Congressional Research Service
Informing the legislative debate since 1914

Diesel and Fuel Oil: Distillate Supply Issues

March 9, 2023

Congressional Research Service
https://crsreports.congress.gov
R47469

CRS REPORT
Prepared for Members and
Committees of Congress

Congressional Research Service
Informing the legislative debate since 1914

SUMMARY

R47469

March 9, 2023

Lexie Ryan
Analyst in Energy Policy

Diesel and Fuel Oil: Distillate Supply Issues

Distillate fuel oil, a fuel category that includes diesel and heating oil, is a middle distillate produced by separating crude oil in a refinery. Distillate fuel oil is primarily used for two purposes: (1) as diesel fuel, it provides fuel for trucks, buses, automobiles, and construction and farm equipment; and (2) as fuel oil, it provides space heating (especially to residences across New England and the Mid-Atlantic) and energy for commercial and industrial uses.

Distillate fuel oil stocks primarily consist of commercial inventories held at refineries, in pipelines, at terminals, and in storage facilities. Stocks are tracked and organized within the seven Petroleum Administration for Defense Districts (PADDs) that divide the United States and U.S. territories. Prices and supply can vary widely among these regional districts based on different supply sources, demand patterns, season and weather impacts, excise and other state-specific taxes, and fuel transportation capabilities.

The U.S. Energy Information Administration (EIA) conceptualizes the amount of distillate fuel available through its "Days of Supply," a national metric quantifying the number of days the current U.S. inventory of distillate could last if all U.S. refineries immediately ceased producing and importing fuel. Days of Supply reached 30-year seasonal lows in October 2022, falling to 25.9 Days of Supply the week ending October 21, 2022. This prompted concerns regarding a potential diesel shortage. During the same time, stocks also reached 30-year lows, although availability varied across different PADDs. The director of the National Economic Council said that "all options are on the table" to increase supplies of "unacceptably low" diesel inventories. Fuel demand adjusted and prices fell beginning in November 2022, though some regions across the United States saw higher prices than other regions.

Diesel prices reached all-time nominal highs in several PADDs in May and June 2022, and the price of heating oil also reached a record nominal high in November 2022. This capped a period of rising prices since early 2021. Supply is one of the many factors that influence the prices of distillate fuel oil and can change based on a variety of factors related to economic activity, seasons and weather, geopolitical events, and scheduled maintenance, among others. Low supplies and high prices in 2022 were partially driven by cuts in domestic refinery capacity as well as a tighter global market due to Russia's war in Ukraine and lower exports from China. The EIA pointed to seasonal demand for heating oil as "likely the primary catalyst" for high prices in November 2022.

To address high prices, bills were introduced in the 117th Congress to forbid price-gouging (Consumer Fuel Price Gouging Prevention Act, H.R. 7688; Gas Price Gouging Prevention Act, S. 3920; GOUGE Act, H.R. 7751, and Price Gouging Prevention Act of 2022, S. 4214), and to repeal the federal diesel fuel tax (Relief for Our Truckers Act (H.R. 8414).

In the 118th Congress, legislation has been introduced to establish a new federal reserve in each PADD to store gasoline and diesel fuel (Buy Low and Sell High Act, H.R. 432). An amendment to H.R. 21 to block price increases in gasoline and diesel (H.Amdt. 13) failed in January 2023.

Congress has also considered legislation in other contexts that could have impacted the availability of diesel and heating oil, even if the legislation was not introduced or considered with distillate fuel oil supplies in mind. The Jones Act, which requires water transportation between U.S. ports to use U.S.-built and -flagged vessels, is intended to support and maintain domestic shipping but also can constrain supply options, especially in the Northeast. Members for various reasons have introduced legislation regarding the Jones Act, including The Jones Act Repeal Act, H.R. 8996, in the 116th Congress, and the Open America's Water Act, S. 1646, in the 117th Congress.

Other options to counter low supplies and high prices may include export prohibitions and mandating inventory or storage, or fuel rationing and bans. Neither the President nor Congress has implemented any mandatory distillate fuel oil rationing. In 2022, private industry suppliers rationed their own supplies to consumers as inventories in local markets dwindled.

Contents

Introduction 1
Distillate Fuel Oil Production and End Uses 1
U.S. Distillate Fuel Oil Stocks 3
Petroleum Administration for Defense Districts 3
EIA's "Days of Supply" Metric and Distillate Fuel Oil Stocks 4
Regional Price and Supply Variation 6
Factors That May Affect Supply 9
Falling Refinery Capacity 10
Tighter Global Distillate Market 11
Seasonal Demand and Maintenance 12
Supply Recovery and Price Adjustment 13
Policy Considerations 14
Jones Act 14
Export Prohibition 16
Minimum Inventory Levels 17
Fuel Rations 17

Figures

Figure 1. Crude Oil Distillation Products 2
Figure 2. Share of Distillate Fuel Oil by End Use 3
Figure 3. Petroleum Administration for Defense Districts, Continental United States 4
Figure 4. EIA's Days of Supply of Distillate Fuel Oil 5
Figure 5. U.S. Stocks of Distillate Fuel 6
Figure 6. Weekly Stocks of Distillate Fuel Oil in 2022, PADDs 1-5 7
Figure 7. On-Highway Diesel Prices, PADD 1-5, 2022 7
Figure 8. Weekly Distillate Fuel Oil Stocks and No. 2 Nominal Diesel Retail Prices, 2000-2022 9
Figure 9. U.S. Operable Crude Oil Distillation Capacity 10
Figure 10. U.S. Monthly Distillate Fuel Oil Imports from Europe, 1993-2022 12
Figure 11. U.S. Distillate Fuel Oil Change in Stocks, 2000-2022 13
Figure 12. U.S. Monthly Distillate Fuel Oil Imports and Exports, 2019-2022 17

Contacts

Author Information 18

Introduction

At the end of October 2022, U.S. inventories of distillate fuel oil, a fuel category which includes diesel, fell to the lowest levels in any October since 1951.[1] In October and November 2022, some federal officials and media commentators speculated that low inventories would cause a diesel fuel shortage. They expressed concern that consumers were facing high prices and that the United States could ultimately run out of diesel fuel. National Economic Council Director Brian Deese reportedly stated that "all options are on the table" to increase supplies of "unacceptably low" diesel inventories.[2] During this time, some Members of Congress also reportedly expressed similar concern over high diesel prices and low supply.[3]

Through the remainder of 2022, the U.S. Energy Information Administration (EIA) had projected diesel prices to remain above $5 per gallon and bills for homes using heating oil, another common type of distillate fuel oil, to increase by 45% compared to a year prior.[4] While fuel demand adjusted and diesel prices ended up falling below the $5 level in December in several regions across the United States, they remained above $5 in others. The U.S. average on-highway diesel fuel price on February 13, 2023 was $4.44, $0.43 higher than the same week in 2022.[5]

Inventory metrics tracked by EIA, such as stocks and "Days of Supply," help give an overview of U.S. supplies of distillate fuel oils such as diesel and heating oil. These metrics highlight October 2022 as a time period of low domestic supply amid a tight global market. International, domestic, and seasonal factors all acted to pressure U.S. supplies, forcing prices up, which drove concern among analysts. Although Congress debated some measures to take action on low supply and high prices, ultimately supply increased and prices fell without federal intervention.

Distillate Fuel Oil Production and End Uses

Distillate fuel oil is a petroleum product produced in refining operations. During the distillation process, a refinery uses heat to separate crude oil into its components, called distillation fractions, with different boiling points: light fractions such as gasoline components and liquefied refinery gases, medium weight liquids such as kerosene and distillates, and heavier liquids such as gas oils.[6] Some heavier distillation fractions can be processed further with pressure, catalysts, and

[1] U.S. Energy Information Administration (EIA), "Short-Term Energy Outlook," November 2022, https://www.eia.gov/outlooks/steo/archives/Nov22.pdf.

[2] Chunzi Xu, "Diesel Supply of Just 25 Days Poses Problem for Biden," *Bloomberg*, October 19, 2022, https://www.bloomberg.com/news/articles/2022-10-19/a-25-day-diesel-supply-and-surging-demand-are-a-worry-for-biden.

[3] Jesse Allen, "Farm State Senators Vent over High Diesel Prices," *American Ag Network*, November 23, 2022, https://americanagnetwork.com/2022/11/farm-state-senators-vent-over-high-diesel-prices/; Giulia Carbonaro, "Diesel Shortage Fears Rise as Joe Biden Urged to Stop Supplies Running Out," *Newsweek*, November 2, 2022, https://www.newsweek.com/diesel-shortage-fears-rise-joe-biden-urged-stop-supplies-running-out-1756264; Kevin Freking and Matthew Daly, "Top Democrats Push for Federal Crackdown on High Gas Prices," *AP News*, April 28, 2022, https://apnews.com/article/russia-ukraine-business-europe-federal-trade-commission-congress-eefe1247eb70be0d0247590c0811fd41.

