5. Distillate Fuel Oil Supply, Infrastructure, and Pricing

Introduction

Distillate fuel oil markets in the United States involve two products: low-sulfur distillate, which is used as a transportation fuel (diesel) for on-highway vehicles, and high-sulfur distillate, which is used for space heating (heating oil) in the residential and commercial sectors and as a fuel for other stationary (nontransportation) applications in the commercial, industrial, and electricity generation sectors. Beginning in October 1993, the U.S. Environmental Protection Agency limited the allowable sulfur content of distillate fuel oil used as diesel fuel for on-highway trucks, buses, and cars. Although low-sulfur distillate can be used in any application, it is usually taxed as a highway fuel. The tax is imposed at the point the product "breaks bulk," or is separated from a large shipment into smaller delivery sizes, usually at a storage terminal. At the same time, high-sulfur distillate for non-highway use is dyed to identify it. Since 1993, the Energy Information Administration (EIA) has collected data separately for low-sulfur and high-sulfur distillate fuel oil.[89]

The Northeast uses more high-sulfur distillate fuel oil than any other U.S. region, accounting for more than two-thirds of the total consumption of distillate fuel oil in the U.S. residential and commercial sectors in 1998. The residential and commercial sectors in the Northeast account for more than one-half of the region's distillate fuel oil use (67 percent in New England and 44 percent in the Central Atlantic), whereas in the other regions of the country residential and commercial uses make up only 7 percent of total distillate consumption. Conversely, on-highway use of low-sulfur distillate accounts for only 38 percent of total distillate consumption in the Northeast (25 percent in New England and 44 percent in the Central Atlantic), compared with 62 percent in the other regions.[90]

Market Structure

The infrastructure of the distillate fuel oil industry in the Northeast begins with large distribution centers, which provide supplies to smaller distribution points that, in turn, supply thousands of retail dealers who deliver fuel to millions of homes. The large distribution centers play a central role in setting market prices throughout the region. A variety of factors have combined to make New York Harbor a product trading center for distillate fuel oil: continuous supply from a variety of sources, available storage capacity, transportation alternatives for bringing the product into and out of the area, and the participation of many market players. Because it is the physical source of much regional supply and an alternative market for companies with product to sell, including area refineries, the New York Harbor price quickly reverberates throughout the region. Boston is a second-tier trading center in terms of the world market because its sources of supply are fewer (imports and resupply from the New York Harbor area), but it is a critical distribution center for New England.

Generally speaking, independent marketers provide the gateway for distillate fuel oil supplies in the Northeast, and especially in New England. They own and operate oil storage terminals that receive supplies via tanker, barge, or pipeline. They sell to retailers and to large bulk consumers from their terminal "racks"—the superstructure of pipes, manifolds, and hoses under which trucks are loaded. Marketers offer a host of services to their customers, including lines of credit, hedging programs,[91] and bid support. The wholesale market in the Northeast has undergone considerable consolidation in recent years. The largest terminals, which form the core of the region's supply network, are still operating but are owned by fewer companies. Moves toward efficiency, as well as increased environmental regulations, have resulted in closure of some smaller dealer-owned storage facilities located closer to consumers.

For more than a decade, refiners such as the major oil companies have rationalized their operations, carefully choosing their regional product markets and withdrawing from the markets where they did not have a strategic position. The large refiners that have remained in the Northeast continue to own some marketing assets, such as terminals, but the focus of their regional operations has shifted to transportation fuels (motor gasoline and diesel) rather than heating oil. The independent refiners

[89] EIA's petroleum supply data show supply on the basis of broad regions, Petroleum Administration for Defense Districts (PADDs). The information to quantify supply details for regions smaller than the PADDs is not generally available, although selected data series are available on a sub-PADD basis, separating PADD 1, the East Coast, into New England, the Central Atlantic, and the South Atlantic. See Chapter 1 for definitions.

[90] Energy Information Administration, *Fuel Oil and Kerosene Sales 1998*, DOE / EIA-0535(98) (Washington, DC, August 1999).

[91] Hedging programs are based on the commodity futures price of heating oil.

that own capacity in Pennsylvania and New Jersey are active in the heating oil market, but they are bigger players in the Central Atlantic than in New England.

Retail dealers generally pick up high-sulfur distillate fuel oil from wholesale terminals in trucks. The oil is sometimes transferred to a centrally located bulk plant and from there dispatched in smaller trucks for home delivery. Many retailers, however, dispatch delivery-size trucks to the wholesale terminal, which then proceed directly to deliver the oil to homeowners and other consumers.

The dense market infrastructure in the Northeast provided several alternatives for customers to obtain supplies of distillate fuel oil in January and February 2000. Although the system did not work smoothly,[92] it did meet the minimal needs of almost all customers. When a terminal in one area ran out of product because of delivery delays, there was nearly always a neighboring competing terminal that filled the gap. The "wet" terminal, with product to sell, naturally experienced a surge in demand for its barrels. While the barrels were available to all comers, historical customers generally got preferential treatment, and volumes were routinely allocated on the basis of year-earlier purchases. Furthermore, with dealers' trucks all queuing at one terminal instead of two, there were inevitably delays, and in many cases the trucks had to accept less than a full product load. The delays and the need to return to the terminal more often added further to the cost of delivery, and many customers were inconvenienced and paid higher prices than anticipated.

