected annual RPK expansion of nearly 5%. This level of growth comes hand-in-hand with the economic development of small and medium cities, as prosperity spreads well beyond large centers.

Currently there are over 250 urban centers across the continent with somewhere between 300K and 1 million inhabitants, representing over 70% of all African cities. According to the United Nations, the number of these centers will exceed 300 by 2025. These cities already provide plenty of demand for high quality air services.
AFRICAN CITIES GROWTH OVER TIME

![Graph showing the growth of African cities over time.](image)

**AFRICAN CITIES GROWTH OVER TIME**

- **Source:** United Nations, Department of Economic and Social Affairs

**PROFITABILITY CHALLENGES**

There is consensus that, historically, the aviation industry as a whole has faced headwinds when it comes to achieving positive economic results. However, in Africa this statement resonates even stronger: for 2019, IATA forecasts a net post-tax profit margin of -2.1%, an improvement from 2018’s results, but still well below the ideal.

Several elements contribute to this unfavorable scenario, such as high regulatory costs, the challenging revenue environment, and unstable exchange rates. Additionally, load factors play a key role in enabling airlines to generate profits, and must be watched carefully. Moving forward, the right capacity strategy is instrumental in moving towards a more profitable industry. In this sense, aircraft in the up to 150-seat segment will be the backbone of this movement, helping airlines improve load factor, obtain higher yields and achieve greater profitability across the industry.

Nowadays, 25% of African markets are not directly served and over 60% of routes have less than one daily frequency, showing that this latent growth can be accessed through opening new direct markets and therefore stimulating intra-regional and domestic connectivity. Providing service from less dense areas to main cities, as Kenya Airways and South African Airways already do, will continue to be a very profitable way to tap into new sources of passengers.
ASIA-PACIFIC EVOLVES
Despite GDP growth deceleration, China continues improving infrastructure and traffic conditions;

Asian Regional Aviation Policies keep driving the interest of new startups to access the marketplace;

Chinese investments in the West persist and continue to intensify;

India focuses on infrastructure in order to respond to the highest air transport growth rates in the world;

Opportunities for the future lie in greater demand for optimization.

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**ASIA-PACIFIC**

**ECONOMIC & TRAFFIC GROWTH**

<table>
<thead>
<tr>
<th>GDP</th>
<th>RPK</th>
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<tbody>
<tr>
<td>4.0%</td>
<td>5.5%</td>
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**NEW DELIVERIES**

<table>
<thead>
<tr>
<th>Up to 150-seats Jets</th>
<th>TPs</th>
<th>150-210 Seats NB</th>
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<tbody>
<tr>
<td>2,030</td>
<td>960</td>
<td>7,910</td>
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**FLEET IN SERVICE – UP TO 150-SEAT SEGMENT**

<table>
<thead>
<tr>
<th>2018</th>
<th>2038</th>
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<tbody>
<tr>
<td>1,620</td>
<td>3,980</td>
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CHINA KEEPS STRENGTHENING ITS INFRASTRUCTURE

Although the economy has shown deceleration, with the expected GDP for 2019 being ~1/3 less than ten years ago, infrastructure development remains a top priority for China’s government, as it has consistently been a key focus in the economic development initiatives encapsulated in regular Five Year Plans.

According to CAAC (The Civil Aviation Administration of China), in October 2018 China had 230+ civil airports and expects to almost double this number by 2035. This effort is justified in order to meet the growth on air transportation, which has achieved a CAGR of 13.4% in the past 10 years and is expected to stabilize to 6% over the next 20 years.

Keeping the pace, China is expected to overtake the United States as the world’s largest civil aviation market service by mid-2025.

CHINA SET TO BECOME THE MOST RELEVANT MARKET WORLDWIDE

Source: Sabre, Embraer Analysis
REGIONAL AVIATION POLICIES: A WORK IN PROGRESS

In China, the “Rule 96” policy requires startup airlines to operate at least 25 regional jets before going to a larger segment. This naturally encourages them to focus on regional markets. After three years since its establishment, the rule is gaining traction, as a few startups are beginning to acquire regional jets. Through this policy, China aims to connect small and mid-sized cities with up to 99-seat aircraft.

