EIA-Short-Term Energy Outlook – Highlights

- North Sea Brent crude oil spot prices fell by more than 15% in November, declining from $85/barrel (bbl) on November 3 to $72/bbl on November 28. Monthly average Brent crude oil prices have declined 29% from their 2014 high of $112/bbl in June to an average of $79/bbl in November, the lowest monthly average since September 2010. The November price decline reflects continued growth in U.S. tight oil production along with weakening outlooks for the global economy and oil demand growth. The Organization of the Petroleum Exporting Countries' (OPEC) decision in late November to maintain its current crude oil production target, despite lower oil prices, put additional downward pressure on price expectations.

- The current values of futures and options contracts suggest high uncertainty in the price outlook (Market Prices and Uncertainty Report). WTI futures contracts for March 2015 delivery, traded during the five-day period ending December 4, averaged $67/bbl. Implied volatility averaged 32%, establishing the lower and upper limits of the 95% confidence interval for the market's expectations of monthly average WTI prices in March 2015 at $51/bbl and $89/bbl, respectively. Last year at this time, WTI for March 2014 delivery averaged $96/bbl and implied volatility averaged 19%. The corresponding lower and upper limits of the 95% confidence interval were $82/bbl and $112/bbl.

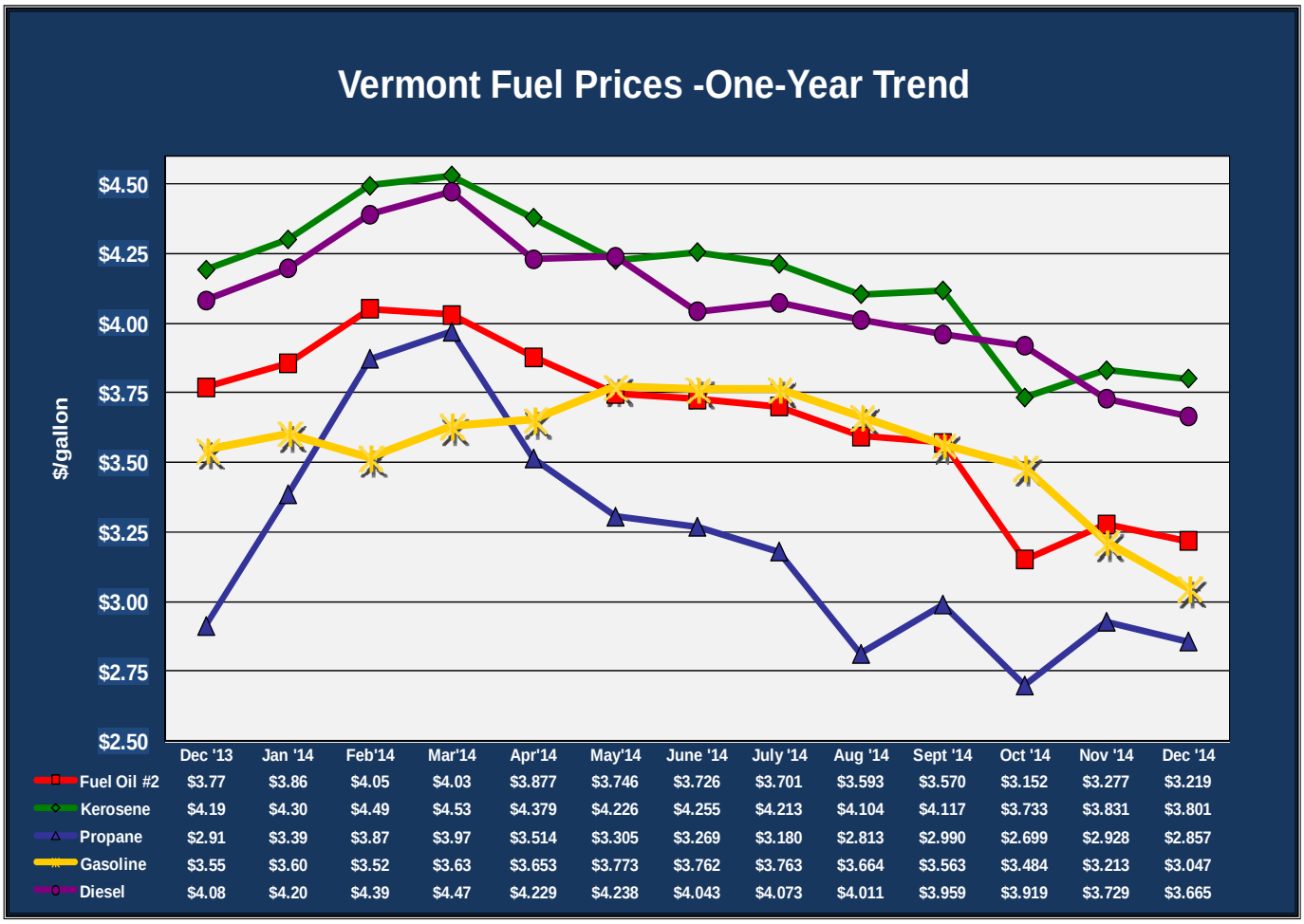
- Total U.S. crude oil production averaged an estimated 9.0 million barrels per day (bbl/d) in November. Projected total crude oil production averages 9.3 million bbl/d in 2015, a reduction of 0.1 million bbl/d from last month's STEO.

