Commercial Jets: Embraer perspective

Lisbon - 27th May 2008

Ricardo Lugris
EMBRAER Senior Sales Director
Contents

1. Embraer company

2. E-Jet family: the regional revolution

3. Embraer market overview
Evolution

Origin and Development

- The outcome of World War II – strategic national aircraft manufacturing project
- The creation of CTA and ITA
- Embraer established in 1969

Privatization (1994)

- The integration of two cultures
- Entrepreneurial+
- Technological & Industrial
Highlights

- World’s third major commercial aircraft manufacturer
- Significant market share
- Global customer base
- Renowned international partners
- Excellent financial performance
- One of Brazil’s largest exporters
- Investment Grade – Moody’s Investor Service and Standard & Poor’s
- A diluted capital ownership, with no controlling groups
Net Revenue (U.S. GAAP)

- 97% of revenue is exports

(US$ million)

Qualified People

Number of Employees

Dec / 94 Embraer was privatized
April / 97 was the lowest level of employment – 3,200 people

BRAZIL 21,001*
USA 613
FRANCE 207
CHINA 273
SINGAPORE 30
PORTUGAL 1,669

* ELEB employees included
Global Business

Operations in Brazil, United States, Europe and Asia

USA
- Nashville
- Fort Lauderdale

France
- Villepinte
- Le Bourget

Porugal
- Alverca

Brazil
- Gavião Peixoto
- Botucatu
- São José dos Campos

China
- Beijing
- Harbin

Singapore
- Singapore
Business Areas

Commercial Aviation Market

Defense Systems

Executive Aviation Market

Aviation Services
Business Areas

- Commercial Aviation Market
- Executive Aviation Market
- Defense Systems
- Aviation Services

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ERJ 145 Family

ERJ 135
37 Seats

ERJ 140
44 Seats

ERJ 145
50 Seats

ERJ 145 XR
50 Seats
(2,000 mn range)
# ERJ 145 Family Order Book

<table>
<thead>
<tr>
<th></th>
<th>Firm Orders</th>
<th>Options</th>
<th>Total</th>
<th>Deliveries</th>
<th>Firm Backlog</th>
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</thead>
<tbody>
<tr>
<td>ERJ 135</td>
<td>108</td>
<td>-</td>
<td>108</td>
<td>108</td>
<td>-</td>
</tr>
<tr>
<td>ERJ 140</td>
<td>74</td>
<td>-</td>
<td>74</td>
<td>74</td>
<td>-</td>
</tr>
<tr>
<td>ERJ 145</td>
<td>733</td>
<td>75</td>
<td>808</td>
<td>690</td>
<td>43</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>915</strong></td>
<td><strong>75</strong></td>
<td><strong>990</strong></td>
<td><strong>872</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>

(as of March 31st, 2008)
Portugalia ERJ 145
1000th ERJ delivered on September, 2007
E-Jets: EMBRAER 170/190 Family

**EMBRAER 170**
- 66 to 80 Seats
- 2,100 nm Range

**EMBRAER 175**
- 73 to 88 Seats
- 2,000 nm Range

**EMBRAER 190**
- 93 to 114 Seats
- 2,400 nm Range

**EMBRAER 195**
- 100 to 122 Seats
- 2,200 nm Range
## E-Jets Family Order Book

<table>
<thead>
<tr>
<th></th>
<th>Firm Orders</th>
<th>Options*</th>
<th>Total</th>
<th>Deliveries</th>
<th>Firm Backlog</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMBRAER 170</td>
<td>179</td>
<td>114</td>
<td>293</td>
<td>139</td>
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<tr>
<td>EMBRAER 175</td>
<td>129</td>
<td>148</td>
<td>277</td>
<td>74</td>
<td>55</td>
</tr>
<tr>
<td>EMBRAER 190</td>
<td>431</td>
<td>479</td>
<td>910</td>
<td>140</td>
<td>291</td>
</tr>
<tr>
<td>EMBRAER 195</td>
<td>96</td>
<td>99</td>
<td>195</td>
<td>16</td>
<td>80</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>835</strong></td>
<td><strong>840</strong></td>
<td><strong>1,675</strong></td>
<td><strong>369</strong></td>
<td><strong>466</strong></td>
</tr>
</tbody>
</table>

Note: (*) Include purchase rights.

