

The Market for Large Commercial Jet Transports

Product Code #F611

A Special Focused Market Segment Analysis by:



Analysis 1

The Market for Large Commercial Jet Transports

2010-2019

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PROGRAMS

The following reports are included in this section: (**Note:** a single report may cover several programs.)

Airbus A319/320/321
Airbus A330
Airbus A340
Airbus A350 XWB
Airbus A380
Antonov/Aviastar An-124/225
Boeing 737
Boeing 747
Boeing 767
Boeing 777
Boeing 787
Ilyushin Il-96
Tupolev/Aviastar Tu-204
Yakovlev Yak-42/MC-21

Introduction

The global financial collapse of the fall of 2008 and the subsequent economic recession presaged a severe downturn in air passenger and air cargo markets worldwide. While there is, of course, never a good time for a downturn to hit, this particular downturn came at an especially bad time for the airline industry. The industry had just managed, a couple of years prior, to bring its balance sheets back into the black after several years of net financial losses.

The world's airlines posted huge losses in 2008 and 2009 as business activity dwindled and air traffic slumped. The industry posted net losses of \$15.9 billion in 2008 and an estimated \$9.4 billion in 2009.

Battling in many instances for their very survival, airlines put into place a number of measures to control costs and boost revenue. These have included capacity reductions, exploitation of ancillary revenue streams, various adjustments to business models, and the use of marketing alliances. As the global economy continues to recover, airlines are hoping that the implementation of such measures will enable them to fully take advantage of the opportunities that the future market will provide.

Meanwhile, Airbus and Boeing are faced with the challenge of how best to respond to the requirements of the airline industry. This challenge involves more than the formulation and refinement of an airliner product line through improvements to existing models and development of new models. The two manufacturers also need to determine optimum build rates for their products, a task made all the more daunting as demand continues to be fairly robust for these products despite otherwise sluggish conditions in the airline industry.

Airbus and Boeing thus have a difficult balancing act to perform. The manufacturers have to produce sufficient numbers of aircraft to meet the needs of their customers while, at the same time, avoiding the real danger of ending up with a bunch of white tails should customers ultimately prove to be unable to take delivery of many of these aircraft.

In the meantime, Airbus and Boeing are each facing a number of difficult decisions regarding product improvement and development. Much of this activity is driven by demands from the airline industry for more cost-efficient aircraft. However, competitive pressures also play a big role here. Airbus and Boeing need to match each other's product innovations while, at the same time, guarding their market shares against encroachment from newcomers such as Bombardier and its CSeries airliner.

These various trends and factors are examined in detail in this market analysis, which also includes 10-year production forecasts. The forecasts, which are broken out by aircraft model and engine, are calculated in terms of unit production as well as monetary value of production.

Fourteen families of large commercial jet transports are forecast in this study. These 14 families account for nearly 30 individual aircraft models. The aircraft production forecasts form the basis for the manufacturer market share forecasts that are also included in this analysis.

For methodological reasons, Forecast International separates the large jet airliner market into light/medium transports and heavy transports. These two large categories are then further broken down into seating classes in order to further assist market evaluation and product comparison.

The light/medium transport and heavy transport categories are as follows:

LIGHT/MEDIUM COMMERCIAL JET TRANSPORTS

Airbus A319
Airbus A320
Airbus A321
Boeing 737
Comac C919
Irkut MC-21
Tupolev Tu-204

The aircraft in this class are more commonly called narrowbody, or single-aisle, airliners. These aircraft are acquired in quantity by mainline network airlines as well as low-fare carriers.

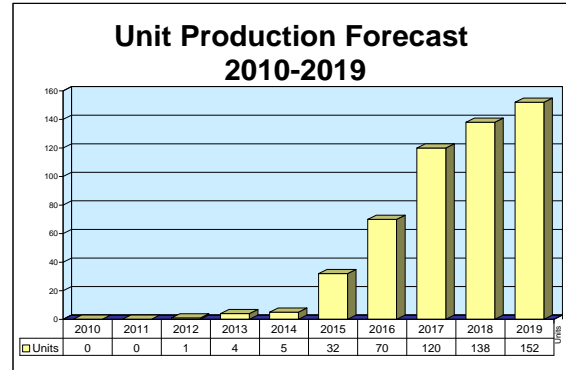
Unit production of light/medium jet transports significantly exceeds that of heavy jet transports. As a consequence, competition is quite heated in this category between Airbus and Boeing, the two dominant manufacturers in the large airliner market. It is also in this category where Airbus and Boeing will begin to face challenges to their dominance. These challenges will come not only from the C919 from China and the MC-21 from Russia, but also from the aforementioned Bombardier CSeries and possibly a new aircraft from the Brazilian company Embraer.

