Vermont Fuel Price Report

MAY 2014

EIA-Short-Term Energy Outlook – Highlights

- During the April-through-September summer driving season this year, regular gasoline retail prices are forecast to average $3.61/gallon (gal), 3 cents higher than last year and 4 cents higher than projected in last month's STEO. The projected monthly national average regular gasoline retail price falls from $3.72/gal in May to $3.51/gal in September. EIA expects regular gasoline retail prices to average $3.48/gal in 2014 and $3.39/gal in 2015, compared with $3.51/gal in 2013.

- Brent crude oil spot prices averaged $108/barrel (bbl) in April. This was the 10th consecutive month in which the average Brent crude oil spot prices fell within a relatively narrow range of $107/bbl to $112/bbl. New pipeline capacity from the Midwest into the Gulf Coast helped reduce inventories at the Cushing, Oklahoma storage hub to 25 million barrels by the end of April, the lowest level since October 2009. The discount of WTI crude oil to Brent crude oil, which averaged more than $13/bbl from November through January, fell below $4/bbl in early April. Total U.S. commercial crude oil stocks at the end of April reached a record high of nearly 400 million barrels, which is expected to put downward pressure on crude oil prices. EIA projects Brent crude oil prices to average $106/bbl in 2014 and $102/bbl in 2015 and the WTI discount to Brent to average $10/bbl and $11/bbl in 2014 and 2015, respectively.

- EIA estimates U.S. total crude oil production averaged 8.3 million barrels/day (bbl/d) in April 2014, which would be the highest monthly average production since March 1988. U.S. total crude oil production, which averaged 7.4 million bbl/d in 2013, is expected to increase to 8.5 million bbl/d in 2014 and 9.2 million bbl/d in 2015. The 2015 forecast represents the highest annual average level of production since 1972.

- Natural gas working inventories on April 25 totaled 0.98 trillion cubic feet (Tcf), 0.79 Tcf (45%) below the level at the same time a year ago and 0.98 Tcf (50%) below the previous five-year average (2009-13). Very cold weather and low inventories contributed to volatile Henry Hub natural gas spot prices over the past few months, increasing from $3.95 per million British thermal units (MMBtu) on January 10 to a high of $8.15/MMBtu on February 10, before falling back to $4.61/MMBtu on February 27, and then bouncing back up to $7.98/MMBtu on March 4. EIA expects that the Henry Hub natural gas spot price, which averaged $3.73/MMBtu in 2013, will average $4.74/MMBtu in 2014, $0.30 higher than in last month's STEO, and $4.33/MMBtu in 2015.

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

Vermont Fuel Price Report

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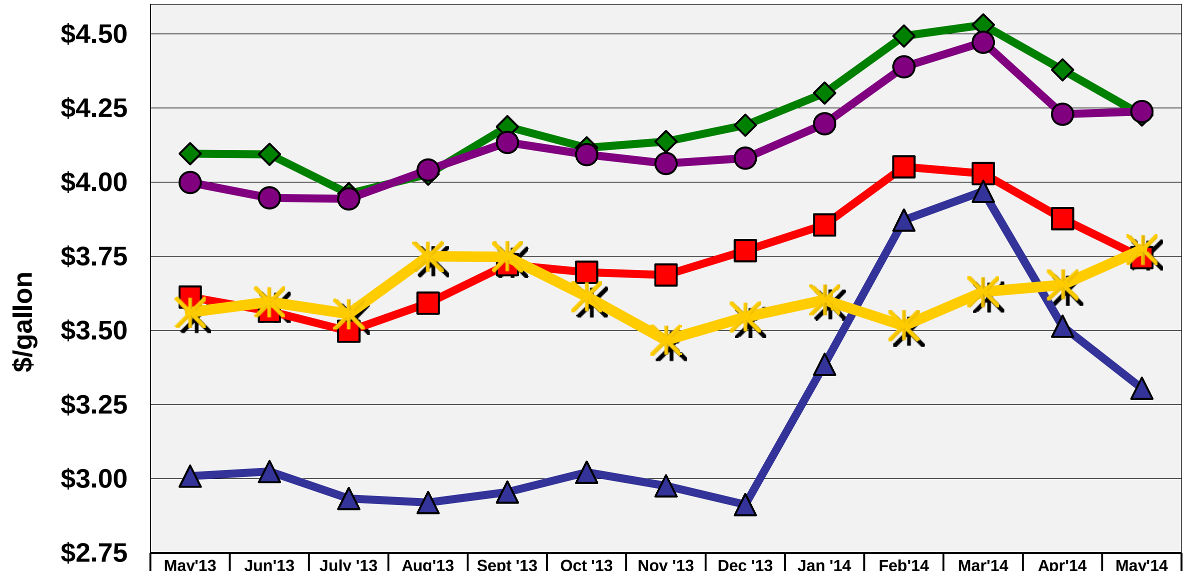
Vermont Fuel Prices -One-Year Trend



