Petroleum Fuels Winter Outlook

2018-2019 New York State Winter Fuels Outlook Meeting

October 31, 2018
Matthew Milford
NYSERDA
Contents

• NOAA Weather Forecast
• Winter Fuels Outlook for 2018-19 Winter Season
• Crude Oil
• Home Heating Oil and Distillate Fuels
• Propane
NOAA Weather Forecast
Greater than 33% chance of above normal temperatures for Western and Downstate NY. Greater than 40% chance of above normal temperatures for Northern and Eastern NY.

Equal chances of drier than normal, normal, or wetter than normal precipitation for all of NYS for the upcoming winter season.

NOAA Winter Weather Outlook 2018-2019

November 2018

November-January 2018-19
NOAA Winter Weather Outlook 2018-2019

NOAA Outlook New York heating degree-days forecast (October – April):

• 1.1% warmer than normal (1981-2010) winter
• 1.7% warmer than last season.

<table>
<thead>
<tr>
<th>Month</th>
<th>Forecast HDD</th>
<th>Normal (1981-2010)</th>
<th>Forecast Departure</th>
<th>%</th>
<th>Last Year (2017-2018)</th>
<th>Forecast Departure</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct</td>
<td>418</td>
<td>397</td>
<td>21</td>
<td>5%</td>
<td>235</td>
<td>183</td>
<td>78%</td>
</tr>
<tr>
<td>Nov</td>
<td>667</td>
<td>679</td>
<td>-12</td>
<td>-2%</td>
<td>716</td>
<td>-49</td>
<td>-7%</td>
</tr>
<tr>
<td>Dec</td>
<td>1006</td>
<td>1038</td>
<td>-32</td>
<td>-3%</td>
<td>1129</td>
<td>-123</td>
<td>-11%</td>
</tr>
<tr>
<td>Jan</td>
<td>1181</td>
<td>1207</td>
<td>-26</td>
<td>-2%</td>
<td>1236</td>
<td>-55</td>
<td>-4%</td>
</tr>
<tr>
<td>Feb</td>
<td>1007</td>
<td>1021</td>
<td>-14</td>
<td>-1%</td>
<td>854</td>
<td>153</td>
<td>18%</td>
</tr>
<tr>
<td>Mar</td>
<td>888</td>
<td>892</td>
<td>-4</td>
<td>0%</td>
<td>911</td>
<td>-23</td>
<td>-3%</td>
</tr>
<tr>
<td>Apr</td>
<td>518</td>
<td>516</td>
<td>2</td>
<td>0%</td>
<td>702</td>
<td>-184</td>
<td>-26%</td>
</tr>
<tr>
<td>Total</td>
<td>5685</td>
<td>5750</td>
<td>-65</td>
<td>-1%</td>
<td>5783</td>
<td>-98</td>
<td>-2%</td>
</tr>
</tbody>
</table>
NOAA Outlook New York heating degree-days forecast:

- 1.1% warmer than normal (1981-2010) winter
- 1.7% warmer than last season.
New York State Heating Degree-Days

For the week ending October 27, NYS cumulative HDD’s since October 1 total 348 HDD and are 12 HDD or 3.6% above the normal level and 155 HDD’s or 80.3% above last year’s level.

The 348 HDD’s represent about 6.1% of the total normal heating season.

Source: NOAA National Climate Data Center
Winter Fuels Outlook for 2018-19 Winter Season
Winter Fuels Outlook for 2018-19

• EIA expects higher heating fuel prices this winter for heating oil and electricity in the Northeast. EIA expects propane prices to be about the same and natural gas prices to decrease slightly compared to last year.

• Based on the HDD forecast by NOAA, NYSERDA is projecting fewer heating degree-days than last year (1.7%) (Oct. – Apr.).

• Based on EIA and NOAA data, NYSERDA projects higher average household heating fuel expenditures in New York for heating oil and electricity, and lower average household heating fuel expenditures for propane and natural gas compared to last year.
### Fuel Expenditure Variance Example

Colder or warmer (+/- 10% HDD) than forecast winters can swing expected fuel expenditures by as much as 16% or as little as 5% depending on the fuel.