- Driven largely by falling crude oil prices, U.S. weekly regular gasoline retail prices averaged $2.78/gallon (gal) on December 1, the lowest since October 4, 2010. U.S. regular gasoline retail prices are projected to continue declining for the remainder of the year, averaging $2.61/gal in December. EIA expects U.S. regular gasoline retail prices, which averaged $3.51/gal in 2013, to average $3.37/gal in 2014 and $2.60/gal in 2015. Forecast retail gasoline prices for 2015 are $0.35/gal lower than in last month's STEO.

- U.S. population-weighted heating degree days (HDD) were an estimated 18% higher than the previous 10-year average for November. Despite a cold start to the winter, lower fuel prices and the National Oceanic and Atmospheric Administration's (NOAA) projection of near-normal temperatures for the remainder of the winter are expected to help lessen consumer expenditures on home heating compared with last winter. Lower crude oil prices are expected to help reduce household heating oil expenditures by 27% ($632) compared with last winter, with U.S. heating oil prices averaging 20% lower at $3.09/gal. Propane prices are expected to be 13% lower in the Northeast and 26% lower in the Midwest, resulting in households spending 20% and 34% less on propane in those regions, respectively.

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

- Natural gas working inventories on November 28 totaled 3.41 trillion cubic feet (Tcf), 0.23 Tcf (6%) below the level at the same time a year ago and 0.37 Tcf (10%) below the previous five-year average (2009-13). Despite the lower stocks at the start of this winter's heating season, EIA expects the Henry Hub natural gas spot price to average $3.98/million British thermal units (MMBtu) this winter compared with $4.53/MMBtu last winter, reflecting both lower expected heating demand and higher natural gas production this winter.



Vermont Average Retail Petroleum Prices (per gallon)					
	Dec '14	**Nov '14**	**%change**	**Dec '13**	**%change**
No. 2 Fuel Oil	**$3.219**	$3.277	-1.79%	**$3.769**	-14.60%
Kerosene	**$3.801**	$3.831	-0.77%	**$4.192**	-9.32%
Propane	**$2.857**	$2.928	-2.42%	**$2.913**	-1.91%
Reg. Unleaded Gasoline	**$3.047**	$3.213	-5.15%	**$3.545**	-14.03%
Diesel	**$3.665**	$3.729	-1.72%	**$4.081**	-10.19%

Comparing the Cost of Heating Fuels							
Type of Energy	BTU/unit	Typ Effic	$/unit	$/MMBtu		High Efficiency	$/MMBtu
Fuel Oil, gallon	138,200	80%	$3.22	$29.11		95%	$24.52
Kerosene, gallon	136,600	80%	$3.80	$34.78			
Propane, gallon	91,600	80%	$2.86	$38.99		93%	$33.54
Natural Gas, therm	100,000	80%	$1.48	$18.52	*	95%	$15.60
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.

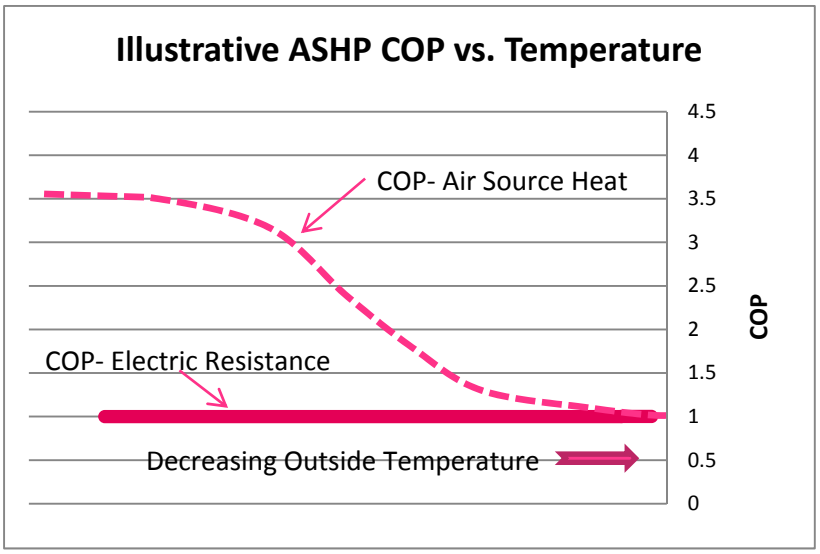
Since the Fuel Price Report's *Comparing the Cost of Heating Fuels* section began including information on heat pumps, the Department has received a number of comments and suggestions concerning the value of the Coefficient of Performance (COP) for air source heat pumps (ASHP). A COP over 1 means that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

