YESTERMORROW

DESIGN/BUILD SCHOOL

Environmental Impact Report

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9/7/11

LINNEAN Solutions

2011 Snapshot

Total Number of Students and Faculty	936
Total Number of Interns	17
Total Number of Staff	10
Total Meals Served	14,592
Total Nights of Accommodation	2,966
Total Electricity Used on Campus	60,946 KWh
Total Electricity Produced on Campus	34,544 KWh
Total Water Used on Campus	214,720 gallons

Contents

Overview of Yestermorrow's Environmental Impact

Overall energy and water use by the Yestermorrow campus is low, relative to other educational institutions in New England and around the country. Linnean Solutions compared Yestermorrow to other campuses using the Sustainability Tracking Assessment and Rating System (STARS) from the Association for the Advancement of Sustainability in Higher Education (AASHE). The STARS system is designed to facilitate this sort of cross-campus comparison. A general comparison of Yestermorrow to other institutions is provided on page 11.

STARS Weighted Users

A key tool in the STARS system is the definition of a "weighted user". This calculated number is used to create a count of the population of each campus that is comparable across different housing settings and campus sizes. The "weighted user" calculation takes into account the number of full-time campus residents, the number of commuting students and staff, and the number of part-time students and staff. For the Yestermorrow calculation of weighted users, we took the number of full-time residents for each week in a month and averaged them to get a monthly average full-time resident number, and then added that to the number of staff to get an annual number of full-time resident-equivalents. While there are around 1,000 students and faculty who stay at Yestermorrow over the course of a year, most stay for only a few days. This weighted user calculation produced a full-time residence equivalent of 41 "weighted users". This number allowed for easy comparisons to other campuses.

Energy and Water Comparisons

	Energy use per "user"	Water use per "user"
Yestermorrow	**15,190 KBtu**	**5,237 gal.**
Middlebury College	*not provided*	**15,747 gal.**
Earlham College	**19,000 KBtu**	**35,304 gal.**
Royal Roads University	**14,000 KBtu**	**10,968 gal.**

Carbon Equivalent Emissions

Campus carbon (or carbon equivalent) emissions are also low, but are dominated by travel-related emissions. Estimates done by Linnean Solutions have determined that energy use is only 5% of the total carbon emissions from the campus. Overall, carbon emissions from energy use on campus is very low, helped by the on-site renewable energy production and the low percentage of Green Mountain Power generated from carbon-emitting sources. We estimate that transportation of students, faculty, and staff to and from the campus accounts for 95% of the campus-related carbon emissions. This is an important strategic issue that might define some of Yestermorrow's growth plans.

Waste Water

Another growth-related finding is the total sewage generated by the campus and the sewage per user. Yestermorrow uses water lightly, which means that the campus produces waste water at a low rate, as well. Linnean estimates that a "weighted user" on campus generates approximately 3,927 gallons of waste water per year. We also estimate that a student who is on campus for a 2-day class is equivalent to about 3% of a weighted user. These estimates provide information useful to planning for accommodating growth in the student population.

Electricity Consumption and Production

Sun exposure, electricity production and electricity consumption for FY 2011 *(units: kwh)*