We currently categorize the CSeries as a regional airliner, and so it is not specifically covered by this study. Nevertheless, the CSeries is already challenging the lower-capacity models in the Airbus and Boeing
Continued...

Airbus A350 XWB

Outlook

- The forecast incorporates a 12-18-month slip in the entry-into-service date
- The A350 XWB series includes three basic models
- The series targets both the Boeing 787 and the Boeing 777



Orientation

Description. Family of twin-turbofan-engine, widebody commercial transport aircraft.

Sponsor. The A350 XWB is sponsored by Airbus.

Status. Development

Total Produced. Not applicable.

Application. Long-range, medium-capacity, scheduled and non-scheduled passenger and cargo transportation.

Price Range. A350-800, \$225.2 million; A350-900, \$254.5 million; A350-1000, \$285.2 million. All in 2010 U.S. dollars.

Contractors

Prime

Airbus France	http://www.airbus.com , 316 Route de Bayonne, Toulouse, 31060 France, Tel: + 33 5 61 93 55 55, Prime
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Subcontractor

Aerolia	http://www.aerolia.com , Boulevard des Apprentis, BP 50301, Saint Nazaire, 44605 France, Tel: + 33 2 28 54 80 00, Fax: + 33 2 28 54 81 31 (Hydraulic and Cabin System Tubes and Pipes; Nose Fuselage Subassemblies)
Alliant Techsystems Inc (ATK)	http://www.atk.com , 7480 Flying Cloud Dr, Minneapolis, MN 55344 United States, Tel: + 1 (952) 391-3000, Fax: + 1 (952) 351-3009, Email: atk.corporate@atk.com (Composite Aft Fan Case)
B/E Aerospace Inc	http://www.beaerospace.com , 1400 Corporate Center Way, Wellington, FL 33414 United States, Tel: + 1 (336) 767-2000, Ext: 1440, Fax: + 1 (336) 744-1009 (Passenger and Crew Oxygen Systems; Galley System)
Bodet Aero	http://www.circoraerospace.com , ZI du Bompas, BP 77, Chemille, 49120 France, Tel: + 33 2 41 30 35 46, Fax: + 33 2 41 30 36 40 (Speed Transducers and Sensors)
Circor Aerospace Inc	http://www.cicoraerospace.com , 2301 Wardlow Circle, Corona, CA 92880-2881 United States, Tel: + 1 (951) 270-6200, Fax: + 1 (951) 270-6201 (Main and Nose Landing Gear Door Actuators; Main and Nose Landing Gear Hydraulic Valves)

