Embraer Market Outlook 2009–2028
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### Aircraft Segmentation
Embraer segments its forecast in the following categories:

#### Definitions

**Aircraft Segmentation**
- 30 to 60-Seat Turboprops
- 60+ Seat Turboprops
- 30 to 60-Seat Jets
- 61 to 90-Seat Jets
- 91 to 120-Seat Jets
- 121 to 210-Seat Jets
- 210+ Seat Jets

**Regional Definitions**
- North America (USA and Canada)
- Latin America (includes Mexico and the Caribbean)
- Europe (includes Israel)
- Russia/CIS
- Africa
- Middle East (includes Egypt)
- Asia Pacific
- China (includes Hong Kong, Macau and Mongolia)

**Data Sources**
All analyses developed in this outlook use data from:
- Global Insight
- BACK, ACAS
- ICAO, IATA, ATA, CAAs
- Sabre
- Embraer Market Intelligence
- Airlines

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The Embraer Market Outlook–6th Edition is also available online at:
www.embraer.com/outlook
We welcome your feedback.
Send your comments to erik.jenichen@embraer.com.br

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### Definitions Table

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<td>ATR-72</td>
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<tr>
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<td>MA60</td>
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<td>30 to 60-Seat Jets</td>
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<td>EMB-120</td>
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<td>Dornier DO328</td>
<td>Saab 340, 2000</td>
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<td>121 to 210-Seat Jets</td>
<td>ATR-72</td>
<td>Q400</td>
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<td>210+ Seat Jets</td>
<td>Ilyushin Il-114</td>
<td>BAE ATP</td>
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<td>CRJ100, 200, 440</td>
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<td>TU-134</td>
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<td>YAK-40</td>
<td>BAE 146-100, -200, AVRO-RJ70, -RJ85</td>
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<td>EMBAER 190, 195</td>
<td>Fokker F28, F70</td>
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<td>A318</td>
<td>DC-9-10, -20</td>
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<td>B737-600</td>
<td>ARJ-21</td>
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<td>B717, 727-100, 737-100, -200, -500</td>
<td>Antonov An-148</td>
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<td>Fokker F100</td>
<td>Mitsubishi MRJ90</td>
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<td>BAE 146-300, AVRO-RJ100</td>
<td>EMBRAER 170, 175</td>
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<td>DC-9-30, -40, MD-87</td>
<td>CRJ1000, C110</td>
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<td>YAK-42 , BAC 111</td>
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<td>MD-11</td>
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<td>C130</td>
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<td>DEHLEN</td>
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<td>A319, A320, A321</td>
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<td>B737-700, -800, -900</td>
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<td>B707, 757, 727-200, 737-300, -400, -800</td>
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<td>DC-9-50</td>
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<td>MD-80, -81, -82, -83, -88, -90</td>
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<td></td>
<td></td>
<td>Tupolev TU-154, -204</td>
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<td></td>
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<td>Ilyushin IL-62</td>
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<td></td>
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<td>C130</td>
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Foreword
When we conceived The Rule of 70 to 110 six years ago, we foresaw untapped opportunity in a market segment defined by the forces of economic growth, capacity right-sizing, ageing fleets and network development. Our E-Jets family is the product of that vision.

As this 20-year forecast shows, that foresight has proven to be accurate. More than 500 E-Jets are in service with airlines on every continent, and the segment has attracted new manufacturers. That success is reflected in our numbers, which indicate continued growth of commercial air transport, especially in the emerging markets of China, Latin America and Russia/CIS.

In a period of volatile fuel costs, the need to improve airline operating efficiency has accelerated the replacement of old-generation aircraft. Today, the ability to upgrade fleets is more challenging, given the economic environment that is affecting asset financing and passenger demand. Nonetheless, airlines around the world continue to recognize the importance of acquiring right-sized aircraft.

The aviation business is cyclical, and I remain positive on the future prospects for our market segment. We have weathered swings in demand and cost, seen the maturity of the 50-seat regional jet market and introduced innovative products to help airlines seize new opportunities in our changing industry.

Now, more than ever, size matters.

Mauro Kern
Executive Vice President
Airline Market
Executive Summary
World air travel demand will continue to increase by 4.9% per year from 2009 to 2028 despite short-term challenges generated by the economic crisis. China will lead the growth in the next 20 years, with an average annual rate greater than 7.5%, followed by the emerging regions of Latin America and Russia/CIS, with rates of about 6% per year. Asia Pacific and Africa will grow around 5%, and mature economies, such as North America and Europe, around 4%.

### 30 to 120-Seat Jet Segment

Embraer forecasts a requirement for 6,750 new jets in the 30 to 120-seat capacity segment over the next 20 years, with a total market value estimated at US$ 220 billion. The company projects that 2,950 aircraft will be delivered between 2009 and 2018, with the remaining 3,800 units to be delivered between 2019 and 2028.
Over the next five years, the 30 to 60-seat capacity segment will be under pressure due to the economic crisis and fuel price volatility, which will force airlines to review their strategies, mainly in the North American environment. Although the 50-seat regional jet market has reached maturity, it will continue to feed hubs in the USA and Europe and support regional aviation development in Russia/CIS, Mexico, Africa and South America.

The 61 to 120-seat capacity segment will continue to help airlines match aircraft capacity to market demand, with improved service levels through the right-sizing of low load factor narrow-body flights, natural growth of regional airlines on high demand 50-seat markets and expansion into mid-sized markets.

The issue of emissions will become one of the main drivers of airline fleet decisions and will influence future aircraft development. Today, more than 700 jets in the 30 to 120-seat world fleet are older than 20 years and need to be replaced with more fuel-efficient and environmentally friendly aircraft like Embraer E-Jets, which produce up to 50% less CO₂ than older-generation jets of similar capacity.

The world fleet of 30 to 120-seat jets will increase from 4,630 aircraft in 2008 to 9,000 by 2028. In this period, 65% of new deliveries (4,370 units) will be added to support current demand growth and 35% (2,380 units) to replace ageing equipment. By 2028, 49% (2,250 jets) of the current fleet will still be operating.

### Commercial Jet Delivery Forecast for the 30 to 120-Seat Segment, by Region (2009–2028)

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Deliveries</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>230</td>
<td>3%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>520</td>
<td>8%</td>
</tr>
<tr>
<td>China</td>
<td>875</td>
<td>13%</td>
</tr>
<tr>
<td>Europe</td>
<td>1,350</td>
<td>20%</td>
</tr>
<tr>
<td>Latin America</td>
<td>540</td>
<td>8%</td>
</tr>
<tr>
<td>Middle East</td>
<td>210</td>
<td>3%</td>
</tr>
<tr>
<td>North America</td>
<td>2,570</td>
<td>38%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>455</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,750</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Embraer
The focus on environmental issues is helping renew turboprop demand. Although turboprops have typically operated in short-haul and niche markets, new opportunities are increasing. Jet aircraft, however, will continue to dominate the medium and long-haul markets.

Assuming an average future oil price of US$ 110 per barrel, the total number of new turboprop (30+ seats) deliveries from 2009 to 2028 will be 3,050 units: 30% will replace old aircraft, and 70% will support demand growth. The 60+ seat capacity segment will represent about 80% of total demand.

The world total turboprop fleet will increase from 2,260 units in 2008 to 4,400 by 2028.

New-generation aircraft are expected in these segments in the coming years, which will bring new economic and environmental benefits. By 2028, airlines will require 20,950 new jets in the 120+ seat segment, with 70% of all deliveries being narrow-bodies.

