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The Northeast Home Heating Oil Reserve and the National Oilheat Research Alliance

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September 19, 2013

Congressional Research Service

7-5700

www.crs.gov

R43235

Summary

During the winter of 1999-2000, the price of home heating oil virtually doubled in some Northeastern states while storage levels of middle distillate stocks—the range of home heating oil and diesel fuels—sharply declined. The situation attracted lawmakers’ attention and concern. Of the U.S. households that use heating oil to heat their homes, 69% reside in the Northeast. The Northeastern states continue to rely on heating oil as a source of home heating, but at a reduced level of dependency compared to 2000. The Northeast demand for home heating oil has declined by 47% since 2000, from nearly 7 billion gallons to 3.6 billion gallons in 2011. However, the price of heating oil has increased more than 2½ times from roughly \$1.50 per gallon beginning in 2000 to just over \$4.00 gallon in early 2013. The price increase reflects the trend in the price of crude oil.

Both population and housing occupancy rates ostensibly drive heating oil demand. Both increased in the Northeast over the past decade. At the same time, improved insulation and more energy-efficient heating systems in newly constructed homes may have offset demand. As a percent of overall domestic demand for natural gas, the Northeast region has remained nearly steady, varying between 20% and 22%, and recently returned to a level barely above 2001-2002 demand. Natural gas, electricity, bottled propane, and wood can substitute for heating oil. Natural gas demand in 2011 barely exceeded the 2000 demand. While natural gas production in the Northeast has increased because of unconventional gas shale development, the existing pipeline distribution system has not expanded in the New England States. Retail electricity sales have increased in New York and Pennsylvania, the two most populous states in the Northeast, while sales in the New England states remained nearly level. While the Energy Information Administration (EIA) does obtain volume data on residential propane sales, it does not publish this data. However, U.S. propane residential prices did rise from \$1 per gallon in 2000 to over \$2.80 per gallon in 2012. Residential use of kerosene has also declined.

In response to the 1999-2000 heating oil price spike and supply shortage, the United States Congress authorized the Northeast Home Heating Oil Reserve (NHHOR) in the Energy Policy Act of 2000 (P.L. 106-469). As a two million barrel emergency stockpile of government-owned heating oil, NHHOR was intended to meet roughly 10 days of demand by the Northeastern states at the time it was created. Congress also authorized the National Oilheat Research Alliance (NORA) to develop projects for the research, development, and demonstration of clean and efficient oilheat utilization equipment; and to operate programs that enhanced consumer and employee training.

Middle-distillate range petroleum products can serve as a heating and transportation needs. In its 13-year history, NHHOR has only released fuel for use by federal, state, and local emergency responders during natural disasters and not for retail sales during market dislocations. While the release demonstrated the utility of maintaining a distillate stockpile, the authorizing legislation had only anticipated a heating oil supply shortage during market dislocation. The recent change out of NHHOR stocks with ultra-low sulfur distillate increased its utility as a transportation fuel. In the absence of NHHOR, residential consumers have the recourse of substituting ultra-low sulfur diesel fuel for their heating needs.

Contents

Background.....	1
Northeast Heating Oil Demand and Price	2
Northeast Demand for Alternative Heating Fuels	5
Electricity	6
Northeast Population and Housing Unit Occupancy	7
Northeast Home Heating Oil Reserve	8
Drawdown Authority	9
Drawdowns.....	10
Sale and Exchange for Ultra Low Sulfur Oil	10
Hurricane Sandy, October 2012	10
National Oilheat Research Alliance.....	11
Function and Operation	11
Funding Source.....	12
Spending Issues	13
Lobbying Prohibitions.....	16
Conclusions.....	16

Figures

Figure 1. U.S. Total Distillate Sale/Deliveries to Northeast Residential Customers	2
Figure 2. State by State Comparison of Heating Oil Demand	3
Figure 3. U.S. No. 2 Heating Oil Residential Price	4
Figure 4. U.S. Crude Oil Composite Acquisition Cost by Refiners.....	4
Figure 5. Northeast Natural Gas Transmission Pipeline Infrastructure	5
Figure 6. Natural Gas Use by Northeast Residents.....	6
Figure 7. Retail Electricity Sales to Residential Customers	7
Figure 8. Northeast Occupied Housing Units	8
Figure 9. NORA Revenue by Funding Source.....	13
Figure 10. NORA Expenses and Spending.....	15

Tables

Table 1. Northeastern States Population 2000 through 2010.....	8
Table 2. NORA Assessment Revenue 2001-2011	12
Table 3. NORA Expenses and Spending During Assessment Authorization 2001-2011.....	14
Table B-1. Total Distillate Sales/Deliveries to Northeast Residential Customers	20

Appendixes

Appendix A. Definitions of Distillate Fuel Categories	18
Appendix B. Northeast Fuel Oil Sales	20

Contacts

Author Contact Information.....	20
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Background

A number of factors may have contributed to the near doubling of heating oil prices in some Northeastern states during the winter of 1999-2000, but the most significant may have been the sharply lower storage levels of middle distillate stocks (the range of home heating oil and diesel fuels) at the time. The acute conditions drew the concern of many Northeastern lawmakers because 69% of the U.S. households that used heating oil were located in the Northeast.¹ The region continues to rely on heating oil as a source of home heating, but at a sharply reduced level. Alternative heating fuels may be responsible for the reducing the dependency, as may improvements in home heating and insulation. Heating oil prices continue to remain high, as do other petroleum products and the price of crude oil, which may be discouraging use. These factors raise the question of whether the region still depends on heating oil to the extent it did over a decade ago, and whether Congress should continue to monitor the region's heating oil supply.

Heating oil (alternatively referred to as fuel oil) is a middle-distillate refined petroleum product comparable to diesel fuel and even jet fuel (except for additives and sulfur content). The similarity of these fuels allows one to substitute for the other under certain conditions.² However, taxation and air emission regulations differ based on use, and availability is seasonally dependent and subject to price volatility.

Middle distillate intended for use as fuel oil is exempt from the \$0.244 per gallon excise tax that the Internal Revenue Service (IRS) currently imposes on highway diesel fuel.³ Other middle distillate fuels are tax-exempt or subject to a reduced tax rate, including those used for heating, for farming, by state or local governments or non-profit educational organizations, and by boats engaged in fishing or transportation.

Both the Internal Revenue Service (IRS) and the Environmental Protection Agency (EPA) have required refiners to add red dye⁴ to certain classes of middle distillate fuel, but for different reasons:

- The IRS—to prevent tax evasion by using exempt high-sulfur and low-sulfur middle-distillate for highway transportation use (a \$10 per gallon penalty may apply to red-dyed middle-distillate fuel used as on-highway transportation fuel).
- The EPA—to identify diesel fuel with high-sulfur content to ensure that it is not used in on-highway vehicles (the introduction of ultra-low sulfur diesel (ULSD) now reduces that possibility).⁵

¹ “Northeast” means the nine states of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

² No. 1 fuel oil, No. 2 fuel oil, and No. 3 fuel oil are variously referred to as distillate fuel oils, diesel fuel oils, light fuel oils, gasoil, or just distillate. See **Appendix A** of this report for further descriptions.

³ 26 U.S.C. §4081.

⁴ The Clean Air Act, however, does not give EPA specific authority to regulate heating oil or its sulfur content. For these reasons, Solvent Red 164 dye is to added middle-distillate to indicate that it can only be sold as heating oil (with at least a \$0.244 per gallon discount to diesel fuel).