Airbus A350 XWB

Cobham Avionics and Surveillance Division	http://www.cobham.com/about-cobham/avionics-and-surveillance , Brook Rd, Wimborne, BH21 2BJ Dorset, United Kingdom, Tel: + 44 1202 882020, Fax: + 44 1202 840853 (Radio and Audio Integrated Management System)
Diehl Aerospace GmbH, Plant Überlingen	http://www.diehl-aerospace.de , Alte Nussdorfer Strasse 23, Überlingen, 88662 Germany, Tel: + 49 7551 89 02, Fax: + 49 7551 89 6001 (Cabin and Cargo Lighting; Common Remote Data Concentrator; Door and Slide Control System)
ECE	http://www.ece.zodiac aerospace.com , 129 Blvd Davout, BP 113, Paris, 75960 France, Tel: + 33 1 56 06 10 00, Fax: + 33 1 56 06 10 10 (Electrical Power Distribution System)
Eaton Aerospace	http://www.aerospace.eaton.com , 9650 Jeronimo Rd, Irvine, CA 92618 United States, Tel: + 1 (949) 452-9500, Fax: + 1 (949) 452-9555 (Main Engine Fuel Pump; Engine Build-Up Subsystems)
Fokker Aerostructures	http://www.fokker.com/aesp , PO Box 1, Papendrecht, 3350 AA Netherlands, Tel: + 31 78 64 19 911 (Composite Outboard Flaps)
Fokker Elmo BV	http://www.fokker.com/elmo , PO Box 75, Aviolandalaan 33, Hoogerheide, NL-4630 AB Netherlands, Tel: + 31 164 617540 (Engine Electrical Wiring)
GE - Aviation Systems, Aerostructures	http://www.geaviationsystems.com , Kings Ave, Hamble-le-Rice, SO31 4NF Hampshire, United Kingdom, Tel: + 44 2380 453371, Fax: + 44 2380 744042 (Wing Trailing Edge Subassemblies and Components)
GKN Aerospace	http://www.gknaerospace.com , PO Box 55, Ipsley House, Ipsley Church Ln, Redditch, B98 0TL United Kingdom, Tel: + 44 1527 517 715, Fax: + 44 1527 517 700 (Composite Wing Spar; Wing Trailing Edge)
Goodrich Aerostructures	http://www.goodrich.com , 850 Lagoon Dr, Chula Vista, CA 91912-0878 United States, Tel: + 1 (619) 691-4111, Fax: + 1 (619) 691-3030 (Nacelle & Thrust Reverser System)
Goodrich Aircraft Wheels & Brakes	http://www.goodrich.com , 101 Waco St, PO Box 340, Troy, OH 45373-3872 United States, Tel: + 1 (937) 339-3811, Fax: + 1 (937) 440-3250 (Wheels and Brakes)
Goodrich Engine Components	http://www.goodrich.com , 811 Fourth St, PO Box 65100, West Des Moines, IA 50265-0100 United States, Tel: + 1 (515) 274-1561, Fax: + 1 (515) 271-7201 (Combustion System Fuel Nozzle)
Goodrich Sensors and Integrated Systems	http://www.goodrich.com , 14300 Judicial Rd, Burnsville, MN 55306-4000 United States, Tel: + 1 (952) 892-4000, Fax: + 1 (952) 892-4800 (Air Data System; Ice Detection System; External Video System)
Goodrich Specialty Seating Systems	http://www.goodrich.com , 1275 N Newport Rd, Colorado Springs, CO 80916-2779 United States, Tel: + 1 (719) 380-0020, Fax: + 1 (719) 380-0040 (Cabin Attendant Seats)
Hamilton Sundstrand	http://www.hamiltonsundstrand.com , 4747 Harrison Ave, PO Box 7002, Rockford, IL 61125-7002 United States, Tel: + 1 (815) 226-6000 (Electric Power Generation System; Ram Air Turbine)
Hexcel Corp	http://www.hexcel.com , Two Stamford Plaza, 16th Fl, 281 Tresser Blvd, Stamford, CT 06901 United States, Tel: + 1 (203) 969-0666, Fax: + 1 (203) 358-3977 (Carbon Fiber Composite Materials)
Honeywell Aerospace, Air Transport & Regional	http://www.honeywell.com , 21111 N 19th Ave, Phoenix, AZ 85027 United States, Tel: + 1 (602) 436-2311 (Flight Management System; Aircraft Environment Surveillance System)
Honeywell Aerospace, Engines, Systems & Services	http://www.honeywell.com , 111 S 34th St, Phoenix, AZ 85034-2892 United States, Tel: + 1 (602) 231-1000, Fax: + 1 (602) 231-5713 (HGT1700 Auxiliary Power Unit)
Honeywell Aerospace	http://www.honeywell.com , 1944 E Sky Harbor Circle, Phoenix, AZ 85034 United States, Tel: + 1 (602) 231-1000, Fax: + 1 (602) 365-2075 (Air Management System)
Kidde Aerospace	http://www.kiddeaerospace.com , 4200 Airport Dr NW, Wilson, NC 27896-9643 United States, Tel: + 1 (252) 237-7004, Fax: + 1 (252) 246-7181 (Overheat Detection System)
Liebherr-Aerospace Lindenberg GmbH	http://www.liebherr.com , Postfach 1363, Pfaenderstr 50, Lindenberg, D-88161 Germany, Tel: + 49 8381 460, Fax: + 49 8381 464377, Email: info@lli.liebherr.com (Nose Landing Gear; Slat Actuator)
MAINTag SAS	http://www.maintag.fr , 9 Rue Francaise, Paris, 75002 France, Tel: + 33 1 40 13 89 60 (FLYtag RFID Tag)