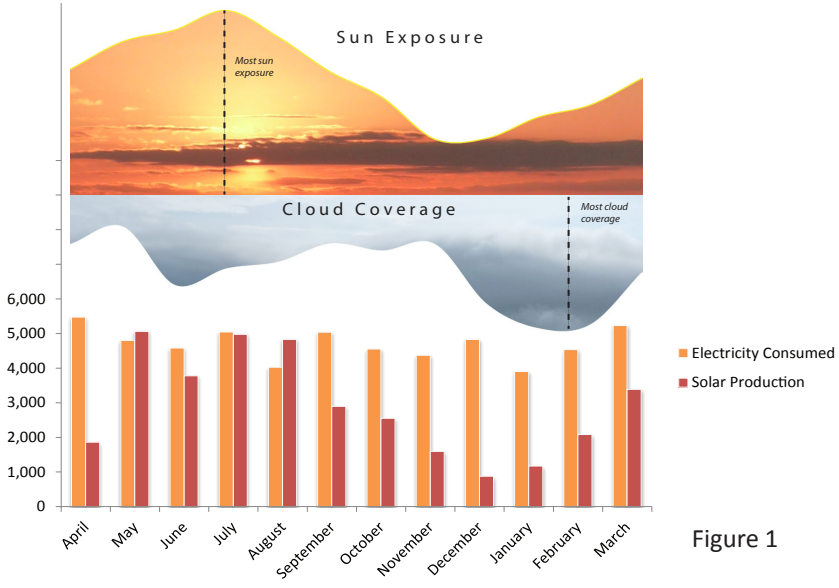


Figure 1

Fees and credits for electricity use and production for FY 2011

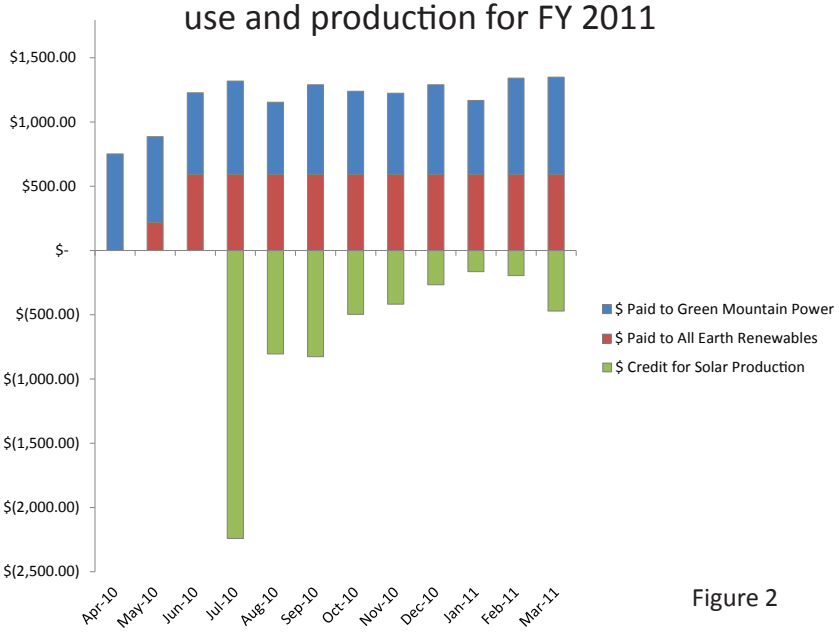


Figure 2

Fiscal Year 2011 Electricity Use Analysis

Total Electricity Consumed: **60,946 kWh**

Total Electricity Produced: **34,544 kWh (57%)**
note: In April 2010, Yestermorrow installed a 28 kW grid-tied PV array in partnership with All Earth Renewables to produce energy for the campus.

kWh per 'Weighted User' **1,486 kWh**
note: a student in a 2-day class equals approx. 3% of a 'weighted user', as defined in STARS rating system.

Electricity Energy Use Intensity (EEUI) **15.7 KBtu/sf**
note: KBtu per sq. ft. of building, including unconditioned space.

By comparison, the Omega Center has an EEUI of 13.2 KBtu/sf

Fiscal Year 2011 Electricity Purchasing Analysis

Total Electricity Purchased: **$8,095.13**

Total Electricity Credit: **$5,888.31 (73%)**

Fiscal Year 2011 Electricity Purchasing and Production Notes:
Yestermorrow installed a 28 KW photovoltaic (PV) system on campus, in a partnership with All Earth Renewables. Green Mountain Power (GMP) provides a credit to Yestermorrow for PV power produced. However, GMP was slow to account for the credit from April 2010 until July 2010, so the July 2010 credit includes the previous months.

