VERMONT FUEL PRICE REPORT

APRIL 2015

EIA-Short-Term Energy Outlook – Highlights

- On April 2, Iran and the five permanent members of the United Nations Security Council plus Germany (P5+1) reached a framework agreement that could result in the lifting of oil-related sanctions against Iran. Lifting sanctions could substantially change the STEO forecast for oil supply, demand, and prices by allowing a significantly increased volume of Iranian barrels to enter the market. If and when sanctions are lifted, the baseline forecast for world crude oil prices in 2016 could be reduced $5-$15/barrel (bbl) from the level presented in this STEO.

- Iran is believed to hold at least 30 million barrels in storage, and EIA believes Iran has the technical capability to ramp up crude oil production by at least 700,000 bbl/day (bbl/d) by the end of 2016. The pace and magnitude at which those volumes would reach the market would depend on the terms of a final agreement. For additional analysis of the possible oil market effects of a lifting of sanctions against Iran, please see analysis box for further discussion.

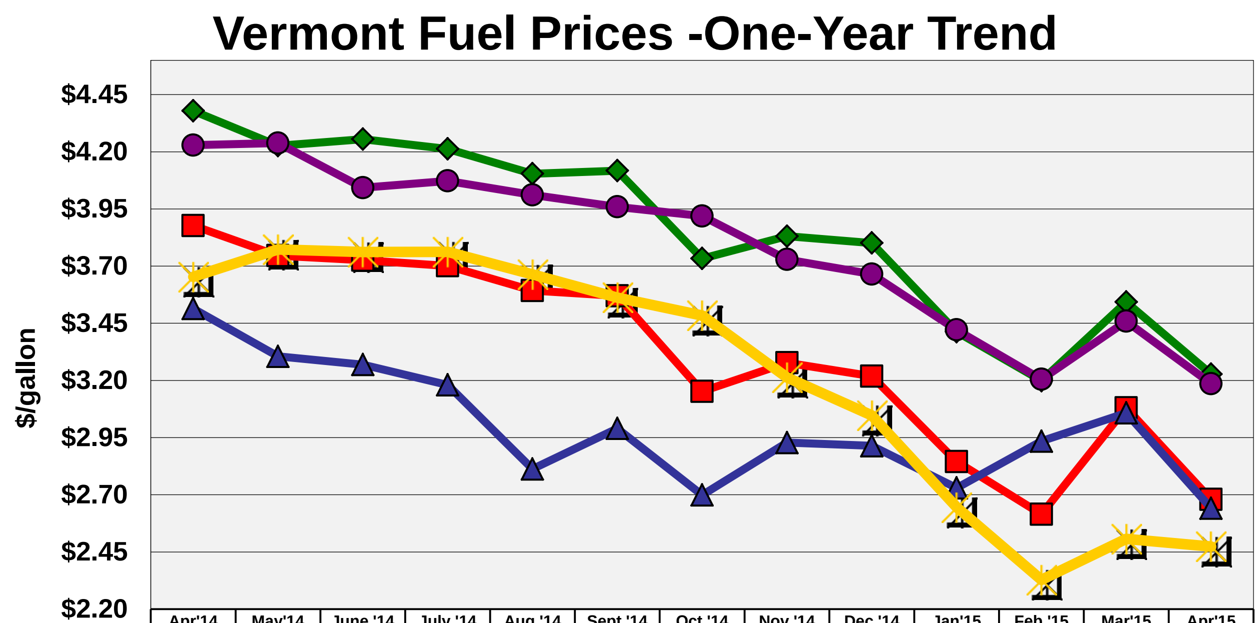
- North Sea Brent crude oil prices averaged $56/bbl in March, a decrease of $2/bbl from the February average. EIA forecasts that Brent crude oil prices will average $59/bbl in 2015 and $75/bbl in 2016, both unchanged from last month's STEO. West Texas Intermediate (WTI) prices in 2015 and 2016 are expected to average $7/bbl and $5/bbl below Brent, respectively. The current values of futures and options contracts continue to suggest very high uncertainty in the oil price outlook (Market Prices and Uncertainty Report). Although WTI futures contracts for the broadly held December 2015 delivery traded during the five-day period ending April 2 averaged $52/bbl , the market's expectations (at the 95% confidence interval) for monthly average WTI prices in that month ranges from $32/bbl to $97/bbl.