	May'13	Jun'13	July '13	Aug'13	Sept '13	Oct '13	Nov '13	Dec '13	Jan '14	Feb'14	Mar'14	Apr'14	May'14
Fuel Oil #2	$3.61	$3.565	$3.497	$3.59	$3.72	$3.70	$3.69	$3.77	$3.86	$4.05	$4.03	$3.877	$3.746
Kerosene	$4.10	$4.094	$3.961	$4.03	$4.19	$4.12	$4.14	$4.19	$4.30	$4.49	$4.53	$4.379	$4.226
Propane	$3.01	$3.024	$2.933	$2.92	$2.96	$3.02	$2.98	$2.91	$3.39	$3.87	$3.97	$3.514	$3.305
Gasoline	$3.56	$3.596	$3.556	$3.75	$3.75	$3.61	$3.47	$3.55	$3.60	$3.52	$3.63	$3.653	$3.773
Diesel	$4.00	$3.947	$3.944	$4.04	$4.13	$4.09	$4.06	$4.08	$4.20	$4.39	$4.47	$4.229	$4.238

Vermont Average Retail Petroleum Prices (per gallon)

	May'14	Apr'14	%change	May'13	%change
No. 2 Fuel Oil	$3.746	$3.877	-3.39%	$3.612	3.69%
Kerosene	$4.226	$4.379	-3.48%	$4.096	3.18%
Propane	$3.305	$3.514	-5.95%	$3.009	9.86%
Reg. Unleaded Gasoline	$3.773	$3.653	3.27%	$3.561	5.93%
Diesel	$4.238	$4.229	0.21%	$3.999	5.98%

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Vermont Fuel Price Report

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Comparing the Cost of Heating Fuels				
Type of Energy	**BTU/unit**	**Adj Effic**	**$/unit**	**$/MMBtu**
Fuel Oil, gallon	138,200	80%	$3.75	$33.88
Kerosene, gallon	136,600	80%	$4.23	$38.68
Propane, gallon	91,600	80%	$3.31	$45.10
Natural Gas, therm	100,000	80%	$1.46	$18.30
Electricity, kWh (resistive heat)	3,412	100%	$0.15	$43.46
Electricity, kWh (cold climate heat pump)	3,412	240%	$0.15	$18.32
Wood, cord (green)	22,000,000	60%	$193.33	$14.65
Pellets, ton	16,400,000	80%	$247.00	$18.83

* The natural gas price is based on the rate effective 5/8/14. *Wood green updated 9/25/13.

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.

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Vertmont Fuel Price Report

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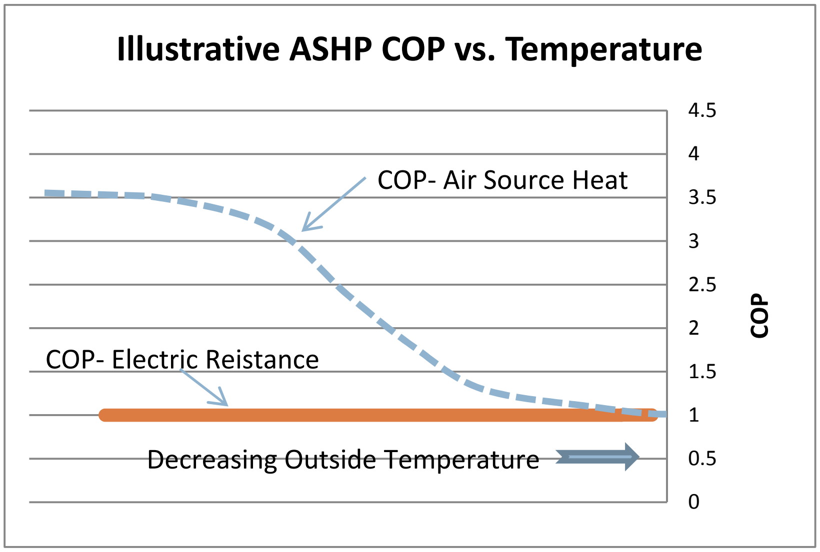
In recent years manufacturers have developed air source "cold climate" heat pumps which have improved performance over a larger temperature range, due in part to the introduction of new refrigerants and more advanced compressors. These ASHPs have the potential to displace other heating sources down to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