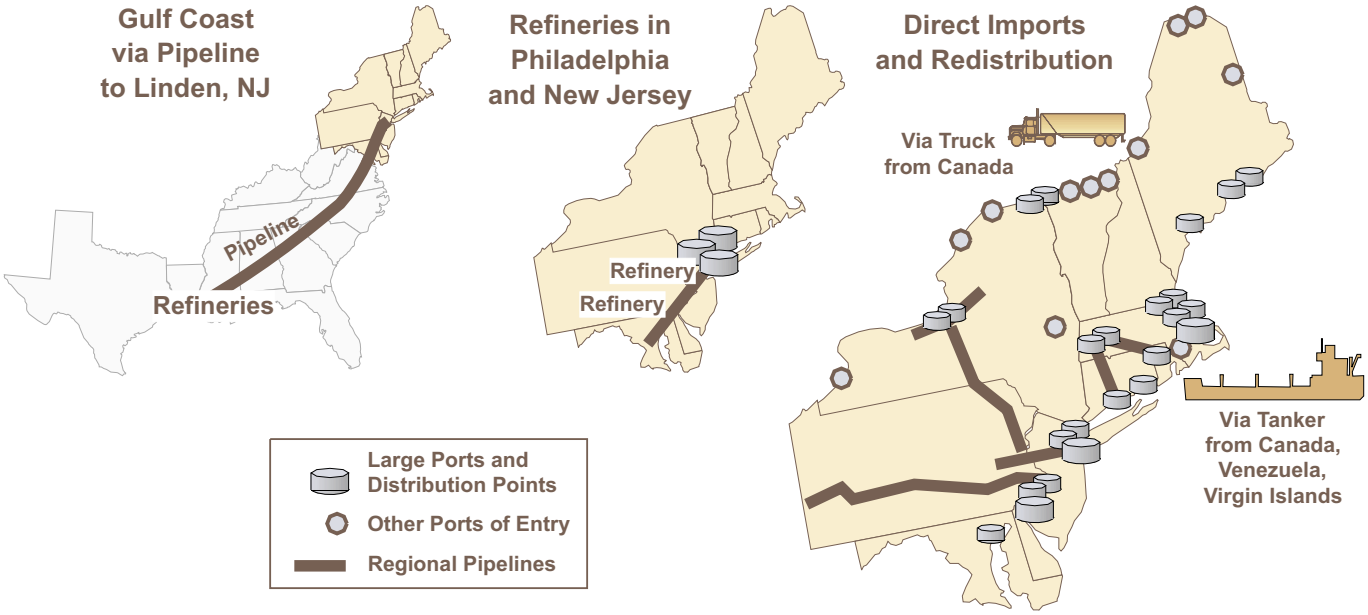
The delivery system in the Northeast has become tighter and tighter as competitive pressures have required that market participants store and deliver oil more efficiently. Decades ago, stocks probably would not have reached such low levels, and there would have been more inventory in smaller terminals backing up the supplies in the major terminals. Although the current system fosters lower prices in a normal market, it increases the potential for brief periods of price spikes, as seen in the winter of 1999-2000.

Sources of Supply

As shown in Figure 39, the Northeast gets its supplies of distillate fuel oil from the following sources:

- Shipments from Gulf Coast refineries via pipelines and, to a smaller extent, tankers or barges
- Shipments from Central Atlantic refineries distributed throughout the region by pipelines and barges
- Imports from offshore and foreign areas—most notably, Canada, Venezuela, and the Virgin Islands (considered by EIA to be imports)—which come either to central distribution centers such as New York Harbor and Boston, from which they are redistributed, or to smaller ports, where they meet local needs.

Figure 39. Northeast Distillate Fuel Oil Supply Sources



Source: Energy Information Administration, Office of Oil and Gas.

[92]There was widespread press coverage of supply dislocations and readjustments. See, for instance, *Hartford Courant*,"Supply of Oil Tightens, Weather Keeps Tanker Waiting in New Haven Harbor" (February 3, 2000), and"Dwindling Supply Adds to State's Oil Crunch . . ." (February 4, 2000).

These sources provide "fresh" supplies to the region. Generally, from April to November, fresh supplies exceed regional demand, allowing for a buildup of regional stocks. From November through March, fresh supplies amount to less than the market needs, and stocks are used to make up the remainder of the requirement.

More than half, and up to 60 percent in some years, of the supply of low-sulfur distillate fuel oil to the East Coast comes from the U.S. Gulf Coast (Figure 40). Supplies of high-sulfur distillate rely about evenly on shipments from other regions, such as the Virgin Islands, and on local refineries. Imports make up a small but significant percentage of supply for both products. The line for "Product Supplied" in Figure 40—a proxy for consumption—shows stock buildups in the years when the bars are higher than the line and stock drawdowns when the bars are lower than the line, as in 1999.

