

THE FUTURE OF HEAVY OILS

A talk by John H. Lichtblau, Research Director, Petroleum Industry Research Foundation, Inc., before the annual meeting of the National Oil Jobbers Council, Chicago, Ill. November 9, 1962

It is entirely fitting that the National Oil Jobbers Council should have a talk about heavy fuel oil on its agenda. For over 60% of the heavy fuel oil consumed in this country is sold to end-users by independent marketers such as yourselves. Hence, for you, residual fuel oil and the products blended from it, such as No. 4 and No. 5 oil, are of vital importance to the success of your businesses.

However, not all segments of the oil industry feel this way about residual fuel oil. Some regard it as just a by-product, the "bottom of the barrel", in short, something which has little economic significance. This attitude has its foundation in the facts of life of refinery technology and refinery economics. But while refiners can not be blamed for preferring to sell gasoline at nearly \$5 per barrel to No. 6 oil at \$2 per barrel, the U. S. market for heavy fuel oil is neither unimportant nor small. In fact, residual fuel oil is the third most important oil product consumed in this country; last year's total domestic sales of about 1.5 million barrels daily were more than twice as high as the combined U. S. kerosene and jet fuel demand and only about 20% less than total sales of distillate oil, the industry's second most important product. Last year residual oil sales also had a value of well over one billion dollars at the primary wholesale level and contributed some 12% to total primary heating consumption for all purposes in the U. S.

Thus the commodity we are speaking about is really of considerable importance, both to the oil industry and to the energy consuming public. Its future - since this is the subject of my talk - depends primarily on three things: imports, promotion and products research - the first to maintain and expand the supply of residual fuel oil, the second and third to maintain and expand the demand for it.

Let us first look at imports for they provide the basis of the entire residual fuel oil business east of California. In the 17 East Coast States where the bulk of all U. S. residual fuel oil is consumed, imports account currently for about 63% of the domestic consumption of this product. So you can see, for the heavy fuel oil marketers in that region the primary supply source is not in this country but offshore. In other words, they must either import more or stop selling.

In the Midwest the situation is different. Most heavy fuel oil consumed here is supplied by local refiners. But indirectly the Midwest, too, is somewhat affected by imports. For some of its supplies come from the Gulf Coast, by barge up the Mississippi river; and the availability and price of residual fuel oil at the Gulf Coast depends primarily on the volume of imports going to the East Coast.

The reason for the high ratio of imports to domestic production is well known. Domestic refiners are interested primarily in making gasoline and secondarily in kerosene and distillates but not at all in residual fuel oil. Most of them - particularly those east of California - look upon residual oil as nothing more than an accidental by-product - like the sawdust

in a sawmill operation. Consequently they have steadily reduced their yield of this product in order to produce more of those products whose price permits a profit margin. This reduction in yield and in output has occurred in all parts of the country, those affected by imports and those where imports play no part - even in California which has a surplus of residual fuel oil.

For some years predictions have been made that the decline in the domestic residual oil yield is about to level off. So far, there is no sign of this. The latest Bureau of Mines statistics show that in all but one of the Nation's thirteen refinery districts residual fuel oil yields in July 1962 were below those for a year ago. Furthermore, some Gulf Coast refiners have recently said they will cease making residual fuel oil next year. Of course, the decline in the yield is bound to level off at some point because the upgrading of residual oil is an expensive process which is being made somewhat less attractive by the current lower rate of growth, compared to the 1950's, in gasoline and distillate oil demands. But, the levelling-off point will not come this year nor next.

Thus, imports must rise, if only to offset the declining level of domestic production which during the first half of 1962 alone shrunk by the equivalent of nearly 4% of total residual oil production east of California.

As you know, the Government has restricted the importation of this commodity for the past three and a half years. This has caused the price of domestic residual fuel oil at the East Coast to rise by 20¢ to 35¢ above the imported product. Previously, the two sold of course at approximately the same landed

price. The wisdom of imposing these restrictions has been questioned many times and not only by those who have been personally affected by them. In 1959, for instance, the then Senator John F. Kennedy denounced the restrictions as "a completely unjustified, uneconomic and shortsighted action".

Certainly the domestic oil producers for whose protection the whole oil imports restriction system was imposed have not benefited from the limitation on residual oil imports, since the decline in the yield of this product started long before these limitations became effective and have continued unabated since then. Natural gas sales to commercial and industrial users may have benefited somewhat from the restrictions, but with an average annual growth rate of 6.6 % east of California, sales to these markets hardly need Governmental protection, nor have gas marketers asked for it.

The coal industry has of course been the driving force behind these restrictions. Yet, it would seem that coal's effort was considerably out of proportion with the attainable results. Total residual fuel oil imports are equal to only about 10% of total U. S. coal consumption but a large part of these imports do not compete with coal. Those of you who sell No. 4, 5 or 6 oil to residential and commercial users on the East Coast know that coal competition is quite insignificant in these markets. Similarly, most industrial users and quite a number of utilities are only equipped to burn one kind of fuel. Thus, it would appear that less than 3% of U. S. coal consumption is in active competition with imported residual fuel oil. It is to

protect this small fraction of its total market that coal insists on maintaining the imports restrictions.