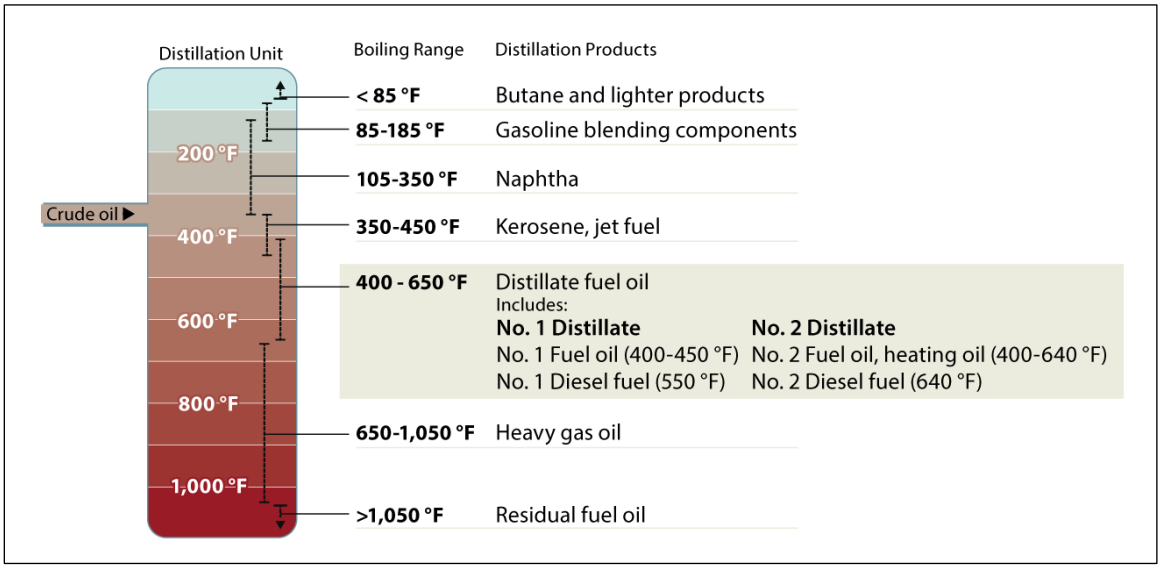
[4] EIA, "Short-Term Energy Outlook," November 2022, https://www.eia.gov/outlooks/steo/archives/Nov22.pdf. Diesel prices ended up falling below the $5 level in December in several regions across the United States.

[5] EIA, "Gasoline and Diesel Fuel Update," *Petroleum and Other Liquids*, released February 13, 2023, https://www.eia.gov/petroleum/gasdiesel/.

[6] For more information on the petroleum refining process, see EIA, "Oil and Petroleum Products Explained," last reviewed February 23, 2022, https://www.eia.gov/energyexplained/oil-and-petroleum-products/refining-crude-oil-the-refining-process.php.

sometimes hydrogen. Products produced by this fractional distillation process range from residual fuel oil to butane (**Figure 1**). Other processes combine distillates with other materials to create asphalt, ship and aircraft bunker fuels, and gasolines. Distillate fuel oil is classified as a middle distillate. Kerosene and jet fuel are also middle distillates but are not counted as distillate fuel oil in EIA classifications.

Figure 1. Crude Oil Distillation Products



Source: Graphic created by CRS based on figure from EIA, "Oil and petroleum products explained," last reviewed February 23, 2022, https://www.eia.gov/energyexplained/oil-and-petroleum-products/refining-crude-oil-the-refining-process.php.

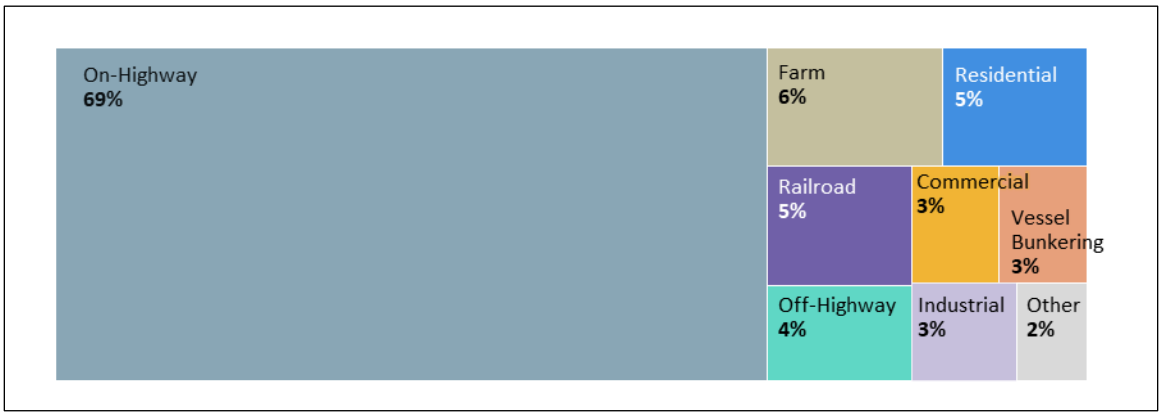
Notes: The figure does not include all distillation products. Other classifications of distillate fuel oil include No. 4 fuel oil, used in industrial plants and some commercial burners; No. 4 Residual fuel oil, used in steam-powered vessels and power plants; and No. 6 Residual fuel oil, used in the production of electricity, space heating, vessel bunkering, and industrial purposes.

Some types of distillate fuel oil are more commonly known as diesel or heating fuel oil. Distillate fuel oil is used for a wide variety of applications, shown in **Figure 2**. Most is used as diesel in on- and off-highway and farm end uses, which includes freight trucks, buses, automobiles, construction and farm equipment. Diesel can also fuel back-up generators. Additionally, 18% of residences in New England and the Mid-Atlantic use distillate heating oil for their primary heat supply in the winter.[7]

[7] EIA, "Winter Fuels Outlook, October 2022," *Short-Term Energy Outlook*, released October 2022, https://www.eia.gov/outlooks/steo/report/WinterFuels.php.

Figure 2. Share of Distillate Fuel Oil by End Use

Uses in 2020



Source: Figure created by CRS. Data from EIA, "Sales of Distillate Fuel Oil by End Use," *Petroleum and Other Liquids*, released February 9, 2022, https://www.eia.gov/dnav/pet/pet_cons_821dst_dcu_nus_a.htm.

U.S. Distillate Fuel Oil Stocks

U.S. distillate fuel oil stocks are primarily composed of commercial inventories held in refineries, pipelines, terminals, and storage facilities. The federal government controls approximately 1 million barrels[8] of ultra-low sulfur distillate inventory in the Northeast Home Heating Oil Reserve,[9] for use during severe supply interruptions.[10]

The United States has other strategic fuel reserves. The Strategic Petroleum Reserve[11] (SPR) consists of crude oil. The SPR does not contain distillate fuel oil. The Northeast Gasoline Supply Reserve[12] is an emergency supply of 1 million barrels of gasoline located in New York Harbor, NY; Boston, MA; and South Portland, ME.

Petroleum Administration for Defense Districts

Seven Petroleum Administration for Defense Districts (PADDs) divide the United States and U.S. territories into geographic districts that track, allocate, and organize fuels and related data (**Figure 3**).[13] PADD 1, East Coast, is further divided into three subdistricts. These regional districts have different supply sources, demand patterns, and fuel transportation capabilities. Fuel prices, supply, and consumption patterns can vary widely among PADDs.[14] For example, constraints on natural gas pipeline capacity in New England have pushed the region to use fuel oil for heating

[8] Roughly 1% of U.S. stocks.

[9] Office of Cybersecurity, Energy Security, and Emergency Response (CESER), "The Northeast Home Heating Oil Reserve," Energy.gov, accessed January 18, 2023, https://www.energy.gov/ceser/northeast-home-heating-oil-reserve.

[10] See CRS In Focus IF12205, *Northeast Home Heating Oil Reserve,* by Phillip Brown.

[11] CESER, "About the SPR," Energy.gov, accessed January 18, 2023, https://www.energy.gov/ceser/strategic-petroleum-reserve.

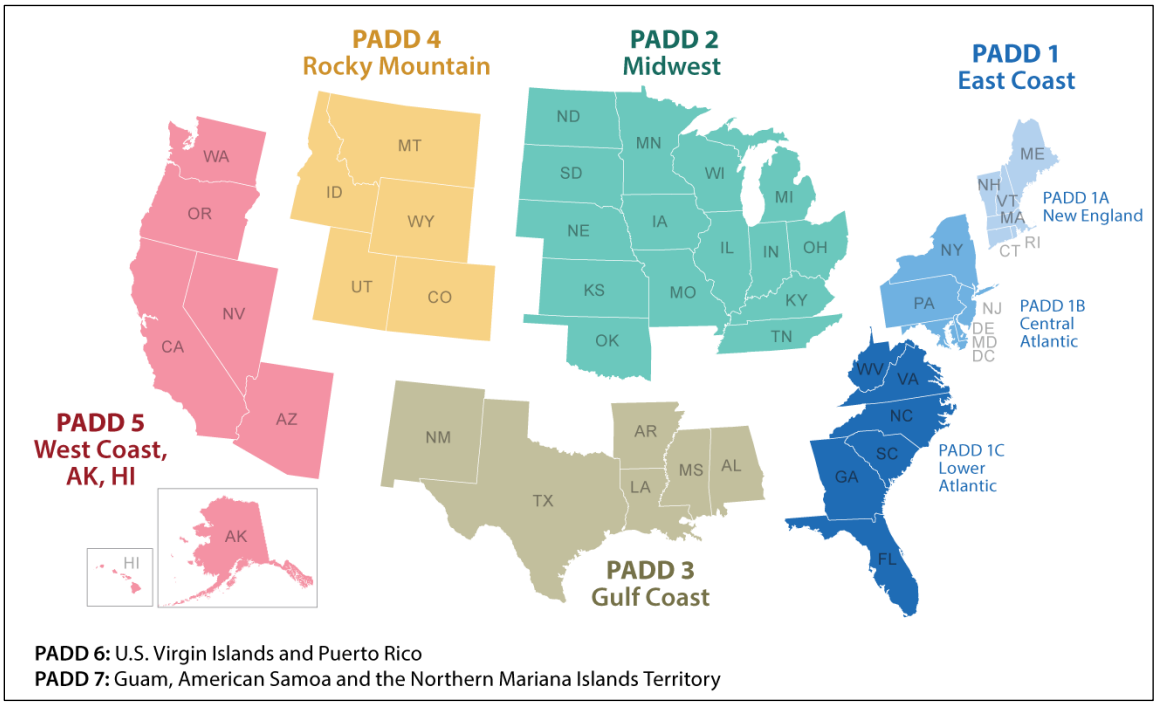
[12] CESER, "About NGSR," Energy.gov, accessed January 18, 2023, https://www.energy.gov/ceser/northeast-gasoline-supply-reserve.

