EMBRAER
THE RIGHT SIZE
FOR LATIN AMERICA
MARKET LEADERSHIP

UP TO 150-SEAT AIRCRAFT

SHARED OF DELIVERIES

- BOEING 12%
- ATR 13%
- AIRBUS 17%
- BOMBARDIER 25%
- EMBRAER 29%
- OTHERS 4%

COMMERCIAL AVIATION CUSTOMERS

111 Airlines
60 Countries
1,700+ in Service

Airlines
Countries
in Service
Dear fellow colleague,

If you, like me, have been part of Latin America aviation over the last decade, you have seen many changes. Important consolidations, such as LAN and TAM joining forces to become the biggest airline in Latin America, the rise of LCCs, and Avianca’s acquisition of small airlines to increase its footprint in the region are some examples of how much has changed.

Ten years ago, TAM and GOL shared more than 90% of Brazil’s domestic market. And then Azul was born, flying E-Jets to secondary cities that the two incumbents could not fly with their narrow bodies. Today, Azul serves twice as many cities as its main rivals. Similarly, Austral opened more than 50 routes in Argentina between 2007 and 2017. Copa and Aeromexico, with their mixed fleets, were able to open and sustain service for a broad range of markets, increase frequency and connectivity, and feed their hubs.

Network capillarity suffers when airlines have only big airplanes. But carriers with more versatile fleets can offer more destinations to everyone. Truly, the competitive environment has changed in many ways.

Despite this, old issues persist – the lack of investment in infrastructure, high taxes and airport fees, volatile economies, and fluctuating market demand. These things challenge airline capacity management, especially for carriers that do not have adaptable fleets to better respond to swings in demand. Sometimes, airlines are even held hostage by their own inflexible business models.

More than 70% of Brazil’s commercial air transport market is comprised of low/mid-density city pairs (up to 400 PAX/day) served mostly by just one daily flight. We can expect this percentage to increase since the number of these mid-density markets is increasing every year. For us, it is clear – right-sized aircraft are the best way to improve service for both consumers and airlines.

Latin America has many of the essential elements to build a better future: modern and efficient airlines, great demographics and geographical characteristics, and a growing middle class. When you combine these with the right balance of infrastructure, modern regulation, and right-sized fleets, airlines can unleash the huge potential of the region, allowing it to be better served and more profitable for airlines.

I am sure we will meet soon!

REINALDO KRUGNER
Vice President Sales & Marketing
Embraer Commercial Aviation
Latin America & Caribbean
LATIN AMERICA MACROECONOMIC SCENARIO SNAPSHOT

Air travel demand is directly related to GDP growth. Here is how GDP has evolved, and its future trend for the region:

At the beginning of the decade, notice the robust GDP growth for Latin America. It gradually declined until it started recovering after the 2015-16 recession. The decline was particularly severe in Brazil and Argentina. Economies in the region have recovered slightly since 2017 with 2% average GDP growth. In the near-term, forecasts indicate that recovery will continue. However, GDP growth will still be below the world average, and be about half of the average of other emerging markets. Moreover, there are several risks associated with this growth forecast: the presidential election in Brazil, how Argentina will recover from its severe currency depreciation, and more importantly, the impact of U.S. protectionist policies on the region’s economies.

As we see it, there are some uncertainties in the forecast. Airlines need to have sufficient flexibility in their fleets to prepare for different demand growth scenarios right from the start. We have seen airlines bravely fight to adjust capacity and, as a consequence, incur high costs associated with aircraft return conditions, early lease contract terminations, postponement of new aircraft deliveries, and worse, reducing flight frequencies or withdrawing from markets. That leaves the door wide open for competitors to fill the void.

LATIN AMERICA GDP TO GROW ~2% FROM 2017

In Mexico and Argentina, growth has been consistent and driven by LCCs that have stimulated the market on the one hand, and severely reduced yields on the other. In Argentina, new aviation policies that authorized new routes and new airlines also contributed to demand growth. In Brazil, the deepening economic crisis severely impacted demand for air travel - domestic RPKs fell 5% in 2016. Even with the slight improvement in 2017, traffic in the country is only at 2014 levels. Brazil “lost” almost 4 years of demand.