The coal industry claims that its need to compete with imported residual oil on the East Coast affects its prices throughout the country. This may sound correct in theory but it does not seem to correspond to the facts. Coal prices at the minehead in the various regions do not all follow the same trend. In fact, they often move in divergent directions, reflecting differences in market conditions. Furthermore, most of the price reductions made to East Coast coal consumers in the last few years to meet residual oil competition have taken the form of rail freight reductions and, hence, did not affect prices at the minehead.

In short, the benefits of the imports restrictions for domestic energy producers are quite marginal. However, the negative effects of these restrictions on heavy fuel oil markets, such as supply dislocations, higher prices and market rigidities, are by no means marginal. In fact - and this is the reason why I have dwelt so extensively on this point - the level of residual fuel oil supplies is now primarily a matter of Government discretion rather than a function of market demand. And it will continue to remain so as long as we have the present restrictions.

Well, so much for the supply side of the heavy fuel oil business. Now, let us take a brief look at demand.

Residual oil is an under-boiler fuel, used primarily to heat water and generate steam. The demand for under-boiler fuel for commercial and industrial establishments and for utilities has risen sharply in the last ten years. But residual oil has not shared in this increase. In the regions east of the Rocky Mountains total residual oil consumption has remained virtually unchanged - except for short-term fluctuations - since 1950. During the same period natural gas consumption by commercial, industrial and utility users has risen by 150% while under-boiler coal consumption in these markets has grown by about 33%.

On the East Coast alone residual fuel oil consumption has grown by an average annual rate of about 1%. While this is better than its performance in inland areas, even on the East Coast residual has not been able to keep pace with the overall growth in under-boiler fuel demands.

Why this persistent lag behind other fuels? Part of the answer lies of course in the aforementioned import restrictions on the East Coast and the decline in domestic supplies in the inland regions.

Part of the answer lies in the price of the imported product. Contrary to some of the charges levelled against imported fuel oil, it is not "dumped" at the East Coast at whatever price it takes to undersell competitors but is sold at prevailing world market prices which are influenced not only by U. S. market conditions but also by such factors as the extremely rapid growth of residual fuel oil consumption in Europe and in Japan.

But there is still another reason for the persistent decline of residual fuel oil's share, namely the relative absence of product promotion and technical research. Psychologically this is probably due to the "by-product" attitude of a large segment of the oil industry. However, the marketers of competitive fuels have no such attitude towards their products. Consequently both the coal and gas industry are devoting considerable efforts and funds to promote and improve the utilisation of the fuels with which residual oil must compete. Thus, the coal industry has done much work towards erasing the image that coal is a major source of air pollution. Coal also seems to have achieved a technical breakthrough in the reduction of transportation costs. The planned coal slurry pipeline from West Virginia to New Jersey is expected to reduce the delivered cost of coal by at least \$3 per ton.

The gas industry, too, is very active in protecting and expanding its industrial and commercial sales which are far bigger in volume than its sales to residential users. In fact, interruptible natural gas sales to non-residential consumers, i.e. users with stand-by facilities for alternative fuels, have greatly contributed to the development of the residential market, by shifting some of the burden of the fixed pipe-line costs to off-peak non-residential users. Had the fuel oil industry been more successful in preventing the growth in interruptible gas sales to non-residential consumers, gas would undoubtedly have captured a smaller share than it did of the U. S. home heating market. Both industries also maintain large engineering staffs, modern research laboratories and are frequent institutional advertisers in industrial and trade publications.

All this gives coal and gas a competitive edge over oil which may be difficult to overcome. I don't wish to sound unduly pessimistic. Let me say therefore that total residual oil sales east of California are not likely to decline from their present level, unless the Government's import policy forces a reduction in supply.

But I am not at all sure that heavy fuel oil can share in the growth of this market, even on the East Coast and even if import restrictions were removed. The growth potential is there all right. Just look at residential space heating. In 1962 28% of all new residential dwelling units will consist of apartments in multi-family structures. Last year the percentage was only 24% and in 1960 it was 18%. Few of these multi-family structures will use light heating oil but many present potential markets for No. 4, 5 or 6 oil. Industrial production - and hence, industrial energy consumption - is also increasing at a rapid pace as are commercial fuel requirements. And the phenomenal growth of thermal power production is of course well known.

How much of this growth will go to heavy fuel oil? To judge from the recent past, very little. But in the oil industry the past has not always been a reliable key to the future. Right now, with domestic residual oil production declining and imports restricted, not much is done to develop the heavy fuel oil market in the United States. But some day - and I do not mean some day in the distant future - enough grass roots support will be generated to remove residual oil import restrictions, if not the de jure at least de facto. When that happens it is likely to

stimulate a lot of fresh thinking on the subject. Out of this may well come the realization that the market potential for the bottom of the barrel is really quite sizeable, and also the realization that to maximize crude oil production - which, after all, is the oil industry's principal source of earnings - it is necessary to have outlets not only for the top of the barrel but also for the bottom portions. Thus, importers and domestic marketers of heavy fuel oil have both a real stake in protecting and expanding the market for the industry's third largest product.