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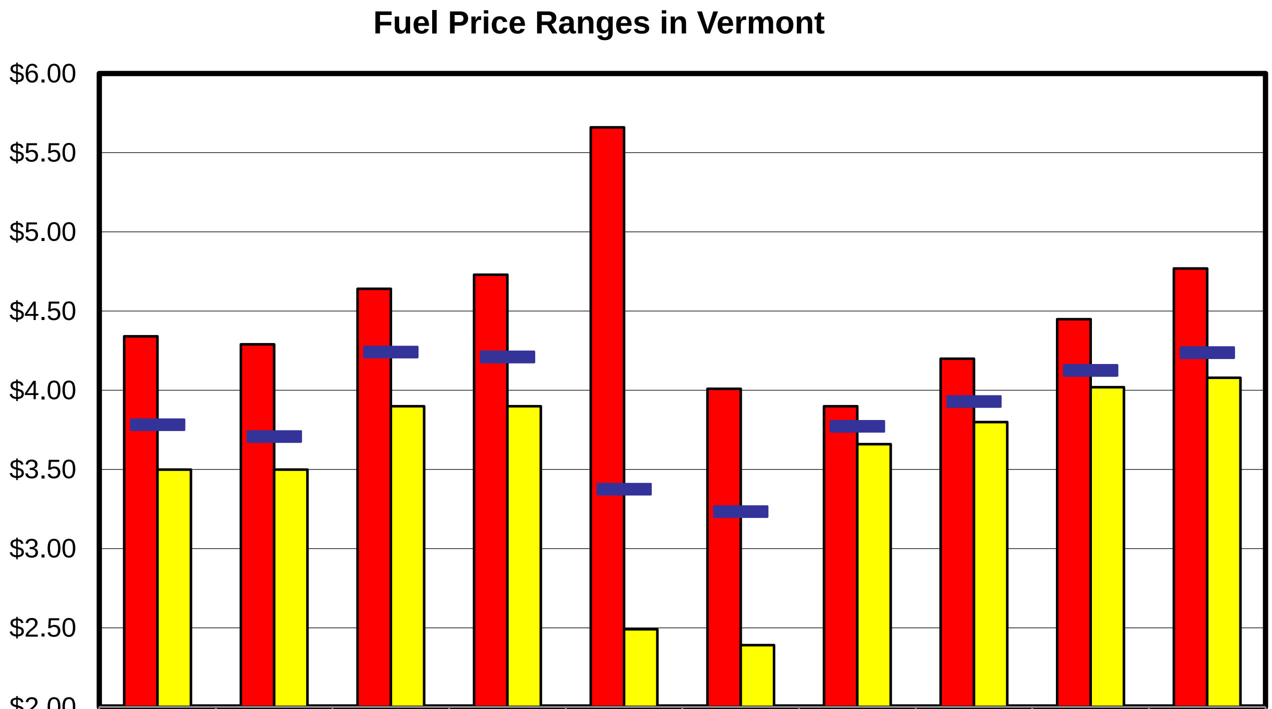

	Oil-Credit	Oil-Cash	Kero-Credit	Kero-Cash	Pro-Credit	Pro-Cash	Regular Gasoline	Mid Grade Gasoline	Super Gasoline	Diesel
Maximum	$4.34	$4.29	$4.64	$4.73	$5.66	$4.01	$3.90	$4.20	$4.45	$4.77
Minimum	$3.50	$3.50	$3.90	$3.90	$2.49	$2.39	$3.66	$3.80	$4.02	$4.08
Average	$3.78	$3.71	$4.24	$4.21	$3.38	$3.23	$3.77	$3.93	$4.13	$4.24

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 $	$0.15	$0.14	$0.20	$0.22	$0.70	$0.45	$0.26	$0.94	$0.24	$0.42
Stan.Dev%	4.03%	3.79%	4.71%	5.12%	20.60%	13.97%	2.05%	5.88%	1.93%	2.22%