Of the 20,950 aircraft, 75% will be delivered to support market growth and 56% will remain in service in 2028. In this category, the world fleet in service will increase from 11,810 aircraft in 2008 to 27,400 units in 2028.
### Fleet in Service

<table>
<thead>
<tr>
<th>Segment</th>
<th>2008</th>
<th>2028</th>
</tr>
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<tbody>
<tr>
<td>TP 30–60</td>
<td>1,750</td>
<td>1,540</td>
</tr>
<tr>
<td>TP 60+</td>
<td>510</td>
<td>2,860</td>
</tr>
<tr>
<td>Jet 30–60</td>
<td>2,030</td>
<td>1,150</td>
</tr>
<tr>
<td>Jet 61–90</td>
<td>1,000</td>
<td>3,230</td>
</tr>
<tr>
<td>Jet 91–120</td>
<td>1,600</td>
<td>4,620</td>
</tr>
<tr>
<td>NB 121–210</td>
<td>8,600</td>
<td>19,040</td>
</tr>
<tr>
<td>WB 210+</td>
<td>3,010</td>
<td>8,360</td>
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<tr>
<td>Total</td>
<td>18,500</td>
<td>40,800</td>
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Source: BACK and Embraer

### Deliveries and Fleet in Service, By Capacity Segment

#### New Aircraft Deliveries (2009–2028)

<table>
<thead>
<tr>
<th>Segment</th>
<th>Units</th>
<th>Share</th>
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<tbody>
<tr>
<td>TP 30–60</td>
<td>650</td>
<td>2%</td>
</tr>
<tr>
<td>TP 60+</td>
<td>2,400</td>
<td>8%</td>
</tr>
<tr>
<td>Jet 30–60</td>
<td>650</td>
<td>2%</td>
</tr>
<tr>
<td>Jet 61–90</td>
<td>2,450</td>
<td>8%</td>
</tr>
<tr>
<td>Jet 91–120</td>
<td>3,650</td>
<td>12%</td>
</tr>
<tr>
<td>NB 120–210</td>
<td>14,650</td>
<td>48%</td>
</tr>
<tr>
<td>WB 120+</td>
<td>6,300</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>30,750</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Embraer
Market Trends
Air Travel Demand Will Grow Despite Current Economic Crisis

The main drivers of air transport growth are the continued globalization of business and increases in GDP. The industry is also highly sensitive to economic downturns but remarkably robust in being able to recover from such crises.

Embraer forecasts that world air transport demand in 2028 will be 2.6 times higher than in 2008, reaching around 12 trillion revenue passenger kilometers (RPK), with average annual growth of 4.9% and 3.1% annual GDP growth.

Mature markets, like the USA and Europe, will register a decrease in their share of world traffic from 57% in 2008 to 47% in 2028. The Asia Pacific and China markets will represent more than one-third of world air traffic by 2028.

Environmentally Responsible Fleets

2008 was a year in which there were tremendous strides in research for alternative fuels that will increase efficiency, reduce consumption and generate lower CO₂ emissions. Embraer has been a pioneer in the development of bio-fuel technology, having produced the world’s first certified ethanol-powered airplane. The company was also a signatory to the Air Transport Action Group’s Commitment to Action on Climate Change declaration, which advocates carbon-neutral industry growth and eventually a carbon-free future.
Ageing fleets approaching retirement will need to be replaced with green-technology aircraft that meet stringent environmental regulations.

**Cost Challenges**

According to IATA, industry net losses rose to US$ 4 billion during the first three quarters of 2008. Airlines in the USA continue to see the greatest financial decline, and airlines in Europe and Asia Pacific are also experiencing declines since Q2 hedging contracts generated losses in Q3 and Q4. Spot fuel prices fell sharply late in the year. The US$ 45 per barrel crude oil price is at the same level as it was in 2004, which is just 30% of the peak price reached in July 2008. If demand does not weaken, airlines that have cut capacity, accelerated the retirement of older aircraft and are operating more fuel-efficient fleets could see profits in 2009.

<table>
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<tr>
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<th>2007/Q1–Q3</th>
<th>2008/Q1–Q3</th>
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<tr>
<td></td>
<td>OP Profit</td>
<td>Net Profit</td>
</tr>
<tr>
<td>USA</td>
<td>7,452</td>
<td>7,029</td>
</tr>
<tr>
<td>Europe</td>
<td>6,002</td>
<td>6,016</td>
</tr>
<tr>
<td>Asia</td>
<td>3,678</td>
<td>3,504</td>
</tr>
<tr>
<td>Other</td>
<td>356</td>
<td>246</td>
</tr>
<tr>
<td>Total</td>
<td>17,488</td>
<td>16,795</td>
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</tbody>
</table>

Source: IATA

LCCs have historically outperformed other business models during market downturns. In 2008, LCCs reported growth in both traffic and market share:

**Low-Cost Carrier Expansion**

The low-cost carrier global fleet has doubled since 2000, while traditional network carrier fleets increased only 10%. The LCC models in North America and Europe are being duplicated in Asia Pacific and Latin America, where airlines rely on Internet point-of-sale and new fuel-efficient aircraft to keep costs low. ICAO data show that world nominal yields have increased by 10% since 2002, while in real terms, the trend remains stable.

**Intra-Europe**

<table>
<thead>
<tr>
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<th>RPK Growth (%)</th>
<th>RPK Share (%)</th>
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<tr>
<td></td>
<td>Jan–Sept/08</td>
<td>Jan/08</td>
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<tr>
<td>Low-Cost Carriers</td>
<td>24%</td>
<td>32%</td>
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<tr>
<td>Network Carriers</td>
<td>2%</td>
<td>57%</td>
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<tr>
<td>Regional Carriers</td>
<td>8%</td>
<td>11%</td>
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Source: AEA, ERA and Airlines

**USA Domestic**

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<tr>
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<th>RPK Growth (%)</th>
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<tr>
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<td>Jan–Oct/08</td>
<td>Jan/08</td>
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<tr>
<td>Low-Cost Carriers</td>
<td>0%</td>
<td>36%</td>
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<tr>
<td>Network Carriers</td>
<td>-6%</td>
<td>52%</td>
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<tr>
<td>Regional Carriers</td>
<td>2%</td>
<td>12%</td>
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Source: ATA and Airlines
The Resurgence of Turboprops?

The dramatic rise in the price of oil naturally made turboprops more attractive, especially on short-haul routes. It also prompted existing manufacturers to explore the development of larger capacity turboprops and more efficient engines that could offer greater range.

Today, more than 80% of all turboprop ASKs are generated on city pairs of 400 nm or less. Since 2004, turboprop demand has increased. However, after a record 200 orders in 2007, sales of new turboprops dropped to 50 from January to September 2008.

Industry Outlook

- Continuous growth in world air transport demand despite current economic crisis
  - 2% in 2008 and 1% in 2009
  - 4.9% in the 2009–2028 period
- More consolidations and mergers and fewer start-ups
- Additional drive for efficiency: cost reduction, higher load factors and higher aircraft utilization
- Early retirement of older jets
- Better match of aircraft capacity to (expected) lower demand
- Limited aircraft financing in short term
Regional Overview
AFRICA

Key Figures (2008)

- GDP: US$ 1.1 trillion
  5.0% annual growth (2009–2028)
- Population: 973 million
  5.0% annual growth (2009–2028)
- Passenger Demand: 89 billion RPKs
  5.5% annual growth (2009–2028)
- Passengers: 58 million
- Scheduled Airlines: 124
- Fleet in Service: 725
- Airports: 350

Regional Air Transport Industry

Despite a population of 973 million and the progressive economies of some countries, the growth of air transport on the continent is still limited by regulatory forces.