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Base Case</th>
<th>If 10% warmer than forecast</th>
<th>If 10% colder than forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating oil*</td>
<td>20%</td>
<td>7%</td>
<td>33%</td>
</tr>
<tr>
<td>Natural gas</td>
<td>5%</td>
<td>-4%</td>
<td>16%</td>
</tr>
<tr>
<td>Propane *</td>
<td>-1%</td>
<td>-17%</td>
<td>15%</td>
</tr>
<tr>
<td>Electricity</td>
<td>3%</td>
<td>-2%</td>
<td>9%</td>
</tr>
</tbody>
</table>

*Note: Propane expenditures are a volume-weighted average of the Northeast and Midwest regions. All other fuels are U.S. volume-weighted averages. Propane and heating oil prices do not reflect prices locked in before the winter heating season starts.*

*Source: EIA Short-Term Energy Outlook, October 2018.*
New York State Fuel Price Forecast

Fuel prices are forecast to be:

- Higher for heating oil
- The same for propane
- Lower for natural gas.

Source: EIA/NYSERDA
New York State HDD and Heating Fuel Expenditures

- Heating oil and propane expenditures vary more from winter to winter than electricity and natural gas.

Source: EIA/NYSERDA
Heating fuel market shares vary across U.S. regions

Primary home heating fuel by state, 2017

2017 New York Percentages:
- 59.4% Natural Gas
- 20.5% Heating Oil
- 4.0% Propane
- 11.9% Electricity
- 1.7% Wood
- 2.5% Other

Source: American Community Survey
### New York State Household Heating Fuel

<table>
<thead>
<tr>
<th>New York State Household Heating Fuel</th>
<th>2017</th>
<th>%</th>
<th>2010</th>
<th>%</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Occupied Housing Units</td>
<td>7,304,332</td>
<td>100%</td>
<td>7,196,427</td>
<td>100%</td>
<td>107,905</td>
<td>1%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>4,339,349</td>
<td>59%</td>
<td>3,961,085</td>
<td>55%</td>
<td>378,264</td>
<td>10%</td>
</tr>
<tr>
<td>Bottled Tank or LP Gas</td>
<td>294,973</td>
<td>4%</td>
<td>227,607</td>
<td>3%</td>
<td>67,366</td>
<td>30%</td>
</tr>
<tr>
<td>Electricity</td>
<td>867,925</td>
<td>12%</td>
<td>676,262</td>
<td>9%</td>
<td>191,663</td>
<td>28%</td>
</tr>
<tr>
<td>Fuel oil or Kerosene</td>
<td>1,496,843</td>
<td>20%</td>
<td>2,068,004</td>
<td>29%</td>
<td>-571,161</td>
<td>-28%</td>
</tr>
<tr>
<td>Coal or Coke</td>
<td>17,881</td>
<td>0%</td>
<td>19,949</td>
<td>0%</td>
<td>-2,068</td>
<td>-10%</td>
</tr>
<tr>
<td>Wood</td>
<td>122,088</td>
<td>2%</td>
<td>143,242</td>
<td>2%</td>
<td>-21,154</td>
<td>-15%</td>
</tr>
<tr>
<td>Solar Energy</td>
<td>5,988</td>
<td>0%</td>
<td>1,823</td>
<td>0%</td>
<td>4,165</td>
<td>228%</td>
</tr>
<tr>
<td>Other</td>
<td>77,386</td>
<td>1%</td>
<td>61,664</td>
<td>1%</td>
<td>15,722</td>
<td>25%</td>
</tr>
<tr>
<td>No Fuel Used</td>
<td>81,899</td>
<td>1%</td>
<td>36,791</td>
<td>1%</td>
<td>45,108</td>
<td>123%</td>
</tr>
</tbody>
</table>

- **Natural Gas** up 378k homes (+10%) over 7 years
- **Heating Oil** down 571k homes (-28%) over 7 years