[13] EIA, "Petroleum Administration for Defense District (PADD)," Glossary, Accessed January 18, 2023, https://www.eia.gov/tools/glossary/index.php?id=P#PADD_def.

[14] The EIA notes that PADDs 6 and 7 are not included in U.S. totals for EIA data.

purposes more than elsewhere in the country.[15] On the West Coast, California frequently sees higher diesel fuel prices than other parts of the country due to state taxes and relative geographic isolation from other PADDs.[16]

Figure 3. Petroleum Administration for Defense Districts, Continental United States



Source: Figure created by CRS. Information from EIA, "States by PADD region for on-highway diesel," *Petroleum and Other Liquids*, accessed February 3, 2023, https://www.eia.gov/petroleum/gasdiesel/diesel_map.php.

EIA's "Days of Supply" Metric and Distillate Fuel Oil Stocks

EIA uses "Days of Supply" to conceptualize the amount of distillate fuel available. The metric acts as a benchmark of general supply and demand. Days of Supply is calculated by dividing the current stock level by estimated demand averaged over the preceding four weeks. Sometimes, commentators may interpret EIA's Days of Supply as a bellwether for total stocks of fuel. For example, the EIA reported that the United States had 25.9 Days of Supply of distillate for the week ending October 21, 2022, marking a seasonal low since 1991 (**Figure 4**). This fell within a seven-week period between the end of September and second week of November during which

[15] ISO New England, "Natural Gas Infrastructure Constraints," accessed January 23, 2023, https://www.iso-ne.com/about/what-we-do/in-depth/natural-gas-infrastructure-constraints.

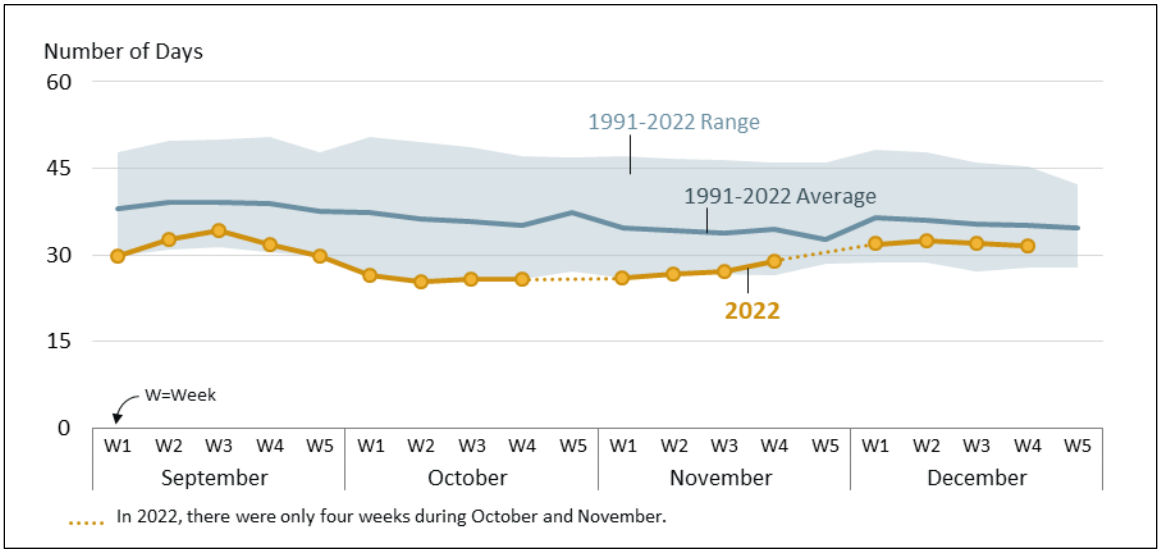
[16] According to EIA, "Unlike other U.S. markets, which are interconnected by pipelines and river systems, the West Coast liquid fuels market is relatively isolated and largely supplied by in-region refinery production." Additionally, as of July 1, 2020, total state taxes on diesel in California were 66.66 cents per gallon, while the average of total state taxes for all 50 states was 31.76 cents per gallon. EIA, "Factors Affecting Diesel Prices," *Diesel Fuel Explained*, last updated February 15, 2022, https://www.eia.gov/energyexplained/diesel-fuel/factors-affecting-diesel-prices.php; EIA, "West Coast Transportation Fuels Markets," September 2015, https://www.eia.gov/analysis/transportationfuels/padd5/pdf/transportation_fuels.pdf.

Days of Supply hit lows for that week of the year (**Figure 5**). During that time, several media outlets published articles and opinion pieces discussing a potential diesel shortage.[17]

However, Days of Supply does not provide a comprehensive overview of how much fuel is available, and EIA's announcement did not mean that the United States would run out of diesel and fuel oil by the end of November 2022. Total stocks, which EIA defines as "inventories of fuel stored for future use," also includes imports and production, described as "domestic and Customs-cleared foreign stocks held at, or in transit to, refineries and bulk terminals, and stocks in pipelines."[18] Days of Supply quantifies the number of days the current U.S. inventory of distillate could last if all U.S. suppliers immediately ceased refining and importing fuel. Total stocks reached low points for corresponding weeks of the year since 1991 from the last week of September through the third week of November 2022, an eight-week period (**Figure 5**). Although they are not the same, Days of Supply and total stocks are closely related, which is evident in comparing **Figure 4** and **Figure 5**.

Figure 4. EIA's Days of Supply of Distillate Fuel Oil

Weekly, September to December 1991-2022



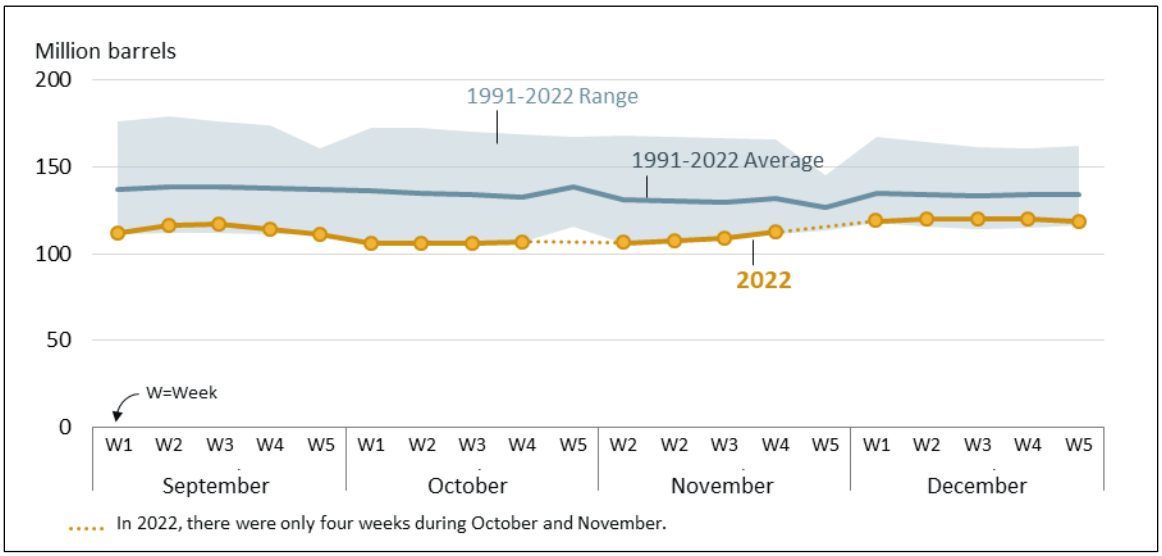
Source: Figure created by CRS. Data from EIA, "Weekly U.S. Days of Supply of Total Distillate (Number of Days)," released December 29, 2022, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPD0_VSD_NUS_DAYS&f=W.

[17] Examples of articles include Chunzi Xu, "US Down to 25 Days of Diesel Supply Poses Problem for Biden," *Bloomberg*, October 19, 2022; Robert Rapier, "Why The U.S. Has a Diesel Shortage," *Forbes*, October 20, 2022; Tucker Carlson, "Thanks to Biden's Religious War in Ukraine, the US Is About to Run Out of Diesel Fuel," *Fox News*, October 27, 2022.