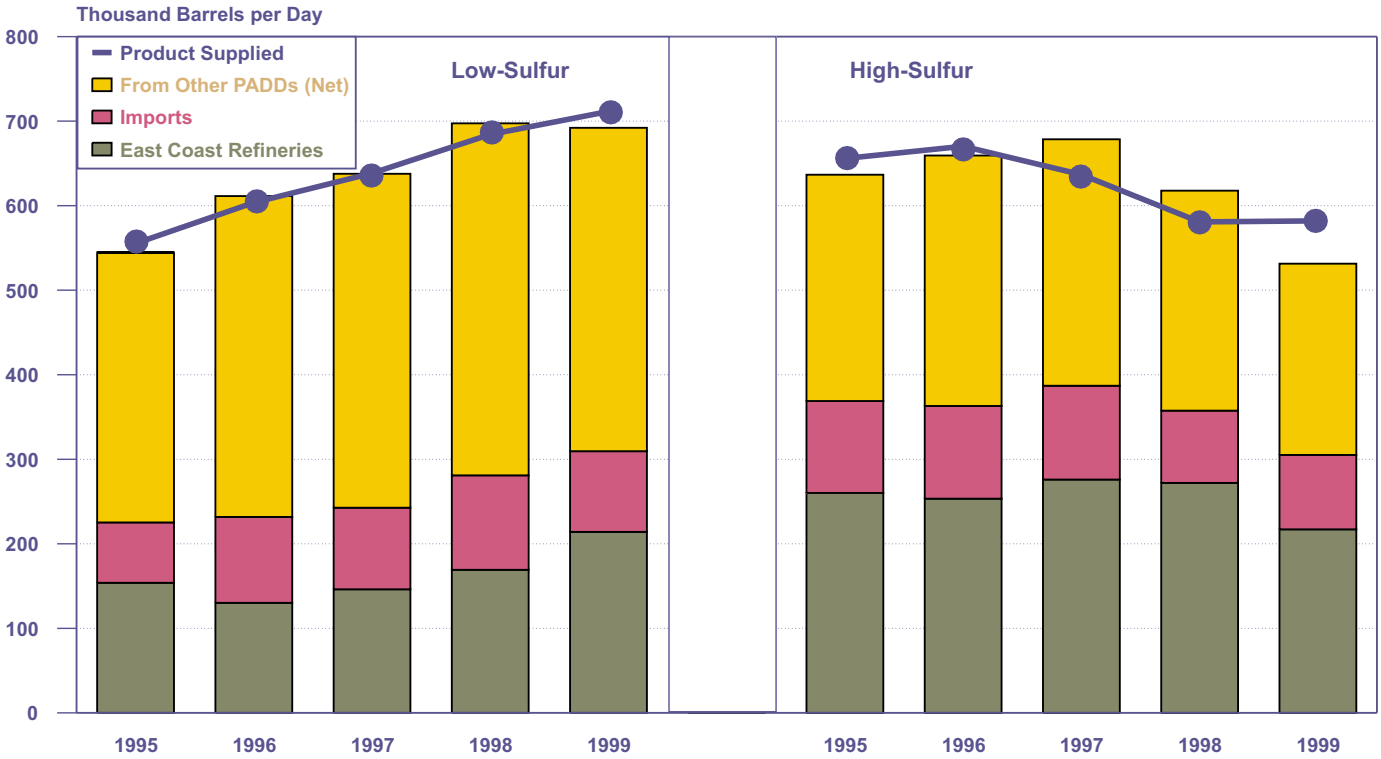
The monthly pattern of annual supply to the East is shown in Figure 41. For low-sulfur distillate fuel oil, there is little seasonal variation in supply, with only a few percentage points difference from the lowest to the highest month. In contrast, for high-sulfur distillate fuel oil, the volume of product supplied in the highest months is 2.5 times the volume in the lowest months. Each of the supply components increases during the peak months, and the importance of stocks is clear. On average over the 1995-1999 period, stock drawdowns contributed 20 percent of the supply of high-sulfur distillate fuel oil in the winter heating season.

Receipts from the U.S. Gulf Coast

The East Coast receives supplies of distillate fuel oil from the Gulf Coast via pipeline and waterborne shipments (tankers and, more commonly, barges). Of the net supplies from other regions shown in Figure 41 (approximately 385,000 barrels per day of low-sulfur distillate and 230,000 barrels per day of high-sulfur distillate), pipeline supplies make up the vast majority. Figure 42 shows "gross" shipments to the East Coast from the Gulf Coast (i.e., without accounting for any shipments moving in the other direction). About 80 percent of the low-sulfur supplies and more than 85 percent of the high-sulfur supplies are shipped via pipeline. Supplies leave the Gulf Coast on the Colonial Pipeline and the Plantation Pipe Line. The two lines follow roughly the same route, with the Plantation's terminus in the Washington, DC, area and Colonial's terminus in Linden, New Jersey. About half of the East Coast's on-highway (low-sulfur) distillate fuel oil is consumed in the South Atlantic. Hence, a considerable portion of the pipeline supply from the Gulf Coast is delivered into PADD 1 in the South Atlantic States, not in the Northeast.

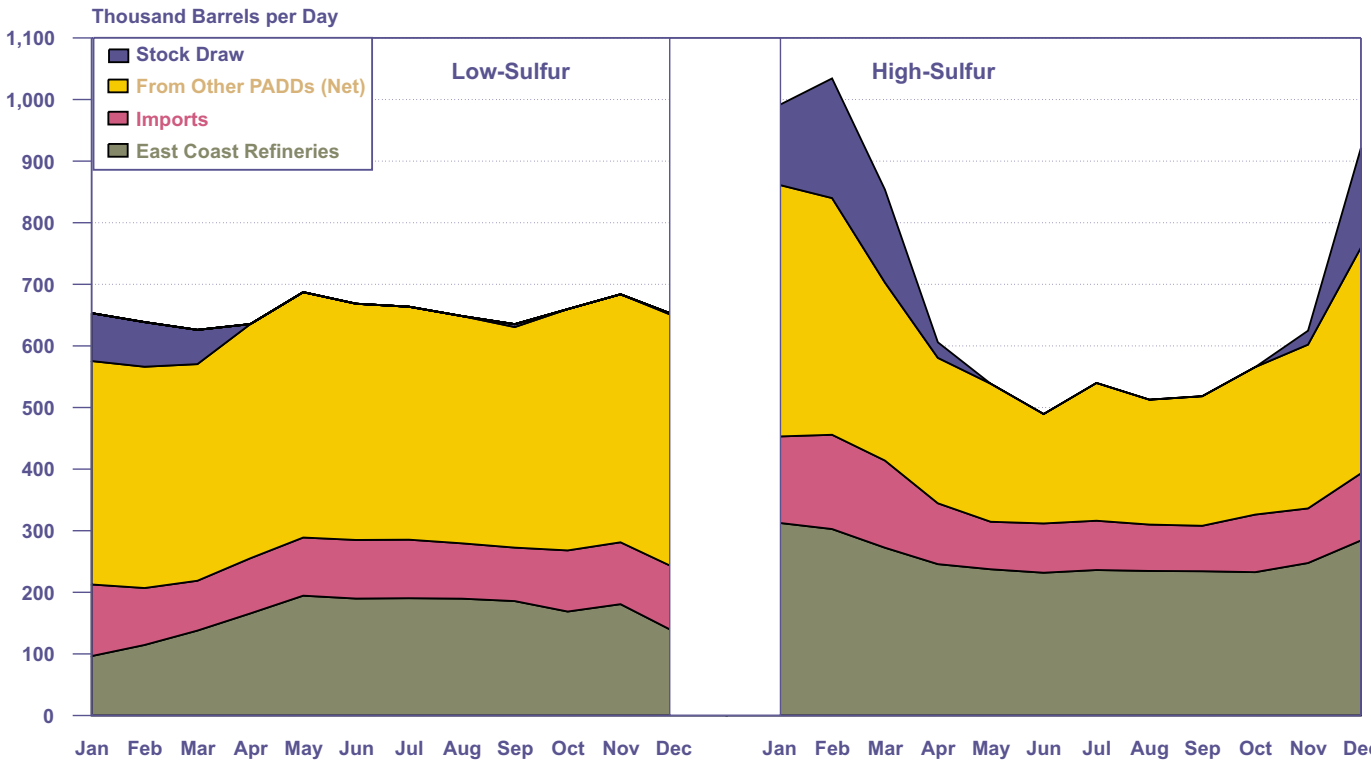
The tanker and barge movements from the Gulf Coast to the East Coast are now almost exclusively shipments across the Gulf of Mexico to Florida, which has no