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McStarlite Company	http://www.mcstarlite.com , 1531 W 240th St, Harbor City, CA 90710 United States, Tel: + 1 (310) 325-2063, Fax: + 1 (310) 325-9682 (Engine Nacelle Leading Edges)
Meggitt Safety Systems Inc	http://www.meggittsafety.com/ , 1915 Voyager Ave, Simi Valley, CA 93063-3349 United States, Tel: + 1 (805) 584-4100, Fax: + 1 (805) 578-3400, Email: MSSI-Marketing@meggitt.com (Fire Protection System)
Messier-Bugatti	http://www.messier-bugatti.com , Zone Aéronautique Louis Breguet, BP40, Velizy-Villacoublay, 78140 France, Tel: + 33 1 4629 8100, Fax: + 33 1 4629 8700 (Electronic and Hydraulic Landing and Braking Control Systems)
Messier-Dowty International	http://www.messier-dowty.com , Zone Aéronautique Louis Breguet, BP 10, Velizy-Villacoublay, 78140 France, Tel: + 33 1 46 29 18 00, Fax: + 33 1 46 29 18 03 (Main Landing Gear)
Mitsubishi Heavy Industries (MHI) Ltd	http://www.mhi.co.jp , 16-5 Konan 2-chome, Minato-ku, Tokyo, 108-8215 Japan, Tel: + 81 3 6716 3111, Fax: + 81 3 6716 5800 (Engine Combustion System Components; Low-Pressure Turbine Blades)
Moog Inc	http://www.moog.com , Jamison Rd, East Aurora, NY 14052 United States, Tel: + 1 (716) 652-2000, Fax: + 1 (716) 687-4457 (Primary Flight Control Actuation System; Trailing Edge Actuation System)
PT Dirgantara Indonesia (Indonesian Aerospace - IAe)	http://www.indonesian-aerospace.com , Jalan Pajajaran 154, Bandung, 40174 Indonesia, Tel: + 62 22 6034562, Fax: + 62 22 6019538, Email: infosales@indonesian-aerospace.com (Portion of Wing Leading Edge)
Pacific Scientific HTL/Kin-Tech Division	http://www.pacificscientific.com/ , 1800 Highland Ave, Duarte, CA 91010 United States, Tel: + 1 (626) 359-9317, Fax: + 1 (626) 357-2107, Email: marketing@htl.pacsci.com (Cargo Bay Fire Suppression System)
Parker Aerospace Electronic Systems Division	http://www.parker.com , 300 Marcus Blvd, PO Box 9400, Hauppauge, NY 11788 United States, Tel: + 1 (631) 231-3737, Fax: + 1 (631) 434-8152, Email: esdmarket@parker.com (Fuel Measurement System; Fuel Management System)
Parker Aerospace Fluid Systems Division	http://www.parker.com/ , 16666 Von Karman Ave, Irvine, CA 92606-4917 United States, Tel: + 1 (949) 833-3000, Fax: + 1 (949) 851-3788, Email: AFDMarketing@Parker.com (Fuel Tank Inerting System; Fluid Mechanical Equipment)
Parker Aerospace Hydraulic Systems Division	http://www.parker.com , 2220 Palmer Ave, Kalamazoo, MI 49001-4165 United States, Tel: + 1 (269) 384-3400, Fax: + 1 (269) 384-3862 (Hydraulic Power Generation and Distribution System)
Parker Aerospace Nichols Airborne Division, Elyria Facility	http://www.parker.com , 711 Taylor St, PO Box 4032, Elyria, OH 44036 United States, Tel: + 1 (440) 284-6300, Fax: + 1 (440) 322-6094 (Engine Feed and Transfer Fuel Pumps)
Premium Aerotec GmbH	http://www.premium-aerotec.com , Haunstetter Str 225, Augsburg, 86136 Germany, Tel: + 49 821 801 0, Fax: + 49 821801 62090 (Aft Fuselage Section Floor Structure; Aft Pressure Bulkhead; Aft Fuselage Side Shells; Forward Fuselage Structures)
Rockwell Collins Inc	http://www.rockwellcollins.com , 400 Collins Rd NE, Cedar Rapids, IA 52498-0001 United States, Tel: + 1 (319) 295-1000, Fax: + 1 (319) 295-5429 (Communication Global Work Package; Trimmable Horizontal Stabilizer Actuator; Avionics Full Duplex Switched Ethernet Network; Digital Low Range Altimeter; Multi-Mode Receiver; ADF-900 Automatic Direction Finder; DME-2100 Distance Measuring Equipment; VOR-900 VHF Omnidirectional Radio Receiver; Information Management Onboard System)
Rolls-Royce plc	http://www.rolls-royce.com , 65 Buckingham Gate, London, SW1E 6AT United Kingdom, Tel: + 44 20 7222 9020, Fax: + 44 20 7227 9170 (Trent XWB Turbofan Engine)
Saft	http://www.saftbatteries.com , 12, rue Sadi Carrot, Bagnolet, 93170 France, Tel: + 33 1 49 93 1918, Fax: + 33 1 49 93 1950 (Battery)
Sagem	http://www.sagem-ds.com , Le Ponant de Paris, 27, Rue Leblanc, Paris, 75512 France, Tel: + 33 1 58 11 78 00, Fax: + 33 1 58 11 78 50 (Flight Data Acquisition and Security System)
Sirio Panel SpA	http://www.siriopanel.it , Loc. Levanella Becorpi, Montevarchi, 52025 Italy, Tel: + 39 055 913671, Fax: + 39 055 9180463 (Cockpit Lighting System; Avionics Interface Control Unit)