[18] See "Notes" at EIA, "Weekly Stocks," *Petroleum and Other Liquids*, released February 1, 2023, https://www.eia.gov/dnav/pet/pet_stoc_wstk_a_epd0_sae_mbbl_w.htm.

Figure 5. U.S. Stocks of Distillate Fuel

Weekly, September to December 1991-2022

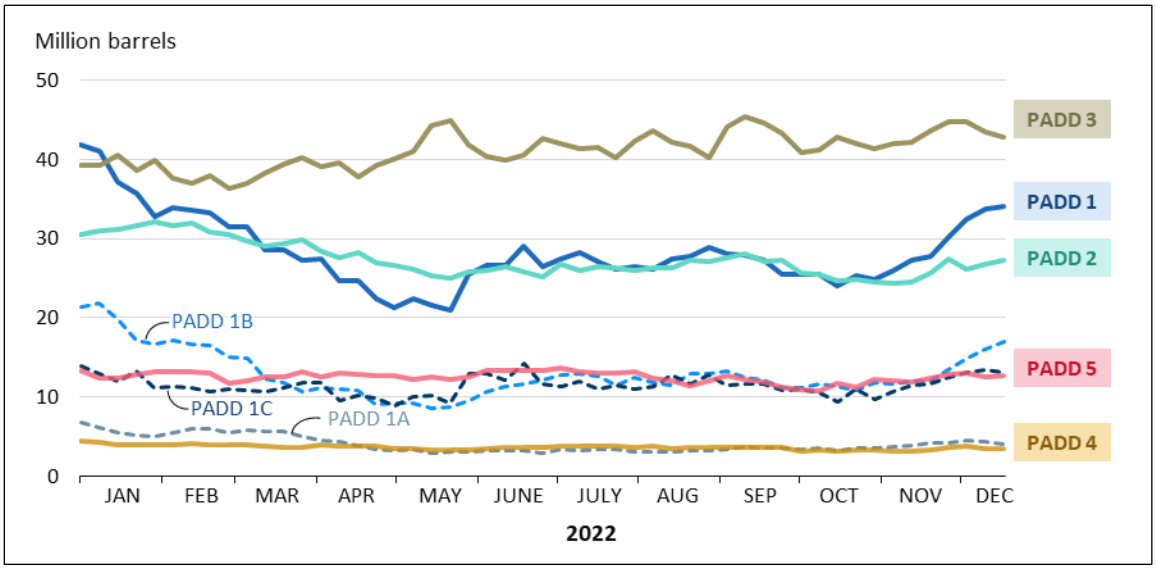


Source: Figure created by CRS. Data from EIA, "Weekly U.S. Ending Stocks of Distillate Fuel Oil," *Petroleum and Other Liquids*, released January 11, 2023, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WDISTUS1&f=W.

Regional Price and Supply Variation

Regional factors such as transportation options (e.g., pipeline, rail, ports, and trucks), availability of in-region refineries, capacity limitations along distribution routes, and state fuel taxes are among the reasons why supply, demand, and price may differ among PADDs. For example, total stocks in PADD 1, East Coast, fell by over half between January and June 2022, while stocks in PADD 5, West Coast, stayed more constant over the same period (**Figure 6**). Prices also vary across regions, with diesel in PADD 5 costing around $1 more per gallon than in PADD 3 (**Figure 7**). EIA's Days of Supply is a national metric that includes PADDs 1-5 and does not account for widely varying characteristics among these regions.

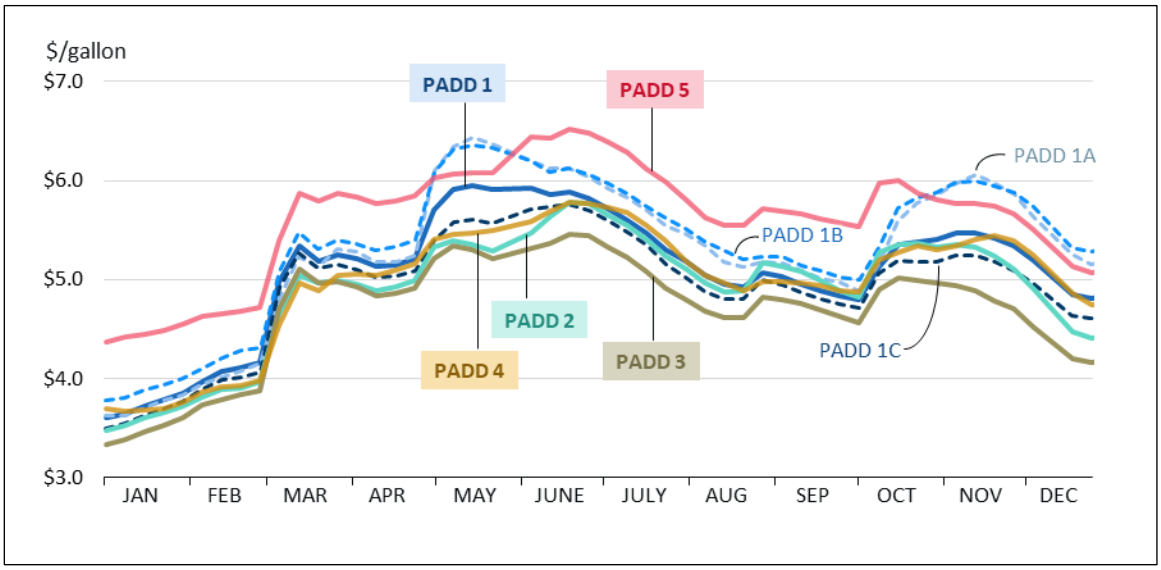
Figure 6. Weekly Stocks of Distillate Fuel Oil in 2022, PADDs 1-5



Source: Figure created by CRS. Data from EIA, "Weekly Stocks," *Petroleum and Other Liquids*, released January 5, 2023, https://www.eia.gov/dnav/pet/pet_stoc_wstk_a_epd0_sae_mbbl_w.htm.

Notes: PADD= Petroleum Administration for Defense District. EIA does not publish data from PADD 6 or 7 on its Weekly Stocks page.

Figure 7. On-Highway Diesel Prices, PADD 1-5, 2022



Source: Figure created by CRS. Data from EIA, "U.S. On-Highway Diesel Fuel Prices (dollars per gallon)," released January 3, 2023, https://www.eia.gov/petroleum/gasdiesel/.

Notes: EIA does not publish data from PADD 6 or 7 in its weekly Gasoline and Diesel Fuel Update. Prices are nominal.

Diesel prices reached all-time nominal highs in several PADDs in May and June 2022.[19] Adjusting for inflation, the national average price in real terms in June 2022 ($5.84) was lower

[19] Record nominal high prices were hit on May 16, 2022 (PADD 1: $5.94; PADD 1A: $6.43; PADD 1B: $6.36) and

than the all-time real price high in June 2008 ($6.45 in 2022 dollars). While distillate fuel oil stocks have seen times of lower or higher inventory over the past two decades, prices of diesel have steadily climbed since mid-2020, with some variations between regions (**Figure 8**). Heating oil, too, saw record-high nominal prices in 2022, reaching a national average price of $5.93 per gallon on November 7, 2022.[20] Similarly, the national average price of heating oil in real terms in November 2022 was lower than the all-time real price in July 2008 ($6.37 in 2022 dollars).

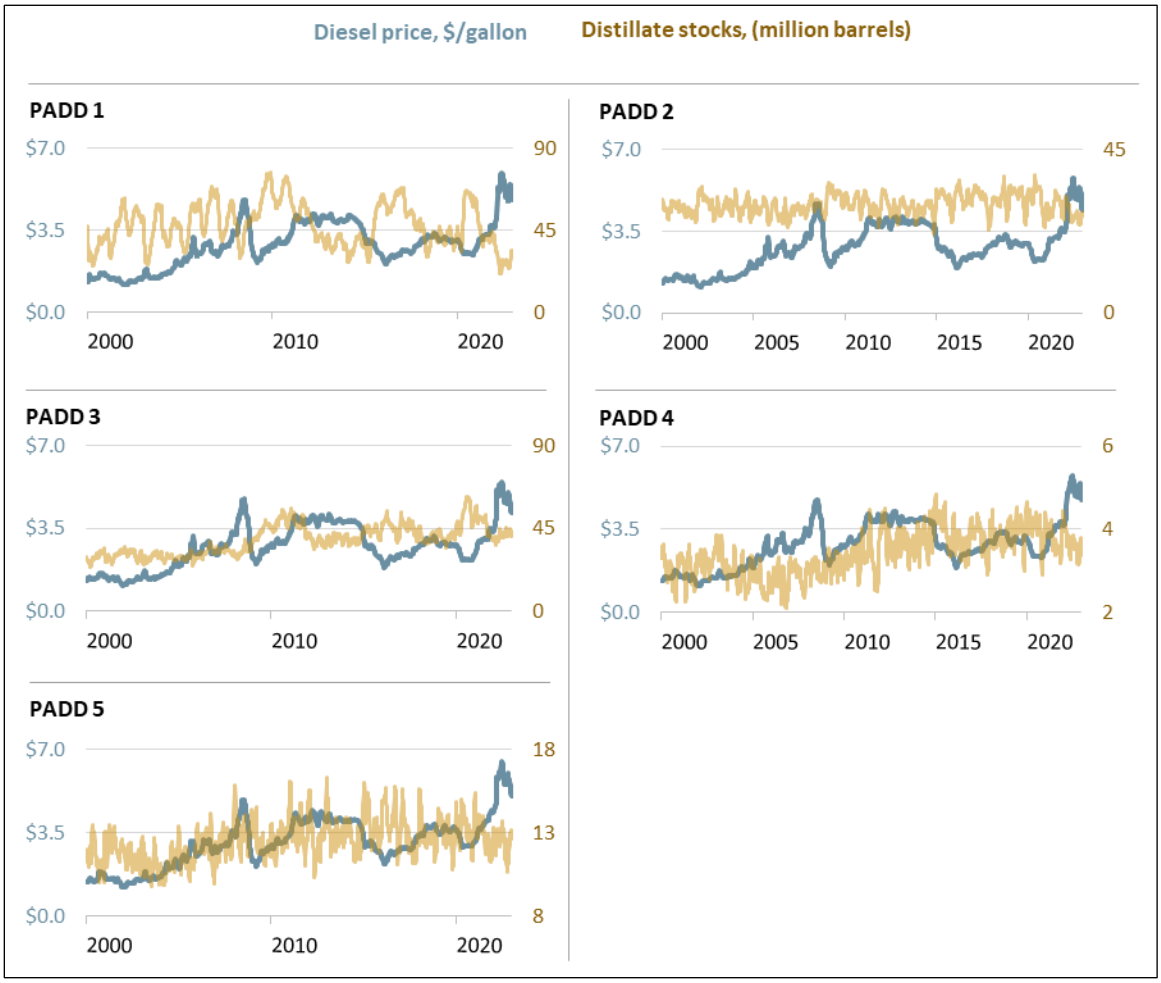
Stock changes are one of many factors that influence the prices of distillate fuel oil. As the EIA Administrator explained, "Inventories are just one part of the supply equation for diesel and other distillates…. The distillate fuels in storage aren't the only source of diesel we have to keep trucks and trains moving, but lower-than-average storage levels will contribute to higher costs for diesel and for heating fuels through the winter."[21]