- During the 2015 April-through-September summer driving season, regular gasoline retail prices are forecast to average $2.45/gallon (gal) compared with $3.59/gal last summer (see EIA Summer Fuels Outlook slideshow). Based on EIA's gasoline price forecast, the average U.S. household is expected to spend about $700 less on gasoline in 2015 compared with 2014, as annual motor fuel expenditures are on track to fall to their lowest level in 11 years.

- Natural gas working inventories were 1,461 billion cubic feet (Bcf) on March 27, which was 75% higher than a year earlier, but 12% lower than the previous five-year (2010-14) average. The winter withdrawal season typically ends in March, and April is typically the beginning of the injection season, which runs through October. EIA projects natural gas inventories will end October 2015 at 3,781 Bcf, a net injection of 2,310 Bcf. This would be the fourth-highest injection season on record, but it would be 420 Bcf lower than last year's net April-October injection.

- Power generators are using more natural gas than last year, primarily because of lower natural gas prices compared with coal prices. The use of natural-gas-fired generation is projected to average 30.4% of total generation in 2015 compared with 27.4% during 2014. U.S. coal production is expected to fall by 7.1% in 2015, as natural gas displaces coal for power generation.

- Editor's Note: Data presented in the Vermont Fuel Price Report as in the past, is collected on the first Monday of the month.



	Apr'14	May'14	June '14	July '14	Aug '14	Sept '14	Oct '14	Nov '14	Dec '14	Jan'15	Feb '15	Mar'15	Apr'15
Fuel Oil #2	$3.877	$3.746	$3.726	$3.701	$3.593	$3.570	$3.152	$3.277	$3.219	$2.845	$2.615	$3.080	$2.679
Kerosene	$4.379	$4.226	$4.255	$4.213	$4.104	$4.117	$3.733	$3.831	$3.801	$3.413	$3.199	$3.543	$3.228
Propane	$3.514	$3.305	$3.269	$3.180	$2.813	$2.990	$2.699	$2.928	$2.914	$2.730	$2.934	$3.058	$2.641
Gasoline	$3.653	$3.773	$3.762	$3.763	$3.664	$3.563	$3.484	$3.213	$3.047	$2.646	$2.328	$2.507	$2.474
Diesel	$4.229	$4.238	$4.043	$4.073	$4.011	$3.959	$3.919	$3.729	$3.665	$3.421	$3.205	$3.459	$3.186

Vermont Average Retail Petroleum Prices (per gallon)					
	Apr'15	Mar'15	%change	Apr'14	%change
No. 2 Fuel Oil	$2.679	$3.080	-13.01%	$3.877	-30.89%
Kerosene	$3.228	$3.543	-8.90%	$4.379	-26.29%
Propane	$2.641	$3.058	-13.63%	$3.514	-24.84%
Reg. Unleaded Gasoline	$2.474	$2.507	-1.33%	$3.653	-32.29%
Diesel	$3.186	$3.459	-7.90%	$4.229	-24.67%

Comparing the Cost of Heating Fuels							
Type of Energy	**BTU/unit**	**Typ Effic**	**$/unit**	**$/MMBtu**		**High Efficiency**	**$/MMBtu**
Fuel Oil, gallon	138,200	80%	$2.68	$24.23		95%	$20.41
Kerosene, gallon	136,600	80%	$3.23	$29.53			
Propane, gallon	91,600	80%	$2.64	$36.04		93%	$31.00
Natural Gas, therm	100,000	80%	$1.44	$18.01	*	95%	$15.17
Electricity, kWh (resistive heat)	3,412	100%	$0.15	$43.46			
Electricity, kWh (cold climate heat pump)	3,412		$0.15			240%	$18.32
Wood, cord (green)	22,000,000	60%	$ 227.14	$17.21	*		
Pellets, ton	16,400,000	80%	$294.00	$22.41	*		

* The natural gas price is based on the rate effective 2/5/15. *Wood green and Pellets updated 9/19/14.

The *Comparing the Cost of Heating Fuels* table includes two additional columns “High Efficiency” and $/MMBTU HF. The new furnaces which are manufactured to meet higher efficiency standards can result in savings on energy for the customer. If you are in need of or thinking of replacing your current system contact your dealer for information on high efficiency systems.