Figure 40. Distillate Fuel Oil Supply on the East Coast by Source, 1995-1999



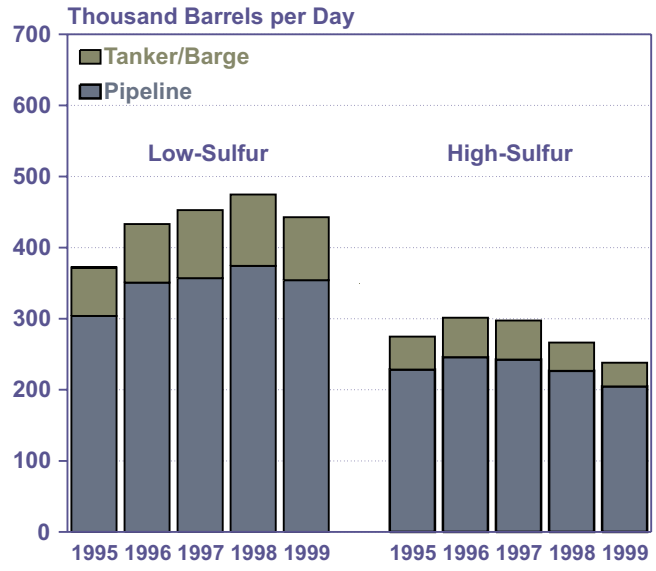
Sources: Energy Information Administration, *Petroleum Supply Annual*, DOE/EIA-0340, Volume 1 (Washington, DC, 1995-1998 issues); and *Petroleum Supply Monthly*, DOE/EIA-0109(2000/02) (Washington, DC, February 2000), Table 9.

Figure 41. Average Monthly Distillate Fuel Oil Supply on the East Coast by Source, 1995-1999



Sources: Energy Information Administration, *Petroleum Supply Annual*, DOE/EIA-0340, Volume 2 (Washington, DC, 1995-1998 issues), Table 5; and *Petroleum Supply Monthly*, DOE/EIA-0109 (Washington, DC, various issues), Table 8.

Figure 42. Distillate Fuel Oil Supplied to the East Coast from the U.S. Gulf Coast by Mode of Transport, 1995-1999



Sources: Energy Information Administration, *Petroleum Supply Annual*, DOE/EIA-0340, Volume 1 (Washington, DC, 1995-1998 issues), Tables 33 and 34; and *Petroleum Supply Monthly*, DOE/EIA-0109 (Washington, DC, various issues), Tables 54 and 55.

interstate pipeline connections. At times in the past, tanker and barge shipments of high-sulfur distillate to the Northeast have briefly soared, in response to market economics. In late 1996 and early 1997, for instance, when heating oil stocks were quite low, tanker and barge shipments from the Gulf Coast to the Northeast ran at 40,000 to 50,000 barrels per day for several months. In 1999, they were less than 5,000 barrels per day, because the market did not require these high-cost supply supplements. (Throughout 11 months of 1999, heating oil stocks in the Northeast were high, not low, by historical standards.) The East Coast also receives minor volumes of distillate from PADD 2, the Midwest.

Supplies from Area Refineries

East Coast refineries supplied about 37 percent of the East Coast's high-sulfur distillate fuel oil in 1999, a significant decline from the 47-percent share in 1998. The difference is a reflection of the overall market in 1999, when high inventories and low margins discouraged additional output. According to EIA's *Petroleum Supply Annual*, there were 14 operating refineries in PADD 1 as of January 1, 1999. The 11 refineries in the Delaware to New York City corridor accounted for 95 percent of the capacity of 1.5 million barrels per day. Supplies from area refineries are distributed throughout the Northeast coast by barge and are transported to inland Pennsylvania and New York via the Buckeye Pipeline system.

The refineries in the Northeast, like U.S. refiners in general, have their peak operations in the warmer months, supplying gasoline and diesel for seasonal consumption and high-sulfur distillate (heating oil) for seasonal stock builds. Refinery production of high-sulfur distillate fuel oil increases during the winter months, however, when demand for home heating oil is at its annual peak. The sudden unavailability of steady supply from area refineries was a factor in the price runup of early 2000. Low margins encouraged refiners to undertake routine maintenance in January, and when the supply situation deteriorated, the lack of ready capacity combined with unexpected equipment outages prevented refiners in the Northeast from responding rapidly with production increases.

Imports

According to EIA data, imports supply about 15 percent of the distillate fuel oil on the East Coast. In recent years, the major sources of distillate fuel oil imports to the Northeast have been Canada (32 percent of the Northeast's 1999 imports), Venezuela (23 percent), and the Virgin Islands (37 percent).[93] In 1999, the refinery in the Virgin Islands began to be operated by a joint venture between Amerada Hess (the plant's original owner) and the Venezuelan oil company, Petroleos de Venezuela. In New England, the volume originating in the Virgin Islands rose while the volume originating in Venezuela fell from 1998 to 1999. Although distillate fuel imports to New England that originated in Venezuela declined by about 10 percent, the share of Venezuelan high-sulfur distillate imports declined even more, from 75 percent in 1998 to 60 percent in 1999 (Table 12). The shift to low-sulfur distillate in January and February 2000 combined was even more pronounced, rising from 46 percent in 1999 to 74 percent in 2000. The share of Venezuelan distillate fuel imports to the East Coast rose slightly, from 24.5 percent in 1998 to 24.9 percent in 1999. In the Central Atlantic, 1999 import volumes from the Virgin Islands fell. (Venezuelan supplies of distillate fuel oil into the Central Atlantic are very small.) Imports into New England often show a distinct seasonal swing, especially for high-sulfur distillate (Figure 43). The Central Atlantic, with lower imports, is also more focused on low-sulfur supplies in most years.