Medium-density markets that are ideal for 70 to 120-seat capacity equipment are underserved or have no air service. There have been some advances to open these markets with private airlines recognizing the opportunities for new frequencies.

The Yamoussoukro Decision represents a good solution to develop air transport on the continent. If approved, the accord would allow any African carrier to operate any route, thereby developing the intra-regional network and providing better feed for international flights.

African airlines are vulnerable to competition from foreign carriers, particularly European airlines. The Open Skies Agreement in Europe gives airlines in those countries access to more markets to connect with their international services to Africa. Carriers from Africa, however, rely upon limited traffic feed at their hub cities and are permitted, by regulation, to fly to only a handful of European destinations.
This competitive disadvantage is compounded with an old and inefficient fleet operated by most African airlines. The average age of the African fleet in service is 15 years, and there are almost 200 aircraft (30% of the current fleet) older than 20 years.

**Turboprops**
Over the next 20 years, the turboprop fleet in service is forecast to increase from 140 to 300 aircraft. In that period, 135 new and 160 pre-owned aircraft will be required. Replacement of old aircraft will account for 46% of deliveries and market growth, 54%. By 2028, only 4% of the current fleet will still be in service.

**Narrow and Wide-Bodies**
The narrow and wide-body commercial jet fleet will grow from 310 aircraft in 2008 to 800 by 2028. Only 53% of the current fleet in service will be in operation by 2028. Over the next 20 years, 445 new and 190 pre-owned units will be delivered: 23% to replace old aircraft and 77% to sustain industry growth.

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**The 30 to 120-Seat Jet Segment**
Embraer forecasts a requirement for 230 new and 150 pre-owned aircraft in the next 20 years. Deliveries will support growth (63%) and the replacement of old aircraft (37%). The segment will see a fleet increase from 160 units in 2008 to 400 by 2028, at which time only 13% of the current fleet will still be in service.
ASIA PACIFIC

Key Figures (2008)
• GDP: US$ 8.95 trillion
  2.8% annual growth (2009–2028)
• Population: 2.43 billion
• Passenger Demand: 875 billion RPKs
  5.2% annual growth (2009–2028)
• Passengers: 355 million
• Scheduled Airlines: 160
• Fleet in Service: 2,900
• Airports: 890

Regional Air Transport Industry
The Asia Pacific aviation industry is investing in additional capacity to match demand growth. However, its fleet is still mainly comprised of high-capacity narrow-body aircraft, which restricts their profitable deployment to medium and low-density airports. New regulations and policies are encouraging more opportunities for regional aviation.

Liberalization
Initiatives have been introduced that are bringing new opportunities for aircraft in the 70 to 120-seat capacity segment, notably the ASEAN roadmap for liberalization benefiting capital cities.

Indian Market
Deregulation created a boom in domestic air travel. Strong growth and fierce competition have driven yields downward and prompted industry consolidation. Although airlines continue to focus on high-density markets and high-capacity aircraft, there are still a large number of medium-density cities with low-frequency air service that are ideal for 70 to 120-seat jet operations. Recently introduced aviation policies are encouraging the development of more regional services, which should improve overall domestic network connectivity.

More Flexibility in Established Markets
Competition in Australasia is intensifying with the presence of more LCCs. There are opportunities to replace turboprops, increase route frequencies, open new markets and better match capacity to demand with right-sized aircraft. In Japan, for example, the recent introduction of 70 to 120-seat jets demonstrates the potential for growth in the region.

Opportunities for Right-Sizing
The Asia Pacific fleet is comprised mostly of high-capacity narrow-body aircraft that prevent profitable deployment in medium and low-density markets. A mix of large narrow-body aircraft and small narrow-bodies gives airlines more flexibility to respond to a dynamic market environment.
The 30 to 120-Seat Jet Segment

Embraer forecasts a requirement for 520 new and 70 pre-owned jets in the next 20 years: 81% to support growth and 19% to replace old aircraft. The 30 to 120-seat jet fleet will increase from 220 units in 2008 to 700 by 2028, when only 50% of the current fleet will still be in service.

Turboprops

Over the next 20 years, the turboprop fleet in service is forecast to increase from 460 to 990 aircraft. From 2009 to 2028, 720 new and 120 pre-owned aircraft will be required: 37% to replace old aircraft and 63% to support market growth. In 2028, only 33% of the current fleet will still be in service.

Narrow and Wide-Bodies

The narrow and wide-body commercial jet fleet will grow from 2,000 aircraft to 5,850 in the next 20 years. By 2028, 70% of the current fleet in service will remain in operation. Over the next 20 years, 4,140 new and 320 pre-owned units will be delivered: 14% to replace old aircraft and 86% to sustain growth.

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<tr>
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<tbody>
<tr>
<td>Turboprops</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>30–60</td>
<td>50</td>
<td>60</td>
<td>110</td>
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<tr>
<td>&gt;60</td>
<td>270</td>
<td>340</td>
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<tr>
<td>Total Turboprops</td>
<td>320</td>
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<tr>
<td>Jets</td>
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<tr>
<td>30–60</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>61–90</td>
<td>110</td>
<td>130</td>
<td>240</td>
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<tr>
<td>91–120</td>
<td>115</td>
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<td>270</td>
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<td>Total 30–120 Seats</td>
<td>225</td>
<td>295</td>
<td>520</td>
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<tr>
<td>Narrow and Wide-Bodies</td>
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<tr>
<td>121–210</td>
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<td>1,105</td>
<td>2,390</td>
</tr>
<tr>
<td>&gt;210</td>
<td>830</td>
<td>920</td>
<td>1,750</td>
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<tr>
<td>Total NB and WB</td>
<td>2,115</td>
<td>2,025</td>
<td>4,140</td>
</tr>
<tr>
<td>Total</td>
<td>2,660</td>
<td>2,720</td>
<td>5,380</td>
</tr>
</tbody>
</table>

Source: Embraer
**CHINA**

**Key Figures (2008)**
- GDP: US$ 3.1 trillion
  7.2% annual growth (2009–2028)
- Population: 1.3 billion
- Passenger Demand: 380 billion RPKs
  7.7% annual growth (2009–2028)
- Passengers: 170 million
- Scheduled Airlines: 33
- Fleet in Service: 1,250
- Airports: 147

---

**More Economic Development**

Beijing Capital Airport’s new Terminal 3 opened in time for the 2008 Summer Olympic Games. The airport will be capable of serving up to 90 million passengers annually by 2012. Over the next 20 years, China will enter a new era of economic development. The rise of domestic consumption and increasing investment in the high-efficiency energy industry will be the new driving forces for economic growth. With a population of 1.3 billion, urbanization in China will further increase the flow of people and goods.

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**High Growth of Air Transportation, Low Share of Regional Aviation Services**

In recent years, the volume of air traffic experienced rapid growth; however, regional aviation lagged. Regional air services represent only 2% to 4% of the total market. This indicates that there is great potential for more development of regional aviation.

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**High-Capacity Growth with an Imbalanced Fleet**

The rapid growth of mainline jets produced an imbalance in the country’s fleet composition. At the end of 2007, aircraft in the 30 to 120-seat capacity segment accounted for only 8% of the total. By comparison, regional jets represented 36% and 43% in Europe and the USA respectively. Based on the current aircraft order backlog, the fleet structure will further shift toward large aircraft.

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**Government Support for the Development of Regional Air Services**

In 2008, to stimulate the development of regional air services, the General Administration of Civil Aviation of China implemented a series of new policies, including furthering the development of small airports, subsidizing small and medium-sized airports and providing subsidies to promote regional air
services. At the same time, many local governments issued regulations to support the development of regional air services.