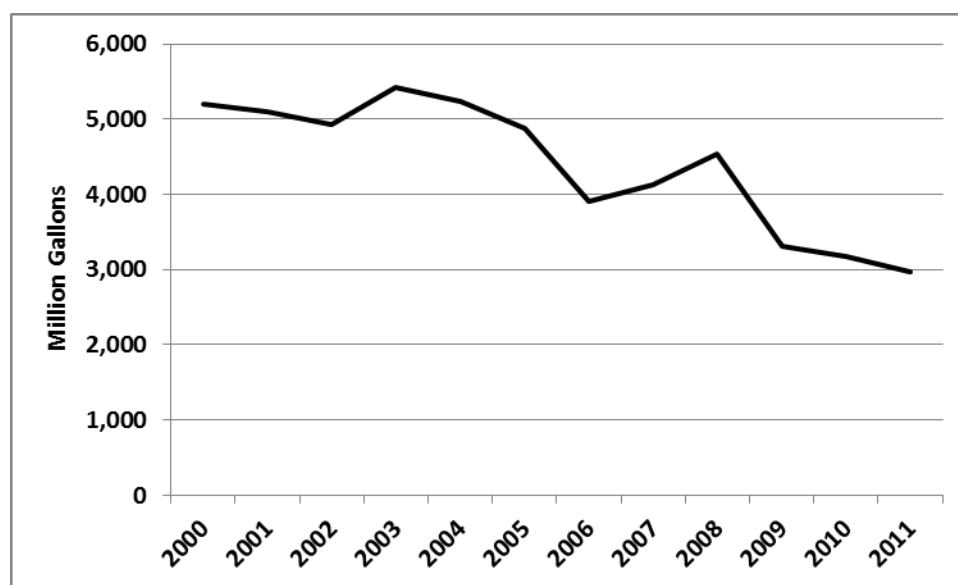
⁵ A 15 parts per million (ppm) sulfur specification, known as Ultra Low Sulfur Diesel (ULSD), was phased in for highway diesel fuel from 2006-2010. Diesel engines equipped with advanced emission control devices (generally, 2007 and later model year engines and vehicles) must use highway ULSD fuel. Low sulfur (500 ppm) and Ultra Low Sulfur (continued...)

Heating oil demand is seasonal, and U.S. refineries prepare for it by switching their product slates during late summer to begin producing and stockpiling both heating oil and winter gasoline blends.⁶ During these “turnarounds,” summer gasoline typically sees a price drop, and diesel fuel and heating oil see a price increase.

Northeast Heating Oil Demand and Price

The demand for home heating oil in the Northeast has been declining over the last decade (**Figure 1**). In 2000, Northeast residential customers consumed nearly 5.2 billion gallons (123.7 million barrels). By 2011 the (latest information available), consumption declined by 43% to 2.9 billion gallons (70.9 million barrels).

Figure 1. U.S. Total Distillate Sale/Deliveries to Northeast Residential Customers



Source: U.S. Energy Information Administration, *U.S. Total Distillate Sales/Deliveries to Residential Consumers*, <http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=KD0VRSNUSI&f=A>.

Notes: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

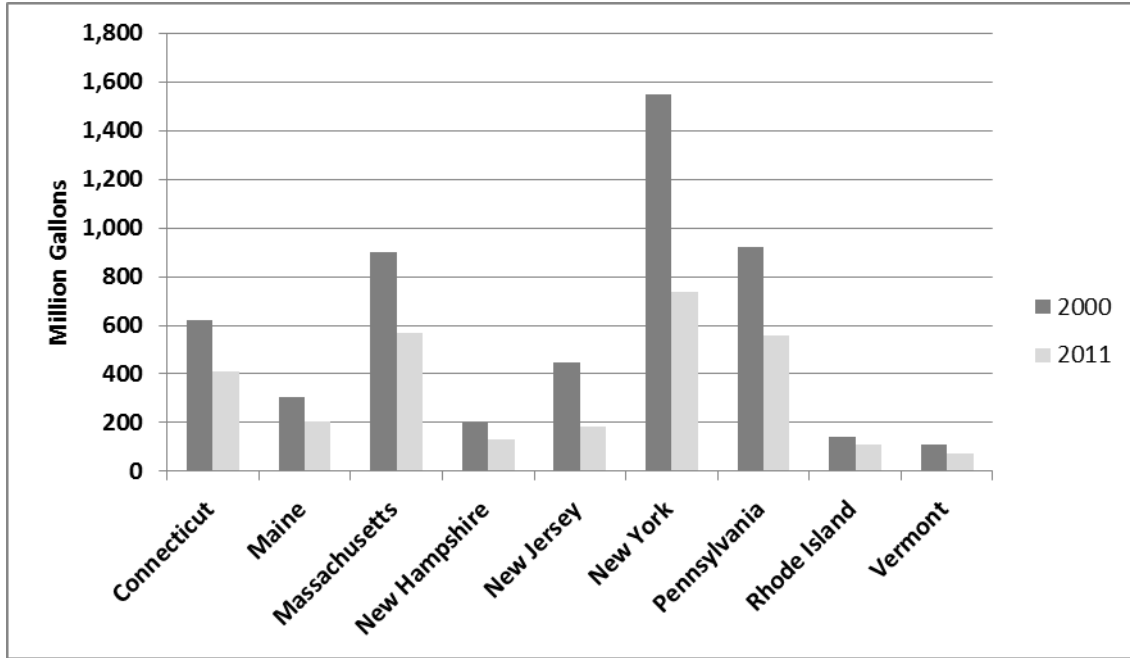
All states in the Northeast have experienced a decline in heating oil demand (**Figure 2**) since 2000. New York, the largest consumer of residential heating oil, dropped 52% from 1,549 million gallons in 2000 to 739 million gallons in 2011. Rhode Island, the smallest consumer, experienced an 8.8% drop from 118.5 million gallons in 2000 to 108.1 million gallons in 2011.

(...continued)

Diesel (ULSD) fuel will be phased in for non-road, locomotive, and marine (NRLM) engines from 2007-2014. EPA, Diesel Fuel, <http://www.epa.gov/otaq/fuels/dieselfuels/index.htm>.

⁶ CRS Report R41478, *The U.S. Oil Refining Industry: Background in Changing Markets and Fuel Policies*, by Anthony Andrews et al.

Figure 2. State by State Comparison of Heating Oil Demand



Source: U.S. Energy Information Administration, U.S. Total Distillate Sales/Deliveries to Residential Consumers, <http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=KDOVRSNUSI&f=A>