A few ports dominate the import trade into the Northeast. In 1999, Boston was the largest import point in New England, at 36,000 barrels per day, followed by New Haven (20,000 barrels per day), Portland, Maine (15,000 barrels per day), and Portsmouth, New Hampshire (14,000 barrels per day). Other ports in the region receiving more than 2,000 barrels per day included Providence, Rhode Island; New London, Connecticut; and Searsport and Belfast, Maine. Barges and trucks redistribute supplies from these large terminals and distribution centers. In addition, pipelines carry product inland from New Haven (Buckeye) and Providence (Mobil) to the Springfield, Massachusetts, area. In the Central Atlantic, the big ports are in the New York Harbor area. New York and Perth Amboy, New Jersey, together received 22,000 barrels per day of distillate fuel oil in 1999 (a significant decline from 1998 volumes, as noted earlier).

Some of the ports and channels in New England could be dredged and deepened to allow larger vessels to

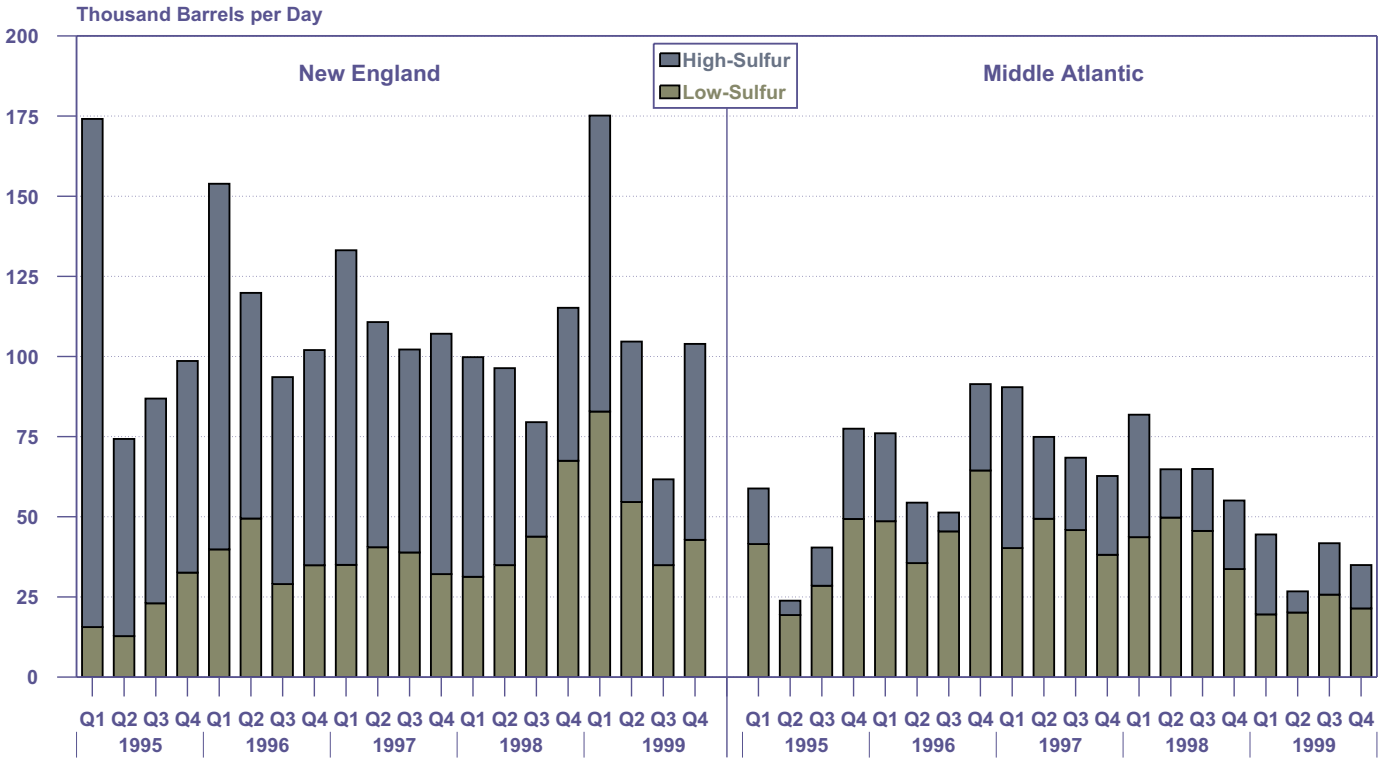
Table 12. Distillate Fuel Imports to New England Originating In Venezuela, 1998-2000
(Thousand Barrels)

Year	Month	Low-Sulfur Distillate	High-Sulfur Distillate	Total
1998	January	0	653	**653**
	February	0	1,633	**1,633**
	March	0	1,637	**1,637**
	October	923	668	**1,591**
	November	860	0	**860**
	December	899	282	**1,181**
	Total	**3,362**	**9,919**	**13,281**
1999	January	1,491	959	**2,450**
	February	427	1,283	**1,710**
	March	1,446	623	**2,069**
	October	0	444	**444**
	November	418	1,110	**1,528**
	December	45	632	**677**
	Total	**4,724**	**7,198**	**11,922**
2000	January	1,054	214	**1,268**
	February	1,180	559	**1,739**

Source: Energy Information Administration, Form EIA-814 (data available on the EIA web site, www.eia.doe.gov).

[93] Although the Virgin Islands are officially part of the United States, EIA data classify petroleum shipments from the Virgin Islands as imports.