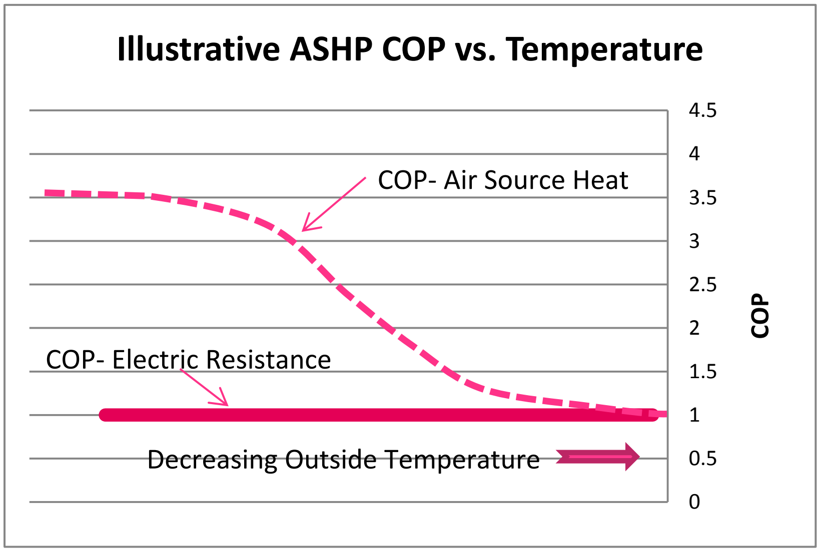
Since the Fuel Price Report’s *Comparing the Cost of Heating Fuels* section began including information on heat pumps, the Department has received a number of comments and suggestions concerning the value of the Coefficient of Performance (COP) for air source heat pumps (ASHP). A COP over 1 means that occupants of a home receive more heat than is contained in the electricity delivered to run the ASHP.

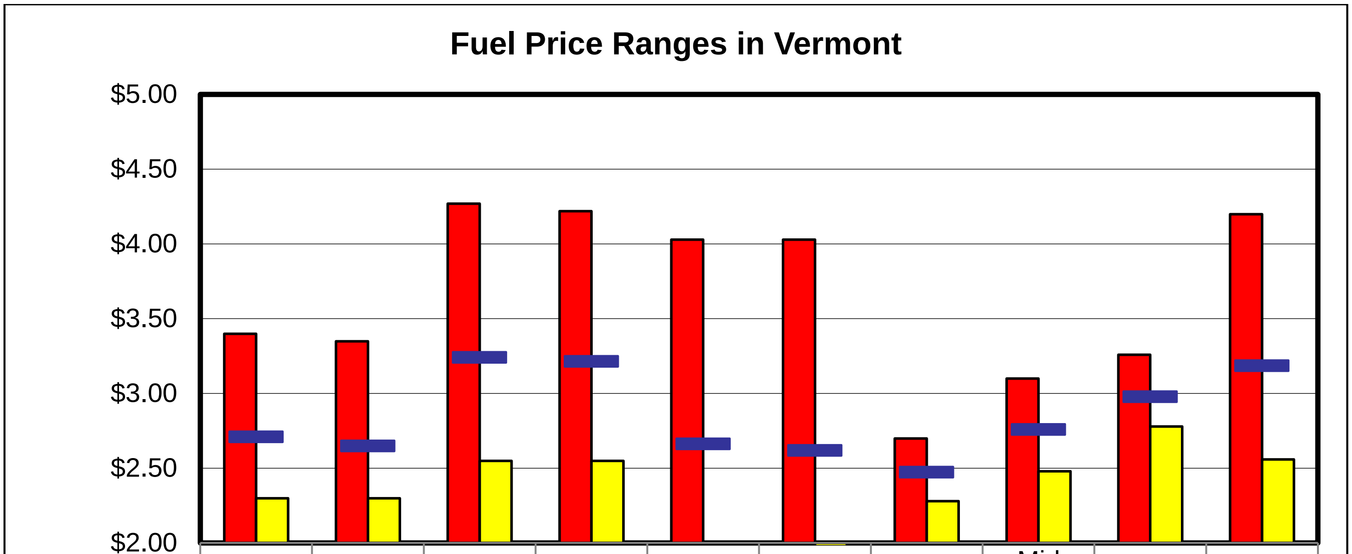
$$Heat\ Pump\ Efficiency = \frac{Quantity\ of heating\ or\ cooling\ delivered}{Electricity\ required\ by\ the\ heat\ pump}$$

Historically, the use of heat pumps has been concentrated in areas with temperate climates which rarely see temperatures much below freezing. This is because the performance of these systems tended to decline significantly at temperatures below freezing. These systems’ COPs remain high as temperature varies through cool, but not cold, weather. As ambient temperatures begin declining from the optimal operation range the operational efficiency begins to decline as well. At some point, depending on the refrigerant and configuration of the heat pump, the COP = 1 which is the same as for electric resistance heating. At that level the heat pump alone cannot supply enough heat to maintain a comfortable interior temperature and requires that a supplemental source of heat be available.

