

sibilities in air pollution control. The proposition was that New York City would need 0.3-percent sulfur fuel. Philadelphia would need 0.6-percent sulfur fuel, and Chicago, 0.6-percent sulfur fuel. Previously, New York had proposed that they wanted to go to a 1-percent sulfur fuel. I am not a refining expert and perhaps if I make a mistake here Mr. Gammelgard can correct me, but my understanding is that to go from 1-percent sulfur fuel to 0.3-percent sulfur fuel in a single refinery might represent an increase in capital investment in refining equipment of the order of \$50 to \$100 million; the total investment running between \$150 and \$200 million, with an additional \$50 or \$100 million if you have to go from 1 percent to 0.3. Would this be a fair figure?

Mr. GAMMELGARD. In that ball park; yes. We are talking about desulfurizing heavy black fuel. The cost of desulfurizing home heating oils Nos. 1 and 2 is much lower. But the heavy black fuel is harder to desulfurize. It has more sulfur in it by far than the lighter fuels to begin with and it takes a lot more hydrogen and a lot more severe processing to get the sulfur out. If you start with two and a half or three and a half percent sulfur and you go down to 1 percent, one set of economics applies. If you want to get down to three-tenths of 1 percent, it really adds to the cost. I would say it probably would double the cost to go down to 0.3-percent sulfur.

Do I make myself clear? We are probably talking over a dollar a barrel in added cost to get down to three-tenths of a percent sulfur.

Mr. DADDARIO. Carry that a bit further so that we get it down to terms we understand. A dollar a barrel. How does that affect heating costs in the ordinary home? Can you bring it down that far?*

Mr. GAMMELGARD. Residual fuel would not be used in the ordinary home.

Mr. DADDARIO. Let us say a factory or apartment building.

Mr. GAMMELGARD. This would be big apartment buildings and public buildings. In the New York harbor barge market, the 2.2-percent sulfur residual fuel currently being sold there is probably selling for around \$2.25 per barrel. If the customer would have to pay another dollar a barrel to get down to 0.3 percent or if he has to pay 50 cents more per barrel to get down to 1 percent, the effect on heating costs would be in a direct ratio from the current level of around \$2.25 to either \$2.75 or to \$3.25, as the case might be. These economies, as I have said, do not hold for home heating oils because they can be desulfurized much more easily and at a much lower cost.

Mr. BELL. What effect would this have on your industry as compared with a competitor such as gas? Would it drive your type of fuel oil out of business as far as competing adequately with gas as a source of heat?

Mr. GAMMELGARD. It could well do that if you are talking about residual fuel made from domestically produced crude. The same economics do not hold for foreign-produced crude. The economics change. If you are talking residual fuel from domestic crude in a midwestern refinery, you might price yourself right out of competition with either gas or coal.

If you cannot sell the residual fuel oil due to sulfur specification problems, you could then hydrocrack this fuel into lighter products—which would probably be the route a lot of domestic refiners operating on domestic crude would take.

*See Appendix B, page 555, for additional information obtained from Consolidated Edison Company of New York, Inc.