CHINESE MOVEMENT TO THE WEST

Although approximately 85% of the Chinese population is located in the east, the west still represents a meaningful portion (~190M people), and development plans for this region are in progress. In order to provide all the necessary infrastructure, the Chinese government has pumped $550 billion into transportation. 52 major projects have already been completed with the remaining 100 set to be finished by 2023, these projects include 12 new airports, as well as roads and railways, water diversion facilities and hydroelectric power stations.

By 2023, China’s western regions will have an additional 8,751 kilometers of highways, 3,219 kilometers of new high-speed rail tracks and 187 gigawatts of additional energy generation capacity. As 88% of Chinese land is located in plateaus and mountains, the regional aviation is the best way to reach these areas, where high-speed rail cannot.
INDIA INTENSIFIES EFFORTS TO RESPOND TO THE HIGHEST AIR TRANSPORT GROWTH RATES IN THE WORLD

The Indian air transport sector has shown very strong growth in recent years. The CAGR of the previous decade indicates reaching ~10%, and the forecast for the next 20 years indicates another 8.4% of yearly growth for India’s aviation market.

According to the Indian Ministry of Civil Aviation, the country is getting prepared to serve around 1 billion passengers by 2038. Aiming to support this growth, India plans to construct 100 airports, totaling almost US$ 60 billion of investment in the coming years.

FLEET PROFILE AND FUTURE ALTERNATIVES OF OPTIMIZATION

Both Chinese and Indian markets represent good opportunities for a new balance of fleet between the different segments.

CHINA & INDIA – UNBALANCED FLEET

- Brazil
- US
- Europe
- China
- India

- Less than 130 seats
- 130-210 seats
- More than 210 seats
Considering the Chinese and Indian state-of-play, the main priority for both countries is to accommodate their huge traffic growth, and for this reason, many resources have to be applied in areas like infrastructure and systems. However, after addressing this very important priority of expanding air services, comes the need for the whole system optimization.

In order to do so, two main areas must be considered – the airline industry’s profitability and service efficiency:

- As the airlines have been opting for larger aircraft, and the average yield keeps falling, a right-sized fleet would allow more adaptable and profitable operations;

- A robust hub & spoke system would represent a game changer for both China and India in terms of improving the connectivity and efficiency of their traffic development.
CIS LOOKS AHEAD

World Regions | CIS

Moscow, Russia
Higher commodity prices and gradual improvements in the labor market drive the region’s economic recovery;

Sustainable long-term growth will be met with disciplined capacity addition, as a way of not overwhelming the market with excess supply;

After an era of great Soviet platforms, oil price volatility and rising maintenance costs put pressure on results. Meaning, airlines will be more open for fleet renewal.

### ECONOMIC & TRAFFIC GROWTH

<table>
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<td>2.0%</td>
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### NEW DELIVERIES

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### FLEET IN SERVICE – UP TO 150-SEAT SEGMENT

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**CIS ECONOMIC UPTURN**

Economic recovery stays on track with projected GDP growth of around 2% over the coming years. Tailwinds come from higher commodity prices, an improving labor market, and stable inflation – reflected directly in the disposable income of local residents and their willingness to travel.

Aligned with this is the trend towards opening up to the rest of the world, as tourism becomes an important source of capital in the region. The 2018 World Cup boosted travel in Russia in the short term, but the entire CIS will benefit from the positive awareness created by the event.

The lifting of visa restrictions comes as an additional measure to boost tourism, followed by tax benefits. Countries in the central-Asian region will particularly benefit from the large wave of visitors from China and India, generating widespread ripples across the macro-economy.

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**TRAFFIC PERFORMANCE GETTING MATURE**

Since economic downturn in 2015-2016, aviation in the CIS region seems to have worked a formidable turnaround. Last year the region’s airlines collectively enjoyed an almost 10% growth rate in RPK, carrying in excess of 130 million passengers.

This outcome is to be celebrated, but with caution, as it does not mean that carriers will be able to keep moving at this pace unconditionally. Analysis points to yet another meaningful record – seat capacity in the region hit nearly 13% growth in the same period, 3% above the traffic growth rate. This, in contrast with the GDP growth level of around 2%, is a sign that the supply-demand scale may be tipping in unfavorably for airlines.

In the described scenario, sustainable long-term growth will be met through disciplined capacity addition, as a way of not overwhelming the market with excess supply. Robust pricing policies, the use of right-sized aircraft, and strategies based on a deep understanding of each airline’s market niche, will enable prominent airlines to advance in an increasingly competitive marketplace.
THE TIME FOR FLEET RENEWAL

The Russian manufacturing industry played an important role in historical aircraft development, and Soviet-era models had a long-lasting run in the region. However, many of these types are coming to the end of their useful life: TU-154, AN-148, TU-204 – all had their last commercial flights in 2018, and other models such as the YAK-42 should follow suit soon.