In recent years manufacturers have developed air source "cold climate" heat pumps which have improved performance over a larger temperature range, due in part to the introduction of new refrigerants and more advanced compressors. These ASHPs have the potential to displace other heating sources down to zero F or below, resulting in displacement of a significant fraction of Vermont winter heating. Here in Vermont several programs are currently in the process of collecting actual operational data from ASHPs; their goal is to determine real world annual COP under Vermont's annual temperature range of over 120 degrees. The average yearly heating COP is expected to lie somewhere at a value between 1 and 3 with 2.4 being a reasoned guesstimate based on average winter temperatures and product specifications. As information becomes available we will update the table accordingly.

The figure below is for illustrative purposes only and does not represent actual operational data.

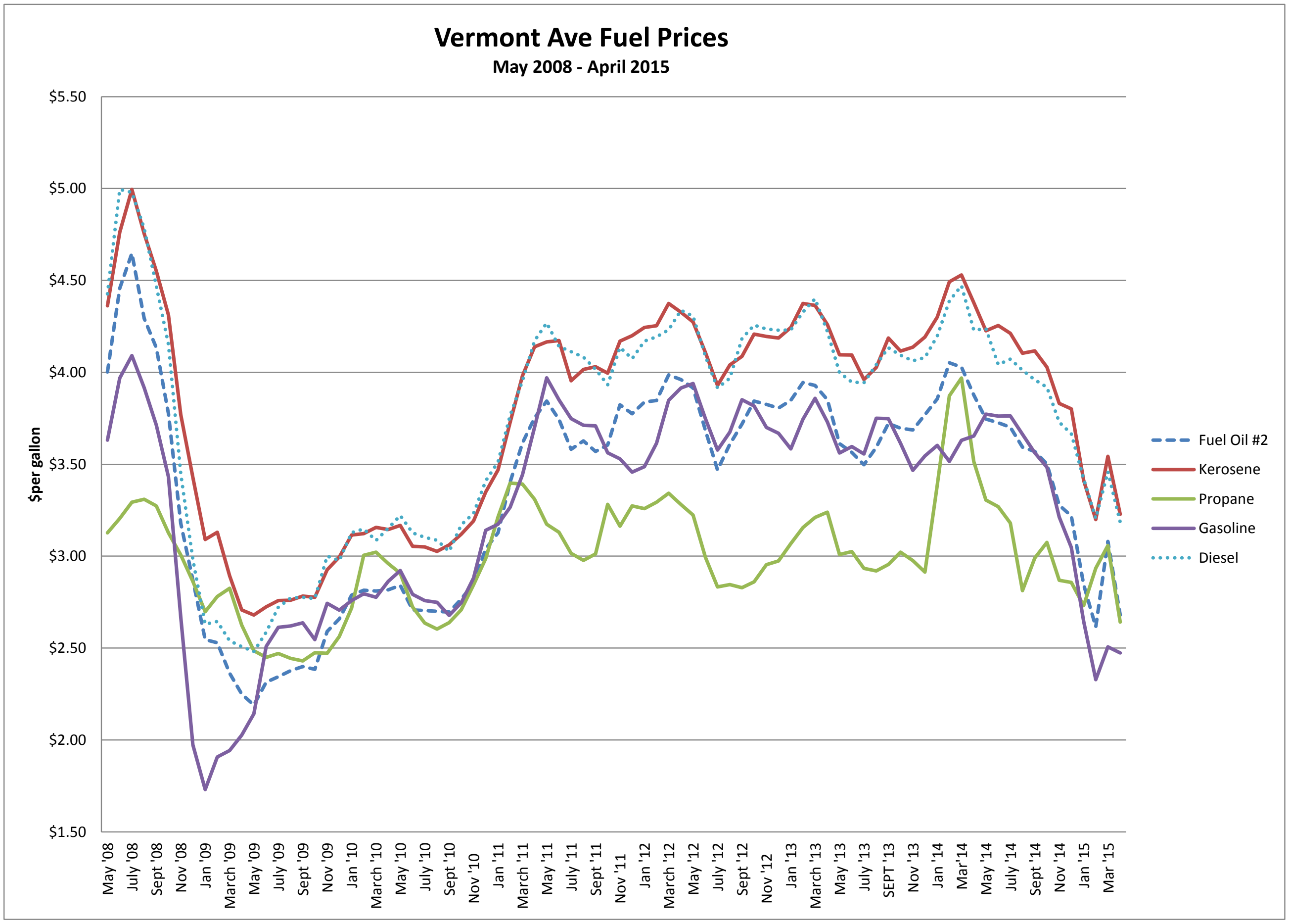




	Oil-Credit	Oil-Cash	Kero-Credit	Kero-Cash	Pro-Credit	Pro-Cash	Regular Gasoline	Mid Grade Gasoline	Super Gasoline	Diesel
Maximum	$3.40	$3.35	$4.27	$4.22	$4.03	$4.03	$2.70	$3.10	$3.26	$4.20
Minimum	$2.30	$2.30	$2.55	$2.55	$1.99	$1.94	$2.28	$2.48	$2.78	$2.56
Average	$2.71	$2.65	$3.24	$3.21	$2.66	$2.62	$2.47	$2.76	$2.98	$3.19

Fuel Price Ranges in Vermont

	Oil-Credit	Oil-Cash	Kero-Credit	Kero-Cash	Pro-Credit	Pro-Cash	Regular Gasoline	Mid Grade Gasoline	Super Gasoline	Diesel
Stan.Dev $	$0.23	$0.23	$0.40	$0.37	$0.51	$0.51	$0.26	$0.94	$0.24	$0.42
Stan.Dev%	8.43%	8.77%	12.26%	11.64%	19.08%	19.32%	2.05%	5.88%	1.93%	2.22%



Monthly Degree Day Comparison (Station: VTNO)									
	Base Year (2014)			Comparison Year (2015)			Comparison Percentages		
Month	HDD	CDD	TDD	HDD	CDD	TDD	HDD	CDD	TDD
January	1398	0	1398	1496	0	1496	7%		7%
