

# Airbus and the Dreamliner

In December 2003, Boeing's board authorized the commercial launch of the 7E7 Dreamliner, a 200/300-seat long-range design aimed at replacing the company's 757/767 series. Making use of composite primary structures and other innovations, the 7E7 offers the prospect of a major product line rejuvenation for Boeing, and an opportunity to retake the technological initiative from Airbus. If an industrial launch decision is made in mid-2004, the new family could enter service in 2008.

Assuming the 7E7 goes ahead, it creates several issues for Airbus, currently focused on bringing its 550-seat A380 super jumbo to market. Although Airbus disputes the size of the 7E7's market, and possibly some of the funding behind it, the new airplane could make a competitive response by Airbus imperative. But until the 7E7 is launched, Airbus has a window of opportunity to derail the program before it firms up.

### The competitive response

Much of the appeal of the 7E7's business case depends on the current debate over air route fragmentation. With the 7E7, Boeing is clearly betting on increased numbers of thinner, longer range routes that reflect greater market choices for international carriers.

Airbus does not deny this trend, but also points out that, because of localized growth, many markets are not vulnerable to geographic fragmentation, and large air-

craft such as its A380 will absorb an equally important share of the market.

Boeing estimates a 20-year market for 2,500-3,000 7E7-sized aircraft, while Airbus thinks the middle market is closer to 1,800 planes.

Yet curiously enough, the Airbus view of the market would seem to justify a 7E7 go-ahead. Airbus says the 7E7 would probably get half the market, about 900 planes. That production rate—45 per year—is close to the maximum rate yet achieved by any Airbus widebody. And as a very conservative "worst-case" scenario, it ought to sound respectable to Boeing and its partners.

Boeing's new emphasis on the middle market could place Airbus in a difficult position. Right now, Airbus is spending heavily on its A380 super jumbo, due to enter service in 2006. Hence, despite Airbus' history of aggressive new product development, any new Airbus response to the 7E7 would have to wait until A380 spending ramps down, in 2006 or 2007. Assuming that a program is launched at that time, with an all-new composite aircraft arriving around 2011, this would give the 7E7 about three years alone on the market.



Airbus is currently concentrating on bringing its 550-seat A380 to market.

### The A330 question

Although three years is not a particularly big window of opportunity, there is still the matter of the A330-200. This 250-seat shrink of the 300-seat A330-300 is relatively young, having entered service in April 1998. It is also quite successful. While it should suffer from all of the disadvantages associated with a shrink—the operator is paying for the wing and systems associated with a plane that normally holds more revenue-paying passengers—it has proven remarkably popular, particularly in Asia and with operating lessors GECAS and ILFC. Airlines seem willing to pay for its range advantage over the Boeing 767.

The A330 backlog, as of early 2004, is around 180 planes, mostly for the -200 version, and any new Airbus product launch in this segment would truncate this successful aircraft's life.

Airbus' initial answer to this conundrum was straightforward. They said it would be relatively easy to take new systems developed for the 7E7, particularly the new engines, and apply them to an upgrade of the A330-200 airframe. This new variant would probably not cost more than



The 7E7 may offer Boeing the opportunity to retake the technology initiative from its major competitor.

\$1 billion to develop, and could be brought to market within a few years of the 7E7's arrival, if not before.

And of course, Boeing reliance on its vendor base for 7E7 partnership financing should make these systems suppliers unwilling to reach contractual exclusivity agreements with Boeing. The systems would be available for Airbus.

Nevertheless, there are problems with this solution. For one, Boeing is developing the 7E7 with unique features that could make systems difficult to use on traditional aircraft. Boeing has a history of using this tactic—the 777, for example, was developed with ground clearance that allowed the use of very high bypass turbofans like General Electric's GE90. These engines' fans were too large for use under an A330 wing.

Most specifically, the 7E7 will be an all-electric design, with no need for bleed air. Adapting a large turbofan for a traditional airframe might prove expensive. But in any case, at the time of the 7E7's commercial launch, Airbus had changed its stated plan, saying that the current A330-200 would need only minor upgrading to make it competitive with the 7E7. It also pointed out that with few up-front costs associated with its plane, it would have greater price flexibility, giving them the ability to entice potential 7E7 customers with a lower-priced alternative.

Of course, there is still no way of knowing the 7E7's actual operating cost advantage over the current Airbus jetliner. Presumably, the big investment in composite materials and other technologies would produce double-digit results.

Another problem for Airbus could be that any A330-200X's operating cost difference with the 7E7, however slight, could be enough to obtain market victory. Since airline operating margins are razor-thin, a few percentage points better performance could make all the difference between profit and loss.

That assumes, of course, that Boeing is able to amortize development costs over a relatively long production run, and give itself the pricing flexibility necessary



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for the 7E7 to compete with the A330-200X's lower price tag. Given Boeing's ongoing emphasis on the short-term bottom line, Airbus may indeed have a price advantage.

### The funding issue

A major component of the 7E7 industrial plan depends on Japanese funding, much of it coming from the industry level. Airbus has indicated that it might challenge the legality of this plan.