June 20, 2022 (PADD 1C: $5.76; PADD 2: $5.78; PADD 3: $5.45; PADD 4: $5.78; PADD 5: $6.52). Adjusting for inflation, the national average prices in real terms in May and June 2022 were lower than the all-time real price high in June 2008: EIA, "Real Prices Viewer," *Short-Term Energy Outlook*, accessed February 23, 2023, https://www.eia.gov/outlooks/steo/realprices/.

[20] EIA, "Weekly Heating Oil and Propane Prices (October-March)," *Petroleum and Other Liquids*, released February 8, 2023, https://www.eia.gov/dnav/pet/pet_pri_wfr_a_EPD2F_PRS_dpgal_w.htm; EIA, "U.S. Residential Heating Oil Prices Decline from Record Highs in November," *Today in Energy*, February 9, 2023, https://www.eia.gov/todayinenergy/detail.php?id=55479. Adjusting for inflation, the national average price hit a real all-time high in July 2008: EIA, "Real Prices Viewer," *Short-Term Energy Outlook*, accessed February 23, 2023, https://www.eia.gov/outlooks/steo/realprices/.

[21] EIA, "EIA Expects Continued High Prices for Diesel and Home Heating Oils," press release, November 8, 2022, https://www.eia.gov/pressroom/releases/press521.php.

Figure 8. Weekly Distillate Fuel Oil Stocks and No. 2 Nominal Diesel Retail Prices, 2000-2022



Source: Figure created by CRS. Data from EIA, "U.S. On-Highway Diesel Fuel Prices*(dollars per gallon)," *Gasoline and Diesel Fuel Update*, released January 30, 2023, https://www.eia.gov/petroleum/gasdiesel/; EIA, "Weekly Stocks," *Petroleum and Other Liquids*, released February 1, 2023, https://www.eia.gov/dnav/pet/pet_stoc_wstk_a_epd0_sae_mbbl_w.htm.

Notes: Diesel prices are nominal, not adjusted for inflation. Stock data is typically released on Friday, and price data is typically released on Monday. The chart therefore compares data that was released three days apart. When comparing PADD stocks, distillate stock storage capacity varies widely. For example, the range of distillate fuel oil stocks in PADD 1 from 2000 to 2022 is around 21 million to 77 million barrels, while the range for PADD 4 is around 2 million to 5 million barrels.

Factors That May Affect Supply

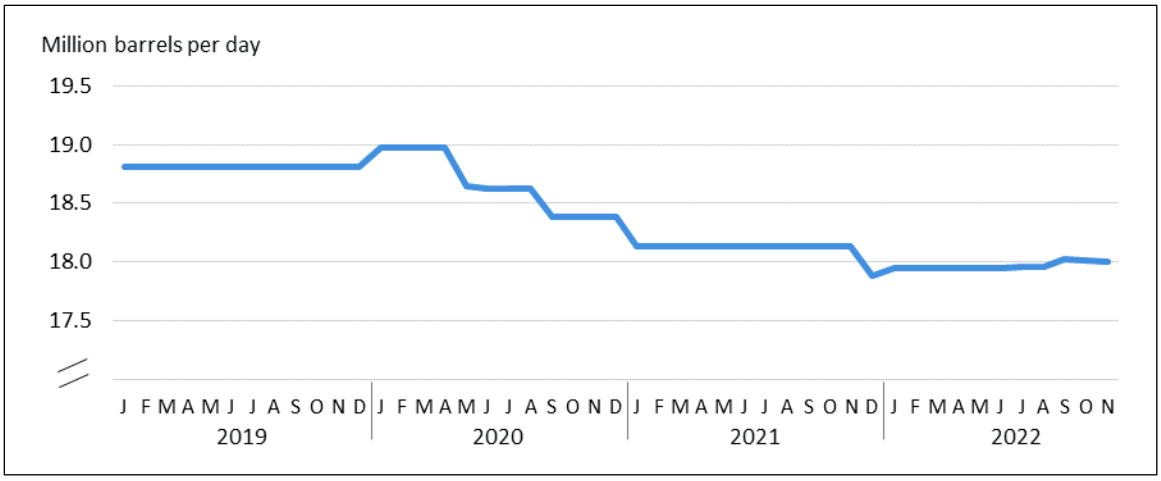
Supply of distillate stocks can change based on a variety of factors related to economic activity, seasons and weather, geopolitical events, and scheduled maintenance, among others. An example of how these factors can impact supply is evident through 2022, when inventory remained lower than in years prior. Several trends, some years in development and others global in scope, contributed to tighter distillate markets.

Falling Refinery Capacity

Since 2019, U.S. refiners have cut distillate capacity (**Figure 9**) for a variety of economic reasons. In 2019, the Philadelphia Energy Solutions refinery, the largest on the East Coast, ceased operations for commercial reasons after sustaining damage from a fire.[22] The COVID-19 pandemic further pressured refiners to cut capacity in response to low demand for many refined petroleum products, including diesel.[23] Some refiners are transitioning to other fuels. For example, Phillips 66 plans to transition its Rodeo refinery in California from petroleum to biofuels. EIA points to faster demand growth for other petroleum products such as motor gasoline and jet fuel relative to distillate fuel oil—and refiners shifting their production away from distillate in favor of jet fuel—as another reason for low refinery production of distillate fuel oil.[24] While distillate fuel oil demand has not reached pre-pandemic levels, it has been rising since 2020.[25] Lower refinery capacity is one factor that can contribute to tighter distillate markets, especially when demand rises, although this can vary across regions.

Figure 9. U.S. Operable Crude Oil Distillation Capacity

Calendar Day, January 2019 to November 2022



Source: Figure created by CRS. Data from EIA, *Petroleum and Other Liquids*, U.S. Operable Crude Oil Distillation Capacity, released January 31, 2023, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MOCLEUS2&f=M.

[22] EIA, "Planned Shutdown of Philadelphia Refinery Will Change Gasoline and Diesel Supply Patterns for the U.S. East Coast," *This Week in Petroleum*, July 3, 2019, https://www.eia.gov/petroleum/weekly/archive/2019/190703/includes/analysis_print.php.

[23] Kevin M. Camp et al., "From the Barrel to the Pump: the Impact of the COVID-19 Pandemic on Prices for Petroleum Products," *Monthly Labor Review*, U.S. Bureau of Labor Statistics, October 2020, https://doi.org/10.21916/mlr.2020.24.

[24] EIA, "Low Inventories and High Demand Boost Global Distillate Crack Spreads," *This Week in Petroleum*, February 24, 2022, https://www.eia.gov/petroleum/weekly/archive/2022/220224/includes/analysis_print.php.

[25] EIA, "Weekly U.S. Product Supplied of Distillate Fuel Oil," *Petroleum and Other Liquids*, released January 19, 2023, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WDIUPUS2&f=W.

Tighter Global Distillate Market

The U.S. distillate market is also influenced by the global market, with which it is linked through international trade in fuels. Global distillate markets tightened during 2022 for several reasons, including Russia's war in Ukraine and related sanctions on some Russian exports, constrained refinery capacity in Europe, and lower refined product exports from China. Russia's war in Ukraine disrupted international trading, leading to lower inventories at international hubs and tightening the market globally. The Amsterdam and Singapore hubs saw distillate inventories remaining more than 30% below their five-year average for the majority of 2022.[26] Through 2022, the European Union stockpiled diesel as a backup fuel to address its own energy crisis and in preparation for a ban on Russian oil product imports that began on February 5, 2023.[27] On top of this, labor strikes in October 2022 in France also cut European refining capacity.[28] Exports from Europe to the United States have frequently fallen to zero for multiple months since 1993 (**Figure 10**). When this happened in 2022, markets tightened further. Also in 2022, China saw its first year-over-year decrease in its petroleum refinery processing going back to 2000 due to COVID-19-related mobility restrictions and low petroleum product export quotas.[29] This led to lower Chinese exports compared to previous years.