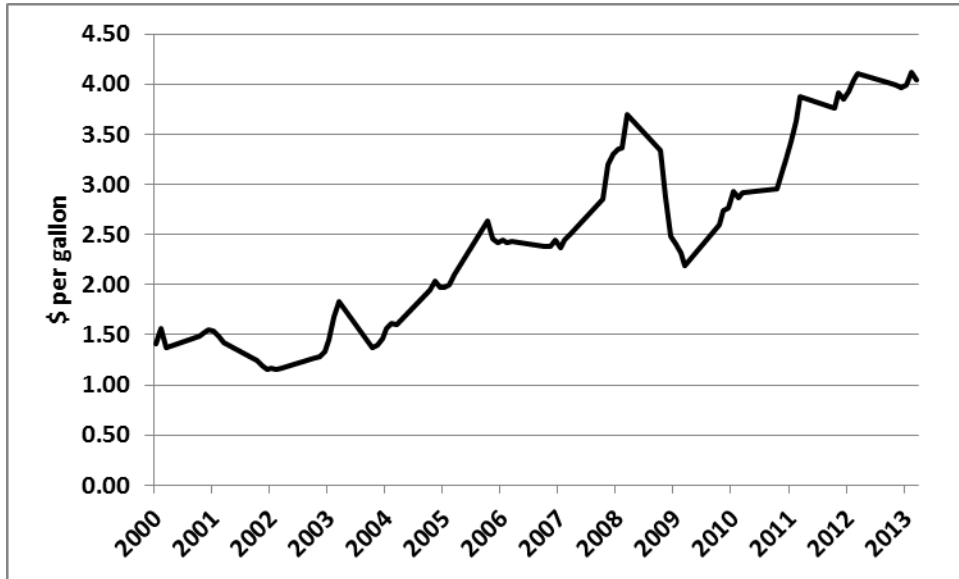
Notes: Million Gallons

Date	CT	ME	MA	NH	NJ	NY	PA	RI	VT
2000	621.0	305.9	899.0	201.3	449.8	1,549.2	919.5	143.4	107.8
2011	411.1	203.1	590.2	131.4	184.1	739.4	559.5	108.1	70.9

See **Appendix B** for more detail.

While the Northeast demand for home heating oil declined, the oil price increased from roughly \$1.50 per gallon beginning in 2000 to just over \$4.00 gallon in early 2013 (**Figure 3**). The price trend reflected the trend in the composite cost of crude oil acquired by U.S. refiners (**Figure 4**), particularly the crude oil price spike in 2008 and the precipitous price drop that followed in 2009.

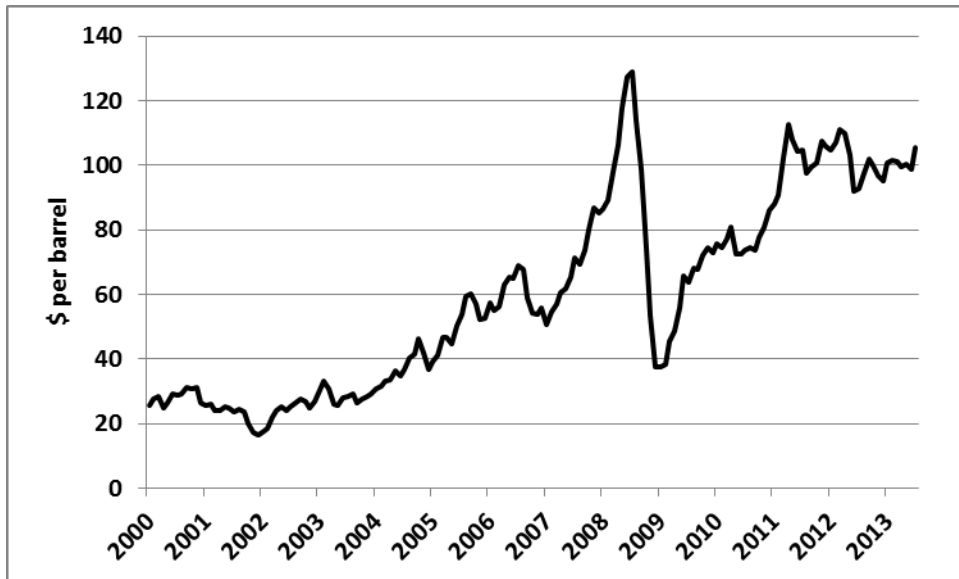
Figure 3. U.S. No. 2 Heating Oil Residential Price
Dollars per gallon



Source: U.S. Energy Information Administration, *U.S. No.2 Heating Oil Residential Price (Dollars per Gallon)*, http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=M_EPD2F_PRS_NUS_DPG&f=M.

Note: Price is in nominal dollars, not adjusted for inflation.

Figure 4. U.S. Crude Oil Composite Acquisition Cost by Refiners
Dollars per barrel



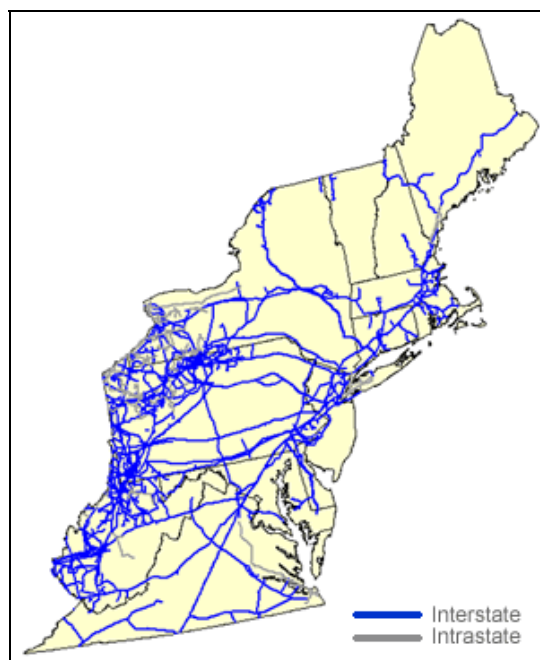
Source: U.S. Energy Information Administration, *U.S. Crude Oil Composite Acquisition Cost by Refiners (Dollars per Barrel)*, http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=R0000____3&f=M.

Notes: Price is in nominal dollars, not adjusted for inflation.

Northeast Demand for Alternative Heating Fuels

Other fuels that can substitute for heating oil include natural gas, electricity, bottled propane, and wood. This raises the question whether residential consumers may have switched from heating oil to other available fuels. The availability of natural gas depends on the availability of transmission and distribution pipelines. At least 20 interstate natural gas transmission pipelines serve the northeast region of the United States (**Figure 5**).⁷ This pipeline system delivers natural gas to several intrastate natural gas pipelines and at least 50 local distribution companies in the region. In addition to the natural gas produced in the region, several long-distance natural gas transmission pipelines supply the region from the southeast into Virginia and West Virginia, and from the Midwest into West Virginia and Pennsylvania. Canadian imports come into the region principally through New York, Maine, and New Hampshire. Liquefied natural gas (LNG) supplies also enter the region through the import terminals in Boston Harbor (Massachusetts) and New Brunswick, Canada.⁸ As shown in **Figure 5**, service to the far northeastern states is limited. Natural gas produced from Pennsylvania's Marcellus shale, which could serve the Northeast, did not begin to come on line until after 2008, and the pipeline infrastructure to deliver this gas has not expanded in the New England states.

Figure 5. Northeast Natural Gas Transmission Pipeline Infrastructure



Source: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System, http://www.eia.doe.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/northeast.html.