Opportunities for Regional Aviation
Of the 1,000 domestic routes with regular air service, there are 800 routes with fewer than 300 passengers per day each way (PDEW), which represents 78% of the total. As most of the aircraft deployed in these markets are 120 to 150-seat aircraft, the load factor is not optimized, which in turn affects overall operating economics.

The 30 to 120-Seat Jet Segment
Embraer forecasts a requirement for 875 new jets in the next 20 years: 90% to support growth and 10% to replace old aircraft. The 30 to 120-seat jet fleet will increase from 110 units in 2008 to 900 by 2028, and only 23% of the current fleet will still be in service in 2028.

Turboprops
The turboprop fleet in service is forecasted to increase from 30 to 210 aircraft in the next 20 years. Of these 180 new jets, 10% will replace old aircraft and 90% will support market growth. By 2028, only 33% of the current fleet will still be in service.

Narrow and Wide-Bodies
The narrow and wide-body commercial jet fleet will grow from 1,170 in 2008 to 3,290 aircraft. By 2028, 65% of the current fleet in service will remain in operation. Over the next 20 years, 2,530 new jets will be delivered: 16% to replace old aircraft and 84% to sustain growth.
EUROPE

Key Figures (2008)
- GDP: US$ 10.8 trillion
  2.0% annual growth (2009–2028)
- Population: 320 million
- Passenger Demand: 1.1 trillion RPKs
  4.2% annual growth (2009–2028)
- Passengers: 530 million
- Scheduled Airlines: 181
- Fleet in Service: 4,343
- Airports: 580

Diversification and Partner Strategies

European airlines were hit by the financial crisis and record fuel prices in 2008. While cost reduction was a priority, carriers also pursued partner strategies to broaden their route networks and appeal to more diverse market segments. Several airline groups have emerged which will continue to reshape the structure of the European airline industry.

Network Airlines

Legacy airlines continue to focus on the long-haul premium passenger, which has given greater visibility to the role of regional and low-cost carriers. New groups of airline partnerships are highlighting the importance of intercontinental mega hubs, which are well positioned to accommodate local and non-local traffic growth. In the future, cooperation among partner airlines will extend to new aircraft acquisitions.

Regional Airlines

Regional airlines feed network carriers and provide point-to-point capacity in low and medium-density markets. In Europe, regional airlines fly twice daily in 62% of the markets they serve. LCCs operate on only 8% of the routes flown by regional airlines.
On lower-demand routes, smaller aircraft permit airlines to maintain their competitive position when demand is weak and to expand services by increasing frequencies and opening new routes when demand strengthens.

In the 92% of markets where there is no LCC competition, regional airlines offer high-frequency service for both connecting and point-to-point travelers.
Regional Airlines
Point-to-Point Operation

Aviation and The Environment

The EU has already made progress on CO₂ reduction goals through its Emissions Trading Scheme (ETS), which has been regulating the heaviest-polluting industries (power, oil and gas, cement) since 2005 and is now focusing on aviation. Globally, aviation accounts for just 2% of CO₂ emissions; however, according to the International Institute for Sustainable Development, airline emissions have grown 34% from 1990 to 2004.

Aircraft are now some 70% more efficient per passenger kilometer than 40 years ago. Most efficiency gains have come from engine improvements, but airframe design improvements have also contributed.

Airlines will need to adapt their operations starting July 2009 to be fully compliant with the ETS by the 2012 deadline.

High-frequency, point-to-point service is important for premium-fare business passengers and essential for airlines to remain competitive with surface transport modes. There are still underdeveloped low and medium-density European markets in which carriers can increase frequency with regional aircraft.

Low-Cost Carriers

European travelers’ appetite for low fares is evident in the large number of LCCs and the competitive ticket price of legacy carriers on competitive routes. The addition of ten new countries to the European Union will increase the demand for Visiting Friends & Relatives (VFR) travel, with much of the traffic focused on point-to-point services.

High-Speed Train Competition

Surface transport has always posed a threat to short-haul air travel, given the geography of continental Europe. New high-speed rail projects are subject to high development costs and face environmental impact scrutiny and, consequently, are not expected to significantly impact future air travel demand.
The 30 to 120-Seat Jet Segment

Embraer forecasts a requirement for 1,350 new and 170 pre-owned jets for Europe in the next 20 years: 57% to support growth and 43% to replace old aircraft. The 30 to 120-seat jet fleet will increase from 900 units in 2008 to 1,760 by 2028, with 27% of the current fleet in service in 2028.

Turboprops

The turboprop fleet in service is forecast to increase from 570 to 980 aircraft. From 2009 to 2028, 680 new and 250 pre-owned aircraft will be required: 56% to replace old fleets and 44% to support growth. By 2028, only 9% of the current fleet will still be in service.

Narrow and Wide-Bodies

The narrow and wide-body commercial jet fleet will grow from 2,730 aircraft in 2008, to 6,630 by 2028, when only 49% of the current fleet will still be in operation. Over the next 20 years, 5,110 new and 190 pre-owned units will be delivered: 26% to replace old aircraft and 74% to sustain growth.

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<td><strong>Turboprops</strong></td>
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<td>30–60</td>
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<td>30–60</td>
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<td>20</td>
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<td>61–90</td>
<td>170</td>
<td>270</td>
<td>440</td>
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<tr>
<td>91–120</td>
<td>420</td>
<td>470</td>
<td>890</td>
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<td>Total 30–120 Seats</td>
<td>590</td>
<td>760</td>
<td>1,350</td>
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<td><strong>Narrow and Wide-Bodies</strong></td>
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<tr>
<td>121–210</td>
<td>1,780</td>
<td>2,050</td>
<td>3,830</td>
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<tr>
<td>&gt;210</td>
<td>555</td>
<td>725</td>
<td>1,280</td>
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<tr>
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<td>3,915</td>
<td>7,140</td>
</tr>
</tbody>
</table>

Source: Embraer
LATIN AMERICA

Key Figures (2008)

- GDP: US$ 2.8 trillion
  4.2% annual growth (2009–2028)
- Population: 576 million
- Passenger Demand: 210 billion RPKs
  6.0% annual growth (2009–2028)
- Passengers: 110 million
- Scheduled Airlines: 120
- Fleet in Service: 1,300
- Airports: 404

Solid Base for Economic Growth

The economies of Latin American countries have been growing consistently since 2003, and many are prosperous as a result of expanding global economic links. Brazil, Chile, Colombia, Mexico and Peru are investment-grade-level countries that reported significant improvements in macroeconomic fundamentals over the past decade. Consequently, passenger air traffic has performed well above the world average.

<table>
<thead>
<tr>
<th>Region</th>
<th>RPK Growth</th>
<th>ASK Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>-1.9%</td>
<td>-2.4%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>2.2%</td>
<td>3.8%</td>
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<tr>
<td>Europe</td>
<td>2.9%</td>
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<tr>
<td>Latin America</td>
<td>14.3%</td>
<td>12.7%</td>
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<tr>
<td>Middle East</td>
<td>9.0%</td>
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</tr>
<tr>
<td>North America</td>
<td>5.6%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Industry</td>
<td>5.6%</td>
<td>6.4%</td>
</tr>
</tbody>
</table>

Source: IATA Traffic Data – August 2008 (YTD 2008 vs. YTD 2007)

Investment liberalization and the expansion of free trade agreements in Latin America are strong stimulators of air transportation growth. The Fortaleza Agreement—a sub-regional proposal aimed at providing more efficient air service beyond the bilateral agreements among Argentina, Bolivia, Brazil, Chile, Paraguay, Peru and Uruguay—is highly committed to the development of air transport in small and medium-sized markets. The anticipation of economic growth, regional cooperation and greater emphasis on multilateral agreements will be the foundation for the expansion of the Fortaleza Agreement to other countries. The result will be a truly integrated air transport system.
A Need for New Aircraft

Many operators are using old equipment to explore new opportunities throughout Latin America and believe aircraft type is instrumental in establishing a differentiated product as competition increases. More than 300 jets in the 91 to 120-seat capacity segment are old and need to be replaced. The average age of these aircraft is 22 years, with 167 more than 20 years old.