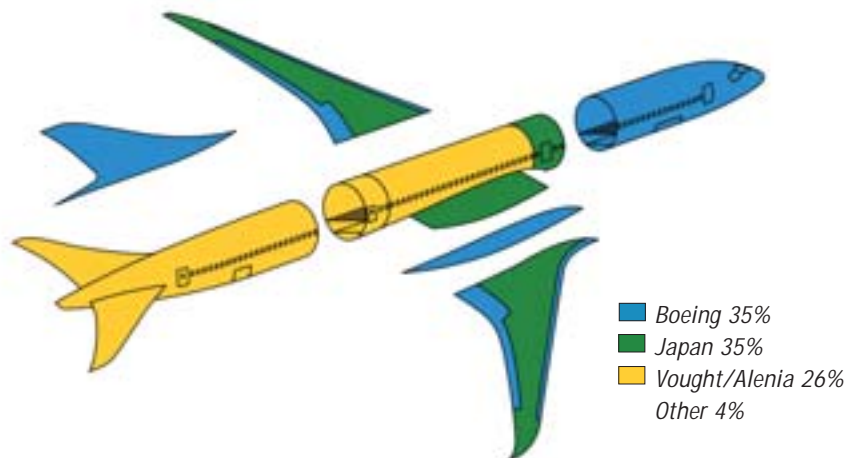
Current plans call for Japanese industry to take a 35% stake in the 7E7. The Japan Aircraft Development Corporation will provide 35% of the 7E7 structure, including the wing. Main companies will include Mitsubishi Heavy Industries (responsible for the main wing box), Fuji Heavy Industries (center wing box, integration of the wing box and main landing gear wheel well), and Kawasaki Heavy Industries (remainder of forward fuselage,

main landing gear wheel well, main wing fixed trailing edge). Nippi and ShinMaywa will also be involved. Japan's Toray is expected to supply much of the composite material for these contractors.

Total up-front expense of Japanese 7E7 involvement is expected to amount to \$2.3 billion. But over two-thirds of this—some \$1.6 billion—will be paid for by repayable government loans similar to those provided for Japanese industry's 777 industrial share. In fact, the 2004 Japanese government budget, approved in December 2003, allocated the first \$25 million for this effort. The government plans to increase this yearly funding considerably as soon as the 7E7 program receives an industrial launch.

The legality of large jetliner development funding is extremely complicated. A gross simplification would look something like this: In 1992, the U.S. and European Union signed a bilateral agree-

### 7E7 STRUCTURES WORK SHARE



ment limiting such funding to one-third of any aircraft's total development cost.

In 1994, the U.S., EU, and most of the other industrial countries signed the World Trade Organization (WTO) accord that made these subsidies basically illegal. Any U.S. efforts to apply this 1994 accord to the Boeing-Airbus arena have met the response that the 1992 bilateral clearly takes precedence, and is not superseded by a later multilateral agreement.

Yet Japan, of course, was not part of the U.S.-EU bilateral agreement. Boeing's biggest single 7E7 partner might conceivably be obligated, therefore, to adhere to the more stringent 1994 WTO accord, even if Airbus itself were exempt.

Boeing has no obligation to defend itself or Japanese industry from these charges; they have merely recruited a risk-sharing partner that will find funding any way it deems necessary. Therefore, any Airbus legal action would have to be directed at Japan itself, which might be problematic for reasons of customer relations and diplomacy.

Still, due to the quirky nature of the international treaties covering jetliner development funding, it is entirely possible that Airbus might have some legal grounds to object to Japan's 7E7 funding plan. On the other hand, the history of successful WTO complaint action in aerospace is extremely limited, due to the difficulty of proving damages or injury until well after the fact. Usually, it merely results in a re-configuration of the funding or loan in question.



The 7E7 is meant to replace Boeing's 757/767 series.



### Parry and riposte

In all, Airbus's responses to Boeing 7E7 can be summarized as follows: First, there is inadequate market demand; second, due to the likelihood of a strong Airbus competitive response, the 7E7 is unlikely to take a particularly large part of this market demand; and finally, some international government money going into this project may be illegal.

Although none of these responses should prove debilitating to the project by themselves, it is important to remember that the target audience for these messages isn't just airlines. Rather, the primary objective may be Boeing's board, the investors they represent, and other industrial partners.

Boeing Commercial's noncontract research and development budget (what it spends on new jetliner development) has remained stalled since the 777 program was completed in the mid-1990s. Over the past six years it has stayed below

\$800 million, enough for the development of minor variants of existing aircraft families, but nowhere near the amount needed for an all-new design. In fact, as a percentage of sales, 2002 and 2003 non-contract research expenditures hovered near an all-time low—\$768 million and \$698 million, respectively.

To reach the current level of anticipated 7E7 funding—\$4.2 billion—and to meet other product line obligations, Boeing needs to increase this level to at least \$1.4 billion per year, starting with the 7E7's launch. Simultaneously, the company needs to convince its other industrial partners, including the Japanese companies, Italy's Alenia, and Vought Aircraft of Texas, to spend at least \$3 billion to \$4 billion of their own money.

If any of these partners balk, Boeing will face additional pressure to increase its own level of funding. This funding plan may not survive intact, particularly if Airbus convinces one or more of the players that the end result is not worth the up-front expense.

Therefore, until the 7E7 receives a firm industrial launch, with a commensurate commitment of financial resources by all partners, the very business plan itself is vulnerable to Airbus's comments. The coming months will see additional Airbus concepts and maneuvers designed to undermine confidence in a program that is by no means a done deal.

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<b>April 1998</b>	A330-200 enters service
<b>December 2000</b>	Airbus launches A380
<b>March 2001</b>	Boeing announces Sonic Cruiser
<b>December 2002</b>	Boeing shelves Sonic Cruiser
<b>January 2003</b>	7E7 plan announced
<b>December 2003</b>	Boeing board authorizes 7E7 offer to airlines
<b>Mid-2004</b>	Anticipated 7E7 industrial launch
<b>March 2006</b>	Anticipated A380 service entry
<b>December 2007</b>	Anticipated 7E7 first flight
<b>December 2008</b>	Anticipated 7E7 service entry