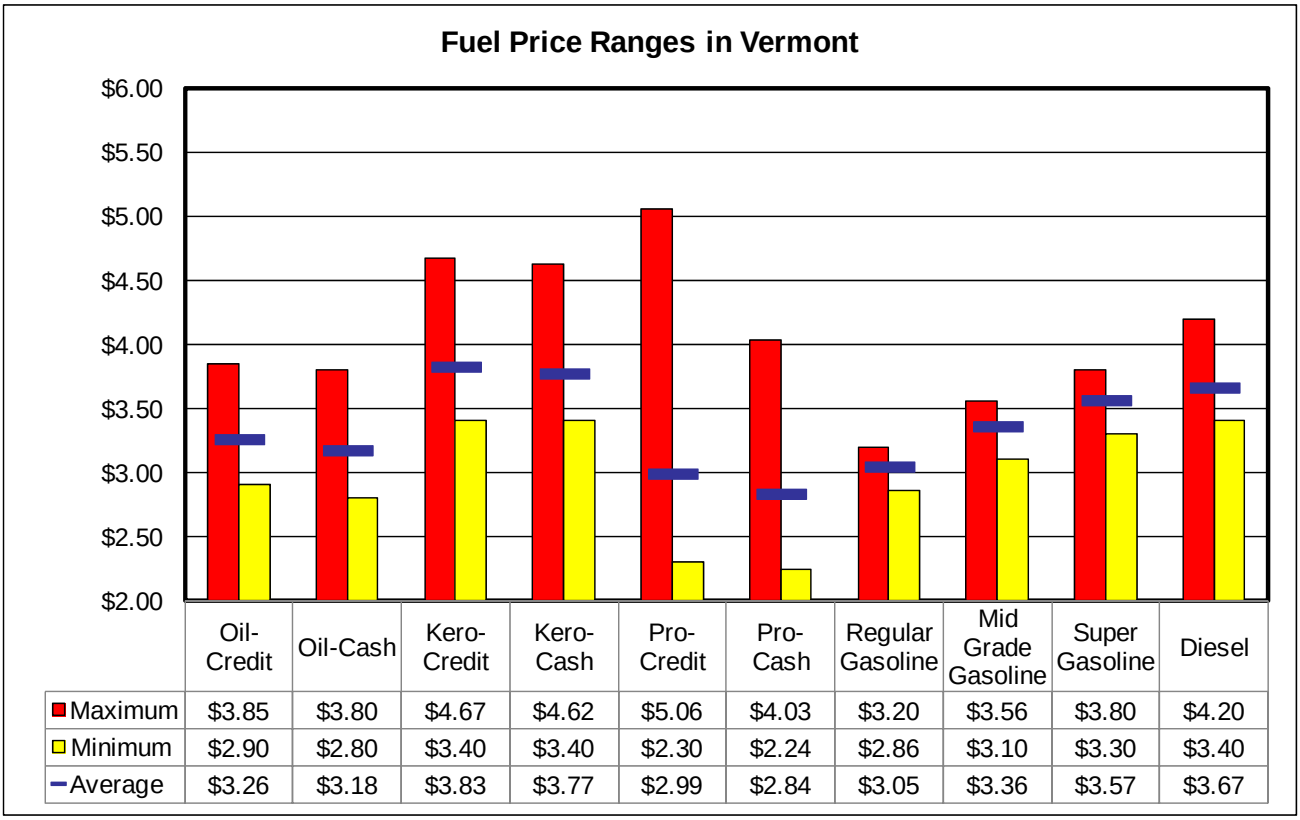
In recent years manufacturers have developed air source "cold climate" heat pumps which have improved performance over a larger temperature range, due in part to the introduction of new refrigerants and more advanced compressors. These ASHPs have the potential to displace other heating sources down to 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.