When we compare the average in the region, traffic is still growing (intra-region RPKs grew around 4% in 2017), but at a much slower pace than the beginning of the decade. Therefore, upgauging aircraft size may not be the best solution for every airline.

LATIN AMERICA RPK GREW ~4% IN 2017

HETEROGENEOUS DEMAND GROWTH

We evaluated how air travel demand (measured in RPKs) evolved in the region’s top three domestic markets. There are different growth patterns:

- In Mexico and Argentina, growth has been consistent and driven by LCCs that have stimulated the market on the one hand, and severely reduced yields on the other.
- In Argentina, new aviation policies that authorized new routes and new airlines also contributed to demand growth.
- In Brazil, the deepening economic crisis severely impacted demand for air travel - domestic RPKs fell 5% in 2016. Even with the slight improvement in 2017, traffic in the country is only at 2014 levels. Brazil “lost” almost 4 years of demand.

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POOR PENETRATION: AN OPPORTUNITY FOR GROWTH AND MARKET DIVERSIFICATION

Here is a graphic representation of demand for air travel and market penetration for the region’s main domestic markets. The size of each bubble indicates the number of 2017 domestic passengers in each country. Brazil is the biggest market in the region. Other domestic markets have different penetration levels. Chile has the greatest per capita GDP and people there have a higher propensity to travel. Accordingly, Chile has more air travel passengers per capita than any other Latin American country.

OPPORTUNITY FOR CONNECTIVITY ON HIGH-YIELD ROUTES

This graph compares domestic traffic concentration (measured in RPKs) of the biggest Latin America markets and the USA.

The Brazilian domestic market is twice as concentrated as the USA domestic market. When we compare market sizes (table below), the USA has almost 8 times more passengers than Brazil yet the aircraft of Brazilian airlines have, on average, 36 more seats. With such big airplanes, domestic airlines are not able to serve mid-density, high yield routes. Regional aviation in the USA is highly developed. In Latin America, there is a lot of room for improvement since traffic is highly concentrated in just a handful of airports. This is a typical characteristic of many countries in Latin America.

Fuel: The cost in Latin America is among the highest in the world. New-generation aircraft are important to help keep fuel costs under control. Embraer’s fuel-efficient E2 family addresses this issue very effectively.

Route Concentration: Airlines operate mainly on trunk routes. They compete against each other for market share on core city pairs. This impacts everyone’s bottom line. In many countries, especially in Brazil, medium-sized cities are developing faster, both in terms of population and economic growth. Airlines are not exploring these opportunities, often because they do not have the right aircraft capacity. Rightsizing is the answer to this.

Lack of Infrastructure Investment: ALTA estimates that if market demand continues to grow at the current rate, there will be a gap of around USD 53 bi 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.

It is easy to see that the propensity to travel by air in all of the countries is still in its infancy compared to the USA. There is, naturally, tremendous opportunity for growth. On the other hand, there are several barriers that restrict the full potential of the region. Some of these are:

One outcome of Latin America’s poor investment in infrastructure and large aircraft size is that only 40 new intra-regional routes were opened in the region in the last 4 years. In Brazil, 45 domestic markets were canceled between 2013 and 2017 due to a national fleet that was not able to accommodate variations in demand. Most of the traffic growth was simply on the same routes.

Embraer’s E-Jets right-sized capacity and the E2’s lower operating costs will allow Latin American airlines to explore opportunities on high-yield, mid-density routes. These aircraft will also give them the flexibility to better manage capacity to cyclical variations in demand.

