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RESIDUAL FUEL OIL AND ITS COMPETITORS

A Review of Developments in 1962
And the Outlook to End of 1963

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TOTAL U.S. CONSUMPTION*

Total domestic residual fuel oil consumption in the U.S. amounted to 1,340,000 barrels daily in 1962, virtually unchanged from the previous year, according to preliminary data by the U.S. Bureau of Mines (including subsequent Bureau of Census revisions) and the Oil Imports Administration:

Table I

Total U.S. Residual Fuel Oil Demand*

	1962 (000 bbls/daily)
Domestic Supplies	820
Imports	533
Inventory Increase[1]	- 13
	1,340

[1]. OIA data for East and Gulf Coasts, B of M data for other regions.

Regionally, declines were registered in all parts of the U.S. except the East Coast. Thus, on the West Coast domestic residual oil consumption fell by 9.8 per cent to 185,000 barrels daily in 1962 while in the interior areas of the U.S. (PAD Districts I and IV) and at the Gulf Coast (PAD District III) it declined by 2.6 per cent and 15.1 per cent respectively to 229,000 barrels daily and 56,000 barrels daily.

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* All consumption figures in this paper are exclusive of foreign trade bunkers and all import figures exclude bonded imports.

EAST COAST CONSUMPTION

On the East Coast, on the other hand, total domestic demand rose by 7.5 per cent to 827,000 barrels daily in 1962. A significant part of the increase was due to the fact that the weather on the East Coast was about 3.5 per cent colder than in 1961. The additional consumption, called forth by this drop in temperature is estimated at about 13,000 barrels daily. Thus, if weather fluctuations are eliminated, last year's East Coast consumption of about 814,000 barrels daily represented a 5.8 per cent increase over 1961. The increase was in contrast to the decline experienced in 1961 and brought East Coast consumption to a level slightly above the previous record figure of 1960.

Of the total 58,000 barrels daily increase in East Coast demand in 1962, 31 per cent were due to higher utility requirements, about 47 per cent to increases in industrial, residential and other demand, not caused by the higher degree days while, as stated earlier, the colder weather accounted for an estimated 22 per cent of the additional consumption.

EAST COAST SUPPLIES

New East Coast supplies from all sources came to 818,000 barrels daily in 1962, a 5 per cent increase from the previous year. The sources of supply were as follows:

Table II A

U.S. East Coast - New Residual Fuel Oil Supplies

	1962	1961 (000 bbls/daily)	% Change
Domestic Supplies			
Local Production	157	158	
Shipments from Gulf Coast	108	129	
Shipments from West Coast	13	13	
Other Domestic Supplies	10	10	
	288	310	- 7.1%
Foreign Supplies			
Quota Imports	511	444	
Other Imports for Domestic Use*	19	23	
	530	467	13.5%
Total New Supplies	818	777	5.0%

* Includes overland imports and shipments from Puerto Rico and unidentified sources.

Inventories

Since the 41,000 barrels daily increase in new supplies were not sufficient to meet all requirements, East Coast inventories were drawn down by 9,000 barrels daily during 1962, compared to an inventory increase of 8,000 barrels daily in 1961.

Table II B

U.S. East Coast - Total Indicated Residual Fuel Oil Demand

	1962	1961 (000 bbls/daily)	% Change
Domestic Supplies	288	310	
Imports	530	467	
Inventory Changes	9	- 8	
	827	769	7.5%

Source: Bureau of Mines and OIA.

As a result of the sharp decline in inventory, 1962 year-end stocks on the East Coast of 16.7 million barrels were the lowest on record since the first year (1927) for which they are reported by the O.I.A. At the January rate of consumption, the inventories were equal to about 13 days of consumption, compared to about 17 days the year before. Inventories at the Gulf Coast - a major supply source for the East Coast - were also at a record low last December.

Domestic Supplies

Among the East Coast's major domestic supply sources, both local refinery production and shipments from the Gulf Coast registered a record low for the post-war period in 1962. However, while East Coast production declined only fractionally last year, following sharp drops in each of the four previous years, shipments from the Gulf Coast, which had held fairly steady over the last few years, fell by over 16 per cent in 1962. The de-

cline in shipments from the Gulf Coast and the maintenance of local production in 1962 reflects partly the fact that residual fuel oil refinery yields at the Gulf Coast dropped from 6.6 per cent per barrel of crude oil in 1961 to 5.2 per cent in 1962, while at the East Coast the yield was maintained in both years at 12.9 per cent.