February	1253	0	1253	1530	0	1530	22%		22%
March	1294	0	1294	1166	0	1166	-9%		-9%
April	580	0	580			0			
May	197	23	220			0			
June	28	109	137			0			
July	1	212	213			0			
August	8	128	136			0			
September	163	62	225			0			
October	357	16	373			0			
November	786	0	786			0			
December	1044	0	1044						
Through March	3945	0	2651	4192	0	4192	6%		6%
Annual Total	7109	550	7659						

Vermont Historical Weather and Degree Day Data

CDD's are used during summer months to compare the current day's average temperature against the 65ºF standard to determine the energy demands of cooling your home through air conditioning or fans. For example, if the current day's high is 85ºF and the low is 65ºF, the day's average temperature will be 75ºF. Since 75ºF-65ºF is 10ºF, this day would have 10 cooling degree days. Adding the degree days together for the whole month provides a way to compare previous months or years.

HDD's are used the same way during winter months to determine the energy demands of heating your home. The 65ºF standard still is used; however, the day's average temperature is subtracted instead of added to the standard. For example, if the current day's high is 30ºF and the low is 10ºF, the day's average temperature will be 20ºF. Since 65ºF-20ºF is 45ºF, this day would have 45 heating degree days.

Just like cooling degree days, heating degree days may be added together for the entire month to compare to previous months or years.[1]

The primary online source for historical weather and degree day data is available from the NOAA - National Climatic Data Center (NCDC) web site at: http://www7.ncdc.noaa.gov/CDO/CDODivisionalSelect.jsp#

NCDC maintains the world's largest climate data archive and provides climatological services. Records in the archive range from paleoclimatic data to centuries-old journals to data less than an hour old.

