VERMONT FUEL PRICE REPORT

MARCH 2015

EIA-Short-Term Energy Outlook – Highlights

- North Sea Brent crude oil prices averaged $58/barrel (bbl) in February, an increase of $10/bbl from the January average, and the first monthly average price increase since June 2014. The price increase reflects news of falling U.S. crude oil rig counts and announced reductions in capital expenditures by major oil companies, along with lower-than-expected Iraqi crude oil exports.

- EIA forecasts that Brent crude oil prices will average $59/bbl in 2015, $2/bbl higher than projected in last month's STEO, and $75/bbl in 2016. West Texas Intermediate (WTI) prices in 2015 and 2016 are expected to average $7/bbl and $5/bbl, respectively, below Brent. The Brent-WTI spread for 2015 is more than twice the projection in last month's STEO, reflecting continuing large builds in U.S. crude oil inventories, including at the Cushing, Oklahoma storage hub.

- 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 June 2015 delivery traded during the five-day period ending March 5 averaged $54/bbl, the market's expectations (at the 95% confidence interval) for monthly average WTI prices in June 2015 range from $33/bbl to $81/bbl. The band widens over time, with lower and upper limits of $32/bbl and $108/bbl for the broadly held December 2015 contract.

- Total U.S. crude oil production was estimated to average 9.4 million barrels per day (bbl/d) in February. Given EIA's price forecast, projected total crude oil production averages 9.3 million bbl/d in 2015 and 9.5 million bbl/d in 2016, close to the 9.6 million bbl/d highest annual average level of U.S. production in 1970.

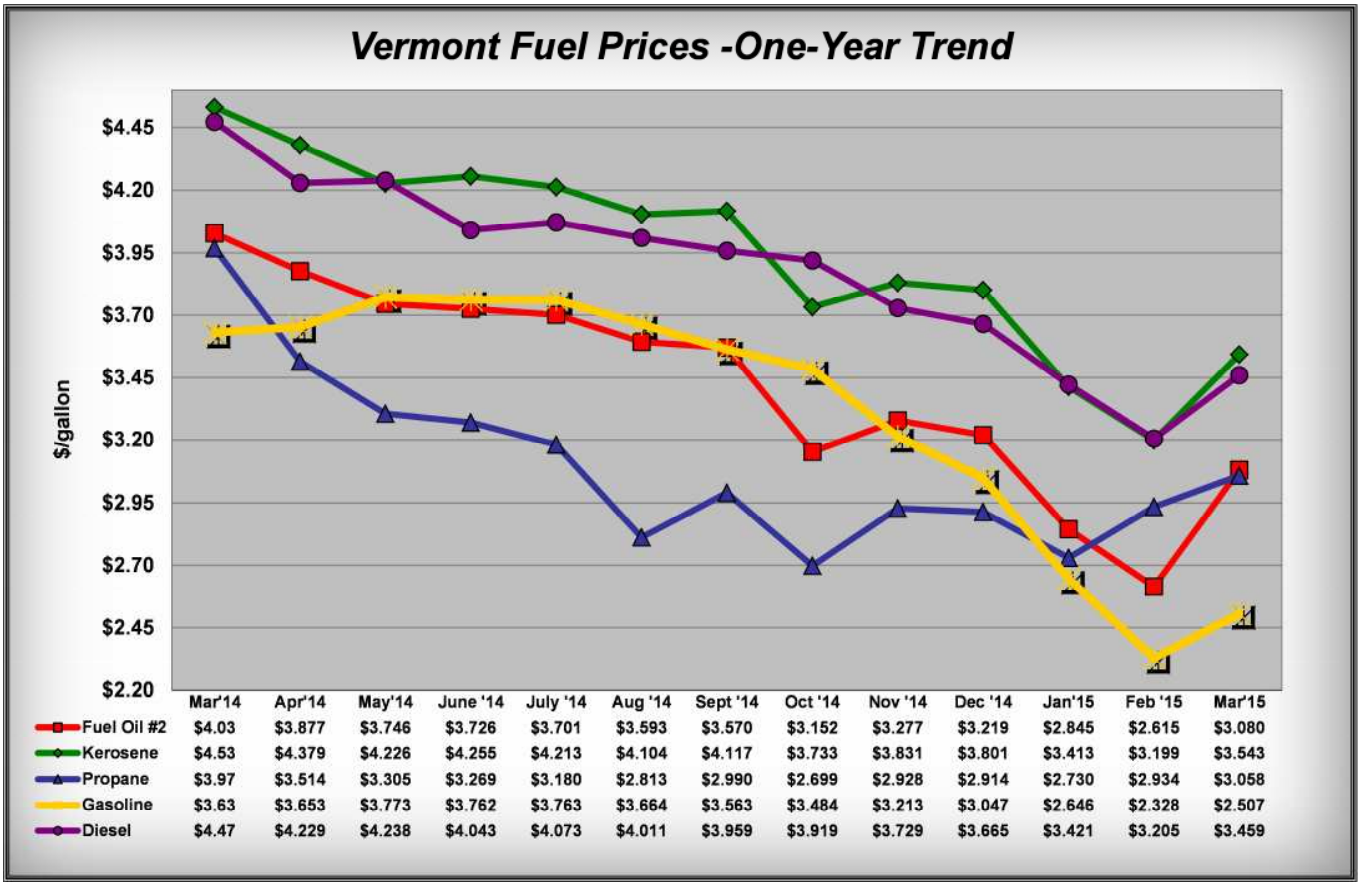
- U.S. average regular gasoline retail prices increased for the sixth consecutive week from $2.04/gallon (gal) on January 26 to $2.49/gal on March 9, reflecting rising crude oil prices and several outages at West Coast refineries. EIA expects U.S. regular gasoline retail prices, which averaged $3.36/gal in 2014, to average $2.39/gal in 2015, an increase of $0.05/gal from last month's STEO, and $2.73/gal in 2016. The average household is expected to spend $710 less for gasoline in 2015 compared with last year because of lower prices.