The E2 will start flying in Latin America in 2019. We are sure to see the positive impact the new airplane will have, especially on airline bottom-line results.
MARKET OPPORTUNITIES

MOST EFFICIENT CHOICE

- To replace A319/B737-700
- As the LCC route opener

NATURAL CHOICE

- For current E-Jets operators
- To bridge the gap between Regional Jets and Narrow Bodies
- For the emerging markets

E2 FLEXIBILITY

% OF AIRCRAFT DEPLOYMENT

- 18%
- 12%
- 20%
- 28%
- 22%
- 5%
- 65%
- 8%

Source: Innovata, Embraer

ORGANIC GROWTH

RIGHT-SIZING

TP REPLACEMENT

SMALLER JETS REPLACEMENT

NEW MARKETS
A NEW DESIGN ON A PROVEN PLATFORM

UPGRADED AVIONICS
E-Jets E2 have the same Pilot Type Rating as the E-Jets E1
New horizontal displays with 45% more area
New Flight Management System FMS and Central Maintenance Computer CMC

NEW WING
A bespoke wing design optimized for each family member, E175-E2, E190-E2, E195-E2
Highest aspect ratio of all single aisle aircraft, optimizing performance and fuel burn
Much improved high lift device systems (slats & flaps)

NEW INTERIOR
Each passenger can bring one carry-on luggage
All passengers enjoy Embraer’s award winning 4-abreast fuselage
All passengers have their own individual PSU (Passenger Service Unit)

NEW LANDING GEAR
Fully enclosed wheel fairing improves aerodynamics, and reduces fuel burn
New trailing link design reduces landing peak loads, and improves ground handling & balance
Easier to maintain and less prone to oil or gas leakages

NEW ENGINE
Double digit fuel burn reduction
Lower noise and lower emissions

UPDATED FUSELAGE
Aerodynamic cleaning
Smarter use of new materials
Quietest Cabin

NEW STABILIZER
Less wet area, less skin drag, less fuel burn
Reduced weight, thanks to 4th Gen FBW integration

EFFICIENCY IMPROVEMENTS ACROSS THE BOARD, 17.3% FUEL BURN REDUCTION:
11% from New Engines,
4.8% from New Wings and Aerodynamic cleaning,
1.5% from 4th Generation Fly-By-Wire

4th GEN FULL FLY-BY-WIRE
Delivers performance improvements with better safety margins
Decreases fuel burn by reducing drag from trims
Allows reduction in structural weight all over the aircraft
THE MOST FUEL EFFICIENT
E-JETS E2 ADVANTAGES VS. A220
Assumption: 800 nm

THE MOST EFFICIENT MAINTENANCE

<table>
<thead>
<tr>
<th></th>
<th>E-JETS E2</th>
<th>A220</th>
<th>Δ E-JETS E2 / A220</th>
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</thead>
<tbody>
<tr>
<td>INTERMEDIATE CHECK</td>
<td>1,000 FH</td>
<td>850 FH</td>
<td>+18%</td>
</tr>
<tr>
<td>BASIC CHECK</td>
<td>10,000 FH</td>
<td>8,500 FH or 36 MO</td>
<td>+18%</td>
</tr>
<tr>
<td>STRUCTURAL INSPECTION</td>
<td>20,000 FC / 40,000 FC</td>
<td>15,000 FC / 30,000 FC</td>
<td>+33%</td>
</tr>
<tr>
<td>CPCP INSPECTION</td>
<td>8 and 16 years</td>
<td>6 and 12 years</td>
<td>+33%</td>
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</tbody>
</table>

E-JETS E2: HIGHEST AVAILABILITY

HIGHEST AIRCRAFT AVAILABILITY
HANGAR VISITS IN 10 YEARS SCENARIO
2,500 FH/year

HANGAR VISITS

E-JETS E2: 2
A220: 3
E-CRJ 900/1000: 3
B737NG/MAX: 3
A320CEO/NEO: 3

E2 vs. A220 -10% FUEL BURN

QUIETEST NEW GENERATION SINGLE AISLE AIRCRAFT
CABIN NOISE LEVEL
More comfort to passengers in all flight phases

HANGAR VISITS

E-JETS E2: 2
A220: 3
E-CRJ 900/1000: 3
B737NG/MAX: 3
A320CEO/NEO: 3

E2 vs A220 Cabin Noise:

GROUND -11
CLimb -6
CRUISE -4
DESCENT -4

One less hangar visit means -$200k on basic check costs and $1M of extra revenue from the 15 days the E2 is available for flying.
EMBRAER IN LATIN AMERICA & CARIBBEAN

11 COUNTRIES
15 OPERATORS
231 AIRCRAFT

ONE EMBRAER JET TAKES OFF EVERY TWO MINUTES
**E195-E2**

**E195-E2 DUAL CLASS CONFIGURATION**
120 SEATS - 12 AT 52" / 108 AT 31"
Business class with staggered seats

**E195-E2 SINGLE CLASS CONFIGURATION**
132 SEATS AT 31"

**E195-E2 SINGLE CLASS CONFIGURATION**
146 SEATS AT 28"

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**PERFORMANCE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Cruise Speed</td>
<td>M 0.82</td>
</tr>
<tr>
<td>Takeoff Field Length</td>
<td>1,915 m</td>
</tr>
<tr>
<td>MTOW, ISA, SL - standard engine</td>
<td>6,283 ft</td>
</tr>
<tr>
<td>Landing Field Length</td>
<td>1,375 m</td>
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<tr>
<td>MLW, ISA, SL</td>
<td>4,512 ft</td>
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<tr>
<td>Takeoff Field Length</td>
<td>1,430 m</td>
</tr>
<tr>
<td>TOW for 500nm, full Pax*, ISA, SL, standard engine</td>
<td>4,692 ft</td>
</tr>
<tr>
<td>Service Ceiling</td>
<td>41,000 ft</td>
</tr>
<tr>
<td>Range</td>
<td>2,600 nm</td>
</tr>
<tr>
<td>Full Pax*, LRC, Typical Reserves, 100 nm alternate</td>
<td>4,815 km</td>
</tr>
</tbody>
</table>

* Single class seating, Pax weight = 100 kg = 220 lb

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**WEIGHTS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Takeoff Weight</td>
<td>61,500 kg 135,585 lb</td>
</tr>
<tr>
<td>Maximum Lading Weight</td>
<td>54,000 kg 119,050 lb</td>
</tr>
<tr>
<td>Maximum Payload</td>
<td>16,150 kg 35,605 lb</td>
</tr>
<tr>
<td>Maximum Usable Fuel*</td>
<td>13,690 kg 30,181 lb</td>
</tr>
</tbody>
</table>

* Fuel Density = 0.803 kg/l

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**FULL PAX PASSENGER AT 100KG CRUISE AT LRC SPEED**

- 85% ANNUAL TEMPERATURE
- 85% ANNUAL EN ROUTE WINDS
- ISA+10°C EN ROUTE TEMPERATURE
- 150NM ALTERNATE
- FAR INTERNATIONAL RESERVES
- 2% AIRWAYS ALLOWANCE
E190-E2 PERFORMADEC

**Max Cruise Speed**
- M 0.82

**Takeoff Field Length**
- MTOW, ISA, SL - standard engine: 1,615 m (5,299 ft)
- TOW for 500nm, full PAX*, ISA, SL, standard engine: 1,165 m (3,823 ft)

**Landing Field Length**
- MLW, ISA, SL: 1,215 m (3,987 ft)

**Service Ceiling**
- 41,000 ft

**Range**
- Full PAX*, LRC, Typical Reserves, 100 nm alternate: 2,850 nm (5,278 km)

**Maximun Takeoff Weight**
- 56,400 kg (124,341 lb)

**Maximum Landing Weight**
- 49,050 kg (108,137 lb)

**Maximum Payload**
- 13,500 kg (29,762 lb)

**Maximum Usable Fuel***
- 13,690 kg (30,181 lb)

* Fuel Density = 0.803 kg/l

**E190-E2 WEIGHTS**

**E190-E2 SINGLE CLASS CONFIGURATION**
- 106 SEATS AT 31"
- PW1922G - 106 SEATS

**E190-E2 DUAL CLASS CONFIGURATION**
- 96 SEATS - 12 AT 52" / 84 AT 31"

**E190-E2 SINGLE CLASS CONFIGURATION**
- 114 SEATS - 114 AT 29"

* Single class seating, Pax weight = 100 kg = 220 lb

---

**FULL PAX\**

**CRUISE AT LRC SPEED**

- 85% ANNUAL TEMPERATURE
- 85% ANNUAL EN ROUTE WINDS
- ISA+10°C EN ROUTE TEMPERATURE
- 150NM ALTERNATE
- FAR INTERNATIONAL RESERVES
- 2% AIRWAYS ALLOWANCE
**E175-E2**