Another source is the Weather Data Depot web site. The data collection is not as extensive as the NOAA collection only covering the years from 1993 forward. But the site is more user friendly. http://www.weatherdatadepot.com/?pi_ad_id=8426228665&gclid=CIaZvMf8krQCFQqk4AodFRYArQ

A negative percentage means the Comparison Year was milder than the Base Year. A positive percentage means the Comparison Year was more severe than the Base Year. When the monthly degree days in either the base year or the comparison year are less than 30, a percentage comparison is not calculated. However, the Annual Total comparison percentages include all heating and cooling degree days.

Monthly Degree Day Comparison (Station: VTNO)									
	Base Year (2014)			Comparison Year (2015)			Comparison Percentages		
Month	HDD	CDD	TDD	HDD	CDD	TDD	HDD	CDD	TDD
January	1398	0	1398	1496	0	1496	7%		7%

[1] http://www.consumersenergy.com/content.aspx?id=4582

February	1253	0	1253	1530	0	1530	22%		22%
March	1294	0	1294	1166		1166	-9%		-9%
April	580	0	580			0			
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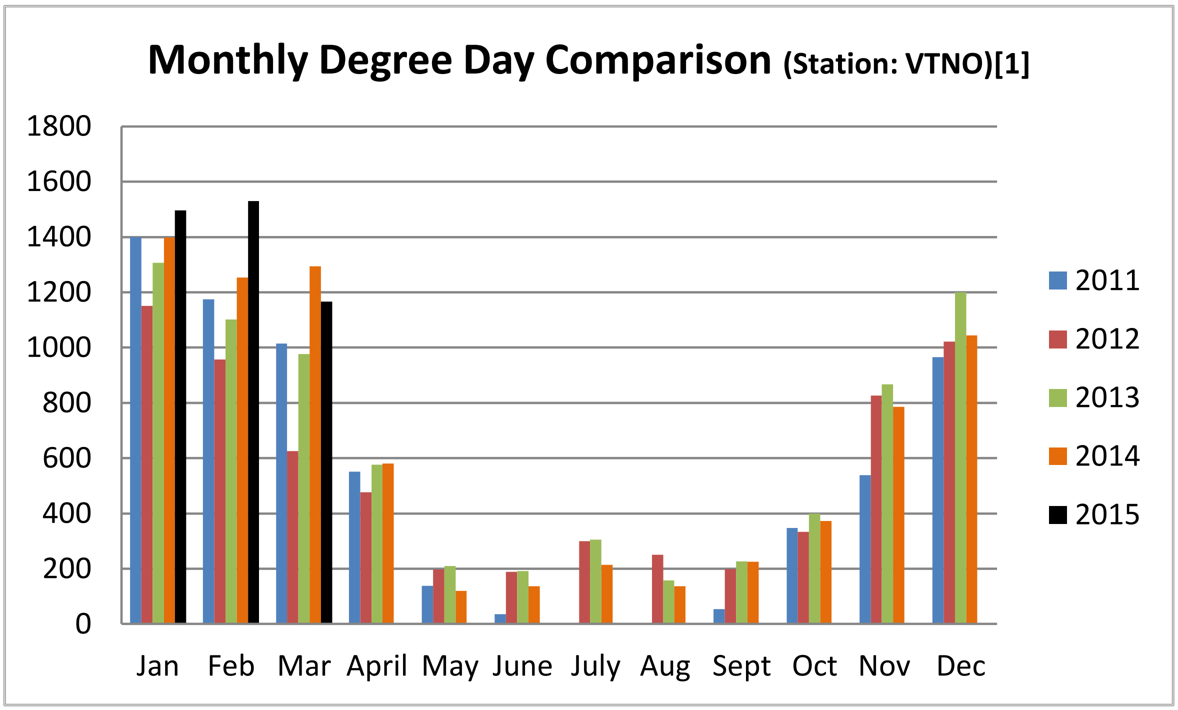
June	28	109	137			0			
July	1	212	213			0			
August	8	128	136			0			
September	163	62	225			0			
October	357	16	373			0			
November	786	0	786			0			
December	1044	0	1044						
Through Febuary	2651	0	2651	4192	0	4192	58%		58%



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NOTE: The Vermont Fuel Price Report is published monthly by the Vermont Department of Public Service. Prices are collected on or about the first Monday of each month and reflect dealer discounts for cash or self-service, except propane prices, which are an average of the credit and discount price. Propane prices are based on 1,000 + gallons. For more information please contact Mike Kundrath at (802) 828-4081 or by email at michael.kundrath@state.vt.us.