Airbus A350 XWB

Spirit AeroSystems	http://www.spiritaero.com , 3801 S Oliver St, PO Box 780008, Wichita, KS 67278 United States, Tel: + 1 (316) 526-9000, Fax: + 1 (316) 526-1845, Email: communications@spiritaero.com (Lower Composite Center Fuselage Frame Section)
Spirit AeroSystems (Europe) Ltd	http://www.spiritaero.com , Prestwick Airport, Prestwick, KA9 2RW Scotland, United Kingdom, Tel: + 44 1292 479 888, Fax: + 44 1292 479 703 (Wing Leading Edge)
Tego Inc	http://www.tegoinc.com , 375 Totten Pond Rd, Waltham, MA 02451 United States, Tel: + 1 (781) 547-5680, Fax: + 1 (781) 547-5822 (RFID Chip)
Thales Aerospace	http://www.thalesgroup.com/aerospace/ , 45, Rue de Villiers, Neuilly-sur-Seine, 92526 France, Tel: + 33 1 57 77 80 00, Fax: + 33 1 57 77 87 70 (Integrated Modular Avionics Suite; Interactive Control and Display Systems; Air Data and Inertial Reference Unit; Head-Up Display)

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Technical Data

(A350-800/900/1000)

Design Features. The A350 XWB (Xtra Wide Body) is a new, clean-sheet-design family of commercial airliners. The XWB's fuselage is a double-lobe ovoid design, with a cross section of 5.9 meters (232 in). The lower section is sized to accommodate two side-by-side LD-3 containers. The XWB is equipped with fly-by-wire flight controls.

In response to customer input, Airbus revised the design of the A350 XWB airframe in the fall of 2007,

switching from metallic fuselage frames to carbonfiber. The aircraft wing is composed largely of carbonfiber with some metallic ribs, and is swept 33 degrees and has raised tips.

The A350 XWB is powered by two Rolls-Royce Trent XWB engines delivering 74,000-93,000 lbst each. Eventually, the aircraft may also be marketed with alternative engines.

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Length	60.54/66.89/73.88 m	198.63/219.46/242.39 ft
Height	17.05 m	55.94 ft
Wingspan	64.75 m	212.43 ft
Wing area	443 sq m	4,767 sq ft
Weight		
Maximum TOW	259,000/268,000/298,000 kg	570,988/590,829/656,966 lb
Performance		
Typical cruise speed	Mach 0.85	Mach 0.85
Range with maximum passengers	15,860/15,000/14,800 km	8,550/8,100/8,000 nm
Propulsion		
A350-800	(2)	Rolls-Royce Trent XWB turbofan engines rated 352 kN (79,000 lbst) each.
A350-900	(2)	Rolls-Royce Trent XWB turbofan engines rated 374 kN (84,000 lbst) each.
A350-1000	(2)	Rolls-Royce Trent XWB turbofan engines rated 414 kN (93,000 lbst) each.
Seating		
A350-800		270 passengers in three-class configuration.
A350-900		314 passengers in three-class configuration.
A350-1000		350 passengers in three-class configuration.

Airbus A350 XWB

Variants/Upgrades

A350-800. The A350-800 seats 270 passengers in a three-class configuration, and has a range of 8,550 nautical miles. Service entry is planned for mid-2014.

A350-900. The A350-900 is slated to be the first A350 XWB version to enter service, with deliveries planned to begin in mid-2013. It accommodates 314 passengers in three classes, and flies up to 8,100 nautical miles.

Besides the basic passenger model, the A350-900 will also be available in two additional versions: an ultra-long-range model called the A350-900R and a freighter version dubbed the A350-900F. Service entry of the

-900R is planned for 2016, while service entry of the -900F is targeted for 2017. These two models incorporate the engines and the structure of the A350-1000. The -900R is able to carry approximately 310 passengers over a range of 9,500 nautical miles. The -900F has a payload of 90,000 kilograms (198,413 lb), which it can carry over ranges in excess of 5,000 nautical miles.

A350-1000. The A350-1000 is slated to enter service in late 2015. This model seats 350 passengers in three classes. Range is 8,000 nautical miles.

Program Review

Background. Airbus initially announced the A350 in 2004 as a derivative of the A330. It was the European firm's response to Boeing's new 787 Dreamliner. The latter aircraft had been chalking up orders at (for Airbus) an alarming rate, leaving Airbus with little option but to launch either an improved spin-off of an existing model or an all-new design. At first, the company chose the former approach.

The A350 was originally slated to become available in 2010, two years after the then-planned service entry of the 787. The order book grew slowly; however, and it soon became clear that the market favored the new Boeing type.