(as of March 31st, 2008)
Executive Market Products: Legacy

Legacy 600

Legacy Shuttle

Transportation of Authorities
## Executive Market Products: Phenom 100 and 300

<table>
<thead>
<tr>
<th></th>
<th>Phenom 100</th>
<th>Phenom 300</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of seats</strong></td>
<td>6 – 8 (occupants)</td>
<td>8 – 9 (occupants)</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>1,160 nm</td>
<td>2,150 km</td>
</tr>
<tr>
<td><strong>Maximum Cruise Speed</strong></td>
<td>380 ktas</td>
<td>705 km/h</td>
</tr>
<tr>
<td><strong>MMO</strong></td>
<td>Mach 0.70</td>
<td>Mach 0.78</td>
</tr>
<tr>
<td><strong>Maximum Operational Altitude</strong></td>
<td>41,000 ft</td>
<td>45,000 ft</td>
</tr>
</tbody>
</table>

* NBAA IFR (35 min) Reserves + 100nm alternate; 4 occupants @ 200 lb (91 kg)
1 Baseline configuration
## Executive Market Products: Lineage 1000

<table>
<thead>
<tr>
<th></th>
<th>Lineage 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of seats</strong></td>
<td>13 – 19 (occupants)</td>
</tr>
<tr>
<td><strong>Range</strong>*</td>
<td>4,200 nm</td>
</tr>
<tr>
<td><strong>Maximum Cruise Speed</strong></td>
<td>470 ktas</td>
</tr>
<tr>
<td><strong>MMO</strong></td>
<td>Mach 0.82</td>
</tr>
<tr>
<td><strong>Maximum Operational Altitude</strong></td>
<td>41,000 ft</td>
</tr>
</tbody>
</table>

* NBAA IFR (35 min) Reserves + 200nm alternate; 8 occupants @ 200 lb
New executive jets program launch

March 28th 2008 - Board approved the launch of 2 new business jets models: MSJ and MLJ, that will transport 7 to 12 passengers with 2 crew members.
Business Areas

- Commercial Aviation Market
- Executive Aviation Market
- Defense Systems
- Aviation Services
Defense Market Products

Integrated Market Approach

Systems & Services
Training
Intelligence, Surveillance and Reconnaissance
Combat
Transport
Business Areas

Commercial Aviation Market

Defense Systems

Executive Aviation Market

Aviation Services
Aviation Services

Services

MRO | Training | Material & Logistics Services | Aerostructures
Aviation Services

MRO – Service Centers:

- **EAMS**
  - Embraer Aircraft Maintenance Services
  - Nashville, TN, USA

- **OGMA**
  - OGMA Indústria Aeronáutica de Portugal SA - Lisbon, PORTUGAL

- **GPX**
  - Embraer Service Center
  - Gavião Peixoto, SP, BRAZIL

- **Le Bourget**
  - Service Center Le Bourget – Le Bourget, FRANCE

Embraer Service Centers
- Embraer Authorized Service Center for Commercial Airline Market
- Embraer Authorized Service Center for Executive Jets Market
- Embraer Authorized Service Center for Executive Aviation Market
- Embraer Service Centers Under Construction

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Revenue per Segment

Revenue per Segment (2007)

- Commercial Aviation, 64.4%
- Executive Aviation, 16%
- Defense Aviation, 6.6%
- Customer Support and Others, 13%

Revenue per Region (2007)

- Americas, 57.4%
- Europe, 21.5%
- Brazil, 3.8%
- Others, 17.3%
Backlog

March 2008 – US$ 20.3 billion in firm orders

US$ billion


Firm Orders

0.6 1.2 3 4.1 6.4 11.4 10.7 9 10.6 10.1 10.4 14.8 18.8 20.3

March 2008 – US$ 20.3 billion in firm orders
Contents

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2. E-Jet family: the regional revolution

3. Embraer market overview
Market Survey Results

Extensive market research with 40 major & regional airlines gives rise to a family of new-generation jets.

Lower Direct Operating Costs
- Increased aircraft efficiency
- Lower maintenance costs
- Reduced TAT (better utilization)

Maximum Family Commonality
- Same training, same spare parts

High Performance
- Short field capability
- Longer range

Mainline Standards
- More comfortable than traditional RJs
- Bigger cabin
- Larger overhead bins
- Larger cargo/baggage compartment
## E-Jets family

### EMBRAER 170/175

**EMBRAER 170**
- 70 to 80 Seats
- 2,100 nm Range
- Certification – February 2004

**EMBRAER 175**
- 78 to 88 Seats
- 2,000 nm Range
- Certification – December 2004

### EMBRAER 190/195

**EMBRAER 190**
- 98 to 114 Seats
- 2,400 nm Range
- Certification – August 2005

**EMBRAER 195**
- 108 to 122 Seats
- 2,200 nm Range
- Certification – June 2006

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E-Jets Commonality

Training ➔ 70% of the potential benefits

same cockpit, common systems and fly-by-wire technology mean maximum training commonality within the family