Imports

Since 1958, the last year before import restrictions were applied, East Coast residual fuel oil imports from all sources rose as follows:

1958 - 381,000 barrels daily
1961 - 467,000 barrels daily
1962 - 530,000 barrels daily

Thus, imports rose by 149,000 barrels daily during these four years. Inasmuch as total East Coast domestic supplies during the same period declined by 65,000 barrels daily, 44 per cent of the rise in imports from 1958 to 1962 went to offset the decline in domestic supplies.

Of last year's quota imports of 511,000 barrels daily, about 17,000 barrels daily (6.2 million barrels) represented advance drawings against import quotas originally reserved by the O.I.A. for the first quarter of 1963. The release of these quotas ahead of time, in order to avoid a fuel oil shortage during the exceptionally cold last quarter of 1962, necessitated the issuance of a supplementary import allocation of 6.5 million barrels, or 17,800 barrels daily on a yearly basis, in the first

quarter of 1963. This raised the total quota for the official imports year (April 1, 1962 - March 31, 1963) to nearly 525,000 barrels daily.

FOREIGN SUPPLY SOURCES

No major changes occurred among foreign supply sources of U.S. residual fuel oil but several existing trends gathered momentum, as the following percentage figures show:

Table III

Share of Foreign Supply Sources*
in Total U.S. Residual Fuel Oil Imports

	1962	1961	1960	1959	1958
Venezuela	50.3	48.4	49.4	43.8	40.5
N.W.I.	34.8	37.6	41.1	43.0	49.3
Trinidad	10.0	9.6	5.4	4.2	3.3
Others	4.9	4.6	4.1	9.0	6.9

* Excludes shipments from Puerto Rico and the Panama Canal Zone.

In 1962 Venezuela alone accounted for the first time for more than half of all U.S. residual fuel oil imports. The Caribbean Republic emerged only fairly recently as our principal foreign supplier; until 1959 its share of U.S. imports was smaller than that of the Netherlands West Indies (N.W.I.) which in the early 1950's shipped two and three times as much residual oil to the U.S. as Venezuela. The increase in Venezuela's share reflects largely the growth in the number and capacity of its refineries in the last five to six years, relative to those in

the N.W.I. Of course, the shift is of only marginal significance to Venezuela, since the N.W.I. refineries are run almost entirely on Venezuelan crude oil.

Of more significance to Venezuela is the rapid emergence of Trinidad as an important U.S. supply source. Not all the growth in Trinidad's oil shipments to the U.S. affects Venezuela since Trinidad has displaced primarily Mexico, the U.S.'s third largest supplier until 1959. However, the decline in Mexican shipments was less than the growth in shipments from Trinidad. Hence, the net effect is that total shipments from areas other than the Venezuela-N.W.I. area rose from 10.2 per cent in 1958 to 14.2 per cent in 1961 and 14.9 per cent in 1962. Venezuela shares partly in Trinidad's exports, since the island's principal refinery uses some Venezuelan crude oil. But the bulk of Trinidad's residual oil exported to the U.S. is made from local and Middle East crude oil.

The rising level of imports from Trinidad has of course an adverse impact on Venezuela whose traditional share of the U.S. residual fuel oil market is thereby being diminished. For the U.S. on the other hand, the slight diversification in foreign supply sources may be considered beneficial, since it lessens our dependence on the Venezuela-N.W.I. area for residual fuel oil supplies - a desirable development from the point of view of national security.

U.S. CONSUMPTION OF COMPETITIVE FUELS

Residual fuel oil's principal competitors - coal and gas - experienced significant increases in demand in 1962. In contrast to the unchanged total U.S. residual fuel oil demand, nation-wide competitive coal shipments (i.e. excluding consumption for coking purposes) rose by 6.6 per cent or 20 million tons, in 1962. All U.S. coal consuming regions, except the Pacific Coast, shared in this growth. Since most coal is consumed for purposes other than space heating, the increase in consumption reflected primarily coal's long-term growth rate, rather than the short-term effect of last year's colder weather.

U.S. natural gas consumption for industrial and commercial purposes - the principal market in which natural gas competes with bituminous coal and residual fuel oil - rose by 7 per cent in 1962 to 8.32 trillion cubic feet, according to preliminary Bureau of Mines data.