These international developments had impacts on regional U.S. markets. In the first half of 2022, EIA pointed to a tight global market, along with the closure of two domestic refineries and the reduction of capacity at another, to explain why distillate fuel oil stocks in June 2022 fell to the lowest level for New England (PADD 1A) in several years.[30]

[26] EIA, "Crude Oil and Petroleum Product Prices Fell in the Second Half of 2022 from Multi-Year Highs," *This Week in Petroleum*, January 5, 2023, https://www.eia.gov/petroleum/weekly/archive/2023/230105/includes/analysis_print.php.

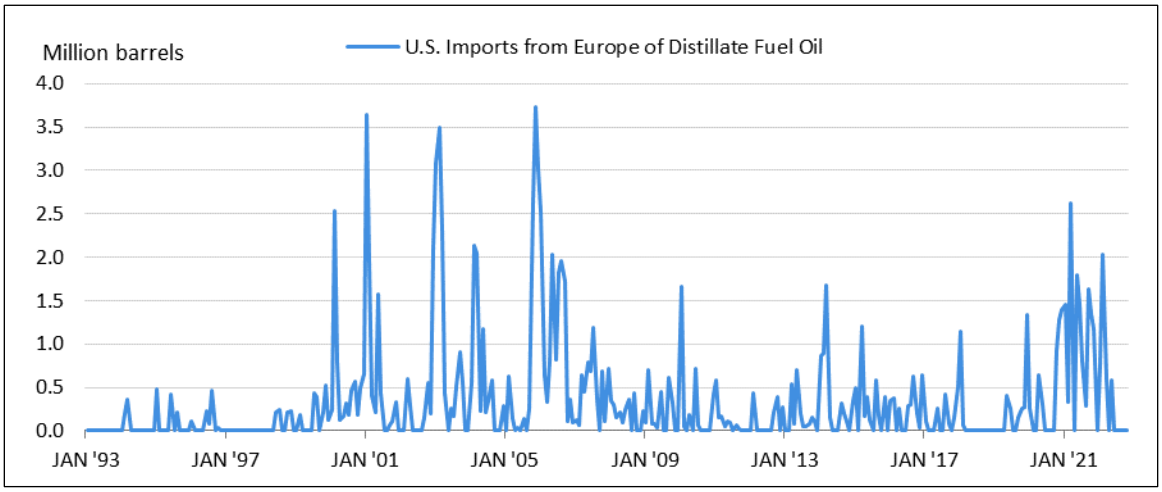
[27] European demand for seaborne distillate fuels may rise after the ban on Russian oil product imports is enacted, and this may serve to further tighten markets due to limitations on shipping capacity in the global tanker fleet. See EIA, "Rapid Increases in Diesel Prices Reflect Low Inventories Going into Winter Demand Season," *This Week in Petroleum*, November 2, 2022, https://www.eia.gov/petroleum/weekly/archive/2022/221102/includes/analysis_print.php; EIA, "Winter Fuels Outlook, October 2022," *Short-Term Energy Outlook*, released January 10, 2023, https://www.eia.gov/outlooks/steo/report/WinterFuels.php; Rowena Edwards and Ron Bousso, "Europe Rushes to Fill Up on Russian Diesel Before Ban Begins," *Reuters*, November 10, 2022, https://www.reuters.com/markets/europe/europe-rushes-fill-up-russian-diesel-before-ban-begins-2022-11-21/; Rowena Edwards, "Explainer: Europe Set to Import Banned Russian Diesel Without Knowing," *Reuters*, December 7, 2022, https://www.reuters.com/business/energy/europe-set-import-banned-russian-diesel-without-knowing-2022-12-07/.

[28] Forrest Crellin and Rowena Edwards, "Explainer: French Refinery Strikes Are Timed to Hit Hard," *Reuters*, October 4, 2022, https://www.reuters.com/business/energy/french-refinery-strikes-are-timed-hit-hard-2022-10-04/.

[29] EIA, "Domestic Policy and Geopolitical Developments Affected China's Refinery Activity and Trade in 2022," *This Week in Petroleum*, February 1, 2023, https://www.eia.gov/petroleum/weekly/archive/2023/230201/includes/analysis_print.php; Ben McWilliams, "What Role for China in the Global Refining Crunch?," *Bruegel*, July 18, 2022, https://www.bruegel.org/blog-post/what-role-china-global-refining-crunch; Muyu Xu and Trixie Sher Li Yap, "China Raises Fuel Export Quotas to Spur Refinery Output," *Reuters*, January 3, 2023, https://www.reuters.com/markets/commodities/china-raises-fuel-export-quotas-first-2023-tranche-consultancies-2023-01-03/.

[30] EIA, "Distillate Stocks in U.S. New England and Central Atlantic States Fall to Low Levels," *Today in Energy*, September 12, 2022, https://www.eia.gov/todayinenergy/detail.php?id=53799.

Figure 10. U.S. Monthly Distillate Fuel Oil Imports from Europe, 1993-2022



Source: Figure created by CRS. Data from EIA, "U.S. Imports by Country of Origin," released December 30, 2022, https://www.eia.gov/dnav/pet/pet_move_impcus_a2_nus_ep00_im0_mbbl_m.htm.

Notes: Imports include supplies from Belarus, Belgium, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Ireland, Italy, Latvia, Lithuania, the Netherlands, Norway, Portugal, Romania, Spain, Sweden, Ukraine, and the United Kingdom.

Seasonal Demand and Maintenance

Seasonality can further pressure supplies during certain times of the year, leading to particularly tight supplies on a temporary basis. In November 2022, EIA pointed to seasonal demand for heating oil as a likely driver for low fall inventories: "The beginning of the winter demand cycle for home heating oil is likely the primary catalyst for rising prices because rising seasonal demand is drawing on already substantially strained regional inventories."[31] In the United States, demand increases in some regions in late fall through winter due to demand from farm vehicles during harvest time, crop transportation, and purchases of heating oil for winter.[32] In the Northeast, PADDs 1A and 1B, for example, showed increased demand in the first months of 2022, partially due to the use of heating oil during the winter (**Figure 6**). Refiners typically schedule maintenance in September and October to switch to winter-grade fuels, and in spring, refineries temporarily shut down again to switch to summer-grade fuels.[33] This scheduled maintenance can lead to tighter inventories on a temporary basis.

[31] EIA, "Rapid Increases in Diesel Prices Reflect Low Inventories Going into Winter Demand Season," *This Week in Petroleum*, November 2, 2022, https://www.eia.gov/petroleum/weekly/archive/2022/221102/includes/analysis_print.php.

[32] The winter heating season generally runs from October 1 through March 31. EIA, "Diesel Fuel Explained," last updated February 15, 2022, https://www.eia.gov/energyexplained/diesel-fuel/factors-affecting-diesel-prices.php.

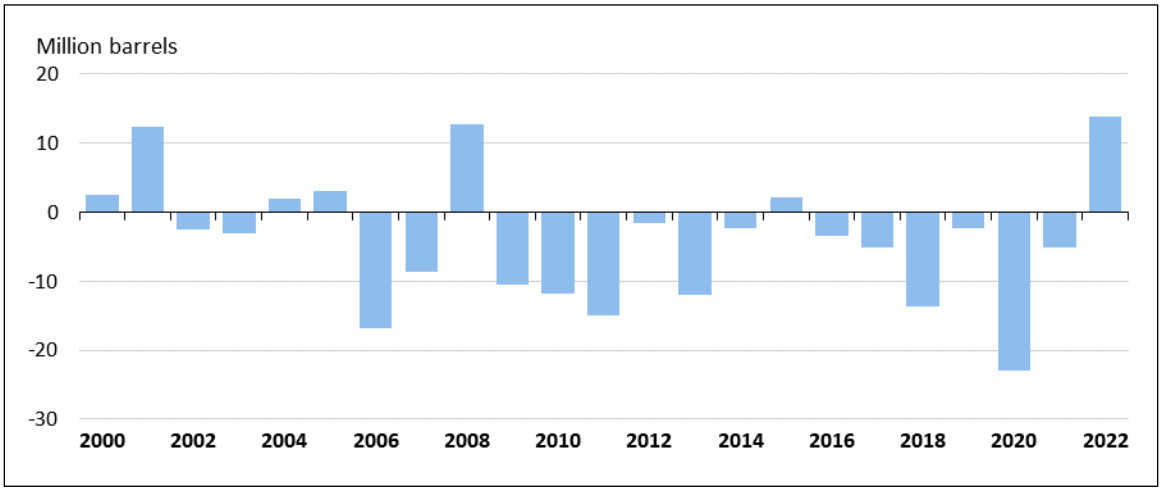
[33] Refiners transition blends based on seasons. Winter-grade gasoline is characterized by high vapor pressure that allows for a vehicle engine to start more easily. Summer-grade gasoline has a low vapor pressure because warm weather more easily evaporates gasoline, which leads to emissions of compounds that contribute to air pollution. U.S. Environmental Protection Agency, "Gasoline Reid Vapor Pressure," Gasoline Standards, last updated September 9, 2022, https://www.epa.gov/gasoline-standards/gasoline-reid-vapor-pressure; EIA, "Gasoline Explained," last updated December 28, 2022, https://www.eia.gov/energyexplained/gasoline/.