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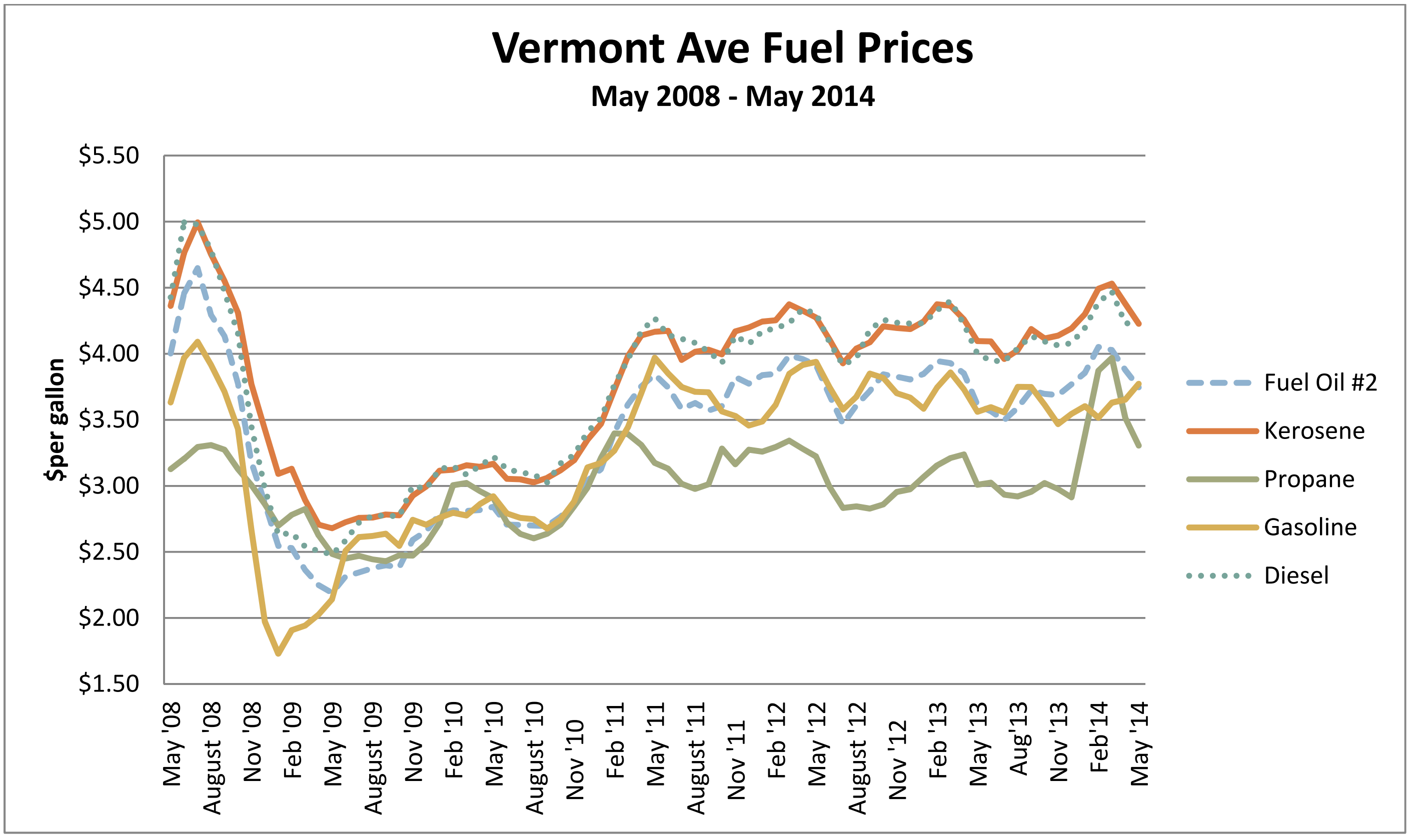

PRICE PROTECTION PROGRAMS

This past winter's combination of colder weather and supply constraints resulted in pretty significant spikes in prices. Here are some suggestions for mitigating some impact caused by the spikes. Around this time of the year many fuel dealers offer their customers "price protection" programs. Such as "Pre-Buy" programs, in which participating customers can purchase a specified volume of fuel at a discounted price by paying for the heating season's fuel in advance. In "Fixed Price" programs, a pre-determined price per unit is set for all of the fuel delivered during the heating season. In "Cap" programs, the fuel price will not exceed a pre-determined value and may go down based on market conditions at time of delivery. Cap and Fixed Price programs may be part of "Budget" programs, in which the customer agrees to make equal monthly payments, often for 10 to 12 months. Price protection programs can be beneficial, as they provide a degree of certainty, and customers are better able to budget their finances and thus are not caught short during the heating season. However, price protection programs don't guarantee savings, so consumers need to consider their options carefully.