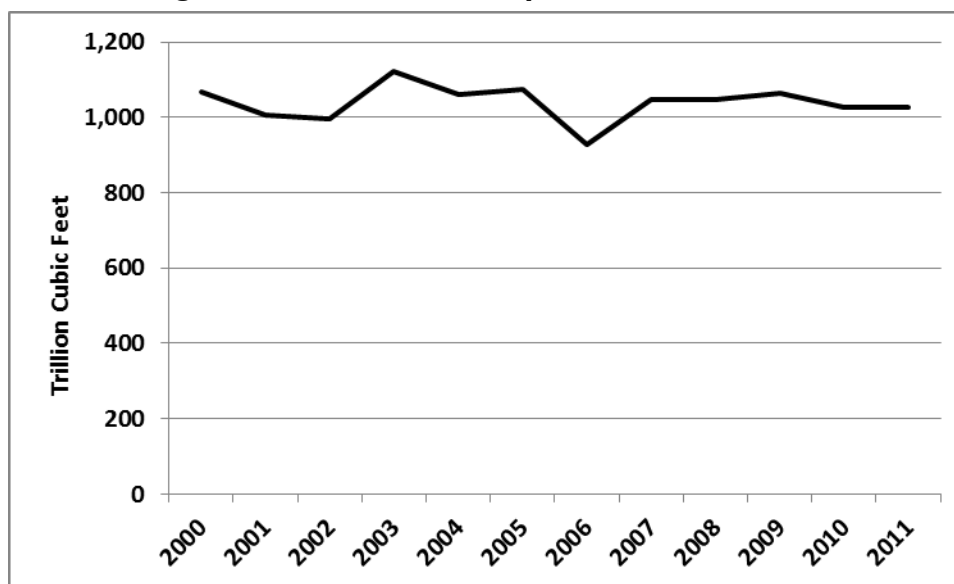
Notes: Includes Connecticut, Delaware, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, and West Virginia.

⁷ U.S. Energy Information Administration, *Natural Gas Pipelines in the Northeast Region*, http://www.eia.doe.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/northeast.html.

⁸ The Cove Point Terminal in Maryland is undergoing conversion to an export terminal.

However, as a percent of overall domestic demand for natural gas, the Northeast region has remained nearly steady, varying between 20% and 22% since 2000. After 2000, the Northeast demand varied somewhat through 2006, and then leveled off in the years since (**Figure 6**) and returned to a level barely above 2001-2002. If heating oil users were switching to an alternative heating fuel, it was not apparent that natural gas was the choice. Residential use of kerosene also declined.⁹ While the Energy Information Administration (EIA) does obtain volume data on residential propane sales, it does not publish this data.¹⁰ Bottled gas (propane) also serves as a heating fuel. However, the price of residential propane prices rose from \$1 per gallon in 2000 to over \$2.80 per gallon in 2012, suggesting that it did not offer a more economic alternative.¹¹

Figure 6. Natural Gas Use by Northeast Residents



Source: U.S. Energy Information Administration, *Natural Gas Consumption by End Use*, http://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm.

Notes: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

Electricity

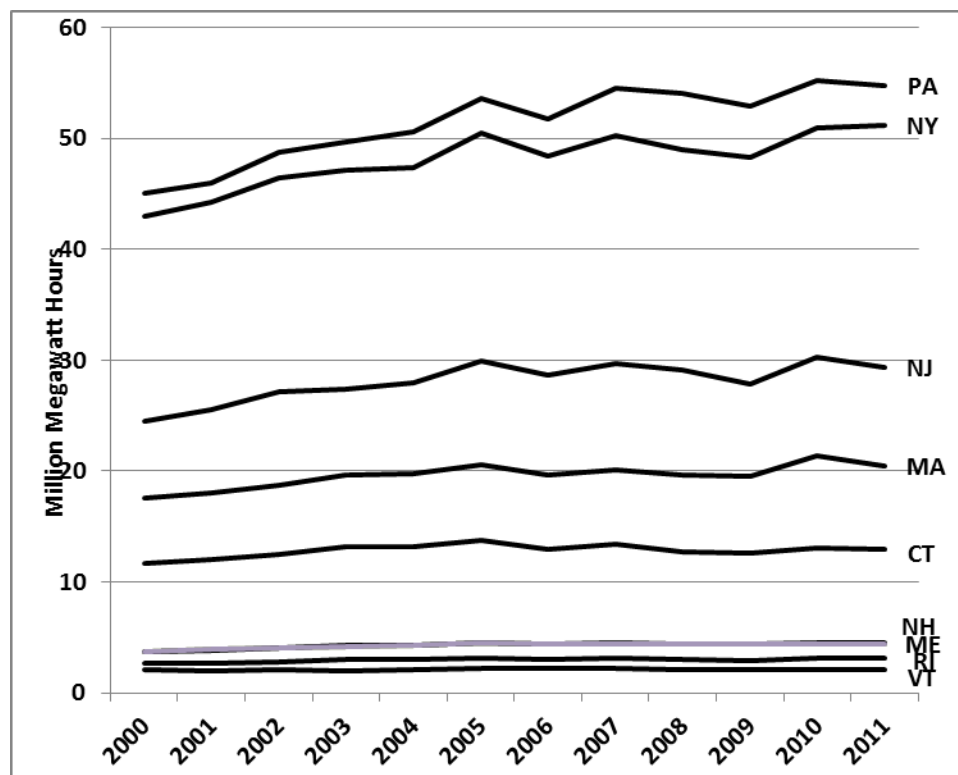
The residential demand for electricity by Northeastern states has been rising. Consumption and growth appeared greatest in the most region's populous states—New York (population 19.4 million) and Pennsylvania (12.7 million). (See **Figure 7**.) Both states also saw dramatic declines in natural gas demand (**Figure 2**) suggesting that some switching to electricity for heating may have occurred. In contrast, New Hampshire-Rhode Island-Vermont saw minimal increase in electricity demand, but still saw substantial drops in natural gas demand.

⁹ U.S. Energy Information Administration, *Adjusted Sales of Kerosene by End Use*, http://www.eia.gov/dnav/pet/pet_cons_821kera_dcu_R1Y_a.htm.

¹⁰ U.S. Energy Information Administration, *Short-Term Energy Outlook Model Documentation: Regional Residential Propane Price Model*, <http://www.eia.gov/forecasts/steo/documentation/propane.pdf>.

¹¹ U.S. Energy Information Administration, *U.S. Propane Residential Price*, http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=M_EPLPA_PRS_NUS_DPG&f=M.

Figure 7. Retail Electricity Sales to Residential Customers
2000-2011



Source: U.S. Energy Information Administration, *State Historical Table for 2011*, <http://www.eia.gov/electricity/data/state/>.

Northeast Population and Housing Unit Occupancy

Ultimately, heating oil, natural gas, and electricity demands are a function of population and housing. Statistics on the number of heating oil customers are not reported (if even collected). However, trends in housing unit numbers and occupancy, as reported by the U.S. Census Bureau, may serve as a proxy for customers. While population has increased, occupied housing rates remained nearly constant. Increased population and housing occupancy rates inversely correlate with heating oil demand, and even natural gas. Households were not turning to either as a preferred heating fuel.

Generally, the Northeastern states experienced a 3.21% aggregate increase in population from 2000 (53.59 million) through 2010 (55.32 million).¹² New York and Pennsylvania, the region's most populated states, experienced growth near the aggregate increase. (See **Table 1.**) The New England states of Maine and New Hampshire, two of the least populous states, exceeded the average population growth with increases of 4.19% and 6.53% respectively.

¹² U.S. Census, 2000 and 2010.