With oil prices on the rise and increasing maintenance costs for legacy aircraft, the moment is ripe to consider substituting such models for new technologies, that are more economical to operate. Although the Russian government has offered political incentives and subsidies to bolster the position of locally manufactured aircraft, finding operators for these native aircraft outside of state-owned companies has been a challenge.
Nearly 400 aircraft in the up to 150-seat segment – between jets and turboprops – will require upgrading in the short to mid-term. While the CIS airline industry as a whole strives to meet international competitiveness standards, western technology will become more and more appealing to operators, as well as an important tool to achieve this goal.
As a decision on Brexit approaches, the relevance of the UK in the European environment will drive final negotiations;

As the market becomes gradually more dynamic, resilience and adaptability will play a key role in the airline industry environment.

**EUROPE**

**ECONOMIC & TRAFFIC GROWTH**

<table>
<thead>
<tr>
<th>GDP</th>
<th>RPK</th>
</tr>
</thead>
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<td>1.5%</td>
<td>3.7%</td>
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**NEW DELIVERIES**

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**FLEET IN SERVICE – UP TO 150-SEAT SEGMENT**

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<th>2018</th>
<th>2038</th>
</tr>
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<tbody>
<tr>
<td>1,770</td>
<td>2,910</td>
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</table>
**THE YEAR OF BREXIT**

By the time 2019 reaches an end, it is likely that the new relationship between the United Kingdom and Europe – in whatever shape it comes in – will be in place. Even though Brexit may bring turbulence for the short-term, time will mitigate economic impacts as the region adapts to the new dynamics.

Many important questions remain unanswered; the upside is the possibility of finally putting an end to the long period of uncertainty and taking assertive action to adapt to the new structure.

As a whole, the EU is the single largest destination market from the UK, accounting for over 50% of passengers and 60% of scheduled commercial flights. On the other hand, the United Kingdom is an important point for European travelers who wish to connect with the rest of the world. With this in mind, conjoined efforts between airlines, authorities and governments alike will be essential for maintaining connectivity in the region and ensuring long-term traffic sustainability.

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**ESTIMATED BREXIT IMPACT IN UNITED KINGDOM GDP**

**Source:** IHS Markit; NIESR Brexit Impact Report, Nov18
There have been a few good years for European airlines, thanks mainly to the windfall from low fuel prices. Consolidated airlines showed extraordinary endurance in face of the growing competition, seeking to adapt to the ever more competitive landscape. However, as industry observers still spot clouds on the horizon, the time calls for a continuous focus on adaptability, resilience and long-term strategy.

There are three main topics in the European market worth keeping an eye on over the mid to long term:

/ **What’s next for LCCs?**

A lot has been said about the rise of Low-Cost Carriers in the European region, and one thing is certain: they’re here to stay. However, no business model is 100% bulletproof. Some LCCs have begun to show signs that they can no longer sustain the same robust market expansion, leading to the reassessment of some received wisdom such as the single-fleet strategy.

Last year, the region’s LCCs closed more intra-regional markets than they actually opened. In fact, the mismatch between large-capacity narrow-body jets and the market demand leads airlines to open low-density markets with once to thrice weekly frequencies, which does not make the route viable. As opportunities to explore trunk routes are limited, low-density markets, explored with aircraft in the up to 150-seat segment, will become more relevant in LCC networks.

/ **Gulf Carrier expansion in Europe**

Gulf Carrier capacity in Europe grew at a 10% annual rate over the past 10 years, a pace even faster than the LCCs. The number of European airports served went from around 60 to over 100, and the ASK share of these carriers in extra-regional capacity went from 9% to 16%.

These factors combined have European carriers on the lookout for these increasingly relevant players, which usually offer high standards of service and fares only slightly above the average market price point.

On the bright side for local carriers, European skies are not completely open yet, posing some challenges for foreign operators. Gulf Carriers frequently have a hard time spreading their passengers from hubs, and are often forced to serve the demand through ineffective demand banks. Having this in mind, the key for differentiation for European airlines lies exactly in the possibility of connecting more points, since they are able to offer a much more developed regional network.