Source: American Community Survey
# New York State Household Heating Fuel

<table>
<thead>
<tr>
<th>Year</th>
<th>Fuel Oil or Kerosene Households</th>
<th>% of NYS Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>3,290,683</td>
<td>51.9%</td>
</tr>
<tr>
<td>1990</td>
<td>2,629,172</td>
<td>39.6%</td>
</tr>
<tr>
<td>2000</td>
<td>2,336,714</td>
<td>33.1%</td>
</tr>
<tr>
<td>2005</td>
<td>2,429,348</td>
<td>34.1%</td>
</tr>
<tr>
<td>2006</td>
<td>2,373,350</td>
<td>33.5%</td>
</tr>
<tr>
<td>2007</td>
<td>2,347,031</td>
<td>33.1%</td>
</tr>
<tr>
<td>2008</td>
<td>2,281,188</td>
<td>32.0%</td>
</tr>
<tr>
<td>2009</td>
<td>2,165,896</td>
<td>30.1%</td>
</tr>
<tr>
<td>2010</td>
<td>2,068,004</td>
<td>28.7%</td>
</tr>
<tr>
<td>2011</td>
<td>1,979,067</td>
<td>27.5%</td>
</tr>
<tr>
<td>2012</td>
<td>1,901,118</td>
<td>26.3%</td>
</tr>
<tr>
<td>2013</td>
<td>1,802,442</td>
<td>25.0%</td>
</tr>
<tr>
<td>2014</td>
<td>1,752,656</td>
<td>24.1%</td>
</tr>
<tr>
<td>2015</td>
<td>1,649,860</td>
<td>22.8%</td>
</tr>
<tr>
<td>2016</td>
<td>1,540,787</td>
<td>21.4%</td>
</tr>
<tr>
<td>2017</td>
<td>1,496,843</td>
<td>20.5%</td>
</tr>
</tbody>
</table>

Source: American Community Survey
### New York Winter Heating Oil and Propane Fuel Summary

<table>
<thead>
<tr>
<th>Household</th>
<th>Actual</th>
<th>Forecast</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heating Oil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. 13-17</td>
<td>714</td>
<td>697</td>
<td>687</td>
</tr>
<tr>
<td>Avg. Price ($/gal)</td>
<td>3.28</td>
<td>3.24</td>
<td>3.82</td>
</tr>
<tr>
<td>Expenditures ($)</td>
<td>2,342</td>
<td>2,259</td>
<td>2,624</td>
</tr>
<tr>
<td><strong>Propane</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption (gals)</td>
<td>1,074</td>
<td>1,049</td>
<td>1,032</td>
</tr>
<tr>
<td>Avg. Price ($/gal)</td>
<td>3.00</td>
<td>3.30</td>
<td>3.30</td>
</tr>
<tr>
<td>Expenditures ($)</td>
<td>3,219</td>
<td>3,455</td>
<td>3,400</td>
</tr>
</tbody>
</table>

**Note:** Individual household volumes, and so, expenditures will vary.

**Note:** Heating Oil data reflect New York prices and adjusted consumption to New York Averages.

**Note:** Propane data reflect New York prices and adjusted consumption to Btu equivalent heating oil.

Forecasts reflect updated NOAA projections.

**Source:** EIA Short-Term Energy Outlook, October 2018, NOAA, NYSERDA
New York Winter Natural Gas & Electric Fuel Summary

<table>
<thead>
<tr>
<th>Household</th>
<th>Actual</th>
<th>Forecast</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Gas</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption (mcf)</td>
<td>67.0</td>
<td>66.2</td>
<td>64.8</td>
</tr>
<tr>
<td>Avg. Price ($/mcf)</td>
<td>10.96</td>
<td>11.29</td>
<td>10.91</td>
</tr>
<tr>
<td>Expenditures ($)</td>
<td>735</td>
<td>747</td>
<td>707</td>
</tr>
<tr>
<td><strong>Electricity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption (kwh)</td>
<td>8,381</td>
<td>8,345</td>
<td>8,161</td>
</tr>
<tr>
<td>Avg. Price ($/kwh)</td>
<td>0.184</td>
<td>0.178</td>
<td>0.183</td>
</tr>
<tr>
<td>Expenditures ($)</td>
<td>1,541</td>
<td>1,488</td>
<td>1,490</td>
</tr>
</tbody>
</table>

Note: Individual household volumes, and so, expenditures will vary.

Note: Natural Gas consumption is adjusted to New York Averages while Electricity consumption is based on Northeast Averages.

Note: Prices reflect New York average prices.

Forecasts reflect updated NOAA projections.