COMPETITIVE FUELS ON THE EAST COAST

On the East Coast competitive coal consumption rose to 107.1 million tons, an increase of 3.8 per cent over the previous year. This was the fourth consecutive annual increase. As in the earlier years, it was due primarily to the higher coal demand by steam-electric utilities. Coal shipments to utilities rose by 5 million tons, or 7.4 per cent, to an all time record of 72.3 million tons, according to the Bureau of Mines. (Actual

coal consumption by East Coast utilities increased by only 4.6 per cent, or 3.5 million tons, according to Federal Power Commission data, indicating that some of the shipments were used to build up utility coal stocks.)

East Coast natural gas consumption increased by 10 per cent last year to 1.26 trillion cubic feet. Included in this total are 243 million cubic feet of gas used as fuel by steam-electric utilities, an increase of 7.3 per cent over the previous year.

INTER-FUELS COMPETITION

United States

For the entire U.S., residual fuel oil's share of the market continued to decline since its consumption remained the same, compared to an increase of 6.6 per cent for competitive coal and 7.0 per cent for industrial and commercial gas. Thus on a nationwide basis, the rapid growth in the demand for under-boiler fuels is going entirely to coal and gas.

East Coast

On the East Coast which currently accounts for 62 per cent of total U.S. residual oil consumption (but only 36 per cent of domestic coal consumption) the situation was somewhat different in 1962. There, residual oil consumption rose by 7.5 per cent, compared to 3.8 per cent for coal and 10.0 per cent for gas, as mentioned before. However, in comparing oil's gain with that of the other fuels it must be kept in mind that some 1½ to 2 per-

centage points of that gain was due to the temporary factor of cold weather which did not significantly affect competitive consumption of the two other fuels. Furthermore, East Coast residual oil consumption had declined in both 1960 and 1961 so that last year's increase represented in part a recovery from the low level of the previous year. Competitive coal and gas consumption had registered increases in both previous years.

Thus, last year's increase in residual fuel oil consumption did not appear to reflect a long term trend. In fact, over the longer run the share of residual fuel oil in total East Coast consumption of competitive fuels appears to have significantly declined, as the following figures indicate:

Table IV

East Coast Consumption of Competitive* Residual Fuel Oil, Natural Gas & Coal 1958, 1962 (prelim.)

				Shares (on Btu basis)	
	1958	1962	Increase	1958	1962
Residual Fuel Oil (000b/d)	750.0	828.0	10.4%	33.3	31.2
Natural Gas (billion cft.)	845.0	1,256.0	48.6%	16.9	21.3
Coal (million tons)	98.9	111.2	12.4%	49.8	47.5
Total (trillion Btu's)	5,200.8	6,129.8	17.9%	100.0	100.0

Residual fuel oil figures exclude foreign trade bunkers and military imports; natural gas figures include only industrial, utility and commercial consumption; coal figures exclude coking consumption. Source: U.S. Bureau of Mines and OIA.

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*Comparability of the data is somewhat limited by the fact that

Thus, since 1958 - the last year before the imposition of import controls on residual fuel oil - consumption of this commodity has grown at a slower rate than did either of its competitors. By contrast, in the four previous years (1954-58) East Coast residual fuel oil consumption rose by over 15 per cent.

If we look just at steam-electric utility fuel consumption, where interfuels competition is most pronounced, the same general pattern may be observed: residual fuel oil's share has declined since imposition of the imports restriction, but registered a gain in 1962:

Table V

East Coast Steam-Electric Utilities - Share of Fuel Consumption

	1958	1961	1962
Residual Fuel Oil	17	15	16
Gas	9	10	10
Coal	74	75	74
	100	100	100

Source: Federal Power Commission

The perceptible decline in the over-all growth of residual fuel oil demand on the East Coast since 1958, compared to the four previous years, as well as the lag in its growth rate

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the gas quantities represent actual end-user consumption, the oil quantities represent indicated demand based on new supplies and stock changes, while the coal figures consist of shipments from the mine.

relative to its competitors since 1958, can be traced to a large extent to the restrictions through import quotas imposed on the commodity's principal supply source in 1959. The over-all figures also show that both in the short run and the long run coal's principal competitor on the East Coast is natural gas*, whose growth rate continues to outpace sharply that of the two other fuels, and not residual fuel oil.