<table>
<thead>
<tr>
<th>EMBRAER</th>
<th>170</th>
<th>175</th>
<th>190</th>
<th>195</th>
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</thead>
<tbody>
<tr>
<td>170</td>
<td>------</td>
<td>A/A/A</td>
<td>A/A/A</td>
<td>A/A/A</td>
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<tr>
<td>175</td>
<td>A/A/A</td>
<td>------</td>
<td>A/A/A</td>
<td>A/A/A</td>
</tr>
<tr>
<td>190</td>
<td>A/A/A</td>
<td>A/A/A</td>
<td>------</td>
<td>A/A/A</td>
</tr>
<tr>
<td>195</td>
<td>A/A/A</td>
<td>A/A/A</td>
<td>A/A/A</td>
<td>------</td>
</tr>
</tbody>
</table>

Training Qualification Differences: According to FAA AC 120-53, grades range from A (best) to E (worst) in 3 categories: Training Differences, Check Differences and Recurrent Training.

Spare Parts ➔ 30% of the potential benefits

Based on the aircraft RSPL (Recommended Spare Parts List)
Note: Airframe and Ground Servicing Equipment only (Engines are not included).

E-Jets have the maximum training commonality (A/A/A)
E-Jets offer an outstanding parts commonality (86% to 100%)
A commonality praised by customers

Airlines that ordered several E-Jets type

- **Finnair**: 10 E170 / 13 E190
- **Royal Jordanian**: 2 E175 / 5 E195
- **Air Canada**: 15 E175 / 45 E190
- **Paramount Airways**: 2 E170 / 3 E175
- **Virgin Nigeria**: 7 E170 / 3 E190
- **Virgin Blue**: 6 E170 / 18 E190
- **LOT Polish Airlines**: 10 E170 / 18 E175
- **nasair**: 8 E190 / 2 E195
- **TAME**: 2 E170 / 3 E190
- **Régional**: 7 E170 / 11 E190
- **U.S. Airways**: 28 E170 / 57 E190

Includes GECAS aircraft
Range from Lisbon - E-Jets family

Max Pax Payload - 105 kg per pax
85% Annual Probability Winds
ISA
5% airways allowance
E170 / 175 Cruise Speed Mach 0.75
E190 / 195 Cruise Speed Mach 0.78

AR Version   -  MTOW [kg]
E 170 38,600
E 175 40,370
E 190 51,800
E 195 52,290

Fully Equipped BOW [kg]
E 170 21,800
E 175 22,400
E 190 28,700
E 195 29,800

Flight Levels
Any
Taxi Time (in & out)
20 minutes

Reserves
5.0% trip fuel
Alternate Distance: 100 [nm]
Hold: 30 min @ 1500 ft
The Double Bubble Solution

Individual comfort
No middle seat cabin
Widest seat in the category
Highest index space per seat
Large overhead bins for 24 x 16 x 10 in roll-on bags
Extensive passenger facilities

Efficiency for airlines
Wide aisle for boarding
Flexibility for interior layouts
Spacious service areas

Roll on Bags
24 x 16 x 10 in
61 x 40 x 25 cm

0.78 m
1.44 m
0.94 m
2.74 m
18.25 in
2.0 m
19.75 in

2 inch gap between seats
A comfort matching narrow-body standards

Matching the “Best In Class” Single Aisle Living Space

**Assumptions:**
- Formula: \( A \times P/n \)
- \( A \): Cabin cross section useful area
- \( P \): Seat pitch (32”)
- \( n \): number of seats abreast

<table>
<thead>
<tr>
<th></th>
<th>E-Jets</th>
<th>B737</th>
<th>A320</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cabin X-Section Area:</strong></td>
<td>4.28 m²</td>
<td>6.14 m²</td>
<td>6.39 m²</td>
</tr>
<tr>
<td><strong>Slice Volume:</strong></td>
<td>3.48 m³</td>
<td>4.99 m³</td>
<td>5.19 m³</td>
</tr>
<tr>
<td><strong>Slice Volume/seat:</strong></td>
<td>0.870 m³/seat</td>
<td>0.832 m³/seat</td>
<td>0.866 m³/seat</td>
</tr>
<tr>
<td><strong>Comparison:</strong></td>
<td>Baseline</td>
<td>-4.6%</td>
<td>-0.5%</td>
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</table>
A significative trip cost advantage