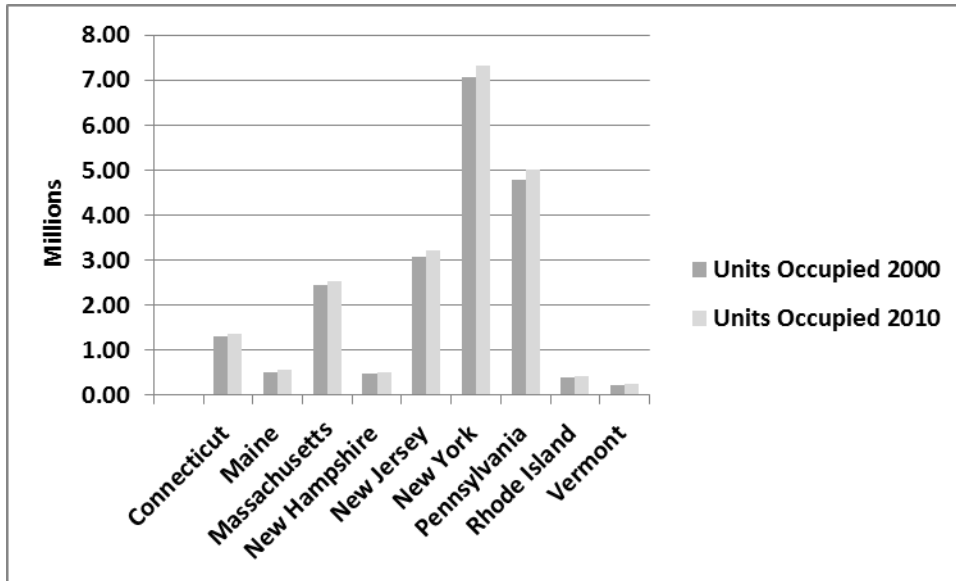
Table I. Northeastern States Population 2000 through 2010
Million

Census	CT	MA	ME	NH	NJ	NY	PA	RI	VT	Total
2010	3.574	6.548	1.328	1.316	8.792	19.378	12.703	1.053	0.625	55.317
2000	3.406	6.349	1.275	1.236	8.414	18.976	12.281	1.048	0.609	53.594
% Change	4.95	3.13	4.19	6.53	4.49	2.12	3.43	0.4	2.78	3.21

Source: U.S. Census for 2000 and 2010

In 2000, the Census Bureau reported just over 22.1 million housing units with 91.5% occupancy (20.3 million) for the Northeast states. By 2010, housing units increased to 23.6 million with 89.7% occupancy (21.2 million). That is, the number of occupied housing units increased by roughly 0.9 million. Furthermore, each Northeast state experienced the same state of change. (See Figure 8.)

Figure 8. Northeast Occupied Housing Units
2000 vs. 2010



Source: U.S. Census Bureau, *Housing Characteristics: 2000* (Oct. 2001), and *Housing Characteristics: 2010* (Oct. 2011).

Northeast Home Heating Oil Reserve

In response to the 1999-2000 heating oil price spike and supply shortage, Congress authorized the Secretary of Energy to establish the Northeast Home Heating Oil Reserve (NHHOR) in the Energy Act of 2000 (P.L. 106-469). As a 2 million barrel emergency stockpile of Government-

owned heating oil, NHHOR was intended to meet roughly 10 days of demand by the Northeastern states at the time it was created.¹³ The regional reserve reached its full capacity by the middle of October 2000 at two sites in New Haven, CT, and terminals in Woodbridge, NJ, and Providence, RI. The NHHOR mission is to supplement commercial fuel supplies should the region either face or experience a severe disruption to normal supplies.

The 2000 Act included established NHHOR as part of the broader Strategic Petroleum Reserve (SPR), and the FY2001 Interior Appropriations Act (P.L. 106-291) made \$8 million from the SPR account available to maintain NHHOR.¹⁴

Drawdown Authority

The 2000 Energy Act authorized the Secretary of Energy to drawdown or sell NHHOR heating oil when a Presidential determination is made that there is a severe energy supply interruption, either due to a “dislocation in the heating oil market,” or a “regional supply shortage of significant scope and duration.” The act defined a dislocation as a price differential between crude oil (reflected in an industry daily publication such as “Platt’s Oilgram Price Report” or “Oil Daily”) and No. 2 heating oil, as reported in the Energy Information Administration’s retail price data for the Northeast, that

- increases by more than 60% over its five-year rolling average for the months of mid-October through March (considered as a heating season average),
- continues for seven consecutive days, and
- continues to increase during the most recent week for which price information is available.

The Energy Secretary can offer NHHOR oil through a competitive bid process, or exchange it through an agreement that replaces the original volume with an added volume as repayment premium.

The act’s language was cause for controversy. Opponents of establishing a regional oil reserve argued that its use might be inappropriate, and the potential availability of the reserve could be a disincentive to private suppliers to maintain their inventories at sufficient levels. The intent of defining a dislocation was to make the threshold for use of the regional reserve high enough so that it would not discourage oil marketers and distributors from building up heating oil stocks. The President could also authorize a release of the NHHOR in the event that a “circumstance exists (other than the defined dislocation) that is a regional supply shortage of significant scope and duration, the adverse impacts of which would be “significantly” reduced by use of the NHHOR.”

¹³ 42 U.S.C. § 6250.

¹⁴ See CRS Report R42460, *The Strategic Petroleum Reserve: Authorization, Operation, and Drawdown Policy*, by Anthony Andrews and Robert Pirog.

Drawdowns

During mid- and late December 2000, heating oil prices breached the 60% differential. However, this was due to a sharp decline in crude prices rather than to a rise in home heating oil prices. In fact, home heating oil prices were drifting slightly lower during the same reporting period. While the 60% differential was satisfied, other conditions requisite to authorizing a drawdown of the NHHOR were not met.

A general strike in Venezuela that began in late 2002 resulted, for a time, in a loss of as much as 1.5 million barrels of daily crude supply to the United States. With refinery use lower than usual because of less crude reaching the United States, domestic markets for home heating oil had to rely on refined product inventories to meet demand during a particularly cold winter. Prices rose, and there were calls for use of the NHHOR; still, the price of heating oil fell significantly short of meeting the guidelines for a drawdown.

Neither the 2000 heating oil price spike nor the 2002 Venezuela strike led to a determination to drawdown NHHOR.

Sale and Exchange for Ultra Low Sulfur Oil

During February 2011, DOE conducted a turnover of the 1,984,253-barrel Northeast Home Heating Oil Reserve for the purpose of converting its high sulfur (2,000 parts per million) stocks to cleaner burning ultra-low sulfur distillate (15 parts per million). On February 3, DOE sold 984,253 barrels stored at the Hess First Reserve Terminal in Perth Amboy, NJ. On February 10, DOE sold 1,000,000 barrels from two storage sites in Connecticut: Hess Groton Terminal and the Magellan New Haven Terminal. DOE received approximately \$227 million from the sale and used the receipts to the purchase ultra-low sulfur distillate during the summer 2011. (DOE would have realized \$114.40/barrel or \$2.72 per gallon, compared to \$2.80 per gallon wholesale price for U.S. No. 2 Distillate.¹⁵)

Hurricane Sandy, October 2012

In late October 2012, Hurricane Sandy struck the Northeast, Mid-Atlantic, and the Great Lakes region with devastating winds, rain, snow, and tidal surges. President Obama responded by declaring that the storm had created a severe energy supply interruption and directed the Department of Energy to transfer emergency fuel from the Reserve to the Department of Defense (DOD) for its use in emergency operations and support for those in the region affected by the storm. At the time, transportation fuel was in short supply. The Defense Logistics Agency-Energy transferred fuel from the Hess Terminal in Groton, CT, and distributed it to state, local and federal responders in the New York/New Jersey area. Although designated a heating fuel, it may have served as a transportation fuel as DOD relies on diesel-fueled vehicles for logistical support.

Following a major snowstorm that hit the Northeast in November 2012 and compounded relief efforts there, DOE received two more requests for NHHOR fuel. It was not reported whether the fuel served heating needs or transportation needs.