Since it was first announced, the A350 design underwent progressive changes. Initially conceived as a close derivative of the A330 but with longer range, subdued airline response led Airbus to rethink the design concept. The A350 eventually became much more of a new design, though it was still clearly a member of the A330/A340 family.

Back to the Drawing Board

Following some very public criticism of the A350 from potential customers in early 2006, Airbus went back to the drawing board. In July 2006, Airbus announced the A350 XWB, an all-new design. Compared to the previous A350 design, the XWB has a 12-inch wider fuselage, new engines in the 74,000-93,000 lbst range, and other changes. Maximum cruise speed was boosted to Mach 0.85.

However, as initially proposed, the A350 XWB design also received some criticism. At first, Airbus had adopted a hybrid design approach to the XWB fuselage structure with carbonfiber fuselage panels attached to aluminum frames. The company felt that this configuration would save weight as well as help with electrical conductivity.

This approach, though, was questioned by two potential A350 XWB customers: International Lease Finance Corp (ILFC) Chairman Steven Udvar-Hazy and Emirates President Tim Clark. Udvar-Hazy believed that the hybrid design would result in higher maintenance costs compared to an all-composite fuselage, and the ILFC chief began pressing Airbus to change the design.

In September 2007, Airbus revised the A350 XWB design, switching from aluminum frames to carbonfiber fuselage frames. The company also reshaped the nose section of the XWB; the nose section will be constructed of aluminum lithium.

Three-Year Slippage

The A350 XWB was formally launched in November 2006. Service entry of the XWB is planned for 2013. If met, this translates into about a three-year delay from the originally planned in-service date of 2010.

Airbus A350 XWB

Related News

Joint Venture to Build A350 Elevators – In January 2010, Harbin Hafei Airbus Composite Manufacturing Centre Company Ltd, a joint venture between Airbus and Chinese partners, signed a contract with the Spanish company Aernnova Aerospace SAU to supply elevators for the A350 XWB. Aernnova is an aerostructures supplier to Airbus.

Under the contract, the Manufacturing Centre will become the sole supplier of A350 XWB elevators to Aernnova. The center is responsible for manufacture and assembly of the complete set of elevators, which are part of the A350's horizontal tail plane. Production in China is scheduled to start in 2012 following an initial industrialization phase in Europe.

Following an agreement for the A350 rudder and S19 maintenance door, the elevator is the third A350 work package allocated to the Manufacturing Centre.

"We are very proud to have obtained another work package from Airbus for the A350 XWB program and to start cooperation with Aernnova," said Liu Guanglin, Chairman of the Manufacturing Centre. "The building of the new facilities is on track and the training of Chinese staff is under way. We are confident in our ability to deliver the aircraft components on time and on quality."

Harbin Hafei Airbus Composite Manufacturing Centre is a joint venture between Airbus China (which holds 20 percent of the entity) and a group of Chinese partners comprising Harbin Aircraft Industry Group Corp Ltd (50 percent), Hafei Aviation Industry Company Ltd (10 percent), AviChina Industry & Technology Company Ltd (10 percent), and Harbin Development Zone Infrastructure Development Company Ltd (10 percent). The Manufacturing Centre began production of elevators for single-aisle Airbus aircraft in December 2009. By the end of 2010, it is slated to begin producing major components for the A350 XWB program.

In November 2007, Airbus had signed a Memorandum of Understanding with the National Development and Reform Commission of China to formalize a commitment to manufacture 5 percent of the A350 XWB airframe in China. (Airbus, 1/10)

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Funding

Development cost of the A350 XWB is estimated at EUR10 billion (\$13.7 billion). Airbus hopes that risk-sharing suppliers will take on EUR1.8 billion (\$2.5 billion) of the development cost.

Contracts/Orders & Options

(As of February 2010)

Operator	Designation	Quantity	Phase
Aer Lingus	A350-900	6	On Order
Aeroflot Russian Airlines	A350-800	18	On Order
Aeroflot Russian Airlines	A350-900	4	On Order
Afriqiyah Airways	A350-800	6	On Order
AirAsia X	A350-900	10	On Order
AirAsia X	A350-900	5	Option
Aircraft Purchase Fleet	A350-800	12	On Order