Propane Consumption and Weather Trends

2011 Propane Use Analysis

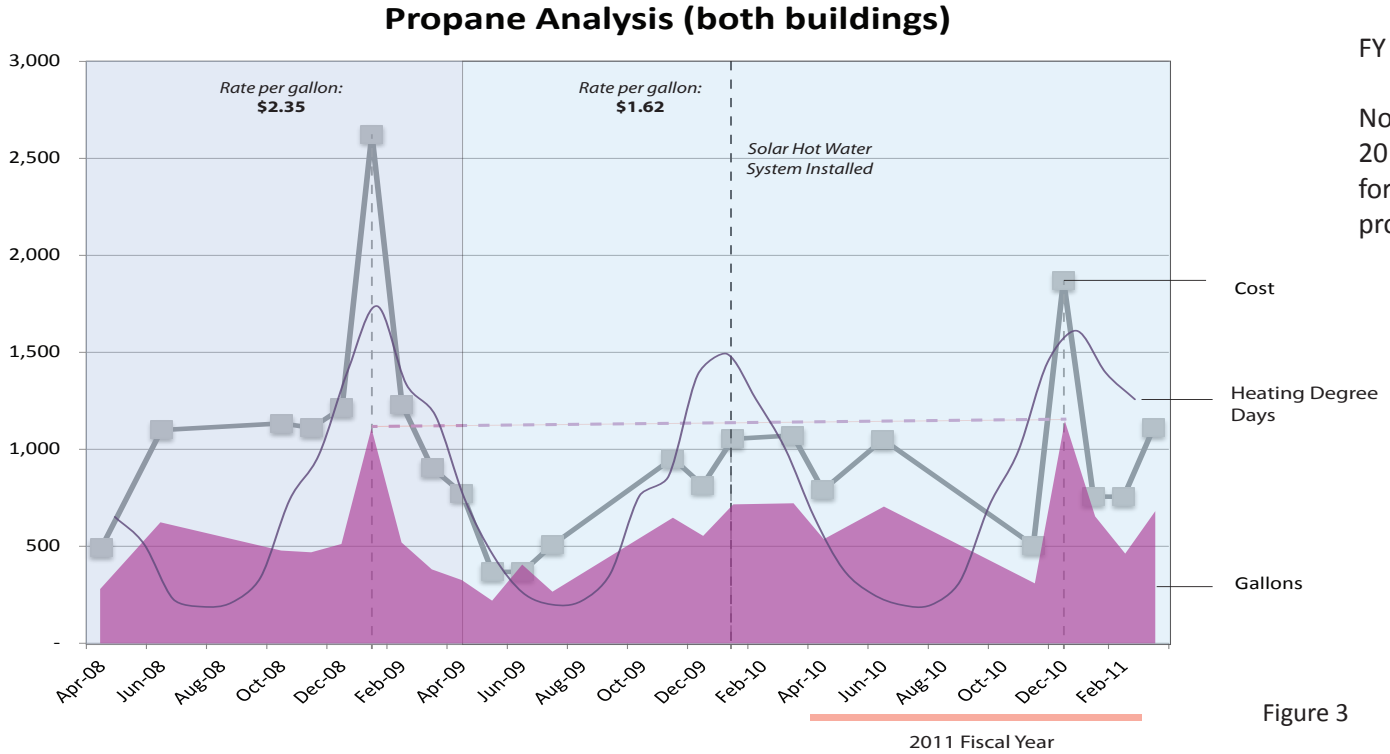
Total Propane Consumed: **4,528 gallons**
414,792 KBtu

Annual Propane per 'Weighted User' **10,117 KBtu**
(note: a student in a 2-day class equals approx. 3% of a 'weighted user', as defined in STARS rating system.)

Propane Energy Use Intensity (PEUI): **31.3 KBtu/sf**
(KBtu per sq. ft. of building: includes all occupied building space on campus, including unconditioned space.)

By comparison, Oaks Hall at Vermont Law has a PEUI of 15.1 KBtu/sf

This graph shows propane gallons delivered and cost, along with heating degree days on a monthly basis for 2 1/2 years, ending in March 2011.



FY 2011 has been highlighted in this graph.

Note that peak propane demand for Dec. 2010 is much higher than peak demand for Dec. 2009. This may be explained by propane delivery schedules.