- Natural gas working inventories on February 27 totaled 1,710 billion cubic feet (Bcf), 492 Bcf (40%) above the level at the same time in 2014 but 143 Bcf (8%) below the previous five-year (2010-14) average. EIA expects the Henry Hub natural gas spot price, which averaged $4.39/million British thermal units (MMBtu) in 2014, to average $3.07/MMBtu in 2015 and $3.48/MMBtu in 2016, largely unchanged from last month's STEO.

- Much of the eastern United States experienced a very cold February, which resulted in increased electricity demand for space heating. EIA estimates total U.S. generation during

February 2015 averaged 11,800 gigawatthours (GWh) per day, which would be a monthly record for February. However, this estimated level of generation still falls short of the winter-month record for total U.S. power generation (12,178 GWh per day) during January 2014.

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



	Mar'14	Apr'14	May'14	June '14	July '14	Aug '14	Sept '14	Oct '14	Nov '14	Dec '14	Jan'15	Feb '15	Mar'15
Fuel Oil #2	$4.03	$3.877	$3.746	$3.726	$3.701	$3.593	$3.570	$3.152	$3.277	$3.219	$2.845	$2.615	$3.080
Kerosene	$4.53	$4.379	$4.226	$4.255	$4.213	$4.104	$4.117	$3.733	$3.831	$3.801	$3.413	$3.199	$3.543
Propane	$3.97	$3.514	$3.305	$3.269	$3.180	$2.813	$2.990	$2.699	$2.928	$2.914	$2.730	$2.934	$3.058
Gasoline	$3.63	$3.653	$3.773	$3.762	$3.763	$3.664	$3.563	$3.484	$3.213	$3.047	$2.646	$2.328	$2.507
Diesel	$4.47	$4.229	$4.238	$4.043	$4.073	$4.011	$3.959	$3.919	$3.729	$3.665	$3.421	$3.205	$3.459

Vermont Average Retail Petroleum Prices (per gallon)					
	Mar'15	**Feb '15**	**%change**	**Mar'14**	**%change**
No. 2 Fuel Oil	$3.080	$2.615	17.79%	$4.029	-23.55%
Kerosene	$3.543	$3.199	10.74%	$4.530	-21.80%
Propane	$3.058	$2.934	4.22%	$3.969	-22.95%
Reg. Unleaded Gasoline	$2.507	$2.328	7.67%	$3.630	-30.95%
Diesel	$3.459	$3.205	7.93%	$4.472	-22.65%

Comparing the Cost of Heating Fuels							
Type of Energy	BTU/unit	Typ Effic	$/unit	$/MMBtu		High Efficiency	$/MMBtu
Fuel Oil, gallon	138,200	80%	$3.08	$27.86		95%	$23.46
Kerosene, gallon	136,600	80%	$3.54	$32.42			
Propane, gallon	91,600	80%	$3.06	$41.73		93%	$35.90
Natural Gas, therm	100,000	80%	$1.48	$18.55	*	95%	$15.62
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 11/1/14. *Wood green and Pellets updated 9/19/14.							

