



*89 out of 124 (72 percent) of the in-production engines have greater than 10 percent margin to the proposed (or CAEP/4) NO_x standards. 56 (45 percent) of the engines have more than 20 percent margin. 18 (15 percent) of the engines have greater than 30 percent margin.

The recent FESG analysis indicates that the environmental benefit (or NO_x emissions reduction) of applying the CAEP/4 NO_x standards to already certified engines, which would only affect these 4 remaining engines, would be very small. As mentioned earlier, the remaining four already certified (or in-production) engines that perform worse than the CAEP/4 or proposed standards are the following Pratt and Whitney (PW) mid- and high-thrust engines: JT8D-217C, JT8D-219, PW4084D, and PW4090. The in-production JT8D-217C and JT8D-219 engines could potentially apply to future supersonic business jets, and the aircraft application for PW4084D and 4090 engines would be the Boeing 777-200s and -300s. Since business jets have a very low utilization (about 100 to 200 annual departures per aircraft), the emission reductions from potential new JT8D-217C and JT8D-219 applications would be very small regardless of the size of the supersonic business jet market. If the potential JT8D-217C and JT8D-219 supersonic

business jets were to capture the entire projected supersonic business jet market (200 to 400 aircraft over a 10 year period or 20 to 40 aircraft per year), the total estimated annual departures would be about 2,000 to 8,000. For the years 2005 and 2010, there are estimated to be from 23 to 27 million departures from the global passenger aircraft fleet (the potential supersonic business jet market could potentially be about .01 to .03 percent of these global fleet departures), so the resulting NO_x emission benefits would be very small.¹⁰⁴ In regard to Boeing 777 aircraft with PW4084D/4090 engines, the incremental departures for such aircraft are projected to be no greater than 0.1 percent per year (up to 25,500 departures in 2010); therefore, the resulting NO_x emissions reductions would also be considered very small. (The FESG assessment also showed that the costs of applying the CAEP/4 standards to already certified engines would be relatively small on an industry

¹⁰⁴ CAEP Steering Group Meeting, "FESG Economic Assessment of Applying a Production Cut-Off To the CAEP/4 NO_x Standard", Presented by the FESG Co-Rapporteurs, Paris, September 10-13, 2002 (CAEP-SG20022-WP/20, September 12, 2002). In particular, see Table 5.1 entitled, "Excerpt from FESG CAEP/5 Traffic and Fleet Mix Forecast." A copy of this paper can be found in Docket OAR-2002-0030.

wide basis.)¹⁰⁵ Consequently, we would expect there to be minimal environmental benefit to also apply the proposed and CAEP/4 NO_x standards for newly certified engines to already certified, newly manufactured engines for an effective date after 2003 (the implementation date of today's proposed standards is December 31, 2003).

Also, if an already certified engine design meets the standards that we are proposing today, then it is unlikely that either existing or future engine designs built to that design or type (derivatives or thrust variants with the same build standard) would not meet these standards. When design modifications are made to an existing engine type, then this engine type would likely need to be re-certified. A re-certified engine type would be required to comply with the CAEP/4 and new proposed NO_x standards.

For the remaining 4 engines (or two engine families) being built that do not meet the CAEP/4 standards, Pratt and Whitney has other in-production engine models (potentially derived versions or thrust variants of engines with the same

¹⁰⁵ The costs of applying CAEP/4 standards to already certified engines would impact just one engine manufacturer.