energy in the operation of fossil-fueled furnaces and boilers. The AFUE descriptor for fossil-fueled units, as defined, deals with only the primary energy consumption (gas or oil) of an appliance, and therefore does not give the consumer a complete account of the overall energy and cost performance of the appliance. A survey of the yearly auxiliary electrical energy consumption and gas consumption of gas-fired furnaces, as published in the October 1993 GAMA Efficiency Certification Directory, showed that the auxiliary electrical energy consumption varies from approximately 2.0 to 6.5 percent of the gas consumption. Even though this energy consumption ratio is small, it is significant in cost to the consumer because electricity costs approximately four times more than gas. On the basis of AFUE alone, a consumer would not be able to compare the overall efficiency of two (or more) different models of fossil-fueled furnaces or boilers of comparable output capacity but with blower motors of different efficiencies and, hence, different costs. The proposed Energy Factor or Annual Efficiency will give the consumer the necessary descriptor for a more informed purchasing decision.

A second reason for having the proposed energy descriptors is to allow for the consideration of design options involving changes in auxiliary electric energy consumption in the Department's analysis supporting the energy efficiency standard rulemaking.

The definition of the F-factor in the 1993 proposed rule was intended to: (1) provide consumers with rating information which reflects annual operating cost, including electrical energy, so they can make informed choices when comparing several models or makes of fossil-fueled appliances; and (2) encourage manufacturers to make the most overall energy efficient appliance, the efficiency of which can be shown to the consumers with a meaningful energy descriptor. After reviewing the objections presented by commenters with regard to the proposed F-factor, the Department invites comment on an alternative formulation of the F-factor based on the ratio of costs. In particular, DOE invites comment on the NRDC suggestion that basing a multiplication factor on energy costs of electricity and fossil fuel to consumers rather than on source energy

ratio would be a more meaningful criterion in reflecting the overall energy efficiency of fossil-fueled appliances. This ratio may also give consumers a clearer grasp of the cost of operating their appliances.

The F-factor value of 3.37 in the 1993 proposed rule was based on historical values of power-plant-to-site energy ratios. More recent calculations, based on future projections in the "Annual Energy Outlook 1994'' (Energy Information Administration, DOE, DOE/ EIA-0383(94), January, 1994, Table A2), showed that a value of F=3.2 would be appropriate for the years 2000 through 2010. Average national electricity-tofuel price (as opposed to energy) ratios also were calculated for the same years, using the "Annual Energy Outlook 1994" (Tables A3 and A4). These price ratios were obtained by first calculating a weighted-averaged fuel price (for natural gas, LPG, and oil), then taking the ratio of average national electricity price to the weighted average fuel price. The weighted average price for the three fuels was calculated by weighting each fuel price by its yearly national residential space heating consumption (in quads per year). These calculations showed that the projected electricity-tofuel price ratio will vary from 3.46 in the year 2000 to 3.30 in the year 2010, and that the trend for this ratio will be toward less variation over time. Therefore, while some variation will exist in the price ratio over time (as cautioned by the NRDC in its testimony), the Department seeks comment on whether a nationwide price ratio of 3.36 will be valid for the next 10 to 20 years (determined by extrapolating for the year 2002 and price ratio remaining unchanged during that period). The actual ratio of electricityto-fuel price will not be the same across the U.S., but the use of a multiplevalued F-factor, as suggested by the Edison Electric Institute, would cause complications for manufacturers that sell the same appliance in different parts of the country. Using a single value is similar to the adoption of a national average outdoor temperature and a national average heating degreedays in the calculation for the heating seasonal efficiency and AFUE in the current test procedure.

The Department is seeking comment on the equations for the proposed Energy Factor and the Annual Efficiency

for furnaces and boilers that use fossil fuel as the primary source of energy, and a much smaller quantity of electrical energy for the auxiliary equipment (2.0 percent to 6.5 percent of the yearly gas consumption for gas furnaces; less than 1.0 percent for boilers). The F-factor should be applied to all types of source energy and to all types of space-heating equipment. As previously stated, the inclusion of the Ffactor in the proposed equations for these energy descriptors is to calculate the total cost of the fossil fuel energy and the auxiliary electrical energy consumed by the appliance. In this way, the consumers would have a more complete energy descriptor than the AFUE to compare the total cost of operating the appliance in their homes. This would also discourage the possible practice of running the air circulation blower longer during burner ignition and shut-off in order to obtain a slightly higher AFUE value, while actually consuming more electrical energy and thus, more overall energy. The Department believes the best information available to consumers to make an informed decision when purchasing a fossil-fueled appliance is an efficiency descriptor that will reflect the total cost of operating the appliance. The proposed energy descriptors do reflect that total cost to the consumer.

Based on the discussion above, DOE is seeking comment today on redefining the F-factor in the August 23, 1993, proposed rule as the ratio of national average price of electricity to the national average price of fossil fuel, on a common unit energy basis. In particular, DOE invites comment on use of value of 3.36 for the F-factor.

The Department solicits comment and information on the application of the proposed consumer energy cost factor to the auxiliary electrical energy consumption as a multiplication factor in the calculation of the proposed Energy Factor and the Annual Efficiency for fossil fuel heating appliances.

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