/ **Industry Consolidation**

Finally, the highly competitive environment and excess capacity has been driving consolidation in Europe. For a few years in a row we have seen troubled airlines succumbing to these challenges – especially during the winter season. This does not mean that this capacity is going to waste, but rather being redistributed among the remaining players. Consolidation solves the issue of over capacity as it tips the supply-demand balance. However, current players who, to guarantee sustainability, need to develop a laser sharp focus on mid to long term strategy, and this means being flexible enough to face the challenges ahead.
Collectively, environmental awareness has been growing amongst European citizens. This is evident in many areas: governmental policies, traveler attitudes, and even technology developments that are steering society towards cleaner energy. For airlines, the most meaningful action available, for now, lies in the adoption of fuel-efficient aircraft.

As state-of-the-art technologies are gradually built into the next generation of aircraft, the new platforms will show between 15-20% improvements in operational efficiency. The European airlines, as global influencers in environmental responsibility, meet all the conditions to lead the demand for new generation aircraft.
LATIN AMERICA RECOVERS
The economic recovery maintains its slow pace while traffic growth presents positive results;

Brazil’s structural reforms are under way and may drive massive investments in the country;

Long term growth relies on some key factors that, once addressed, would result in huge opportunities for the region.

Latin America:

Economic & Traffic Growth

<table>
<thead>
<tr>
<th>GDP</th>
<th>RPK</th>
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<tbody>
<tr>
<td>2.7%</td>
<td>5.1%</td>
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New Deliveries

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<th>Up to 150-seats Jets</th>
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<tbody>
<tr>
<td>860</td>
<td>290</td>
<td>1,630</td>
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Fleet in Service – Up to 150-seat Segment

<table>
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<tr>
<th>2018</th>
<th>2038</th>
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<tr>
<td>740</td>
<td>1,480</td>
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Despite the fact that important countries in the region have major economic difficulties, in general the region continues to present some subtle signs of improving economic conditions. The IHS Markit forecasts that the region’s GDP will grow around 1.7% in 2019. Over the next 20 years, the CAGR is expected to remain subdued at 2.6%.

In terms of traffic, the region is expected to grow around 4.7% in 2019 and 5.1% during the next 20 years.

In Brazil, the region’s largest economy, Pension Reform is being discussed at the Congress and could represent up to ~US$300 billion of savings for the Brazilian government over the next 10 years. These reforms may encourage foreign investors, since it would promote greater financial stability and business confidence in the long term.

The combination of higher government spending power and a stronger appeal for foreign investors means that the country will have resources to apply internally, promoting development. So far, infrastructure has been one of the largest bottlenecks restraining growth – as it is a barrier to the Brazilian competitiveness, and one of the biggest opportunities for improvement and return on investment. In this sense, investments in this area are already becoming very attractive, especially regarding airports and the air transportation system.

Besides this Federal initiative, tax reliefs on jet fuel promoted by some states in Brazil, as well as the Government’s decision to grant all Brazilian airports to the private sector by 2022 will help the country reach a new phase of development, based on a market-driven platform.

Source: IHS Markit
SUSTAINABLE GROWTH RELIES ON KEY-FACTORS

Taking the benchmark of the United States, the region still has a long way to go until it reaches maturity, representing a tremendous opportunity for growth.

STILL A LONG WAY TO GO TO REACH MATURE LEVEL

Meanwhile, there are some key-factors that have restricted the full potential of the region. Some of these are:

- **Lack of infrastructure investment:** ALTA estimates that if market demand continues to grow at the current rate, there will be a gap of around US$53 billion in aviation infrastructure to cope with passenger demand. Even today, some of the most important airports are reaching their capacity limit. Mexico City is the most critical, but Bogota and some of the main airports in Brazil have similar problems.

- **Fuel:** Fuel costs in Latin America are among the highest in the world. New-generation, more efficient aircraft are important for helping mitigate high prices.

- **Route Concentration:** Airlines operate mainly on trunk routes, often because the aircraft capacity is concentrated on large narrowbodies. Players compete fiercely for market share on core city pairs, impacting everyone’s bottom line. In many countries, especially in Brazil, mid-sized cities are developing faster, both in terms of population and economic growth. Airlines such as Azul and Aeromexico are starting to explore these opportunities.