The *Comparing the Cost of Heating Fuels* table now 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.

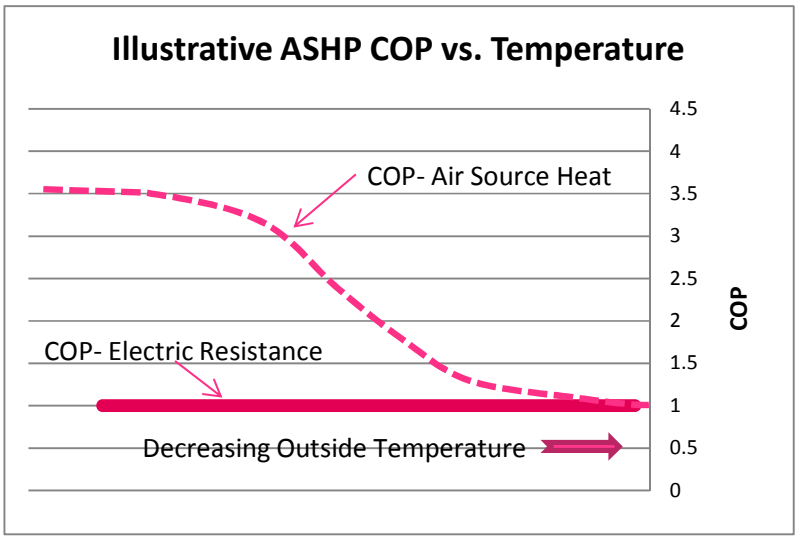
Since the Fuel Price Report's *Comparing the Cost of Heating Fuels* section began including information on heat pumps, the Department has received a number of comments and suggestions concerning the value of the Coefficient of Performance (COP) for air source heat pumps (ASHP). A COP over 1 means that 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.



