contains 10 percent or less by mass hydrochlorofluorocarbon in the blowing agent portion of the foam insulation. According to section 325(o)(2)(B) of the Act, the Department must consider a number of concerns when determining whether the benefits of a standard exceed its burdens. The Department believes that by establishing separate classes for HCFC-free products, industry will be encouraged to develop products which are environmentally benign.

For the HCFC-free full sized refrigerator products, the Department recommends standards which would permit 10 percent greater energy use than the comparable HCFC-using classes. The 10 percent relaxation for HCFC-free classes, however, does not apply to the compact classes, because this would result in standards that are less stringent than those standards now in effect. This is prohibited by section 325(o)(1) of the Act. Instead, for the compact classes, the HCFC-free standards are proposed to be identical to the 1993 standards.

2. Standards. Section 325(o)(2)(A) of the Act specifies that the Department must consider, for amended standards, those standards that ''achieve the maximum improvement in energy efficiency * * * which the Secretary determines is technologically feasible and economically justified.''

a. Standard Level 4. The Department first considered the max tech level of efficiency, i.e., standard level 4 for amended refrigerator, refrigerator-freezer, and freezer standards. Standard level 4, max tech, would save the most energy: 10.0 quads (10.55 EJ) for refrigerators (including refrigerator-freezers) and 2.0 quads (2.11 EJ) for freezers between 1998 and 2030. In order to meet this standard, the Department assumes that all refrigerator products would incorporate vacuum panel insulation. The use of vacuum panel insulation accounts for 30 percent of total energy savings, with increasing wall thickness as the only alternative. Vacuum panel technology has progressed, but it is not ready to be applied as a reliable design option in the production of a 1998 compliant product. There are concerns about manufacturability, availability, reliability, and performance. Vacuum panels are 6 to 10 times heavier than foam. The increase in door weight may cause the appliance to tip over when the door is opened. Also, current production capability for vacuum panels is far too small for the projected demand. A 1-inch increase in wall and door thickness (a 2-inch increase in the side-to-side dimension) is not a viable option. Too many products are already constrained by the need to fit into existing spaces and through doors and passages. Decreasing interior volume would sacrifice product utility. In addition, because standard level 4 is beyond the minimum life cycle point, there are likely to be some consumers who would experience net life-cycle cost increases compared to the units they would have otherwise purchased. Based upon a consideration of the above, the Department therefore concludes that the burdens of standard level 4 for refrigerators, refrigerator-freezers and freezers outweigh the benefits, and rejects the standard level.

b. Standards Level 3. This standard level is projected to save 8.6 quads (9.1 EJ) of energy for refrigerators and refrigerator-freezers and 1.7 quads (1.8 EJ) for freezers. While this level does not use vacuum panels, for most of the classes about 40 percent of the energy savings, compared to the base case, is obtained by increasing the insulation values. As indicated in the comments, there is general agreement that an increase in the wall thickness is not acceptable for many of the larger models in each class. This level has a payback periods as high as 25.5 years (much longer than the product life) and reduces refrigerator manufacturer short-run ROE from 7.3 percent to 5.8 percent, a reduction of 20 percent. For freezer manufacturers, short-run ROE drops from 7.3 percent to 4.7 percent, a reduction of more than 35 percent. Based on a consideration of the above, the Department concludes that the burdens of standard level 3 for refrigerators, refrigerator-freezers and freezers outweigh the benefits, and rejects the standard level.

c. Standard Level 2. This standard level is projected to save 7.8 quads (8.2 EJ) of energy for refrigerators and refrigerator-freezers, and 1.3 quads (1.4 EJ) for freezers. The payback at this level may be as long as 19.0 years, the expected life of the product. The initial burden on the manufacturers is also unacceptably high; short-run ROE for both refrigerators and freezers decreases from 7.3 percent to 6.2 percent, a reduction of 16 percent. Based on a consideration of the above, the Department concludes that the burdens of standard level 2 for refrigerators, refrigerator-freezers and freezers outweigh the benefits, and rejects the standard level.

d. Standard Level 1. During the period 1998–2030, the savings at this level are calculated to be 7.13 quads (7.5 EJ) of primary energy. In addition, the standard could have a positive effect on the environment by reducing the emissions of SO_2 by up to 1017 kt (1120 short tons) or by as much as 0.7 percent by the year 2030. Furthermore, the standard will reduce emissions of CO_2 by 540 Mt (595 million tons), or as much as 0.7 percent, over the forecast period.

The technologies that are necessary to meet this standard level 1 are presently available. The Department finds the level to be economically justified. The consumer payback of this standard level is 3.7 years for the representative class and no more than 9.2 years for any class. This standard is at or near the lowest life-cycle cost for all classes and is expected to result in a reduction in life-cycle cost of approximately $143 for the representative class. The proposed standard is also unlikely to affect adversely any identifiable group of consumers. Additionally, the standard is expected to have essentially no impact on the prototypical manufacturer's ROE of 7.3 percent.

The Department concludes that standard level 1 for refrigerator products saves a significant amount of energy and is technologically feasible and economically justified. The level 1 standards correspond closely to the standards proposed by the Joint Comments. (The Joint Comments standards will result in slightly more energy savings.) The Department proposes to amend the existing standards for refrigerator products to correspond to the standards agreed to by the Joint Comment parties. As discussed in the previous section, the Department agrees with the Joint Comment recommendation to relax the standards for full-sized HCFC-free classes of refrigerator products by 10 percent for a period of 9 years after publication of the final rule, but is proposing that the standards for the HCFC-free compact classes during the same period be the equivalent to the 1993 standards.

3. Effective Dates. The effective date of standards for the full-size refrigerator products (Classes 1–10 in the ''Product Classes and Effective Date Table'') is 3 years after publication of the final rule. The compact refrigerator product classes, Nos. 11–18, would also have an effective date of 3 years after publication of the final rule.

The HCFC-free refrigerators, listed in Product Classes 19–36, have more complex effective dates. The effective date for the HCFC-free standards will be the same date as for the other classes of products—3 years after the publication of the final rule. The effective date proposed for the HCFC-free classes is 3 years earlier than the suggestion in the Joint Comments, because section 325(o)(1) of the Act specifically prohibits the Secretary from specifying