**E175-E2 THREE CLASSES CONFIGURATION**
80 SEATS - 8 AT 52” / 60 AT 31” / 12 AT 30”
Business class with staggered seats

**E175-E2 SINGLE CLASS CONFIGURATION**
88 SEATS AT 31”

**E175-E2 SINGLE CLASS CONFIGURATION**
90 SEATS - 50 AT 30” / 40 AT 29

---

**PERFORMANCE**

- **Max Cruise Speed** M 0.82
- **Takeoff Field Length** MTOW, ISA, SL - standard engine 1,745 m, 5,726 ft
- **Landing Field Length** MLW, ISA, SL 1,345 m, 4,413 ft
- **Takeoff Field Length** TOW for 500nm, full Pax*, ISA, SL, standard engine 1,370 m, 4,495 ft
- **Service Ceiling** 41,000 ft
- **Range** Full Pax*, LRC, Typical Reserves, 100 nm alternate 2,000 nm, 3,704 km

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**WEIGHTS**

- **Maximum Takeoff Weight** 44,800 kg, 98,767 lb
- **Maximum Landing Weight** 40,000 kg, 88,185 lb
- **Maximum Payload** 10,600 kg, 23,369 lb
- **Maximum Usable Fuel*** 8,522 kg, 18,788 lb

* Fuel Density = 0.803 kg/l

---

* Single class seating, Pax weight = 100 kg = 220 lb

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**E175-E2 RANGE**

PW1700 HIGH THRUST - 88 SEATS
E-JETS E2: THE BEST SINGLE-AISLE AIRCRAFT

COCKPIT COMMONALITY WITH E1

NO MIDDLE SEAT

LARGE OVERHEAD BINS

EASY RECONFIGURATION AND MODULARITY

QUIETEST CABIN
**LATIN AMERICA: EMBRAER’S HOME**

SERVICE AND SUPPORT THAT IS CLOSE TO YOU

**EMBRAER OFFERS A WHOLE SUITE OF SERVICES AND SUPPORT TO ENSURE YOUR OPERATIONS RUN SMOOTHLY AND WORRY-FREE.**

**GLOBAL, REGIONAL AND LOCAL SUPPORT NETWORK**

Our Customer Care Center (CCC) in Brazil is manned around-the-clock, vigilantly supporting airlines with specialized technical support, return-to-service and spare parts assistance. Our parts warehouse is manned 24/7 and is ready to respond quickly to material requirements from our customers in the region. There are two authorized MROs for Embraer E-Jets - one in Brazil and one in Argentina. There are also three independent service centers - in El Salvador, Costa Rica and Mexico.

**TOTAL SUPPORT PROGRAM**

Embraer’s Total Support Program (TSP) is designed to provide airlines with a portfolio of aircraft base maintenance, material, and technical services for a simple flight hour rate. Enrollment in TSP gives airlines access to the spare parts pool program, which can reduce initial parts investment by up to 80%. TSP also includes an assured slot at one of Embraer’s authorized service centers in the region, based on projected aircraft utilization. The program also includes access to AHEAD Pro - Embraer’s Data Analytics Program - to keep your fleet performing its best.

**EMBRAER TOTAL SUPPORT PROGRAM**

[Symbol: Maintenance Services] + [Symbol: Material Services] + [Symbol: Technical Services] → $ PER FH

**EMBRAER OFFERS AN ESTABLISHED SUPPORT NETWORK IN THE REGION**

*SFL in USA. Independent Providers in Argentina, Brazil and Mexico.