¹⁵ U.S. Energy Information Administration, *U.S. No. 2 Distillate Wholesale/Resale Price by All Sellers (Dollars per Gallon)*, http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMA_EPD2_PWA_NUS_DPG&f=M.

In total, the Reserve released over 120,000 barrels (more than 5 million gallons) of fuel to support emergency relief efforts. Under its agreement with DOE, DOD replenished the Reserve with an equal volume of ultra-low sulfur diesel. Hurricane Sandy and the subsequent snowstorm marked the first time that emergency withdrawals were made from the Northeast Home Heating Oil Reserve, although the release may have satisfied both domestic heating and transportation needs.

National Oilheat Research Alliance

Congress also authorized the National Oilheat Research Alliance (NORA) in the 2000 Energy Act to develop projects for the research, development, and demonstration of clean and efficient oilheat utilization equipment; and to operate programs that enhanced consumer and employee training. NORA was a not-for-profit industry trade association of heating oil suppliers conceived of, and chartered under, Title VII of the act. As such, it was exempt from taxation under Section 501(c) of the Internal Revenue Code of 1986. NORA fell into a category of federally authorized programs known as check-off programs. To fund check-off programs, a fraction of the wholesale cost of a product is set aside by the producer and deposited into a common fund to be used to benefit producers and consumers.

Title VII included the provision in Section 713 (Sunset) that limited NORA's authorization to four years after establishment (February 2001). Section 302 (National Oilheat Research Alliance) of the 2005 Energy Policy Act (P.L. 109-58) amended Title VII to extend the sunset provision to nine years after NORA's establishment date, effectively extending it to February 2010. NORA actually ceased operation at the end of 2011, more than a year beyond its sunset date, while it disbursed remaining funds. Although Title VII, Section 704 *Referenda*, paragraph (c)—*Termination or Suspension* authorized NORA to hold a referendum to determine whether the oilheat industry favored termination or suspension of the alliance, there is no indication of industry interest in doing so.

Function and Operation

NORA started operation on February 6, 2001, and started collecting fees on March 1, 2001. Marketers and suppliers in 23 states and the District of Columbia chose to participate in NORA.¹⁶

Section 706 (Functions) authorized NORA to develop programs and projects, and enter into contracts to implement programs for

1. consumer and employee safety and training;
2. research, development, and demonstration of oilheat equipment; and
3. consumer education.

Section 706 specifically excluded advertising or promotions, and research on oilheat equipment that had already been verified as technically feasible.

¹⁶ Connecticut, Delaware, Idaho, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Nevada, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, Washington, Wisconsin, and Washington, DC.

Funding Source

To fund the projects and programs, the Title VII, Section 707 (Assessments) directed wholesalers to collect a two-tenths cent (\$0.002) per gallon assessment on No. 1 distillate and No. 2 dyed distillate at the point of sale, to be paid to the Alliance on a quarterly basis. **Table 2** summarizes NORA's assessed fees and other generated income during the years it operated (2001 through 2011). NORA's total revenue (including assessments, interest, other income sources, and contract revenue) reached nearly \$125 million by the end of 2011. Fee assessments represented 97% of total revenue collected. See **Table 2**.

Table 2. NORA Assessment Revenue 2001-2011

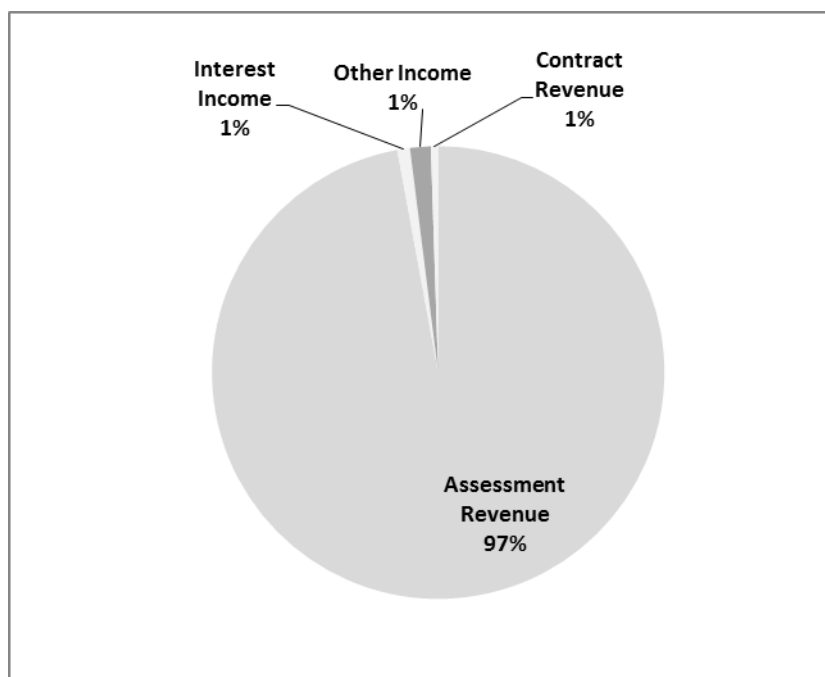
Revenue in current \$

Calendar Year	Net Assessment Revenue	Interest Income	Other Income	Contract Revenue	Total Revenue and Support
2001	11,055,555	77,989	-	-	11,133,544
2002	14,637,440	86,662	19,271	-	14,743,373
2003	17,447,342	43,120	337,051	-	17,827,513
2004	15,621,740	34,518	232,818	-	15,889,076
2005	8,798,154	129,841	225,633	-	9,153,628
2006	13,330,306	325,940	158,872	-	13,815,118
2007	14,001,145	314,418	146,496	-	14,462,059
2008	12,495,762	114,408	129,882	-	12,740,052
2009	12,008,689	6,068	148,715	-	12,163,472
2010	1,953,741	1,113	348,635	153,542	2,457,031
2011	-	1,069	99,994	491,332	592,395
Total	121,349,874	1,135,146	1,847,367	644,874	124,977,261

Source: NORA Annual Reports, <http://www.nora-oilheat.org/site20/index.mv?screen=budgets>.

Notes: Total Revenue Support = Assessment Revenue + Interest Income + Other Income.

Figure 9. NORA Revenue by Funding Source



Source: Compiled from **Table I. NORA Expenses and Spending during Assessment Authorization 2001-2011.**

Spending Issues

Title VII Section 707 ((d) Investment of Funds) authorized NORA to invest funds collected through assessments, and any other funds received by the Alliance, only in—

- (1) Obligations of the United States or any agency of the United States;
- (2) General obligations of any State or any political subdivision of a State;
- (3) Interest-bearing account or certificate of deposit of a bank that is a member of the Federal Reserve System; or
- (4) Obligations fully guaranteed as to principal and interest by the United States.

By the end of 2011, NORA had spent \$124.5 million (**Table 3**), with just \$0.5 million remaining from the \$125 million collected in assessments (**Table 2**). NORA spent nearly 75% (\$92 million) of its assessments in the form of state grants (**Figure 10**). NORA's general and administrative expenses represented slightly more than 6% (\$7.6 million) of overall spending.