Source: EIA Short-Term Energy Outlook, October 2018, NOAA, NYSERDA
## Estimated Average Heating Expenditures

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>% Change Last Year</th>
<th>% Change 5-Year Avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas</td>
<td>-5.3%</td>
<td>-3.7%</td>
</tr>
<tr>
<td>Heating Oil</td>
<td>16.2%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Propane</td>
<td>-1.6%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Electric</td>
<td>0.1%</td>
<td>-3.3%</td>
</tr>
</tbody>
</table>

### NY Estimated Average Heating Bills by Fuel

- **Average (2013-17)**
- **2017-18**
- **2018-19 Forecast**

Source: EIA, NYSERDA
New York State Retail Heating Fuel Surveys


- Year over year change:
  - Heating Oil: +23.3%
  - Kerosene: +18.4%
  - Propane: +11.4%
Crude Oil
U.S. Crude Oil Prices

- WTI crude oil prices have increased over the previous year.
- Current weekly average WTI crude oil price for week of Oct. 19 is $70.24/bbl (36% higher than year-ago price)

Source: Short-Term Energy Outlook, October 2018, and CME Group
Factors Affecting U.S. Crude Oil Prices and Inventories

• Increasing uncertainty due to geopolitical considerations: Iran Sanctions, Venezuela production declines, Saudi Arabia, and other OPEC countries, economic tariffs
• Tightening of global crude oil supplies and reduced worldwide spare production capacity
• Higher worldwide economic growth leading to demand growth for crude oil
• Other monetary factors such as value of US Dollar, U.S. equities
• U.S. crude oil production and export increases
World Production and Consumption Balance

Quarterly World Liquid Fuels Production and Consumption

Source: EIA/NYSERDA
World Production and Consumption Balance

Quarterly World Liquid Fuels Production and Consumption Balance Changes and Brent Crude Oil Prices

Source: EIA/NYSERDA
Widening Brent-WTI Price Spread

- Spread at its largest since 2015 – currently around $10 per barrel
- Not as large as 2011-2014
- Unlikely to be sufficient enough to change how East Coast refiners source crude oil.

Source: EIA/NYSERDA
U.S. Crude Oil Exports

- U.S. crude oil export ban lifted in December 2015
- Explosive growth - current 4-week average is 2.1 million barrels per day
- Capacity to grow depends on new pipeline infrastructure and export facilities along U.S. Gulf Coast.

4-Week Avg U.S. Exports of Crude Oil

Source: U.S. Energy Information Administration
U.S. Crude Oil Production

- U.S. crude oil production over 11 million barrels per day.
- As of August 2018, U.S. is largest crude oil producer in the world.
- U.S. crude oil production has increased by 1.8 million barrels per day (19.3%) since last year.
- Infrastructure capacity limiting growth (pipeline takeaway capacity and export capacity)

Source: U.S. Energy Information Administration
U.S. Crude Oil Stocks

• Current level 423 million barrels
• 35 million barrels below last year (7.6%)
• 7 million barrels above the 5-year average (1.8%)
• Peak 536 million barrels in March 2017

Source: U.S. Energy Information Administration
Heating Oil
Northeast Heating Oil Market

- U.S. home heating oil consumption is highly concentrated in the Northeast.

- More than four-fifths of all homes in the United States that use heating oil are located in the Northeast (source: U.S. Census Bureau, 2017 American Community Survey).

- 21% of homes in the Northeast use oil as their main heating fuel, down from 27% seven years ago as an increasing number of homes switch to using natural gas and electricity for space heating.
Winter 2018-19 takeaways – Heating oil

• Brent crude oil spot prices are expected to average $79 per barrel (bbl) this winter
  ❖ $15/bbl (36 cents/gal) higher than last winter
  ❖ Still expected to remain lower than 2010-14 levels when the average price of Brent crude oil exceed $100/bbl.
  ❖ Prices are highly uncertain heading into the winter season.

• Higher heating oil prices due to higher crude oil prices and higher distillate fuel margins (price difference between wholesale distillate fuel and crude oil).
  ❖ 38 cents/gal heating oil wholesale margin (5 cents/gal higher than last year)
  ❖ Strong demand for distillate
  ❖ U.S. distillate exports
Winter 2018-19 takeaways – Heating oil

• Distillate stocks in the Mid-Atlantic totaled 22.5 million barrels on October 19, 3.6 million barrels (14%) below the same time last year and 7.3 million barrels (25%) below the 5-year average.
  ❖ Distillate inventories have remained below the 5-year average since March.

• Distillate inventories have been falling heading into winter due to recent refinery maintenance combined with strong domestic and international demand.
  ❖ Lack of incentive to build stocks due to the backwardation of the market

• Mid-Atlantic ultra-low sulfur distillate inventories are 12% below last year’s level and 19% below the 5-year average.