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Operator	Designation	Quantity	Phase
Aircraft Purchase Fleet	A350-800	12	Option
ALAFCO	A350-800	12	On Order
Asiana Airlines Inc	A350-1000	10	On Order
Asiana Airlines Inc	A350-800	10	On Order
Asiana Airlines Inc	A350-800	10	Option
Asiana Airlines Inc	A350-900	10	On Order
AWAS	A350-800	2	On Order
Bangkok Airways	A350-800	4	On Order
C Jet Ltd	A350-900 Prestige	1	On Order
China Airlines Ltd	A350-900	14	On Order
China Airlines Ltd	A350-900	6	Option
CIT Leasing	A350-800	5	On Order
CIT Leasing	A350-900	2	On Order
DAE Capital	A350-900	30	On Order
Emirates	A350-1000	20	On Order
Emirates	A350-900	50	On Order
Emirates	A350-900	50	Option
Ethiopian Airlines	A350-900	12	On Order
Etihad Airways	A350-1000	25	On Order
Finnair	A350-900	11	On Order
Finnair	A350-900	4	Option
Hawaiian Airlines	A350-800	6	On Order
Hawaiian Airlines	A350-800	6	Option
International Lease Finance Corp (ILFC)	A350-800	12	On Order
International Lease Finance Corp (ILFC)	A350-900	8	On Order
Kingfisher Airlines Ltd	A350-800	5	On Order
Libyan Airlines	A350-800	4	On Order
MAZ Aviation	A350-800 Prestige	1	On Order
MAZ Aviation	A350-900 Prestige	5	On Order
Qatar Airways	A350-1000	20	On Order
Qatar Airways	A350-800	20	On Order
Qatar Airways	A350-900	40	On Order
Singapore Airlines Ltd	A350-900	20	On Order
Singapore Airlines Ltd	A350-900	20	Option
Synergy Aerospace	A350-800	10	On Order
Synergy Aerospace	A350-800	10	Option
TAM Linhas Aereas SA	A350-800	12	On Order
TAM Linhas Aereas SA	A350-800	10	Option

Airbus A350 XWB

Operator	Designation	Quantity	Phase
TAM Linhas Aereas SA	A350-900	10	On Order
TAP Portugal	A350-800	12	On Order
TAP Portugal	A350-800	3	Option
Tunisair	A350-800	3	On Order
Unidentified	A350-900 Prestige	1	On Order
US Airways	A350-800	18	On Order
US Airways	A350-900	4	On Order
Vietnam Aircraft Leasing Company	A350-900	10	On Order
Yemenia - Yemen Airways	A350-800	10	On Order

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Nov	2004	EADS grants Airbus tentative approval to begin marketing the A350
Oct	2005	Formal launch of initial A350
Jul	2006	New A350 XWB announced
Nov	2006	Formal launch of A350 XWB
Dec	2008	Detailed definition of A350-900 frozen
Dec	2009	Detailed definition of A350-800 frozen
Early	2012	Planned first flight
Mid-	2013	Planned service entry of A350 XWB

Forecast Rationale

Although order intake was significantly below that of the previous year, the A350 XWB order book did continue to grow in 2009, which was a very difficult year in the airline industry. Airbus recorded 27 orders for the A350 XWB family in 2009, compared to the 2008 order total of 186. Taking into account five cancellations, net A350 orders for 2009 amounted to 22, all for the A350-900 variant.

At the end of 2009, total orders for the A350 XWB series numbered 505, including 182 A350-800s, 248 A350-900s, and 75 A350-1000s. Not reflected in these totals was a late 2009 Letter of Intent from United Airlines for 25 A350-900s and purchase rights for 50 more -900s.

A350-800 Design Change

Airbus froze the detailed definition of the A350-800 in December 2009. Prior to achieving this milestone, though, Airbus decided to adjust its development focus for this variant. The firm had originally intended to optimize the -800 design through the incorporation of

various changes, such as to the aircraft's structure and landing gear. However, with the approval of its customers, Airbus chose in 2009 to drop this approach (which was not resulting in the expected benefits anyway), and simplify the development program by deriving the -800 directly from the A350-900 model, the lead variant in the XWB series. The result is an A350-800 that provides significantly more range than the original -800, and increased commonality with the -900.

The -800 is now being developed essentially as a shrunk version of the -900, with identical structure and landing gear. The powerplant for the new -800 is an updated, 79,000-lb_{st} Rolls-Royce Trent XWB, replacing the 75,000-lb_{st} Trent XWB of the older design.

Compared to the earlier -800, the new -800 version can provide a range increase of 460 kilometers (250 nm), or a payload increase of 3 metric tons. Maximum takeoff weight is increased by 11,000 kilograms (24,250 lb), to 259,000 kilograms (570,988 lb). Seating capacity

Airbus A350 XWB

remains the same, at 270 passengers in a three-class configuration. The revision in the -800 design does come with a fuel burn penalty of a few percentage points. The design change has not resulted in any revision to the -800's planned service entry date of mid-2014.