Table 3. NORA Expenses and Spending During Assessment Authorization 2001-2011

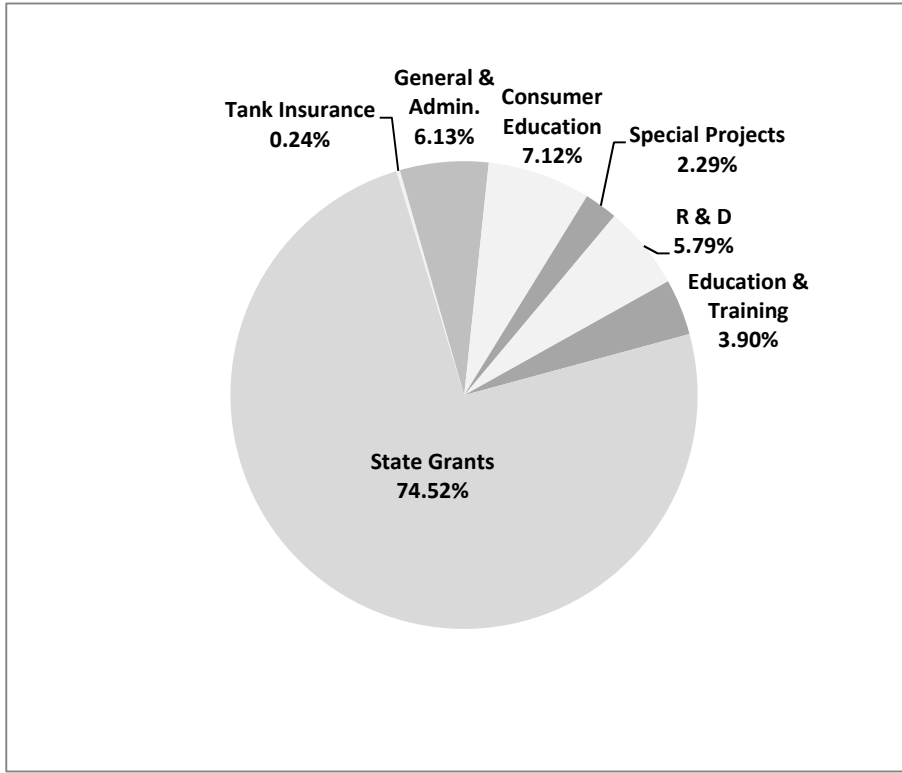
Expense in current \$

Cal. Year	Research and Development	Education and Training	State Grants	Tank Insurance	General Admin.	Consumer Education	Special Projects	Total Expenses
2001	380,431	380,431	8,084,149	-	1,104,991	-	-	9,950,022
2002	554,271	554,271	11,772,201	-	1,046,109	-	-	13,926,852
2003	1,207,679	707,679	12,027,305	-	1,421,878	2,254,292	-	17,618,833
2004	641,000	641,000	12,951,662	150,000	1,259,044	490,496	-	16,133,202
2005	1,000,000	120,000	4,220,343	150,000	571,782	1,000,000	502,464	7,564,589
2006	637,862	662,862	11,502,559	-	520,275	1,548,000	477,682	15,349,240
2007	580,114	645,114	10,733,674	-	556,266	1,468,000	638,888	14,622,056
2008	777,114	645,114	9,123,651	-	591,931	1,110,000	476,076	12,723,866
2009	777,114	300,000	9,610,877	-	607,280	910,000	361,174	12,566,445
2010	89,321	150,000	1,954,802	-	502,693	1,394	233,636	2,931,846
2011	506,553	1,077	-	-	432,539	4,267	138,184	1,082,620
Total	7,151,459	4,807,548	91,981,233	300,000	7,569,725	8,786,449	2,828,104	124,469,571

Source: NORA Annual Reports, <http://www.nora-oilheat.org/site20/index.mv?screen=budgets>.

Notes: NORA reported \$1,905,703 in Net Assets Remaining at the end of 2008.

Figure 10. NORA Expenses and Spending
2001 through 2011



Source: Compiled from **Table 3.** NORA Expenses and Spending during Assessment Authorization 2001-2011.

In its 2010 report reviewing NORA activities, the Government Accountability Office (GAO) noted that it was not clear whether the activities that NORA reported achieved strategic goals.¹⁷ Specifically

NORA's research and development activities were generally consistent with strategic goals, but because NORA's strategic plan lacked goals for its consumer education, education and training, and oil tank programs, GAO could not determine if these activities achieved desired results.

In considering the 18 key legislative requirements in Title VII, GAO concluded that NORA appeared to meet the requirements and did not raise significant issues.

¹⁷ U.S. Government Accountability Office, *Propane and Heating Oil: Federal Oversight of the Propane Education and Research Council and National Oilheat Research Alliance Should be Strengthened*, GAO-10-583, June 2010, pp. 49-50.

Lobbying Prohibitions

Title VII, Section 710 on lobbying restrictions prohibited the NORA from using section 707 assessments to influence legislation or elections. It did, however, allow NORA the exception of using Section 707 funds to formulate and submit recommendations to the Secretary of Energy for amending Title VII or other laws that would further the purposes of NORA.

In a September 2010 audit of NORA's activities GAO reported that¹⁸

minutes of an August 2008, NORA executive committee meeting indicated that the NORA president said he was seeking state senators' support for NORA reauthorization, and that a December 2008 NORA-qualified Massachusetts state association newsletter indicated that the NORA president traveled to Washington to urge both Massachusetts senators to support NORA reauthorization.

However, GAO went on to report that Title VII provides no guidance on what constitutes "influencing legislation or elections:"

there is little pertinent legislative history; no court has addressed what this language means as used in these statutes; and other federal laws containing similar language have been interpreted in different ways. As such, it is not clear whether or not the Propane Act's or the Oilheat Act's prohibitions cover those types of activities.

Conclusions

The Northeast's declining heating oil demand, 47% since 2000, reflects an overall decline in petroleum products demand nationally. In response to the 1999-2000 heating oil price spike and supply shortage, Congress authorized a two million-barrel Northeast Home Heating Oil Reserve (NHHOR) to meet roughly 10 days of the Northeast's demand. At that time (2000), the Northeast annually consumed nearly 5.2 billion gallons (123.7 million barrels). The winter heating season typically begins October 1 and may last through May 31—some 243 days. Based on that assumption, the rate of consumption could reach half a million barrels per day, and thus consume the Reserve in as few as four days. Under the current consumption rate of 70.9 million barrels annually, the Reserve could last as long as a week. Heating fuel shortages are more likely to occur toward the end of the heating season, which lengthy or late-season cold spells may exacerbate. During such episodes, homeowners have the recourse of purchasing diesel fuel (although at a higher price), as do homeowners who run out of heating oil before their scheduled deliveries.

No single factor explains the Northeast's declining demand for heating oil. Although steady price increases appear to correlate with declining demand, consumers may have responded by using less heating oil. It is not apparent that residential consumers switched to natural gas, bottled gas, or kerosene. A rise in electricity sales could suggest some displacement of heating oil, but could also correlate with increased population and new home construction. Both housing stock and occupancy rates increased over the 2000 through 2011 timeframe, suggesting an increased

¹⁸ U.S. Government Accountability Office, Propane and Heating Oil—Federal Oversight of the Propane Education and Research Council and National Oilheat Research Alliance Should be Strengthened, GAO-10-981T, September 29, 2010, pp. 6-7, http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=5e0792b7-a0b4-2908-4e0b-1127615fddef.

demand for residential heating. However, more energy-efficient and better-insulated new houses could have replaced older units. Newer, more efficient oilheat furnaces could have replaced older units, which state grants (**Table 3**) may have subsidized (or aided financially distressed homeowners with their heating oil bills).