Figure 43. Quarterly Imports of Low-Sulfur and High-Sulfur Distillate Fuel Oil into the Northeast Region, 1995-1999



Source: Energy Information Administration, Form EIA-814 (data available on the EIA web site, www.eia.doe.gov).

carry distillate fuel oil, and perhaps to allow larger tankers to dock and unload. Dredging is typically expensive, because both the ports and the channels leading to and from them must be dredged to be effective. Larger tankers would require longer to unload, and that would partially offset some of the gains from having larger deliveries. In the winter of 1999-2000, however, both tankers and barges were unable to dock, and the problems were not limited to shallow-draft ports or ports with significant channel limitations. Under less challenging weather conditions, New England ports have reached import levels of 175,000 per day in the first quarter of 1995 and 1999 (Figure 43).

Other large coastal entry points in the Central Atlantic include Baltimore, Maryland, and Newark, New Jersey. In addition to the coastal imports, supplies from Canada enter at a variety of pipeline points along the New York, Vermont, New Hampshire, and Maine borders. In 1999, there were 30 entry ports for distillate imports coming into the Northeast, with the smaller volumes going to diverse locations, where they are often critical to the local supply picture.

Regional Distribution

The Northeast's distillate fuel oil market has a routine resupply chain, as described above. Among the regular supply sources, pipeline shipments from the Gulf Coast generally have the longest transit time, taking from 14 to 20 days for the run from Texas to New Jersey. Waterborne imports arriving via tanker have shorter transit times, with Venezuela and the Virgin Islands 5 to 7 days away. The shipments are carefully planned in advance so that they arrive at regular intervals. Companies employ a variety of mechanisms to enhance their supply flexibility, such as time exchanges.[94] The transit times illustrate, however, that when the interstate supply system is stretched, immediate incremental supplies are available only from local inventories.

The Northeast receives its distillate fuel oil at many points along the coast and along the border, but the largest volumes come to a few large ports and are redistributed from there. Barges move supplies from New York Harbor to Long Island, northward up the Hudson, and northeastward along the Connecticut coast to Rhode

[94]Time exchanges occur when one company provides a quantity of a product to another with an agreement that it will be repaid in kind at a later date.

Island and on to Massachusetts. Barges based in Boston and other oil-handling ports also move supplies along the coast. Movements of the barges are carefully choreographed to minimize costs and maximize the use of capacity available under the Jones Act.[95]

A delay in loading or unloading or in transit time is quickly felt in the supply chain. With the barge fleet in the Northeast generally operating close to capacity in the peak winter periods, it is a challenge to compensate for any delay. When movements are constrained by bad weather, however, even extra capacity cannot provide relief. Furthermore, the tankers that carry oil imports directly to coastal ports are unable to come into port safely during stormy weather with high seas and high winds.

During the coldest period of January 2000, stormy weather and ice-covered rivers and harbors delayed resupply deliveries, with Coast Guard ice breakers working at capacity to keep up. The fact that barges were weather-bound during the third week of January was a central factor in the price spike. Before that point, the New York Harbor spot prices for distillate fuel oil did not reflect a market concerned with short supply, in spite of the very low inventory levels. The cold weather and its attendant demand surge coincided with the interruption in barge and tanker traffic, breaking the critical pace of resupply. As a result, spot prices were quickly bid up in the regions supplied by river barge, like the Hudson River.

Stocks and Storage

The decision to store oil is a complex one. The market's present need for oil is reflected in the current price. High prices indicate that the market needs more oil, and needs it now. The forward price curve (the price of oil in the future as compared to the price today) provides additional information. A market in which the price for future delivery is lower than the current price discourages storage. Market participants are reluctant to hold inventories or add to them when they are expected to lose value in the future. As the heating oil season approaches, typically in the summer and early autumn, it is common to see a forward price curve that reflects higher prices in December and January than in the following September and October. Using the futures market, a market participant can "lock in" the difference (spread) between the current price and the New York Mercantile Exchange (NYMEX) futures price during the heating season, covering the cost of storage and the cost of money for the purchase.

The unusual—even historic—stock drawdown that took place in the Northeast in December 1999 and January 2000 was precipitated by a variety of factors, as described in Chapter 2 of this report. Importantly, the forward price curve indicated that the product would be worth less in the future. Thus, a ready buyer at the market price was welcome. With natural gas buyers making the economic decision to switch to oil, there were many such buyers available.

EIA collects data on "primary" inventories, the stocks held by refiners, pipelines, and in terminals with large capacity or with access to waterborne or pipeline supplies. In addition to primary inventories, secondary inventories are held by retailers or distributors, and tertiary inventories are held by consumers; however, data on secondary and tertiary inventories are not collected by EIA

Secondary inventories of distillate fuel oil are largely held in bulk plants, the small tanks that formerly dotted the landscape throughout the Northeast, providing the convenience of shorter truck runs for the dealers who owned them. For the market as a whole, they provided an additional cushion and flexibility for local exchanges to smooth out delivery bumps. As the retail industry consolidated, however, owners sought to enhance the efficiency of their operations by closing underutilized storage depots. The trend was clearly accelerated by more stringent environmental rules and the increased business risk the rules presented in the event of tank failures. With no new storage facilities being constructed, there has been a net loss of secondary storage capacity over the past decade. Comprehensive data for the Northeast region are not available, but data from the New York State Department of Environmental Conservation provide an illustration. The agency's data on facilities such as bulk storage plants indicate that there has been a drop of more than 10 percent in the number of storage facilities with 1,100 to 400,000 gallons capacity, and in the capacity at such sites, in the past 2 years alone.

Tertiary stocks held by consumers are also an important part of the distillate fuel oil supply system. For example, home heating oil customers, on average, have about 30 days of supply in tank, a much higher supply relative to consumption than the rest of the industry. For those customers not on a "will call" status, a dealer with an automatic delivery program in place uses degree-days, the characteristics of the house, and consumption history to calculate when a customer's tank needs to be filled. The dealer tries to optimize deliveries, filling the tank before it gets too low but timing the delivery so that the tank can take enough to support the cost of the delivery. (Frequent, small deliveries rapidly multiply the cost of servicing the account without providing any benefit.)