VERMONT FUEL PRICE REPORT

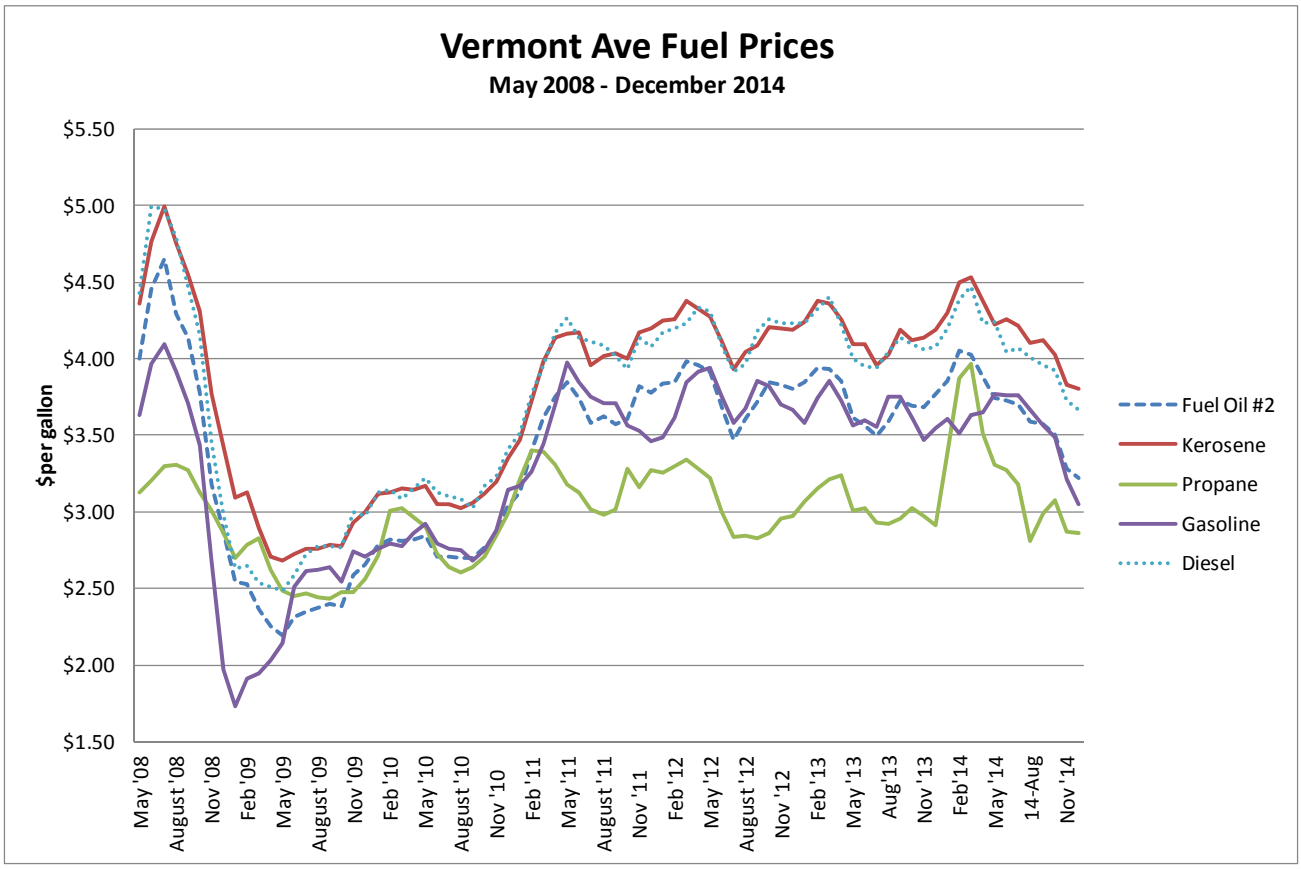
DECEMBER 2014



	Oil-Credit	Oil-Cash	Kero-Credit	Kero-Cash	Pro-Credit	Pro-Cash	Regular Gasoline	Mid Grade Gasoline	Super Gasoline	Diesel
Maximum	$3.85	$3.80	$4.67	$4.62	$5.06	$4.03	$3.20	$3.56	$3.80	$4.20
Minimum	$2.90	$2.80	$3.40	$3.40	$2.30	$2.24	$2.86	$3.10	$3.30	$3.40
Average	$3.26	$3.18	$3.83	$3.77	$2.99	$2.84	$3.05	$3.36	$3.57	$3.67

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	$0.22	$0.33	$0.32	$0.49	$0.36	$0.26	$0.94	$0.24	$0.42
Stan.Dev%	7.03%	6.85%	8.59%	8.54%	16.39%	12.67%	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]