• Unless severely cold temperatures in the Northeast coincide with severely cold temperatures in Europe, distillate supplies should be able to meet demand but localized supply issues and upward pressure on distillate prices are possible.
EIA forecasts distillate inventories to remain within the five-year average range, even in the 10% colder scenario.
EIA expects average residential heating oil prices to be 18% higher than prices last winter

monthly average heating oil and Brent crude oil prices
dollars per gallon

Source: EIA Short-Term Energy Outlook, October 2018, and Thomson Reuters.
Northeast Sulfur & Bioheat Requirements

### CHART 1. SUMMARY

**LOW SULFUR & BIODIESEL BLENDING REQUIREMENTS IN THE NORTHEAST/MID-ATLANTIC**

All data is listed for No. 2 Fuel Oil only. Compliance dates are July 1st of that year unless otherwise specified. Cities are listed in italics.

<table>
<thead>
<tr>
<th>State / City</th>
<th>Previous Sulfur</th>
<th>2012</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018+</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York State (Sulfur)</td>
<td>2,500-5,000 ppm</td>
<td>15 PPM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5% Bio</td>
</tr>
<tr>
<td>New York State (Bioheat)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York City (Bioheat)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2% Bio</td>
</tr>
<tr>
<td>Philadelphia, PA (Sulfur)</td>
<td>2,000 ppm</td>
<td></td>
<td></td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delaware</td>
<td>3,000-10,000 ppm</td>
<td></td>
<td>500 PPM</td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Jersey</td>
<td>2,000-3,000 ppm</td>
<td></td>
<td>500 PPM</td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>3,000 ppm</td>
<td></td>
<td>500 PPM</td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>2,000-5,000 ppm</td>
<td></td>
<td>500 PPM</td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td>3,000 ppm</td>
<td></td>
<td>500 PPM</td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhode Island (Sulfur)</td>
<td>5,000 ppm</td>
<td></td>
<td>500 PPM</td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhode Island (Bioheat)</td>
<td></td>
<td></td>
<td>2% Bio</td>
<td>3% Bio</td>
<td>4% Bio</td>
<td>5% Bio</td>
<td></td>
</tr>
<tr>
<td>Vermont</td>
<td>20,000 ppm</td>
<td></td>
<td>500 PPM</td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecticut</td>
<td>3,000 ppm</td>
<td></td>
<td>500 PPM</td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maine</td>
<td>3,000-5,000 ppm</td>
<td></td>
<td></td>
<td></td>
<td>15 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>4,000 ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15 PPM</td>
<td></td>
</tr>
<tr>
<td>Washington, DC (Sulfur)</td>
<td>10,000 ppm</td>
<td></td>
<td></td>
<td></td>
<td>500 PPM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*New York City will require 5% blend on October 1, 2017 and after a study and report, 10% in 2025, 15% in 2030 and 20% in 2034.*

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**2018 Changes to the Heating Oil Market:**

- New England States moved to ULS July 1, 2018
- Most of NYS (Downstate) requires 5% Bioheat

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**Note:** The term Bioheat® is a registered trademark of the National Biodiesel Board (NBB). Its use in this document refers generally to biodiesel-blended heating oil.

Source: New England Fuel Institute (NEFI) June 2018
New York State moved to ULS for heating oil in 2012

New England States moved to ULS July 1, 2018

More than 85% of total distillate stocks have been ULS over the past three years.

Source: EIA/NYSERDA
Distillate inventories in the Northeast have risen since the summer to move within the five-year range

Northeast region weekly distillate inventories
million barrels

Note: Gray band represents the range between the minimum and maximum from 2013 to 2017.
Mid-Atlantic Distillate Stocks

- For the week ending October 19, total Mid-Atlantic distillate stocks are 14.0% below last year’s level and 24.7% below the 5-year average.
- Ultra-low sulfur distillate stocks are 11.9% below last year’s level and 19.4% below the 5-year average.
Heating Oil Challenges and Concerns

- No overall issues with current supply and industry expects to be able to meet demand.
- Inventories on the lower side due to high demand, exports, and economics.
- Truck driver shortages – across all industries and nationwide.
  - Compliance with Hours of Service (HOS) rules and potential for waivers during prolonged cold periods to meet demand.
- “Interruptibles” put additional strain on supply especially for prolonged timeframes during extended cold periods.
Heating Oil Challenges and Concerns, Cont’d.