In its 13-year history, NNHOR has only released fuel in response to distillate fuel shortages during natural disasters, and not in response to a market dislocation. (The overall short supply of transportation fuels and blocked roads in the regions affected by Hurricane Sandy and winter snowstorms also prevented commercial fuel deliveries to residential heating customers.) While the release demonstrated the utility of maintaining a distillate stockpile, the original authorizing legislation had not anticipated that role. Critics of NNHOR might argue that while maintaining NNHOR better prepares the Northeast for natural disasters, it shortchanges preparedness in other regions of the United States. Supporters might counter that the Northeast lies beyond the product pipeline system that supplies the mid-Atlantic region with fuel refined in the Gulf Coast (but for that matter so does the West Coast and the Mid-Continent).¹⁹

NNHOR does not appear to have influenced heating oil prices the way that the threat of releasing crude oil from the Strategic Petroleum Reserve might influence crude oil prices.²⁰ Commodity traders are likely to bid up heating oil futures contracts early in the season, if long-term weather forecasts call for a colder winter. Heating oil futures contracts will also reflect crude oil price futures. Observers may interpret these trading patterns as speculative bidding that is driving prices higher. However, to guarantee and lock in future supplies, heating oil brokers may be compelled to enter higher bids.

Independent retail marketers tend to respond to more local market conditions and shorter timeframes. Price increases (or decreases) reflect the marketer's expectation of the cost to replace their current fuel stocks in order to stay in business. In authorizing NNHOR, policy makers sought to avert the "price gouging" reported to occur prior to and during fuel shortages. In defense of marketers, consumers only become aware of impending shortages through a price signal, i.e., a price spike. No more direct signal exists to inform consumers of the need to conserve, and nor more immediate mechanism exists to allocate at least a minimum amount of fuel while discouraging hoarding. The reluctance to tap NNHOR may have influenced consumers to conserve fuel as prices escalated over time (very much in line with overall energy conservation policy). The presence of NNHOR may have instilled some confidence that a supply shortage would be temporary. Nevertheless, NNHOR challenges the notion of an "inherently governmental" function. As demonstrated after Hurricane Sandy, NNHOR supported federal disaster response, and policy makers may continue to justify it on that basis but not while shortchanging other regions. Finally, as natural gas supplies increase in the region and utilities expand their service territories, consumers may express a preference for a lower cost, more plentiful, cleaner source of heating.

The Northeast region's reduced dependence on heating oil and the increased availability of alternative heating fuels raise the question of whether DOE should continue maintaining NNHOR, and whether Congress should continue to monitor the region's heating oil supply.

¹⁹ See CRS Report R41478, *The U.S. Oil Refining Industry: Background in Changing Markets and Fuel Policies*, by Anthony Andrews et al.

²⁰ See CRS Report R42460, *The Strategic Petroleum Reserve: Authorization, Operation, and Drawdown Policy*, by Anthony Andrews and Robert Pirog.

Appendix A. Definitions of Distillate Fuel Categories

Distillate Fuel Oil

A general classification for one of the petroleum fractions produced in conventional distillation operations. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those in trucks and automobiles, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.²¹

No. 2 Fuel Oil (Heating Oil)

A distillate fuel oil that has a distillation temperature of 640 degrees Fahrenheit at the 90% recovery point and meets the specifications defined in ASTM Specification D 396. It is used in atomizing type burners for domestic heating or for moderate capacity commercial/industrial burner units.

No. 4 Fuel Oil

A distillate fuel oil made by blending distillate fuel oil and residual fuel oil stocks. It conforms with ASTM Specification D 396 or Federal Specification VV-F-815C, and is used extensively in industrial plants and in commercial burner installations that are not equipped with preheating facilities. It also includes No. 4 diesel fuel used for low- and medium-speed diesel engines and conforms to ASTM Specification D 975.

No. 1 Distillate

A light petroleum distillate that can be used as either a diesel fuel (see No. 1 Diesel Fuel) or a fuel oil (see No. 1 Fuel Oil).

No. 1 Diesel Fuel: A light distillate fuel oil that has distillation temperatures of 550 degrees Fahrenheit at the 90% point and meets the specifications defined in ASTM Specification D 975. It is used in high-speed diesel engines generally operated under frequent speed and load changes, such as those in city buses and similar vehicles.

No. 1 Fuel Oil: A light distillate fuel oil that has distillation temperatures of 400 degrees Fahrenheit at the 10% recovery point and 550 degrees Fahrenheit at the 90% point and meets the specifications defined in ASTM Specification D 396. It is used primarily as fuel for portable outdoor stoves and portable outdoor heaters.

²¹ Rick Wallace, *Definitions of EIA Distillate Categories and Fuels Contained in the Distillate Grouping*, U.S. Department of Energy.

No. 2 Distillate

A petroleum distillate that can be used as either a diesel fuel (see No. 2 Diesel Fuel) or a fuel oil (see No. 2 Fuel Oil).

No. 2 Diesel Fuel: A fuel that has distillation temperatures of 500 degrees Fahrenheit at the 10% recovery point and 640 degrees Fahrenheit at the 90% recovery point and meets the specifications defined in ASTM Specification D 975. It is used in high-speed diesel engines that are generally operated under uniform speed and load conditions, such as those in railroad locomotives, trucks, and automobiles.

No. 2 Diesel Fuel, High Sulfur: No. 2 diesel fuel that has a sulfur level above 500 ppm.

No. 2 Diesel Fuel, Low Sulfur: No. 2 diesel fuel that has a sulfur level between 15 ppm and 500 ppm (inclusive). It is used primarily in motor vehicle diesel engines for on-highway use.

No. 2 Diesel Fuel, Ultra Low Sulfur Diesel (ULSD): No. 2 diesel fuel that has a sulfur level below 15 ppm. It is used primarily in motor vehicle diesel engines for on-highway use.

Appendix B. Northeast Fuel Oil Sales

Table B-I. Total Distillate Sales/Deliveries to Northeast Residential Customers
Million Gallons

Date	CT	MA	ME	NH	NJ	NY	PA	RI	VT	Total
2000	621.0	899.0	305.9	201.3	449.8	1,549.2	919.5	143.4	107.8	5,196.9
2001	579.5	949.7	291.8	192.7	403.4	1,555.0	888.8	151.8	94.6	5,107.2
2002	565.7	953.2	291.5	179.9	390.9	1,420.9	885.7	144.9	91.3	4,924.2
2003	682.4	901.2	393.9	221.3	459.6	1,509.8	992.6	165.3	102.6	5,428.7
2004	713.2	810.2	414.0	223.6	415.2	1,435.6	939.7	163.1	113.0	5,227.5
2005	626.0	773.3	353.7	201.2	369.4	1,471.2	835.0	156.7	94.7	4,881.3
2006	525.8	638.0	303.0	172.8	288.7	1,092.7	689.2	117.0	86.4	3,913.6
2007	537.8	655.1	299.2	167.8	310.5	1,241.7	707.0	122.2	89.0	4,130.2
2008	541.6	677.9	257.1	169.7	342.2	1,207.8	1,138.8	122.2	80.2	4,537.5
2009	506.2	581.8	220.1	138.2	270.6	845.8	542.2	124.1	82.4	3,311.3
2010	460.9	590.2	188.9	122.8	220.3	800.1	598.3	118.5	67.7	3,167.8
2011	411.1	569.3	203.1	131.4	184.1	739.4	559.5	108.1	70.9	2,976.9

Source: U.S. Energy Information Administration, U.S. Total Distillate Sales/Deliveries to Residential Consumers (Thousand Gallons), <http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=KDOVRSNUSI&f=A>.

Notes: Does not include diesel fuel for on-highway use.

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