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

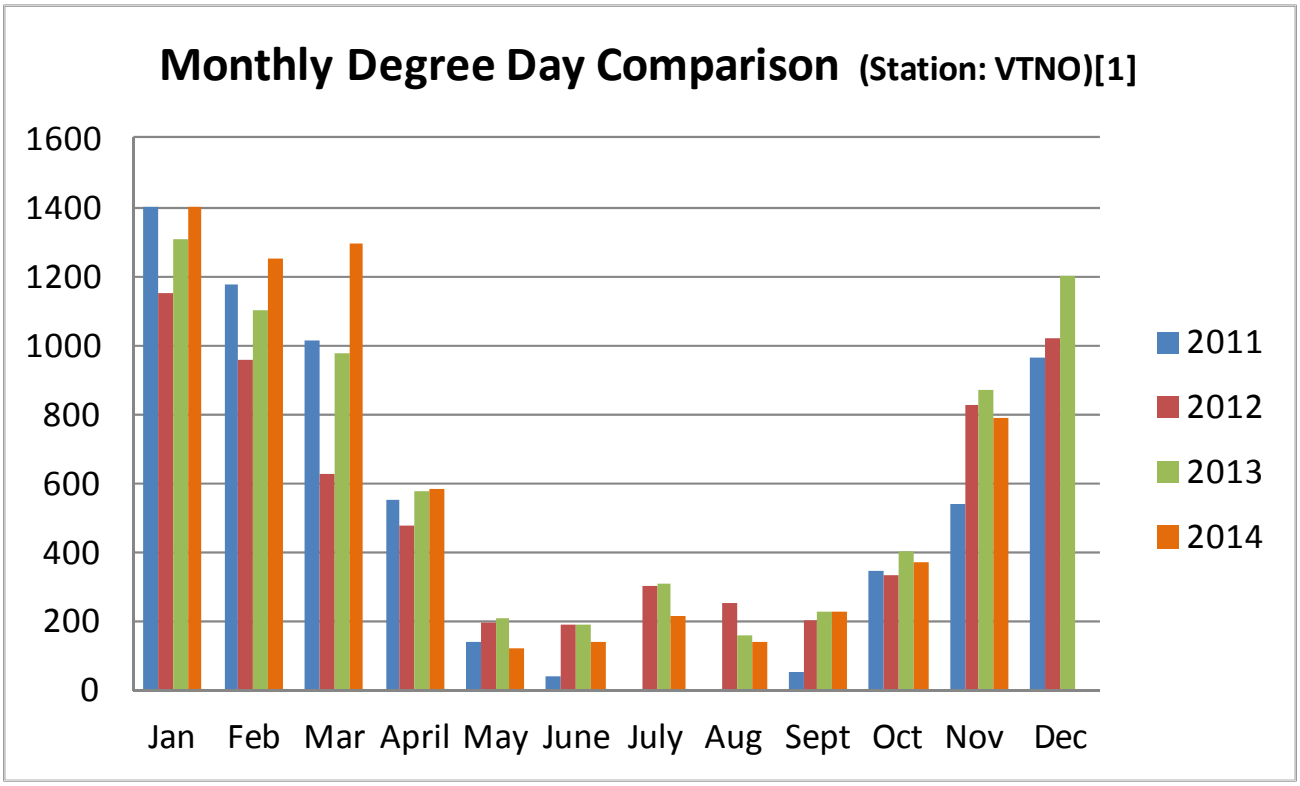
The primary online source for historical weather and degree day data is available from the NOAA - National Climatic Data Center (NCDC) web site at:
http://www7.ncdc.noaa.gov/CDO/CDODivisionalSelect.jsp#

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 (2013)			Comparison Year (2014)			Comparison Percentages		
Month	HDD	CDD	TDD	HDD	CDD	TDD	HDD	CDD	TDD
January	1307	0	1307	1398	0	1398	7%		
February	1102	0	1102	1253	0	1253	13%		13%
March	976	0	976	1294	0	1294	32%		32%
April	574	2	576	580	0	580	1%		0%
May	178	31	209	197	23	120	10%		5%
June	61	130	191	28	109	137		-0.16	-0.28
July	2	303	305	1	212	214		-30%	-30%
August	13	145	158	8	128	136		-11%	-13%
September	167	59	226	163	62	225	-2%	5%	0%
October	400	0	400	357	16	373	-10%		-6%
November	867	0	867	786	0	786	-9%		-9%
December	1200	0	1200						
Annual Total	6847	670	7517	6065	550	6615	7%	-18%	5%



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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.