Supply Recovery and Price Adjustment

U.S. inventories recovered from a seasonal low of just over 106 million barrels the week ending October 7, 2022, to reach over 120 million barrels the week ending December 23, 2022, rising by over 14 million barrels.[34] In most years, distillate inventories were depleted between October and December. A slowdown in fuel consumption and high distillate prices contributed to the recovery in stocks in 2022, and inventories increased at a time of year that usually sees reductions in supply (see **Figure 11**).[35]

Figure 11. U.S. Distillate Fuel Oil Change in Stocks, 2000-2022

Change Each Year from First Week of October to Third Week of December



Source: Figure created by CRS. Data from EIA, "Weekly U.S. Ending Stocks of Distillate Fuel Oil," released January 19, 2023. Based on analysis in John Kemp, *U.S. Distillate Fuel Oil Inventories*, December 30, 2022, https://fingfx.thomsonreuters.com/gfx/ce/zdpxddbkjpx/US%20DISTILLATE%20FUEL%20OIL%20INVENTORIES%20(DEC%202022).pdf.

Prices of diesel and home heating oil fell, in part due to these higher inventories. Prices of home heating oil fell from the record high of $5.93 per gallon on November 7, 2022, to $4.47 per gallon as of February 6, 2023.[36] Warmer-than-normal weather helped to reduce demand during this time, and an increase in distillate inventories from October to December helped to reduce prices.[37] This was especially true in the Northeast region, where most households that rely on distillate fuel oil for heat are located. In October 2022, some private company wholesalers in New England and New York reportedly rationed heating oil supplies ahead of the winter heating season.[38] This may have also led to increased supplies later in the season.

[34] EIA, "Weekly Stocks," *Petroleum and Other Liquids*, released January 5, 2022, https://www.eia.gov/dnav/pet/pet_stoc_wstk_a_epd0_sae_mbbl_w.htm.

[35] John Kemp, "Column: U.S. Diesel Stocks Start to Normalise as Economy Slows," *Reuters*, December 9, 2022, https://www.reuters.com/markets/commodities/us-diesel-stocks-start-normalise-economy-slows-2022-12-09/.

[36] EIA, "U.S. Residential Heating Oil Prices Decline from Record Highs in November," *Today in Energy*, February 9, 2023, https://www.eia.gov/todayinenergy/detail.php?id=55479.

[37] EIA, "U.S. Residential Heating Oil Prices Decline from Record Highs in November," *Today in Energy*, February 9, 2023, https://www.eia.gov/todayinenergy/detail.php?id=55479.

[38] Chunzi Xu, "New York, New England Ration Heating Oil Even Before Peak Winter," *Bloomberg*, October 21, 2022,

Prices of diesel also generally fell in the second half of 2022 (**Figure 7**), caused in part by lower petroleum demand, and then rose again toward the end of the year.[39] EIA explains, "Through October 2022, strong distillate demand and disruptions to international trade contributed to drawdowns in distillate inventories globally and added upward pressure to prices that were already near eight-year highs before Russia's full-scale invasion of Ukraine."[40]

Policy Considerations

Congress has historically expressed an interest in distillate fuel oil supplies, particularly diesel prices. Several hearings have discussed this topic over the past few years.[41] Several bills were introduced in the 117th Congress to address potential price gouging,[42] including the Consumer Fuel Price Gouging Prevention Act (H.R. 7688), the Gas Price Gouging Prevention Act (S. 3920), the GOUGE Act (H.R. 7751), and the Price Gouging Prevention Act of 2022 (S. 4214). To lower diesel prices, the Relief for Our Truckers Act (H.R. 8414) in the 117th Congress would have repealed the federal diesel fuel tax.[43] In the 118th Congress, the House considered, but did not approve, an amendment that would prevent price increases in gasoline and diesel in any PADD (H.Amdt. 13 to H.R. 21).

Other congressional options include supply-side measures, such as export prohibitions or mandating inventory or storage, and demand-side management tools, such as fuel rationing or bans. As is the case with many temporary periods of low inventory or high prices of distillate fuel oil, the market in the fall of 2022 ultimately rebalanced without federal action.

Jones Act

The Jones Act, which refers to Section 27 of the Merchant Marine Act of 1920 (P.L. 66-261), requires that vessels transporting cargo from one U.S. point to another U.S. point be U.S.-built and owned and crewed by U.S. citizens.[44] The act provides a significant degree of protection for U.S. shipyards, domestic carriers, and American merchant sailors.[45] Supporters of the Jones Act

---

https://www.bloomberg.com/news/articles/2022-10-21/heating-oil-being-rationed-in-us-northeast-before-winter-starts.

[39] EIA, "Rapid Increases in Diesel Prices Reflect Low Inventories Going into Winter Demand Season," *This Week in Petroleum*, November 2, 2022, https://www.eia.gov/petroleum/weekly/archive/2022/221102/includes/analysis_print.php.

[40] According to the EIA, "Crude oil prices are the largest determining factor in gasoline and diesel prices." EIA, "Crude Oil and Petroleum Product Prices Fell in the Second Half of 2022 from Multi-Year Highs," *This Week in Petroleum*, January 5, 2022, https://www.eia.gov/petroleum/weekly/archive/2023/230105/includes/analysis_print.php.

[41] Recent hearings include U.S. Congress, Senate Committee on Energy and Natural Resources, hearing on The Causes, Outlook, and Implications of Domestic and International Energy Price Trends, 117th Cong., 1st sess., November 16, 2021; and U.S. Congress, Senate Committee on Energy and Natural Resources, Energy Subcommittee, hearing on Pathways to Lower Energy Prices, 117th Cong., 2nd sess., July 13, 2022.

[42] High gasoline prices also drove discussion about price gouging over the course of 2022. Federal gas tax holidays were also suggested in several bills, focusing on gasoline and not diesel.

[43] As of July 1, 2022, the federal tax on a gallon of diesel fuel is 24.4 cents. Comparatively, the federal tax on a gallon of gasoline is 18.4 cents: EIA, "How Much Tax Do We Pay on a Gallon of Gasoline and on a Gallon of Diesel Fuel?," *Frequently Asked Questions (FAQs)*, last updated August 3, 2022, https://www.eia.gov/tools/faqs/faq.php?id=10&t=5. This is in addition to any state fuel taxes.

[44] For more on the Jones Act, see CRS Report R45725, *Shipping Under the Jones Act: Legislative and Regulatory Background*, by John Frittelli.

[45] On this point, see the views of the American Maritime Partnership, a coalition of Jones Act supporters, at https://www.americanmaritimepartnership.com/.

have pointed to maintaining a domestic maritime industry for national security as one reason why the act should not be repealed or weakened. Additionally, some experts argue the law protects the employment of the majority of U.S. mariners.[46] Others have said that the Jones Act is key to economic prosperity and maritime commerce.[47]

In the past, Congress has enacted exemptions or exceptions to the Jones Act, allowing for foreign vessels to transport fuel, for a variety of reasons. Congress also allows waivers from the Jones Act for national security reasons, which have most often been executed to speed fuel deliveries to a region after a natural disaster disrupted normal supply lines. Title 46, Section 501, of the *U.S. Code* allows the Secretary of Defense or the head of the agency responsible for the administration of navigation or vessel-inspection laws—which is the Department of Homeland Security (DHS)—to temporarily waive compliance with the Jones Act.

DHS reviews requests for Jones Act waivers on a case-by-case basis to determine whether they are in the interest of national defense and usually approves waivers in response to natural disasters. In September and October 2022, DHS approved two Jones Act waivers to "address Puerto Rico's immediate needs in the wake of Hurricane Fiona," including ensuring diesel supply for backup generators.[48] In May 2021, DHS approved two Jones Act waivers in response to oil supply constraints on the East Coast caused by the shutdown of the Colonial Pipeline.[49]

Some experts argue that the Jones Act can constrain the availability of shipping options for domestic transportation of fuels such as diesel and heating oil. This could impact the Northeast, for example, where limited pipeline interconnection with other regions means in times of high demand, the PADD may rely more on distillate shipped by sea. This could result in higher prices, when demand rises for winter fuels. One commentator claimed that in late October 2022, the cost to move fuel on a Jones Act tanker from the Gulf Coast to the Northeast was double what it would cost a foreign-flagged tanker to transport over the same route.[50]

Some have also suggested that the Jones Act exacerbates periods of low fuel supply, especially on the East Coast, and the Northeast in particular.[51] In July 2022, governors from all six PADD 1A

[46] Written testimony of Mark Buzby, Maritime Administrator, House Committee on Armed Services, Subcommittees on Readiness and Seapower and Projection Forces, Hearing on National Defense Authorization Act for FY2019, March 8, 2018, p. 65.

[47] Sen. Roger Wicker, Sen. Maria Cantwell, Rep. Peter DeFazio, and Rep. Sam Graves, "Why the Jones Act Is Still Needed 100 Years Later," *Defense News*, June 5, 2020, https://www.defensenews.com/opinion/commentary/2020/06/05/why-the-jones-act-is-still-needed-100-years-later/.