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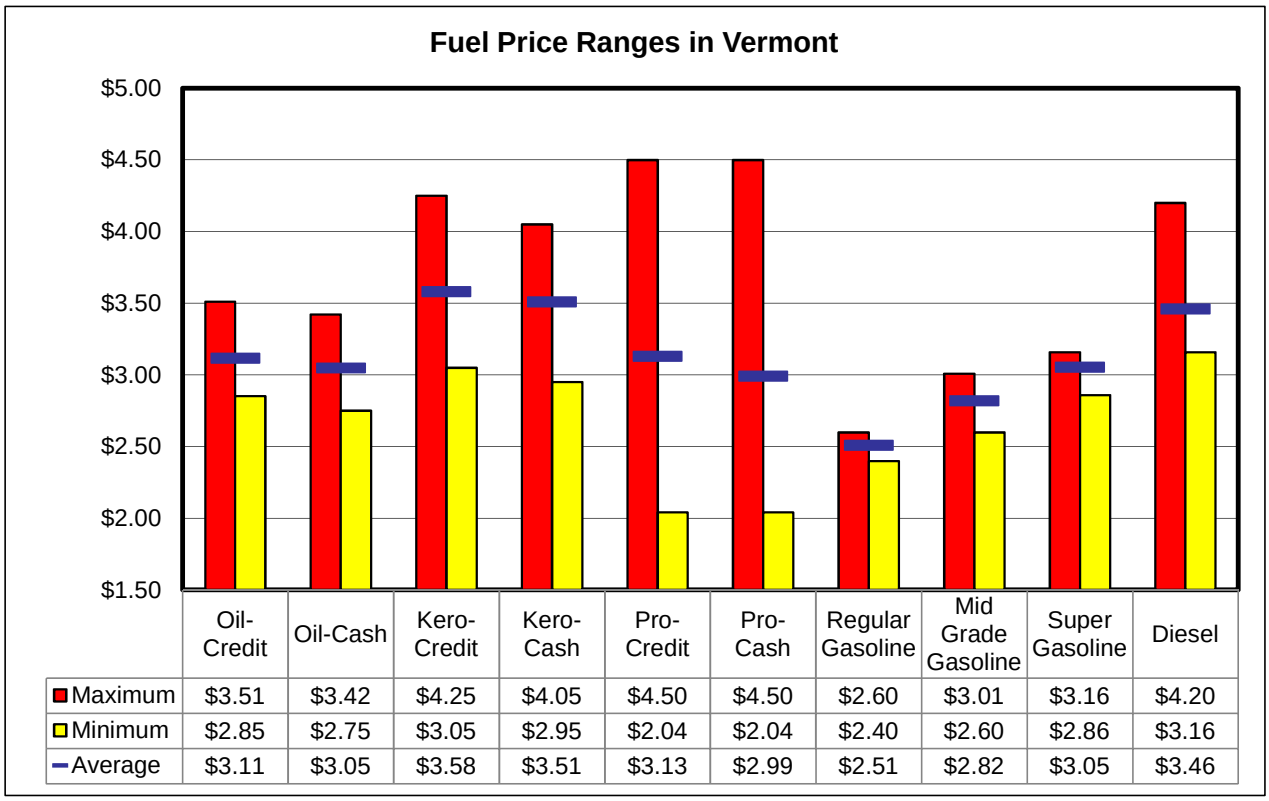
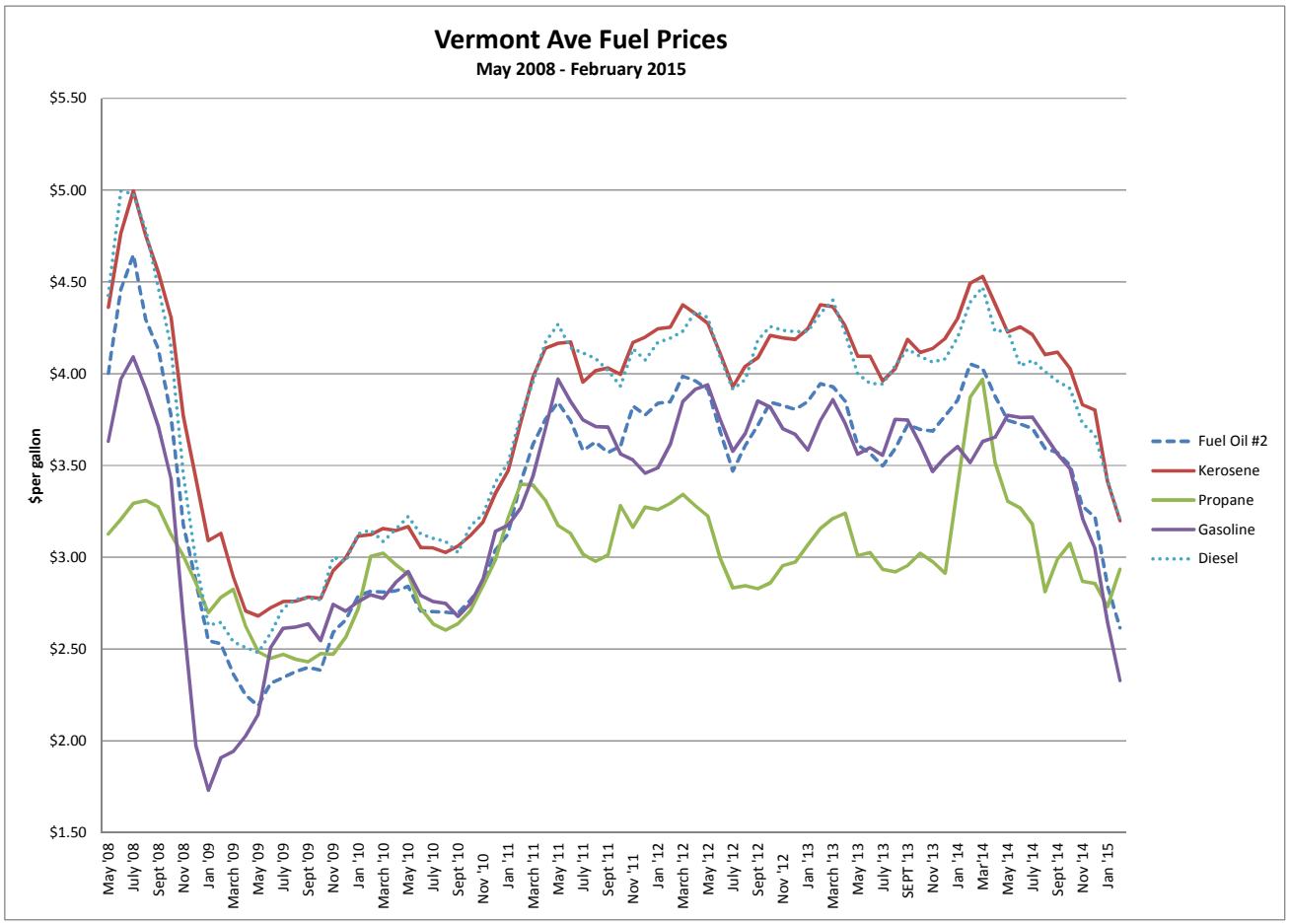