For a typical 275-gallon tank, 78 gallons would be the optimum refill trigger, 182 gallons the optimum fill, and 260 gallons the effective maximum capacity. Because a

[95]The Jones Act requires that U.S. flagged ships transport shipments between U.S. ports after international ships are off-loaded.

typical single-family home consumes about one-eighth gallon of oil per heating degree-day, during a normal January in New England the homeowner would have about 30 days between fills (after allowing for water heating consumption). If the pattern followed the optimum, the homeowner would still have 15 days of supply remaining at the time of the refill. Because of this fill-and-draw pattern, it is unlikely that many homeowners received more than one delivery at the January 2000 spike price.

During the January price runup, some dealers delivered "short" (i.e., did not completely fill the tank) as a means of allocating available supplies and preventing homeowners from receiving excessively high bills during the price spike,[96] which was hoped to be only temporary. It would also raise the cost of delivery, but for homeowners not participating in a price cap or fixed price agreement it would have meant that the next delivery might be at lower prices.

The inventory patterns of large-volume customers have also played a role in recent price spikes (December 1989, January 1994, and January/February 2000). Large-volume customers do not always carry adequate inventory to cover their needs during unusual circumstances, such as the January/February 2000 cold snap. Some turn to distillate fuel oil at times when their natural gas supplies have been interrupted as part of their service agreements. Others turn from natural gas to distillate fuel oil for economic reasons. The sudden entry of these buyers into the market has been a contributing factor in past price spikes.

Pricing and Contracts

Prices in distillate fuel oil markets respond quickly to changes in supply and demand. First, spot prices reflect the outcome of the ongoing "auction" in the marketplace. The routine bid-and-ask process between buyers and sellers quickly reflects the need for more supply or a supply glut. The prices at which once-only transactions are taking place in the big product trading centers such as New York Harbor become known quickly via electronic reporting services and bulletin boards, print media, trade publications, and industry associations. The price of commodity futures is a universally available indicator of the expected balance between supply and demand.

During the price spike of January-February 2000, spot prices for available supplies far outpaced the futures price. At the peak, the price for "prompt" barrels was $1.00 per gallon higher than the futures price. The magnitude of the differential was as unexpected as it was historic. During the supply crunch of late January, deliveries under the February 2000 contract were still weeks away. After the expiration of the February contract on January 31, volumes would not be deliverable again until early March, under the March 2000 contract.

Spot prices in the New York Harbor are a good proxy for the prices paid by large suppliers such as independent marketers. The New York Harbor spot prices quickly reflect increases in the prices paid on the spot market for immediate supply or decreases in prices when supplies exceed demand. Thus, a retail dealer who is detached from the New York market may have to pay the current New York Harbor spot price and pass it on to residential consumers.

Risk management mechanisms, such as hedging and price caps, are used routinely in distillate fuels markets, and retail dealers offer a variety of pricing programs to their customers. According to a voluntary survey of full-service dealers routinely conducted by the Massachusetts-based accounting firm of Gray, Gray, & Gray (Table 13), 98 percent of the dealers in the Northeast who responded to the survey offer "budget payment plans" to their customers. Such programs are also called "levelized" plans. Typically, these plans extend from July to May, allowing customers to make equal payments toward anticipated heating oil bills over the months. Under- and overpayments are settled at the end of the period.

Table 13. Pricing Programs Offered to Consumers by Heating Oil Retailers in Northeast States, 1999
(Percent of Dealers Responding)

State	Guaranteed Pricing	Price Cap	Budget Payment Plan
Connecticut	70	45	90
Maine	86	72	100
Massachusetts	59	56	94
New Hampshire	86	64	93
Rhode Island	57	72	86
Vermont	78	56	100
Delaware	0	50	100
Maryland	38	50	100
New Jersey	28	28	100
New York	44	56	92
Pennsylvania	47	45	92
Virginia	0	0	100
Overall	**55**	**54**	**98**

Source: Gray, Gray, & Gray, *Oilheat Survey 1999*, web site http://graymail.com/news/survey99.pdf. The numbers are based on responses from nearly 500 dealers.

[96]Testimony of Peter D'Arco, SJ Fuel, Before the House Committee on Commerce, Subcommittee on Energy and Power, U.S. House of Representatives (March 9, 2000).

Budget payment plans have the significant advantage of allowing the customer to anticipate a stable bill, and because the payments that would be due in cold months are averaged with those for warm months, the final accounting usually does not result in a large additional payment. Even if an additional payment is due, the consumer has more time to arrange finances to reduce the hardship.

More than half of the dealers in the survey also offered guaranteed pricing and/or price cap programs, which would have allowed their customers to avoid the spike price altogether; however, the extent to which customers participate in the programs is not known. In the New England States, the lowest percentage of retailers offering guaranteed price programs is 57 percent of the respondents in Rhode Island, compared with 86 percent in both Maine and New Hampshire, 78 percent in Vermont, and 70 percent in Connecticut. Although there were a few stories of dealers who did not honor fixed-price contracts during the January 2000 price runup, they are thought to be a small fraction.[97] Dealers who took losses because they left themselves vulnerable to price increases in their supply acquisition strategies are likely to make modifications in the future to cover their own risks.

Retailers offering fixed-price sales to customers must cover the costs of their own purchases. Just as retailers offer programs to their customers, wholesalers often offer risk management programs to retailers. For companies using the necessary mix of futures and options,[98] wholesale prices remained capped even during the worst of the spike. These programs represent insurance, and as in all insurance decisions, there is a tradeoff between the comprehensiveness of coverage (and hence the cost) and the risk of an unanticipated cost event. The volumes covered by such a program are thus seldom all of the company's supply, because the transaction cost is prohibitively high. A retailer, for instance, might lock in or cap the cost side only for those volumes that will subsequently be delivered under a fixed (or capped) price contract. Thus, the high delivery volumes associated with exceptionally cold weather are unlikely to be covered.