[48] DHS, "Statement by Secretary Mayorkas on the Approval of a Jones Act Waiver for Puerto Rico," press release, September 28, 2022, https://www.dhs.gov/news/2022/09/28/statement-secretary-mayorkas-approval-jones-act-waiver-puerto-rico; DHS, "Statement by Secretary Mayorkas on the Approval of a Jones Act Waiver for Puerto Rico," press release, October 16, 2022, https://www.dhs.gov/news/2022/10/16/statement-secretary-mayorkas-approval-jones-act-waiver-puerto-rico.

[49] DHS, "Statement by Secretary Mayorkas on the Approval of a Jones Act Waiver in Response to Eastern Seaboard Oil Supply Constraints," press release, May 12, 2021, https://www.dhs.gov/news/2021/05/12/statement-secretary-mayorkas-approval-jones-act-waiver-response-eastern-seaboard-oil; DHS, "Statement on the Approval of an Additional Jones Act Waiver in Response to Eastern Seaboard Oil Supply Constraints," press release, May 13, 2021, https://www.dhs.gov/news/2021/05/13/statement-approval-additional-jones-act-waiver-response-eastern-seaboard-oil-supply.

[50] Lori Ann LaRocco, "The Diesel Market Is in a Perfect Storm as Prices Surge, Supply Dwindles Ahead of Winter," *CNBC*, October 31, 2022, https://www.cnbc.com/2022/10/30/diesel-market-in-perfect-storm-as-prices-surge-and-supplies-dwindle.html.

[51] Jim Puzzanghera, "A Century-Old Law Poses Problems for New England's Energy Supply This Winter and There's a Push to Find a Way Around It," *Boston Globe*, December 9, 2022, https://www.bostonglobe.com/2022/12/09/nation/century-old-law-poses-problems-new-englands-energy-supply-this-winter-theres-push-find-way-around-it/.

states (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) signed a letter to the Department of Energy expressing concerns over high prices of fuel for the coming winter.[52] The governors suggested suspending the Jones Act for the winter season as one solution.

The Jones Act has been a topic of congressional debate. Legislation has been introduced repealing the Jones Act (for example, Jones Act Repeal Act, H.R. 8996, in the 116th Congress and Open America's Water Act, S. 1646, in the 117th Congress). Neither of these bills were introduced or debated in the context of high distillate prices. However, one newspaper reported that Senators from Maine and New Hampshire were working on legislation to authorize the President to issue waivers for fuel to New England during the winter.[53]

Export Prohibition

Prohibiting or limiting exports of distillate fuel is a potential option for congressional consideration. For example, on October 4, 2022, the White House asked the U.S. Department of Energy to explore whether a ban on exports of refined petroleum products, including diesel, could lower domestic prices.[54] Although no bans were implemented, the President has implied authority to announce and enforce a prohibition of exports through the Emergency Powers Act.[55]

The United States typically imports more distillate than it exports (**Figure 12**). Export restrictions could result in constraints on U.S. supply if foreign suppliers cut or eliminated distillate exports to the United States. This policy could also have diplomatic implications with trade partners. Furthermore, eliminating U.S. exports could tighten the global market and could lead to higher prices for foreign supplies imported to the U.S. and around the world.

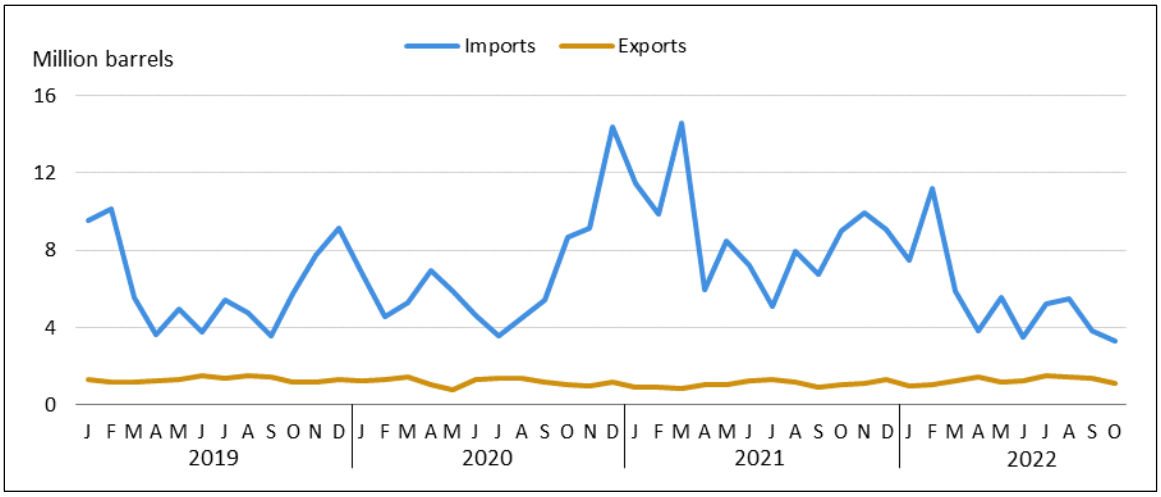
[52] Letter from Charles D. Baker, Governor of Massachusetts; Ned Lamont, Governor of Connecticut; and Janet T. Mills, Governor of Maine, et al. to Jennifer Granholm, Secretary of the U.S. Department of Energy, July 27, 2022, https://www.energy.gov/sites/default/files/2022-09/incoming%20-%20Baker%20Lamont%20Mills%20Sununu%20McKee%20and%20Scott.pdf.

[53] Jim Puzzanghera, "A Century-Old Law Poses Problems for New England's Energy Supply This Winter and There's a Push to Find a Way Around It," *Boston Globe*, December 9, 2022, https://www.bostonglobe.com/2022/12/09/nation/century-old-law-poses-problems-new-englands-energy-supply-this-winter-theres-push-find-way-around-it/.

[54] Ari Natter and Jennifer A. Dlouhy, "White House Takes Closer Look at Gasoline Export Ban Option," October 4, 2022, https://www.bloomberg.com/news/articles/2022-10-04/white-house-seeks-gasoline-export-limit-study-amid-price-fears.

[55] 50 U.S.C. §1621.

Figure 12. U.S. Monthly Distillate Fuel Oil Imports and Exports, 2019-2022



Source: Figure created by CRS. Data from EIA, "U.S. Imports of Distillate Fuel Oil," released December 30, 2022, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MDIIMUS1&f=M; and EIA, "U.S. Exports of Distillate Fuel Oil," released December 30, 2022, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mdiexus2&f=m.

Notes: EIA includes U.S. Virgin Islands in its import data: EIA, "U.S. Imports by Country of Origin," released January 31, 2023, https://www.eia.gov/dnav/pet/PET_MOVE_IMPCUS_D_NUS_NVQ_MBBL_M.htm.

Minimum Inventory Levels

Other potential congressional options could be to require companies to hold minimum inventory levels of fuels or to create a new federal reserve modeled on the Northeast Home Heating Oil Reserve (NEHHOR). The Buy Low and Sell High Act (H.R. 432) would require the Department of Energy to establish a national network of Strategic Refined Petroleum Product Reserves, separate from the SPR and NEHHOR, with at least one reserve storing gasoline and diesel fuel in each PADD.

Discussion of such options might consider the environmental and cost implications of siting, constructing, and maintaining the storage facilities; the distribution of reserves and different demand patterns across PADDs; what kind of distillate products would be stored, and under what circumstances the fuel would be released. Congress could consider whether mandated storage would be necessary, given that the existing NEHHOR has been used once since its establishment in 2000.[56]

Fuel Rations

In times of sustained low supply, private companies have implemented supply rations for fuel. For example, in October 2022, some wholesalers in New England and New York reportedly rationed heating oil supplies ahead of the winter heating season.[57] Historically, gasoline was rationed by states, and eventually the federal government, during World War II and again by states in the 1970s in response to the Middle East oil embargo. Neither the White House nor Congress have implemented any mandatory distillate fuel oil rationing. Such a policy in the

[56] For more details, see CRS In Focus IF12205, *Northeast Home Heating Oil Reserve*, by Phillip Brown.

[57] Chunzi Xu, "New York, New England Ration Heating Oil Even Before Peak Winter," *Bloomberg*, October 21, 2022, https://www.bloomberg.com/news/articles/2022-10-21/heating-oil-being-rationed-in-us-northeast-before-winter-starts.

future could require new legislation. Implications could include public and industry opposition as well as lower economic activity due to reduction in activities that rely on distillate fuel oil (**Figure 2**).

Author Information

Lexie Ryan
Analyst in Energy Policy

Acknowledgments

Amber Wilhelm, Visual Information Specialist, prepared the graphics for the report.

Disclaimer

This document was prepared by the Congressional Research Service (CRS). CRS serves as nonpartisan shared staff to congressional committees and Members of Congress. It operates solely at the behest of and under the direction of Congress. Information in a CRS Report should not be relied upon for purposes other than public understanding of information that has been provided by CRS to Members of Congress in connection with CRS's institutional role. CRS Reports, as a work of the United States Government, are not subject to copyright protection in the United States. Any CRS Report may be reproduced and distributed in its entirety without permission from CRS. However, as a CRS Report may include copyrighted images or material from a third party, you may need to obtain the permission of the copyright holder if you wish to copy or otherwise use copyrighted material.