Excess capacity compromises airline efficiency and profitability. In 2007, 62% all flights would have been operated more profitably by 70 to 120-seat aircraft.

Right-sizing with 70 to 120-seat jets will allow carriers to more profitably serve medium and low-density markets, gradually increasing frequency and improving the overall connectivity of regional air travel.

The 30 to 120-Seat Jet Segment

Embraer forecasts a requirement for 540 new and 200 pre-owned aircraft in the next 20 years: 68% to support growth and 32% to replace old aircraft. The 30 to 120-seat jet fleet will increase from 380 units in 2008 to 880 by 2028, with 39% of the current fleet still in service by 2028.
Turboprops
The turboprop fleet in service is forecast to increase from 230 to 330 aircraft. From 2009 to 2028, 150 new and 180 pre-owned aircraft will be required: 70% to replace old aircraft and 30% to support market growth. By 2028, all of the current fleet will be out of service.

Narrow and Wide-Bodies
The narrow and wide-body commercial jet fleet will grow from 650 to 1,830 aircraft in the next 20 years. By 2028, 57% of the current fleet in service will still be in operation. In that time, 1,220 new and 240 pre-owned units will be delivered: 19% to replace old aircraft and 81% to sustain growth.

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<td>Turboprops</td>
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<td>30–60</td>
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<td>30</td>
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<tr>
<td>&gt;60</td>
<td>50</td>
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<td>120</td>
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<tr>
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<td>85</td>
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<td>Jets</td>
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<tr>
<td>30–60</td>
<td>0</td>
<td>10</td>
<td>10</td>
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<tr>
<td>61–90</td>
<td>40</td>
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<td>80</td>
</tr>
<tr>
<td>91–120</td>
<td>230</td>
<td>220</td>
<td>450</td>
</tr>
<tr>
<td>Total 30–120 Seats</td>
<td>270</td>
<td>270</td>
<td>540</td>
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<tr>
<td>Narrow and Wide-Bodies</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>121–210</td>
<td>420</td>
<td>480</td>
<td>900</td>
</tr>
<tr>
<td>&gt;210</td>
<td>165</td>
<td>155</td>
<td>320</td>
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<tr>
<td>Total NB and WB</td>
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<td>635</td>
<td>1,220</td>
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<tr>
<td>Total</td>
<td>920</td>
<td>990</td>
<td>1,910</td>
</tr>
</tbody>
</table>

Source: Embraer
MIDDLE EAST

Key Figures (2008)
• GDP: US$ 1.3 trillion
  3.9% annual growth (2009–2028)
• Population: 209 million
• Passenger Demand: 230 billion RPKs
  6.2% annual growth (2009–2028)
• Passengers: 72 million
• Scheduled Airlines: 40
• Fleet in Service: 641
• Airports: 120

Implications for Regional Air Travel

Economies once dependent on petroleum are slowly diversifying to capitalize on the growing financial, cargo and tourism sectors. Of all world regions in 2007, airports in the Middle East collectively had the highest growth rates for international tourist arrivals. The high proportion of expatriate residents and temporary workers generates high-volume air travel between GCC countries and the EU, the Indian subcontinent and southeast Asia. Dubai has become a strategic hub linking continents with new, ultra long-haul nonstop flights.

Bilateral air service agreements have slowed the advance of deregulation, but the industry is liberalizing. Six LCCs have been established in the Middle East since 2003.

Because of the predominance of long-haul flying and the small fleet of regional aircraft serving large hubs in Dubai, Abu Dhabi and Doha, the average aircraft size is 178 seats compared to 135 in Europe and 107 in the USA.
Narrow-body jets operate on most intra-regional routes; however, several carriers have acquired aircraft in the 70 to 120-seat capacity segment and are using them to right-size their fleets and offer more frequency, particularly on city pairs in the Levant. There is still opportunity for more flights in many lower-demand markets.

There is also potential for improving connectivity within the region. Some 65% of airports in the Middle East serve just five or fewer cities with nonstop flights. For those airports linking more than five destinations, 78% of those cities do not have daily service.

The 30 to 120-Seat Jet Segment
Embraer forecasts a requirement for 210 new and 40 pre-owned aircraft in the next 20 years: 64% to support growth and 36% to replace old aircraft. The 30 to 120-seat jet fleet will increase from 90 units in 2008 to 250 by 2028, by which time no aircraft from the current fleet will be in operation.
Turboprops

Over the next 20 years, the turboprop fleet in service is forecast to increase from 30 to 140 aircraft. In that period, 105 new and 30 pre-owned aircraft will be required: 19% to replace old aircraft and 81% to support the market growth. By 2028, only 17% of the current fleet will still be in service.

Narrow and Wide-Bodies

The narrow and wide-body commercial jet fleet will grow from 510 aircraft in 2008 to 1,860 by 2028, at which time 35% of the current fleet in service will still be in operation. Over the next 20 years, 1,600 new and 80 pre-owned units will be delivered: 20% to replace old aircraft and 80% to sustain growth.

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<td><strong>Turboprops</strong></td>
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<td>30–60</td>
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<tr>
<td>&gt;60</td>
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<tr>
<td>Total Turboprops</td>
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<td>70</td>
<td>105</td>
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<td><strong>Jets</strong></td>
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<tr>
<td>30–60</td>
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<tr>
<td>91–120</td>
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<td>60</td>
<td>110</td>
</tr>
<tr>
<td>Total 30–120 Seats</td>
<td>90</td>
<td>120</td>
<td>210</td>
</tr>
<tr>
<td><strong>Narrow and Wide-Bodies</strong></td>
<td></td>
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<tr>
<td>121–210</td>
<td>355</td>
<td>335</td>
<td>690</td>
</tr>
<tr>
<td>&gt;210</td>
<td>495</td>
<td>415</td>
<td>910</td>
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<tr>
<td>Total NB and WB</td>
<td>850</td>
<td>750</td>
<td>1,600</td>
</tr>
<tr>
<td>Total</td>
<td>975</td>
<td>940</td>
<td>1,915</td>
</tr>
</tbody>
</table>

Source: Embraer
NORTH AMERICA

Key Figures (2008)
- GDP: US$ 12.6 trillion
  2.5% annual growth (2009–2028)
- Population: 342 million
  2.5% annual growth (2009–2028)
- Passenger Demand: 1.4 trillion RPKs
- Passengers: 770 million
- Scheduled Airlines: 120
- Fleet in Service: 6,700
- Airports: 965

Industry Trends
In order to survive in the intensely competitive and low-yield environment, North American airlines have focused on controlling costs and increasing productivity and efficiency. These initiatives were not sufficient to offset the dramatic increase in fuel cost in 2008 and the onset of the liquidity crisis and economic recession.

As oil peaked at US$ 147 per barrel in July 2008, network carriers cut capacity by 12%, while LCCs curtailed growth plans and deferred aircraft deliveries. Older equipment was withdrawn from fleets and is gradually being replaced with aircraft in the 70 to 120-seat equipment segment.