Airbus has also decided to offer an optional, lower-weight version of the -800, powered by a derated, 74,000-lb-st Trent XWB. Maximum takeoff weight of the optional -800 version is 248,000 kilograms (546,737 lb), the same as that of the original -800 model. Range is slightly less than that model's 15,400 kilometers (8,300 nm). Seating capacity is the same as that of the standard -800 variant.

Definition freeze for the A350-900 occurred in late 2008, while definition freeze for the A350-1000 is scheduled to take place by the end of 2010.

Flight Test Program

First flight of the A350 is scheduled for early 2012. This aircraft will be a -900 model. Airbus intends to utilize five aircraft in the flight test program, all of which are planned to get into the air within a couple of months of each other. The 3,000-hour flight test program is slated to last 15 months. The sixth flyable A350 is to be the first aircraft to be delivered to a customer.

To aid in the development effort, Airbus also intends to build two ground test articles. One is to be used for static testing, which is due to begin in late 2011, and one is for fatigue testing, which is slated to get under way in early 2012.

Service Entry Delay?

Various press reports appeared in late 2009 and early 2010 indicating that the A350 effort has been falling behind schedule, and that a postponement in service entry of the aircraft of anywhere from six months to two years is possible. The various reports, unconfirmed by Airbus, have cited such difficulties as aircraft weight issues and delay in the release of engineering data to suppliers.

Airbus, for its part, is sticking to its program schedule calling for service entry of the A350 in mid-2013. In developing the A350, Airbus does have the benefit of being able to study, and learn from, the problems recently experienced on its own A380 program and Boeing's 787 effort.

Nevertheless, it would not be unusual for an all-new airliner to encounter some schedule delay, particularly an ambitious project such as the A350. Our forecast

incorporates a slip of 12-18 months in service entry of all three versions of the A350.

Airbus' production plan for the A350 calls for a ramp-up to a build rate of 10 aircraft per month, with a contingency to go to 13 per month should market conditions dictate.

Competing with the 787 and 777

Rather than simply design a direct competitor to the Boeing 787, Airbus has smartly and ambitiously positioned the A350 XWB to compete with both the 787 and various models within Boeing's 777 series. The XWB covers much of the capacity/range spectrum represented in the Boeing product line by the 787 and the 777, thus aggressively targeting a wide (and critical) swath of the Boeing widebody product line.

Indeed, it can be argued that, of the three A350 versions, only the A350-800 is actually a direct competitor to the 787, competing for sales against all of the current 787 models: the 787-3, the 787-8, and the 787-9.

On the other hand, both the A350-900 and the A350-1000 have the 777 in their sights and, in fact, constitute Airbus' first direct challenge to the popular Boeing twinjet. The A350-900 is targeted at the replacement market for A340s, MD-11s, and early 777s. It competes for sales against the 777-200ER and, to some degree, the 787-9.

Already, availability of the A350-900 appears to be impacting 777-200ER sales. During the 2008-2009 time period, Airbus recorded 109 orders for the A350-900, while Boeing garnered only 18 for the 777-200ER.

John Leahy, Airbus chief operating officer (customers), has referred to the A350-900 as a "777-200ER killer." In order to shore up its presence in this portion of the market, Boeing could launch a stretched version of the 787.

Meanwhile, the A350-1000 competes for sales against the 777-300ER. Over the past two years, the 777-300ER has outsold the A350-1000, but the potential of the new Airbus model has Boeing looking at ways in which it can improve the 777. For the near term, Boeing may settle for incremental improvements in 777-300ER operating efficiency and performance. For the longer term, though, Boeing could decide to launch a new 777 variant or perhaps even an all-new aircraft family to replace the 777 series.

Airbus is also developing two specialized variants of the A350-900. The A350-900R ultra-long-range version is

Airbus A350 XWB

targeted for service entry in 2016, while the A350-900F freighter is scheduled to enter service in 2017. The -900R competes for sales with the 777-200LR, while the -900F competes against the 777 Freighter.

The VIP Market

Airbus is supplementing airliner sales of the A350 by marketing a VIP version of the aircraft called the

A350 XWB Prestige. As of February 2010, Airbus had garnered eight orders for the Prestige, including one for an A350-800-based Prestige model and seven for A350-900-based Prestige aircraft. Prestige sales could total as many as 50 or so aircraft over the next 10 years.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Airbus France												
A350 -1000 <> Trent XWB												
	0	0	0	0	0	0	1	4	18	33	41	97
A350 -800 <> Trent XWB												
	0	0	0	0	0	1	7	26	41	45	52	172
A350 -900 <> Trent XWB												
	0	0	0	1	4	4	24	40	61	60	59	253
Subtotal	0	0	0	1	4	5	32	70	120	138	152	522
Total	0	0	0	1	4	5	32	70	120	138	152	522

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