Source: IHS Markit, Sabre, Embraer Analysis
As part of the economic diversification process from oil, tourism will play an increasing role, since countries are also looking at regional tourist spots as a source of growth;

Untapped opportunities in the short to medium haul market will be explored with the use of right-sized aircraft.

### MIDDLE EAST

#### ECONOMIC & TRAFFIC GROWTH

<table>
<thead>
<tr>
<th>GDP</th>
<th>RPK</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9%</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

#### NEW DELIVERIES

<table>
<thead>
<tr>
<th>Up to 150-seats Jets</th>
<th>TPs</th>
<th>150-210 Seats NB</th>
</tr>
</thead>
<tbody>
<tr>
<td>290</td>
<td>70</td>
<td>1,900</td>
</tr>
</tbody>
</table>

#### FLEET IN SERVICE – UP TO 150-SEAT SEGMENT

<table>
<thead>
<tr>
<th>2018</th>
<th>2038</th>
</tr>
</thead>
<tbody>
<tr>
<td>210</td>
<td>440</td>
</tr>
</tbody>
</table>
ECONOMIC DIVERSIFICATION

The Middle East has become one of the world’s most dynamic regions when it comes to rapid development of economy, infrastructure and a growing appeal to foreign visitors.

Countries once entirely dependent on natural resources are now opening their doors in an unprecedented way as they diversify their economies, reducing exposure to volatility and uncertainty in the global oil market.

Related to this matter, tourism has become a vital enterprise for investment, and the evolution of the air transport industry plays a pivotal role in its success. Visitors are attracted by the region for a number of different reasons: religion, resorts, shopping, nature and more. Well beyond the mainstream, now established, centers of Dubai and Abu Dhabi, other tourist destinations such as Antalya, Jeddah and Dahab have been growing in popularity amongst travelers, and will demand connectivity to sustain regional growth.

As the whole region becomes more and more attractive, international visitors start to consider new internal destinations – demanding increased connectivity. At this point, right-sized aircraft are playing a meaningful role in providing such service.
SHORT TO MEDIUM-HAUL OPPORTUNITIES

Historically, Middle Eastern airlines have obtained extraordinary growth and relevance mainly for their strategic location as a connectivity hub for long-haul travel. Due to this status, inter-regional traffic currently makes up nearly 90% of all RPKs in the region. However, the small portion of intra-regional traffic is not due to a lack of potential, but rather because of the focus on the region as a global connector business up until this point. When we compare its relevance to other challenging regions such as Africa (which has several intra-regional flow restrictions), it becomes clear that the short to medium-haul traffic in the Middle East has remained quite under explored, and undervalued.

MIDDLE EAST INTRA/INTER REGIONAL TRAFFIC

Source: Sabre, Embraer Analysis
The focus on international traffic over past years has led to an overall unbalanced fleet. The majority of the capacity is allocated in the above 150-seat segment, designed mainly to serve high-density and long haul routes. The short to medium haul routes play a key role in bringing new passengers into the system and distributing them through the network, but are currently served with limited flight options. In fact, around 80% of these markets are served with less than one daily frequency.

As international traffic faces challenges due to geopolitical tensions and traffic restrictions, airlines will strive to find new vectors of growth. Frequency addition and rightsizing within the short and medium haul network present alternatives worthy of advancement, unleashing local demand to its fullest capabilities. Within this context, there will be no aircraft more versatile than jets with 70-150 seats.

**OVERCOMING OPERATIONAL CHALLENGES**

The intense climate conditions in the region represent somewhat of an operational challenge across all segments. However, for aircraft deployed on the short to medium-haul network, this effect tends to be more prominent, due the intense flight cycling regime, which brings additional associated maintenance costs. New generation aircraft will play a major role in overcoming that factor, subsidizing the intra-regional market expansion.
AT A GLANCE

- Despite of the highest level of maturity in the world, the North American market still delivers a meaningful growth rate;

- Industry profitability on a downward trend;

- With the focus on optimization, the small narrowbody concept is a key element to provide connectivity and profitability to the mainlines.