Developing international markets has been an alternative to the reliance on domestic traffic. Airlines continue to focus on raising revenue per passenger. While the business travel segment is still a priority, carriers have implemented programs to raise ancillary revenue, particularly with new checked baggage and on-board catering charges.

Scope clauses have been modified to allow the acquisition of larger regional aircraft. The 91 to 120-seat capacity segment represents an opportunity for new scope-compliant jets to maintain frequencies in markets currently operated by much larger aircraft.

Financial Challenges
After a steady and profitable 2007, the high price of crude oil and failed fuel hedge strategies caused heavy losses in 2008. Depending on the resilience of future passenger demand, North American carriers have streamlined operations and diversified revenue-generating sources in hopes that the lower fuel prices in the near term will help improve margins.
**Scope Clause Agreements**

Current agreements are still constraining the deployment of optimal aircraft type capacity to match city-pair demand. Embraer foresees relaxation of limits up to 76-seat aircraft in the short term, while revisions to agreements governing 90-seat aircraft are forecast only in the mid to long term.

<table>
<thead>
<tr>
<th>Airline</th>
<th>Current Scope Clause</th>
<th>Contract Amendable</th>
</tr>
</thead>
<tbody>
<tr>
<td>American</td>
<td>≤ 50 seats: Unlimited (Up to 110% AA NB fleet) ≤ 70 seats: Up to 50 units</td>
<td>2008</td>
</tr>
<tr>
<td>Continental</td>
<td>≤ 50 seats: Unlimited</td>
<td>2009</td>
</tr>
<tr>
<td>Delta</td>
<td>≤ 50 seats: Unlimited ≤ 76 seats: Up to 200 units (30 units 71–76 seats + 3 units for each mainline aircraft increase)</td>
<td>2010</td>
</tr>
<tr>
<td>NWA</td>
<td>≤ 50 seats: Unlimited ≤ 76 seats: Up to 90 units (May be exceeded ~ 1:1 basis with 100-seater flown by NWA)</td>
<td>2012</td>
</tr>
<tr>
<td>United</td>
<td>≤ 70 seats: Unlimited</td>
<td>2010</td>
</tr>
<tr>
<td>US Airways</td>
<td>≤ 78 seats: Unlimited ≤ 86 seats: Up to 93 units</td>
<td>2010</td>
</tr>
</tbody>
</table>

**Opportunities in the North American Market**

Although the 50-seat regional jet market is mature, with no new deliveries expected, there will be a need to replace those airplanes as they age. The aircraft will continue to support network connectivity and provide a capacity base as demand grows in smaller communities.

The 61 to 90-seat capacity segment has emerged to address the demand that cannot be satisfied with 50-seat aircraft. The segment has also played a pivotal role in right-sizing fleets with both replacement and complementary frequencies. In North America in 2008, 51% of all Embraer E-Jets were deployed to reduce excess capacity by operating airplanes better suited to market demand. Since 40% of large (up to 160-seat) old-generation and nearly 35% of new-generation narrow-body jets carry an average of fewer than 100 passengers per flight, there is considerable potential for still more right-sizing.
The 30 to 120-Seat Jet Segment
Embraer forecasts a requirement for 2,570 new and 330 pre-owned aircraft in the next 20 years: 37% to support growth and 63% to replace old aircraft. The 30 to 120-seat jet fleet will increase from 2,310 units in 2008 to 3,380 by 2028, at which time only 21% of the current fleet will still be in service.

Turboprops
The turboprop fleet in service is forecast to increase from 560 to 990 aircraft over the next 20 years. From 2009 to 2028, 780 new and 200 pre-owned aircraft will be required: 56% to replace old aircraft and 44% to support market growth. By 2028, only 2% of the current fleet will still be in service.

Narrow and Wide-Bodies
The narrow and wide-body commercial jet fleet will grow from 3,680 aircraft in 2008 to 6,160 by 2028. Only 15% of the current fleet in service will still be in operation by 2028. Over the next 20 years, 5,195 new and 400 pre-owned units will be delivered: 56% to replace old aircraft and 44% to sustain industry growth.

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<tr>
<td>30–60</td>
<td>10</td>
<td>15</td>
<td>25</td>
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<tr>
<td>&gt;60</td>
<td>340</td>
<td>415</td>
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<td>Total Turboprops</td>
<td>350</td>
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<td>30–60</td>
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<td>61–90</td>
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<td>91–120</td>
<td>525</td>
<td>545</td>
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<td>Total 30–120 Seats</td>
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<td>Narrow and Wide-Bodies</td>
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<td>121–210</td>
<td>1,985</td>
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<td>3,935</td>
<td>4,610</td>
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Source: Embraer
RUSSIA/CIS

Key Figures (2008)
- GDP: US$ 1.3 trillion
  4.4% annual growth (2009–2028)
- Population: 277 million
- Passenger Demand: 104 billion RPKs
  6.1% annual growth (2009–2028)
- Passengers: 36 million
- Scheduled Airlines: 129
- Fleet in Service: 1,329
- Airports: 170

Nascent Regional Air Transport Industry

Russia, with its 144 million inhabitants, is the most populous of the 12 CIS member states, while Ukraine (47 million) and Uzbekistan (26 million) rank 2nd and 3rd. These regions were instrumental in developing the Russian economy and producing a steady increase in disposable income. Consequently, from 2002 to 2006, the air transport market grew approximately 10% per year.

There is a significant gap between the mobility of the Russian population and the mobility of other countries. In 2006, the ratio of airline passenger departures to population was 0.27 for Russia compared to a global average of 0.70. This gap should decrease as disposable income increases, trade and economic relations expand and new air routes are developed.

International passenger volumes outpaced domestic traffic in recent years. The volatility in oil prices and a need to compete with European airline standards has prompted Russian airlines to replace their ageing fleets with new aircraft. However, the fleet renewal rate remains low even though many aircraft are approaching the end of their operational lives. The Russian Federal Space Agency estimates that the existing commercial fleet can remain in service for no more than 5 to 7 years. Fifty percent of the fleet must be retired by 2010 and 83% by 2015.
In the last 10 years, the Russian airline market has seen a reduction in the number of airlines from 389 to 182 as aviation authorities have enforced compliance with stricter technical standards. The number of airports has also declined: 1,450 in 1991 to 330 in 2008. The prospects for acquiring 70 to 120-seat aircraft are long term, as air transport in the Russian Federation requires comprehensive infrastructure modernization to meet ICAO standards.

**Ukraine**

Following the 1991 break-up of the Soviet Union, Ukraine inherited a number of usable airports, a well-developed rail network and a fleet of outdated Soviet aircraft. The existence of the rail network, coupled with low per capita income, hindered development of the domestic airline market throughout the 1990s and explains why most international air routes serve Kiev’s Borispol airport. Economic growth in Kiev, with its 3 million inhabitants, is outpacing other parts of the country. Additionally, most of Ukraine’s major cities are well connected by rail and served by frequent, low fare, half-day or one-night train rides from Kiev, making domestic point-to-point air travel unattractive.
The 30 to 120-Seat Jet Segment

Embraer forecasts a requirement for 455 new and 260 pre-owned aircraft in the next 20 years: 38% to support growth and 62% to replace old aircraft. The 30 to 120-seat jet fleet will increase from 460 units in 2008 to 730 by 2028, with only 3% of the current fleet still in service in 2028.

Turboprops

Over the next 20 years, the turboprop fleet in service is forecast to increase from 240 to 460 aircraft. From 2009 to 2028, 280 new and 180 pre-owned aircraft will be required: 52% to replace old aircraft and 48% to support market growth. By 2028, all of the current turboprops will have been retired.