	Oil-Credit	Oil-Cash	Kero-Credit	Kero-Cash	Pro-Credit	Pro-Cash	Regular Gasoline	Mid Grade Gasoline	Super Gasoline	Diesel
Maximum	$3.51	$3.42	$4.25	$4.05	$4.50	$4.50	$2.60	$3.01	$3.16	$4.20
Minimum	$2.85	$2.75	$3.05	$2.95	$2.04	$2.04	$2.40	$2.60	$2.86	$3.16
Average	$3.11	$3.05	$3.58	$3.51	$3.13	$2.99	$2.51	$2.82	$3.05	$3.46

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 $	$0.17	$0.17	$0.23	$0.24	$0.63	$0.61	$0.26	$0.94	$0.24	$0.42
Stan.Dev%	5.40%	5.57%	6.45%	6.94%	20.05%	20.53%	2.05%	5.88%	1.93%	2.22%



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.

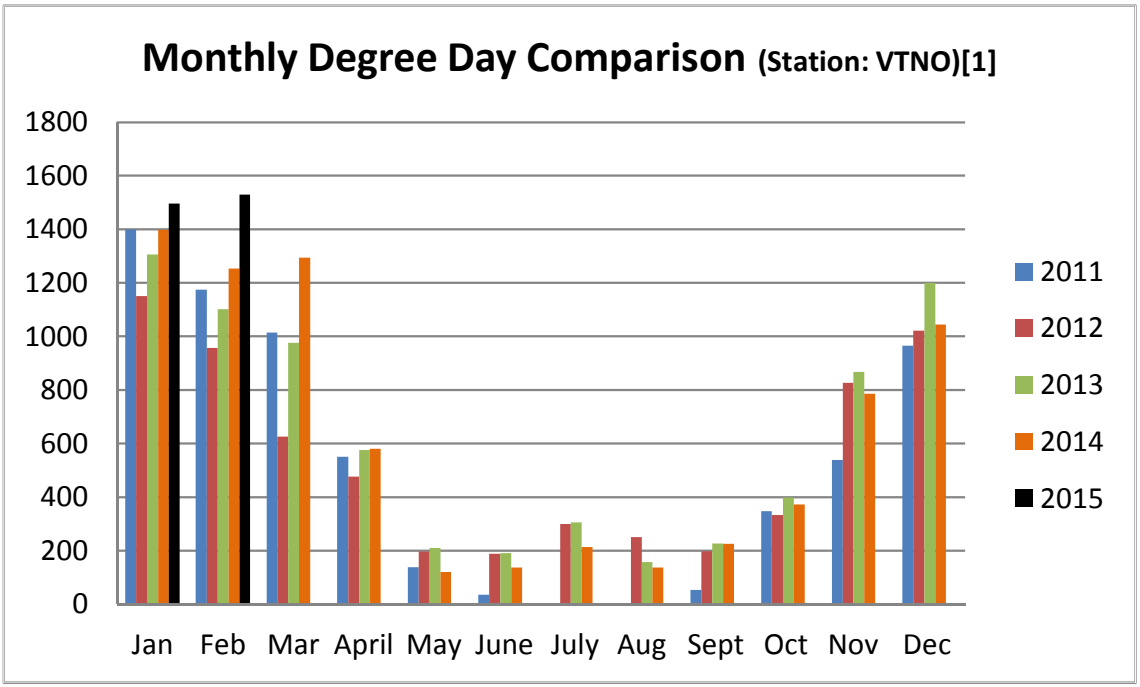
Another source is the Weather Data Depot web site. The data collection is not as extensive as the NOAA collection only covering the years from 1993 forward. But the site is more user friendly. http://www.weatherdatadepot.com/?pi_ad_id=8426228665&gclid=CIaZvMf8krQCFQqk4AodFRYArQ

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%
February	1253	0	1253	1530	0	1530	22%		22%
March	1294	0	1294			0			
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 Febuary	2651	0	2651	3026	0	3026	14%		14%
Annual Total	7109	550	7659						

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



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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.