Market Implications of Reducing Reliance on Distillate

Two approaches have been suggested to reduce the potential for future price spikes in Northeast distillate fuel oil markets: (1) switching large-volume, year-round users of distillate fuel to natural gas and (2) preventing energy customers with interruptible natural gas service from entering the distillate market during periods of high demand. The first approach would reduce the market base, and the second would reduce peak demand levels.

Switching large-volume users of distillate fuel oil to natural gas or another energy source would result in a smaller overall distillate market, with declining economies of scale. Initially, there could be excess supply, leading to a decrease in prices, which could lead to a consolidation of the distillate industry. For example, fewer barge-size deliveries would be needed, which could lead to a reduction in the size of the barge fleet. Similarly, fewer terminals and trucks would be needed, scaling the delivery infrastructure to the size of the market. Many infrastructure costs are fixed, however, and not easily scaled. Spread over a smaller volume, per-unit costs are likely to increase as the market size decreases.

Removing large-volume, year-round users of high-sulfur distillate from the market would also increase the seasonal swings in demand for the product, because the remaining market would consist primarily of consumers who use distillate for space heating. Reducing the size of the market would likely result in the closing down of terminals and companies. Rather than a reduction in volume handled by all terminals, the likely result of a smaller market would be consolidation of terminals in efforts to maintain economies of scale in their operation. Because retail margins are often very thin, some companies probably would shut down. The result would likely be fewer companies operating fewer terminals with fewer barges and trucks. As a result, when another bout of cold weather or supply disruption occurred, the consequences might be just as severe, and possibly worse, than the situation where the large-volume customers

[97] For instance, officials in the office of the Attorney General of Massachusetts were quoted as saying that they had received complaints about six companies that had imposed surcharges on fixed-price contracts (see *Boston Globe*, "Worcester Heating Oil Company to Repay Customers It Surcharged" (February 26, 2000)). While the story does not cite the number of heating oil dealers active in the State, the dealer's trade association in Massachusetts has some 700 members. The case of the Worcester dealer cited in the article's headline ended with the dealer making restitution to its 6,000 fixed-price customers and donating $10,000 for low-income heating assistance; the dealer in question has stated publicly that the surcharge was allowed by the contract. The Attorney General of Rhode Island received complaints on nine companies, all of which finally honored the fixed price (see *Providence Journal*,"Oil Dealers Will Honor Contracts" (February 18, 2000)).

[98] Companies can purchase an option contract above a futures contract strike price as a hedge that, if the price exceeds the strike price before the option expires, they can either sell the option for a profit or ask for delivery at the lower strike price. However, if heating oil futures fall below the strike price at the expiration of the option contract, the option expires and the option seller keeps the premium.

remained in the distillate market. Fewer companies could also mean less competition, which could result in higher prices.

The second approach—preventing energy customers with interruptible natural gas service from entering the distillate market during periods of high demand—probably would mitigate price surges in the heating oil market, because suppliers would be better able to anticipate seasonal demand for distillate fuel in the winter months and plan storage and deliveries accordingly. In recent years there has been a movement toward a "just-in-time" inventory and delivery system that reduces excess storage capacity and reduces costs. In normal times, the system works fine, but when demand rises rapidly beyond the anticipated peak, infrastructure and supplies are stretched. The unanticipated entrance into the market of large-volume customers, due to natural gas supply interruptions, causes even greater strain on the distillate supply system. Preventing those customers from entering the market would lessen the strain on distillate supplies. However, seasonal demand surges by the "regular" distillate customers would still be as unpredictable as winter temperatures. Moreover, as discussed in Chapter 4 of this report, curtailing interruptible natural gas service could have severe consequences for the region's natural gas market.

Interruptible natural gas consumers,[99] by virtue of their *interruptible* status, typically receive favorable gas service rates *after* they show that they can switch to an alternate fuel.[100] Gas deliveries can be interrupted under certain circumstances, such as when temperatures fall below a given threshold or operating conditions on the pipeline require it. Such customers generally must either have on-site storage capability for their alternate fuel, maintain a nearby storage capability operated by a third party, or be prepared to shut down operations when natural gas service is curtailed. Natural gas utilities in New Jersey and New York, for example, require through their tariffs that their interruptible gas customers have an alternate fuel capability. Unfortunately, the stocks or inventory maintained by end users (tertiary storage) are typically not surveyed, and no definitive statement can be made about their inventory levels during critical periods of the 1999-2000 winter. Information from the New Jersey Board of Public Utilities suggests that at least a few large-volume gas-distillate switchable consumers may have gone into mid-January 2000 with distillate inventories that were lower than normal.[101] The total volume of gas service interrupted in New Jersey in January 2000 was equivalent to a maximum of 741,000 barrels of fuel oil.

[99] Interruptible customers are those whose gas service can be curtailed to assure gas service to firm-service customers.

[100] Requirements for alternate fuel capability and minimum maintenance levels of alternate fuel supply (e.g., 10 days worth) vary from utility to utility and normally are integrated into gas utility tariffs. Brooklyn Union's new tariff for large-volume users, for example, requires a minimum 10-day supply; most other New York State gas utilities specify only the requirement to maintain an alternate fuel capability. The Public Utility Commissions or their equivalent endorse these gas utility practices or requirements through their acceptance of the gas utilities' tariffs. Enforcement is left entirely up to the gas utilities.

[101] State of New Jersey, Board of Public Utilities, *Board of Public Utilities Heating Oil Review* (February 23, 2000), web site www.state.nj.us/bpu/wwwroot/communication/Govrpt.PDF. At the hearings, New Jersey gas utilities noted that some of their interruptible gas customers were given their normal interruption notice (about 8 hours) to stop using gas but chose to stay on natural gas despite agreed-upon heavy price penalties for continued use—as much as 10 times their normal gas rates and well above the distillate fuel oil price. This suggests that at least some of those interruptible customers had below-normal alternate fuel inventories and had to continue operating with natural gas, even at much higher costs. Hearings have been held by the Board of Public Utilities on the cause of the distillate fuel oil price spikes, and final recommendations are expected by the end of May 2000.