Narrow and Wide-Body

The narrow and wide-body commercial jet fleet will grow from 560 aircraft in 2008 to 980 by 2028. Only 11% of the current fleet in service will still be in operation by 2028. Over the next 20 years, 710 new and 210 pre-owned units will be delivered: 54% to replace old aircraft and 46% to sustain growth.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Turboprops</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30–60</td>
<td>60</td>
<td>60</td>
<td>120</td>
</tr>
<tr>
<td>&gt;60</td>
<td>70</td>
<td>90</td>
<td>160</td>
</tr>
<tr>
<td><strong>Total Turboprops</strong></td>
<td>130</td>
<td>150</td>
<td>280</td>
</tr>
<tr>
<td><strong>Jets</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>30–60</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>61–90</td>
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<td>155</td>
</tr>
<tr>
<td>91–120</td>
<td>150</td>
<td>140</td>
<td>290</td>
</tr>
<tr>
<td><strong>Total 30–120 Seats</strong></td>
<td>235</td>
<td>220</td>
<td>455</td>
</tr>
<tr>
<td><strong>Narrow and Wide-Bodies</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>121–210</td>
<td>245</td>
<td>255</td>
<td>500</td>
</tr>
<tr>
<td>&gt;210</td>
<td>105</td>
<td>105</td>
<td>210</td>
</tr>
<tr>
<td><strong>Total NB and WB</strong></td>
<td>350</td>
<td>360</td>
<td>710</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>715</td>
<td>730</td>
<td>1,445</td>
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Source: Embraer
Market Forecast
30 to 120-Seat Jet Segment

Projected New Deliveries

<table>
<thead>
<tr>
<th>Region</th>
<th>2009–2018</th>
<th>2009–2028</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>90</td>
<td>230</td>
<td>3%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>225</td>
<td>520</td>
<td>8%</td>
</tr>
<tr>
<td>China</td>
<td>405</td>
<td>875</td>
<td>13%</td>
</tr>
<tr>
<td>Europe</td>
<td>590</td>
<td>1,350</td>
<td>20%</td>
</tr>
<tr>
<td>Latin America</td>
<td>270</td>
<td>540</td>
<td>8%</td>
</tr>
<tr>
<td>Middle East</td>
<td>90</td>
<td>210</td>
<td>3%</td>
</tr>
<tr>
<td>North America</td>
<td>1,045</td>
<td>2,570</td>
<td>38%</td>
</tr>
<tr>
<td>Russia/CIS</td>
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<td>455</td>
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</tr>
<tr>
<td>World</td>
<td>2,950</td>
<td>6,750</td>
<td>100%</td>
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Source: Embraer
### Projected New Deliveries

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<tr>
<th>Region</th>
<th>2009-2018</th>
<th>2009-2028</th>
<th>%</th>
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</thead>
<tbody>
<tr>
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<td>2%</td>
</tr>
<tr>
<td>China</td>
<td>65</td>
<td>120</td>
<td>17%</td>
</tr>
<tr>
<td>Europe</td>
<td>0</td>
<td>20</td>
<td>3%</td>
</tr>
<tr>
<td>Latin America</td>
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<td>2%</td>
</tr>
<tr>
<td>Middle East</td>
<td>0</td>
<td>10</td>
<td>2%</td>
</tr>
<tr>
<td>North America</td>
<td>10</td>
<td>460</td>
<td>70%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>0</td>
<td>10</td>
<td>2%</td>
</tr>
<tr>
<td>World</td>
<td>75</td>
<td>650</td>
<td>100%</td>
</tr>
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</table>

Source: Embraer
### Projected New Deliveries

<table>
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<tr>
<th>Region</th>
<th>2009–2018</th>
<th>2009–2028</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>40</td>
<td>110</td>
<td>5%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>110</td>
<td>240</td>
<td>10%</td>
</tr>
<tr>
<td>China</td>
<td>155</td>
<td>295</td>
<td>12%</td>
</tr>
<tr>
<td>Europe</td>
<td>170</td>
<td>440</td>
<td>18%</td>
</tr>
<tr>
<td>Latin America</td>
<td>40</td>
<td>80</td>
<td>3%</td>
</tr>
<tr>
<td>Middle East</td>
<td>40</td>
<td>90</td>
<td>4%</td>
</tr>
<tr>
<td>North America</td>
<td>510</td>
<td>1,040</td>
<td>42%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>85</td>
<td>155</td>
<td>6%</td>
</tr>
<tr>
<td>World</td>
<td>1,150</td>
<td>2,450</td>
<td>100%</td>
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</table>

Source: Embraer
## 91 to 120-Seat Jet Segment

### Projected New Deliveries

<table>
<thead>
<tr>
<th>Region</th>
<th>2009-2018</th>
<th>2009-2028</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>50</td>
<td>110</td>
<td>3%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>115</td>
<td>270</td>
<td>7%</td>
</tr>
<tr>
<td>China</td>
<td>185</td>
<td>460</td>
<td>13%</td>
</tr>
<tr>
<td>Europe</td>
<td>420</td>
<td>890</td>
<td>25%</td>
</tr>
<tr>
<td>Latin America</td>
<td>230</td>
<td>450</td>
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<tr>
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<td>50</td>
<td>110</td>
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<tr>
<td>North America</td>
<td>525</td>
<td>1,070</td>
<td>29%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>150</td>
<td>290</td>
<td>8%</td>
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<tr>
<td>World</td>
<td>1,725</td>
<td>3,650</td>
<td>100%</td>
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Source: Embraer
## Turboprops

### 30 to 60-Seat TP Segment
Projected New Deliveries

<table>
<thead>
<tr>
<th>Region</th>
<th>2009–2018</th>
<th>2009–2028</th>
<th>%</th>
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<tbody>
<tr>
<td>Africa</td>
<td>30</td>
<td>60</td>
<td>9%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>50</td>
<td>110</td>
<td>17%</td>
</tr>
<tr>
<td>China</td>
<td>60</td>
<td>185</td>
<td>28%</td>
</tr>
<tr>
<td>Europe</td>
<td>50</td>
<td>110</td>
<td>17%</td>
</tr>
<tr>
<td>Latin America</td>
<td>15</td>
<td>30</td>
<td>5%</td>
</tr>
<tr>
<td>Middle East</td>
<td>5</td>
<td>10</td>
<td>2%</td>
</tr>
<tr>
<td>North America</td>
<td>10</td>
<td>25</td>
<td>4%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>60</td>
<td>120</td>
<td>18%</td>
</tr>
<tr>
<td>World</td>
<td>280</td>
<td>650</td>
<td>100%</td>
</tr>
</tbody>
</table>

### 60+ Seat TP Segment
Projected New Deliveries

<table>
<thead>
<tr>
<th>Region</th>
<th>2009–2018</th>
<th>2009–2028</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>35</td>
<td>75</td>
<td>3%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>270</td>
<td>610</td>
<td>25%</td>
</tr>
<tr>
<td>China</td>
<td>5</td>
<td>15</td>
<td>1%</td>
</tr>
<tr>
<td>Europe</td>
<td>250</td>
<td>570</td>
<td>24%</td>
</tr>
<tr>
<td>Latin America</td>
<td>50</td>
<td>120</td>
<td>5%</td>
</tr>
<tr>
<td>Middle East</td>
<td>30</td>
<td>95</td>
<td>4%</td>
</tr>
<tr>
<td>North America</td>
<td>340</td>
<td>755</td>
<td>31%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>70</td>
<td>160</td>
<td>7%</td>
</tr>
<tr>
<td>World</td>
<td>1,050</td>
<td>2,400</td>
<td>100%</td>
</tr>
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### All TPs
Projected New Deliveries