E-Jets: Lower trip costs than narrow-bodies

Costs exclude: revenue related costs and system (overhead) costs
Costs include: variable: fuel, crew, maintenance, landing fees, handling fees; ownership: lease cost, hull insurance, spares inventory costs
Finnair testimonials

Total order: 10 E170 / 13 E190

Finnair needs

- Replace old MD83 (156 seats)
- Right-size capacity on A319 routes (A319 - 126 seats too large on some sectors)
- Acquire best fleet to feed Finnair Helsinki hub to Asia

Reasons for choosing the E-jets family

- High commonality within the family - enabling fleet / network optimisation
- E170 cost per trip 30% lower than A319 (mainly through lower fuel burn and lower navigation charges)
- E190 cost per trip 20% lower than A319 and cost per seat comparable to the A319
- E190 extra-range capabilities

Source: Finnair, Petteri Kostermaa, VP Network Strategy – April 2006 and September 2006 meetings
## E-Jets fitting to all business models

<table>
<thead>
<tr>
<th>North America and Caribbean</th>
<th>South America</th>
<th>Europe</th>
<th>Africa/Middle East</th>
<th>Asia</th>
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<tbody>
<tr>
<td>Republic Airlines</td>
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<td>US Airways</td>
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<td>Air Caraibes</td>
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**Network**

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<tbody>
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<td>US Airways</td>
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**Low Cost & Charter**

| jetBlue Airways               |              |        |                   |      |
|                                |              |        |                   |      |
|                                |              |        |                   |      |
|                                |              |        |                   |      |
|                                |              |        |                   |      |

**Source:** Embraer, as of March 31st, 2008
E-Jets orders in Europe

UK:
Flybe
14 E195

FRANCE:
Air France Regional
7 E170 11 E190

SWITZERLAND:
M1 Commercial Jets
FlyBaboo
8 E190

SPAIN:
Air Europa
6 E195

NETHERLANDS:
KLM Cityhopper 10 E190

FINLAND: Finnair
10 E170 / 13 E190

POLAND: LOT
10 E170 18 E175

GERMANY:
Cirrus: 1 E170 / 1 E175
Lufthansa: 30 E190

ITALY:
Alitalia 6 E170
AlpiEagles 10 E195

MOLDOVA:
Air Moldova: 1 E190

MONTENEGRO:
Montenegro Airlines
2 E195

158 E-Jets firm orders
E-Jets Family - Main Applications

- Replacement of old & inefficient jets
- Natural evolution for existing 50-seat markets
- Right-sizing of low load-factor narrow-body flights
  - Capacity, range & seamless service
  - Enhancing services by increasing frequencies
- New market opportunities – low risk development
  - Medium density and long/thin markets
1. Embraer company

2. E-Jet family: the regional revolution

3. Embraer market overview
30 to 120-seat jets: a large market to tap

Embraer Market Forecast (2008-2027)
Projected Deliveries: 7,450 Jets (30-120 seats)
Regional aircraft: increased competition

New competition coming from Russia, China and Japan

- Bombardier: Turbo-Props, Regional Jets
- Mitsubishi Regional Jet (MRJ)
- ATR: Turbo-Props
- AVIC Commercial Aircraft: Regional Jets
- EMBRAER: Turbo-Props (stopped), Regional Jets
<table>
<thead>
<tr>
<th>Region</th>
<th>Program</th>
<th>Seats</th>
<th>Targeted EIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANADA</td>
<td>Bombardier C-Series</td>
<td>110 and 130</td>
<td>2013</td>
</tr>
<tr>
<td>JAPAN</td>
<td>Mitsubishi Regional Jet</td>
<td>70 and 90</td>
<td>2014</td>
</tr>
<tr>
<td>RUSSIA</td>
<td>Sukhoi SSJ</td>
<td>78 and 98</td>
<td>2009</td>
</tr>
<tr>
<td>CHINA</td>
<td>AVIC 1 - ARJ21</td>
<td>78 to 85</td>
<td>2009</td>
</tr>
</tbody>
</table>
Embraer leading the 30-120 seat market

Market Share (number of orders) - World (30-120 seats)

- Bombardier: 43%
- Embraer: 47%
- Sukhoi: 2%
- Antonov: 1%
- Airbus: 2%
- Boeing: 2%
- AVIC I: 3%
- Mitsubishi: 0%

Considering
- Embraer: ERJ 145/140/135; Embraer 170/175/190/195
- Bombardier: CRJ100/200/440/700/900/1000
- Airbus: A318
- Boeing: B737-600
- AVIC I: ARJ-21
- Sukhoi: Superjet 100
- Antonov: An-148
- Mitsubishi: MRJ

As of April 2008
E-Jets Around the World

Thank you