NORTH AMERICA

ECONOMIC & TRAFFIC GROWTH

<table>
<thead>
<tr>
<th>GDP</th>
<th>RPK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9%</td>
<td>2.7%</td>
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</table>

NEW DELIVERIES

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<th>Up to 150-seats Jets</th>
<th>TPs</th>
<th>150-210 Seats NB</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,520</td>
<td>260</td>
<td>4,120</td>
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</table>

FLEET IN SERVICE – UP TO 150-SEAT SEGMENT

<table>
<thead>
<tr>
<th>2018</th>
<th>2038</th>
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<tbody>
<tr>
<td>3,620</td>
<td>4,660</td>
</tr>
</tbody>
</table>
A MATURE AND STILL GROWING MARKET

Although the North American aviation market is the most mature in the world, the region continues to support significant traffic growth, achieving growth of 5.0% in 2018 compared to the previous year. Such results can attributed to accentuated GDP growth in the region, which reached 2.9% in 2018. In the long term, the expectation is that the RPK will increase by 2.7% (CAGR).

PROFITABILITY ON A DOWNWARD TREND

After a few years of very high profitability levels, the worldwide airline industry is on a downward trend. In North America, since the peak presented in 2015, the margins are systematically falling.

One of the main detractors of profitability is the fuel price, which keeps rising as well as presenting high volatility. At this point the up to 150 seat segment can play a very important role, as the even more efficient new generation of aircraft enters the marketplace.
The airline industry will increasingly consider the importance of profits and returns as the best metric to measure efficiency. Small narrow-body jets, like the E195-E2 are optimized to deliver not only a competitive cost structure and higher profitability, but also provide the flexibility to serve different missions.

The key to sustainability for an airline is less about adapting its network to its capacity, and more about capacity to its network. Not every time slot justifies a larger aircraft.

Given the size and maturity of the North American market, demand does not, and will not, warrant a structural shift upwards toward large narrow-body aircraft across the board: one size simply does not fit all, and a streamlined fleet does not necessarily signify an optimized one.

At this point, the small narrowbodies are not just more fuel efficient than current alternatives, but also suggest gains in operational cost advantages as they can reach between 10-35% less pilot pay costs (comparing 120-seaters to 160-seaters), nicely tapping the existing capacity gap between large regional jets (76-seats) and mid-size narrowbodies (160-seats).
PILOT SHORTAGE GRADUALLY ADDRESSED

For the U.S. alone, which represents 30% of the worldwide pilot pool, the shortage is a result of three major forces:

- Huge wave of pilots flying for major airlines reaching the retirement age (65 years);

- Fewer students are enrolling in flight schools. According to the US FAA, the number of pilot certificates issued for students has fallen by an average of 2.7% annually over the last five decades in the USA;

- The lengthy – and expensive – process of becoming a pilot. Even if a career as a pilot become financially accessible overnight, the effects would be only felt in 3 to 5 years.

In order to address these topics, airlines are developing alternatives to mitigate the pilot shortage issue. Some are working to attract new pilots at earlier ages, others are building their own pilot schools and some are providing loan alternatives for new students.

REGIONAL AVIATION AS THE CORE OF U.S. CONNECTIVITY

By deploying small aircraft, regional carriers fulfil two roles: offering high frequency flights with connectivity for business travelers, and to serve thin regional routes that cannot be sustained by larger aircraft.

Regional carriers are the only source of air service for more than half of all U.S. airports and are responsible for carrying more than 40% of all U.S. passengers. Such figures reinforce the strong relevance of the segment to United States’ connectivity.
COMBINATION OF FACTORS AROUND SCOPE RELAXATION

The combination of the lack of alternatives for the 50-seat segment, the drop in the level of profitability of the local airline industry and the arrival of new and more efficient aircraft in the 70 seat segment by 2021 (with the E175-E2) are factors that demand greater attention from stakeholders regarding the necessity of scope clause relaxation.

As the profits became more pressured by costs, a state-of-the-art and even more efficient aircraft will play a very important role to keep the U.S. market strongly profitable.
DATA SOURCES

ALL ANALYSIS DEVELOPED USING DATA FROM:

- Global Insight
- The Economist, OECD, World Bank, IMF, McKinsey Global Institute
- OAG
- ICAO, IATA
- A4A, A4E, CAAs, AEA, ALTA, CAPA, AFRAA
- CAAC (Civil Aviation Administration of China)
- Sabre
- Cirium Fleet Analyzer
- Innovata
- Embraer Market Intelligence
- Airlines

For more information, please visit: embraermarketoutlook2019.com

REGIONAL DEFINITIONS

- North America
- Latin America (includes Mexico & Caribbean)
- Europe (includes Israel)
- Russia/CIS
- Africa
- Middle East (includes Egypt & Turkey)
- Asia-Pacific (includes China)