<table>
<thead>
<tr>
<th>Region</th>
<th>2009–2018</th>
<th>2009–2028</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>65</td>
<td>135</td>
<td>4%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>320</td>
<td>720</td>
<td>24%</td>
</tr>
<tr>
<td>China</td>
<td>65</td>
<td>200</td>
<td>7%</td>
</tr>
<tr>
<td>Europe</td>
<td>300</td>
<td>680</td>
<td>22%</td>
</tr>
<tr>
<td>Latin America</td>
<td>65</td>
<td>150</td>
<td>5%</td>
</tr>
<tr>
<td>Middle East</td>
<td>35</td>
<td>105</td>
<td>3%</td>
</tr>
<tr>
<td>North America</td>
<td>350</td>
<td>780</td>
<td>26%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>130</td>
<td>280</td>
<td>9%</td>
</tr>
<tr>
<td>World</td>
<td>1,330</td>
<td>3,050</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Embraer
North America: 780 (26%)
Latin America: 150 (5%)
Africa: 135 (4%)
Europe: 680 (22%)
Middle East: 105 (3%)
Russia/CIS: 280 (9%)
China: 200 (7%)
Asia Pacific: 720 (24%)

Source: Embraer
### 120+ Seat Narrow-Body and Wide-Body Segment

#### Narrow-Body Jets (121 to 210-Seat Segment)

<table>
<thead>
<tr>
<th>Region</th>
<th>2009–2018</th>
<th>2009–2028</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>120</td>
<td>260</td>
<td>2%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>1,285</td>
<td>2,390</td>
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<tr>
<td>China</td>
<td>910</td>
<td>1,930</td>
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</tr>
<tr>
<td>Europe</td>
<td>1,780</td>
<td>3,830</td>
<td>26%</td>
</tr>
<tr>
<td>Latin America</td>
<td>420</td>
<td>900</td>
<td>6%</td>
</tr>
<tr>
<td>Middle East</td>
<td>355</td>
<td>690</td>
<td>5%</td>
</tr>
<tr>
<td>North America</td>
<td>1,985</td>
<td>4,150</td>
<td>29%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>245</td>
<td>500</td>
<td>3%</td>
</tr>
<tr>
<td><strong>World</strong></td>
<td><strong>7,100</strong></td>
<td><strong>14,650</strong></td>
<td><strong>100%</strong></td>
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#### Wide-Body Jets (210+ Seat Segment)

<table>
<thead>
<tr>
<th>Region</th>
<th>2009–2018</th>
<th>2009–2028</th>
<th>%</th>
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<tbody>
<tr>
<td>Africa</td>
<td>90</td>
<td>185</td>
<td>3%</td>
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<tr>
<td>Asia Pacific</td>
<td>830</td>
<td>1,750</td>
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<tr>
<td>China</td>
<td>235</td>
<td>600</td>
<td>10%</td>
</tr>
<tr>
<td>Europe</td>
<td>555</td>
<td>1,280</td>
<td>20%</td>
</tr>
<tr>
<td>Latin America</td>
<td>165</td>
<td>320</td>
<td>5%</td>
</tr>
<tr>
<td>Middle East</td>
<td>495</td>
<td>910</td>
<td>14%</td>
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<tr>
<td>North America</td>
<td>555</td>
<td>1,045</td>
<td>17%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>105</td>
<td>210</td>
<td>3%</td>
</tr>
<tr>
<td><strong>World</strong></td>
<td><strong>3,030</strong></td>
<td><strong>6,300</strong></td>
<td><strong>100%</strong></td>
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#### Narrow and Wide-Body Jets

<table>
<thead>
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<th>Region</th>
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<th>2009–2028</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>210</td>
<td>445</td>
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<tr>
<td>Asia Pacific</td>
<td>2,115</td>
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<tr>
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<td>1,145</td>
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<tr>
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<td>2,335</td>
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<td>Latin America</td>
<td>585</td>
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<tr>
<td>Middle East</td>
<td>850</td>
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<td>8%</td>
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<tr>
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<td>2,540</td>
<td>5,195</td>
<td>25%</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>350</td>
<td>710</td>
<td>3%</td>
</tr>
<tr>
<td><strong>World</strong></td>
<td><strong>10,130</strong></td>
<td><strong>20,950</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Embraer
North America 5,195
25%

Latin America 1,220
6%

Europe 5,110
24%

Russia/CIS 710
3%

China 2,530
12%

Middle East 1,600
8%

Africa 445
2%

Asia Pacific 4,140
20%

Source: Embraer
Fleet in Service Evolution

### 30 to 120-Seat Jet Segment

<table>
<thead>
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<th>Region</th>
<th>2008</th>
<th>2028</th>
</tr>
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<td>Africa</td>
<td>160</td>
<td>400</td>
</tr>
<tr>
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<td>220</td>
<td>700</td>
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<tr>
<td>China</td>
<td>110</td>
<td>900</td>
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<td>880</td>
</tr>
<tr>
<td>Middle East</td>
<td>90</td>
<td>250</td>
</tr>
<tr>
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<td>2,310</td>
<td>3,380</td>
</tr>
<tr>
<td>Russia/CIS</td>
<td>460</td>
<td>730</td>
</tr>
<tr>
<td>World</td>
<td>4,630</td>
<td>9,000</td>
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</table>

### 120+ Seat Narrow and Wide-Body Segment

<table>
<thead>
<tr>
<th>Region</th>
<th>2008</th>
<th>2028</th>
</tr>
</thead>
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<td>310</td>
<td>800</td>
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<td>1,830</td>
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<td>6,160</td>
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<tr>
<td>Russia/CIS</td>
<td>560</td>
<td>980</td>
</tr>
<tr>
<td>World</td>
<td>11,610</td>
<td>27,400</td>
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### 30+ Seat Turboprop Segment

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<tr>
<th>Region</th>
<th>2008</th>
<th>2028</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
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<td>300</td>
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<tr>
<td>Asia Pacific</td>
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<td>990</td>
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<tr>
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<td>330</td>
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<tr>
<td>Middle East</td>
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</tr>
<tr>
<td>North America</td>
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<td>990</td>
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<tr>
<td>Russia/CIS</td>
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<td>460</td>
</tr>
<tr>
<td>World</td>
<td>2,260</td>
<td>4,400</td>
</tr>
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</table>

### 30+ Seat Jet and Turboprop Segment

<table>
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<tr>
<th>Region</th>
<th>2008</th>
<th>2028</th>
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</thead>
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<tr>
<td>World</td>
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<td>40,800</td>
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Source: BACK and Embraer
Definitions

Aircraft Segmentation
Embraer segments its forecast in the following categories:

Regional Definitions
North America (USA and Canada)
Latin America (includes Mexico and the Caribbean)
Europe (includes Israel)
Middle East (includes Egypt)
Asia Pacific
China (includes Hong Kong, Macau and Mongolia)

Data Sources
All analyses developed in this outlook use data from:
- Global Insight
- GKIC
- ATR
- Q300
- MA60
- EMB-120
- A318
- B737-600
- B737-700
- B767
- A320
- A321
- A330
- A340
- A380
- B777
- B747
- A300
- A310
- MD-80
- -81
- -82
- -83
- -88
- -90
- Tupolev TU-154
- -204
- Ilyushin IL-86
- -96
- A350
- B787
- A350
- B747
- A300
- A310
- B767
- DC-10
- MD-11
- Ilyushin IL-62
- C130
- A330
- A340
- A380
- B777
- B747
- A300
- A310
- MD-80
- -81
- -82
- -83
- -88
- -90
- Tupolev TU-154
- -204
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