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In the coming months we will be reporting a sampling of dealer's offerings. for price protection programs.. Contact your Dealer for up to date terms and conditions of their "price protection" programs.

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 the 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.

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

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Vertmont Fuel Price Report

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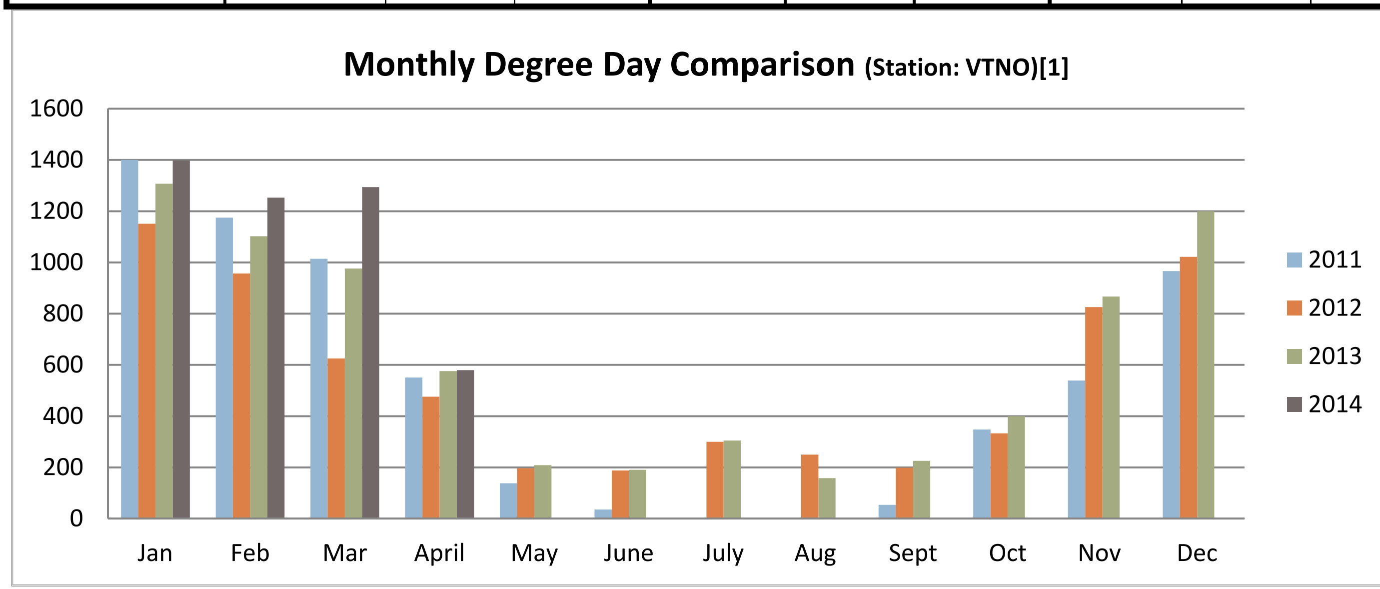
Monthly Degree Day Comparison (Station: VTNO)									
	Base Year (2013)			Comparison Year (2014)			Comparison Percentages		
Month	**HDD**	**CDD**	**TDD**	**HDD**	**CDD**	**TDD**	**HDD**	**CDD**	**TDD**
January	1307	0	1307	1398	0	1398	7%		
February	1102	0	1102	1253	0	1253	13%		13%
March	976	0	976	1294	0	1294	32%		32%
April	574	2	576	580	0	580	1%		0%
May	178	31	209						
June	61	130	191						
July	2	303	305						
August	13	145	158						
September	167	59	226						
October	400	0	400						
November	867	0	867						
December	1200	0	1200						
Annual Total	6847	670	7517	4525	0	4525	14%		14%



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