• Irving Oil refinery explosion in St. John, Canada in early October
  ❖ 320,000 barrels per day, more than half of refined products are exported to the Northeast U.S. (Major source for NY and New England)
  ❖ Refinery was undergoing maintenance so short-term impact limited, the explosion affected a unit required to produce distillate so affect on diesel production likely stronger than gasoline.
  ❖ Limited information available on full restoration of refinery operations.

• New Bioheat requirements – 5% bioheat requirement in Downstate NY
  ❖ Nassau, Suffolk, and Westchester counties B5 - July 1, 2018
  ❖ New York City B5 - October 1, 2017 (B20 by 2034)
  ❖ Approximately 70% of heating oil market in New York State.
On the Horizon – IMO 2020

• What is IMO 2020 – International Maritime Organization rules goes into effect globally January 1, 2020. States that marine fuel will have a maximum sulfur content of 0.5% compared to 3.5% today unless scrubbers are installed.
  ❖ 5,000 ppm sulfur content limit compared to 35,000 ppm sulfur content limit
  ❖ March 1, 2020 ban on carrying high sulfur residual bunker fuel

• What are options for compliance –
  ❖ Install scrubbers aboard vessel – high upfront cost, customized to vessel, recoup long-term
  ❖ Low-sulfur bunker fuel
  ❖ Marine diesel (new fuel)

• Who does this affect – all global maritime shipping. U.S. was already in an Emissions Control Area (ECA) of 200 miles buffer around U.S. shoreline requiring 0.1% sulfur content as of January 2015.

• Why does this matter to NYS Heating Oil Industry – higher demand and thus potential higher price for distillate fuel (heating oil) heading into next winter
Propane
Winter 2018-19 takeaways – Propane

• U.S. propane production is forecast to be 14% higher this winter compared with last winter.

• Total propane consumption is expected to be about the same as last winter and net exports 19% higher.

• U.S. propane inventories on October 19 were 4.4 million barrels (5.6%) higher than year-ago levels, and 3.9 million barrels (4.5%) below the five-year average.

• Mid-Atlantic propane inventories were 26.0% higher than the year-ago level and 44.3% above the five-year average.
Winter 2018-19 takeaways – Propane

• Increasing Mid-Atlantic propane inventories coincide with increasing propane exports out of the Mid-Atlantic from strong global demand for propane.

• Mariner East Pipeline – Marcus Hook export terminal

  ❖ Interruptions in service in Mariner East 1 pipeline (70,000 bbl/d)
  ❖ Delays in completing Mariner East 2 pipeline (275,000 bbl/d)
  ❖ Led to larger-than-normal inventory builds

• With increased production from shale formations and improved pipeline and rail delivery networks for propane, this should contribute to more robust propane supply chains than previous years.
U.S. propane inventories are starting the winter near the middle of the five-year range.

U.S. total end-of-month propane inventories

million barrels

Note: Gray band represents the range between the minimum and maximum from 2013 to 2017. Source: EIA Short-Term Energy Outlook, October 2018.
Northeast propane prices, generally dictated by tariff on TEPPCO pipeline, rose relative to Gulf Coast spot prices, reflecting start of heating season.
New York Propane All Sales/Deliveries by Prime Supplier

Thousand Gallons per Day

Source: U.S. Energy Information Administration
New York Stocks at Refineries, Bulk Terminals, and Natural Gas Plants of Propane

Source: U.S. Energy Information Administration
Pennsylvania Stocks at Refineries, Bulk Terminals, and Natural Gas Plants of Propane

Source: U.S. Energy Information Administration
Mid-Atlantic propane stocks are above both the 5-year average and last year’s level heading into the winter season.

Sea-3 terminal in Newington, NH remains operational and is the only remaining open marine propane terminal in New England. A shipment of propane was received in August.
Propane Production

- Since 2010, East Coast propane production has increased by 1,092% while the U.S. propane production has increased by 148%.
- Increased propane production primarily due to increased natural gas production.
Propane Sources of Supply

East Coast (PADD 1) Sources of Propane Supply

- Field Production
- Refinery and Blender
- Imports
- Pipeline, Tanker, and Barge

Source: EIA
Questions and Discussion

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