FORECAST TO END OF 1963

Total United States

For 1963, the U.S. Bureau of Mines has forecast a total increase of 0.5 per cent in U.S. residual fuel oil consumption. For the same period the gas industry foresees a 5.5 - 6.0 per cent rise in U.S. gas consumption for commercial and industrial purposes, while the National Coal Association projects a 3.1 per cent increase in competitive coal consumption. Thus, on a nation-wide basis, residual fuel oil will continue to lose ground to its competitors. As in 1962, all PAD districts except the East Coast are likely to show an actual decline in consumption as well as a loss in market share.

East Coast

Residual fuel oil consumption in District I can be expected to register some increase over last year. However, given the

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* Only a very small percentage of the increase in competitive natural gas demand since 1958 is due to displacement of manufactured or mixed gas.

current import quotas, the relatively high level of conumption of last year and assuming normal weather conditions, the increase is likely to be a very modest one.

The import quota for the quota year April 1, 1963 - March 31, 1964 has been set at 575,000 barrels daily by the O.I.A. However, since slightly over 4,000 barrels daily of this quota had been advanced to importers in the first quarter of 1963, the actual imports available for the twelve months period are on the order of 571,000 barrels daily, or 208.4 million barrels. Under O.I.A. regulations 61 per cent of this quantity is to be imported during the last nine months of 1963. Thus, total quota imports during 1963 will be as follows:

Table VI

	000 bbls.	b/d
January - March (actual imports)	70,522	723,580
April - December (scheduled imports)	127,133	462,301
January - December	197,655	541,520

This is an increase of 30,000 barrels daily, or 5.9 per cent, over last year's quota imports. Additionally, approximately 13,000 barrels daily of residual fuel oil consumption generated last year by the colder than normal weather is available this year for consumption elsewhere, if normal weather conditions are assumed. These 43,000 barrels daily will be used for the following purposes: (1) to provide for the

necessary stock build-up from the unduly low levels of last December; (2) to compensate for last year's stock withdrawals which cannot be made this year; (3) to offset the expected decline in domestic residual fuel oil supplies; and (4) to meet any increase in demand over last year.

(1) The East Coast stock levels of last December, which were recognized by the O.I.A. as being too low, must be increased by at least 1.5 million barrels or 4,000 barrels daily in the course of 1963.

(2) Last year's 9,000 barrels daily stock withdrawals provided a supply source which is not available in 1963. This volume of consumption must therefore be met out of current supplies.

(3) According to the Bureau of Mines, refinery production declined by nearly 18 per cent on the East Coast and nearly 5 per cent on the Gulf Coast in the first two months of 1963, compared to the same period of last year. API figures indicate declines of 8.6 per cent and 5.3 per cent respectively for the March - May period. An overall decline of 6.0 per cent, or 17,000 barrels daily, in total East Coast domestic supplies appears therefore to be a reasonable assumption for 1963 (last year's decline amounted to 22,000 barrels daily).

(4) Since the above factors account together for 30,000 barrels daily, a total of 13,000 barrels daily (43,000 minus 30,000) is left to meet increases in demand. This is equal to

only 1.7 per cent of last year's demand, or undoubtedly less than this year's growth in competitive gas or coal consumption on the East Coast. Thus, once again, residual oil may be expected to lose some of its market share to other fuels.

Whether the increase in imports is sufficient to meet at least all increases in essential demand in 1963 cannot be judged at this point. However, both the industrial and the electric utility sector of the economy - two major markets for residual fuel oil - are currently operating at considerably higher levels than last year. If these levels are sustained throughout the remainder of the year, as most government economists seem to believe, residual fuel oil supplies may well have to be supplemented by advance drawings against January - March, 1964 import quotas by next December. The same would apply if domestic supplies declined even slightly more than is assumed in this paper or if temperatures should be somewhat below normal. For the current import quota represents a minimum quantity which leaves no margin for flexibility.

Since the quota was issued shortly after the Office of Emergency Planning published its long awaited report to the President on residual fuel oil imports which specifically recommended,

> "a careful and meaningful relaxation of controls... to achieve the maximum reduction of the burden on the economy, given the import levels resulting from the easing of controls",

it must be assumed that the U.S. Interior Department has decided to reject this recommendation and continue to maintain its policy of keeping a tight lid on the importation of this commodity.

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