Figure 3

Energy Analysis

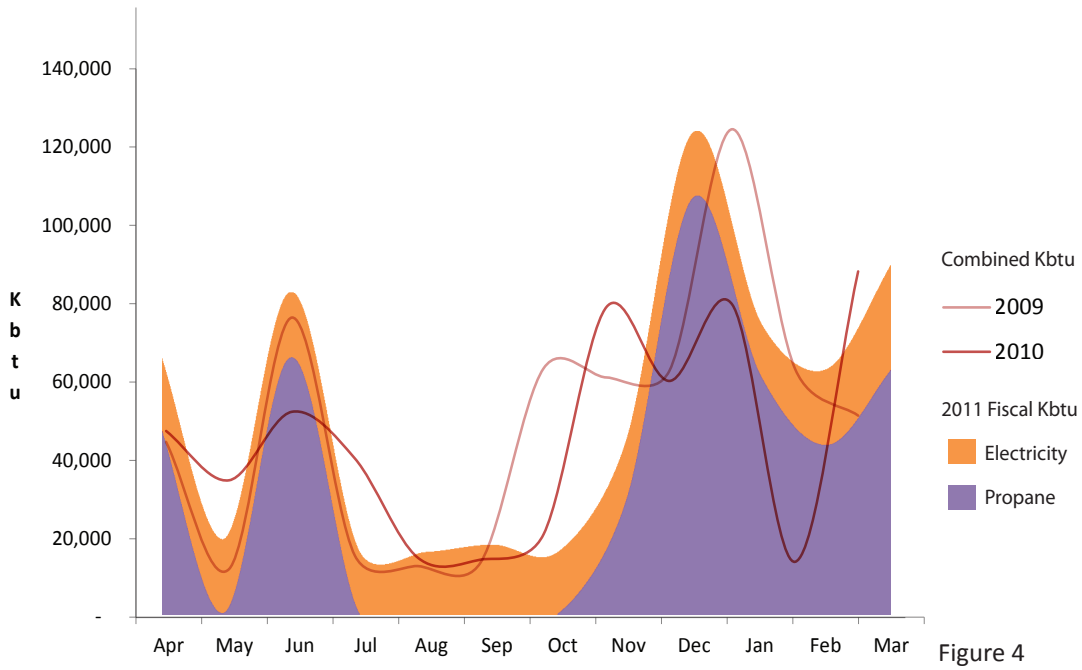


Figure 4

2011 Energy Analysis (KBtu)

Energy from Electricity:	**208,009**
Energy from Propane:	**414,792**
Total Energy Consumed:	**622,801**
kBtu per 'Weighted User'	**15,190**

(note: a student in a 2-day class equals approx. 3% of a 'weighted user', as defined in STARS rating system.)

Total Energy Use Intensity: **47 KBtu/sf**

(KBtu per sq. ft. of building, including unconditioned but occupied space)

FY 2011 Total Energy Use for the Yestermorrow Campus

The graph to the right shows energy used on campus, broken down to show the contribution of electricity use and propane use to total energy use. The 2009 and 2010 totals are show for comparison.

This graph is to show when, during the year, energy is consumed, and from what source.

Site vs. Source Energy Use

The Site and Source Energy Output graph, below, gives a snapshot of the amount of total energy consumed by Yestermorrow, including transmission losses, generation efficiency, and energy types. The Site and Source graph shows the difference between the energy used on the campus, and the total energy consumed by the campus, including losses.

As a general rule, electricity produced off-site looses 2/3 to 3/4 of its total energy content to generation efficiency losses and transmission losses.

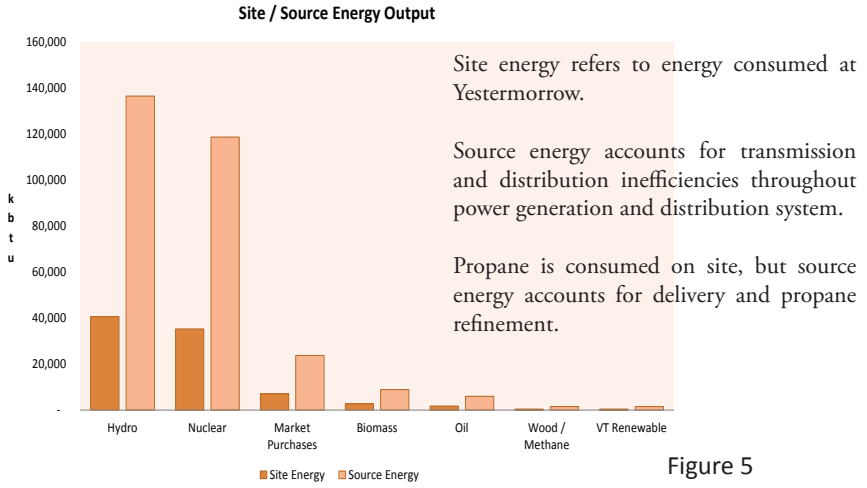


Figure 5

Emissions Analysis

Total Emissions for Yestermorrow are Low

Carbon equivalent emissions produced by Yestermorrow's electricity consumption are low because Green Mountain Power utilized a high percentage of non-emitting energy sources (including nuclear and hydro). We also count the energy generated on site as a reduction in the use of grid-produced electricity. This point is arguable, but wither way, electricity-related emissions are low.

Carbon Dioxide Equivalent emissions (eCo2) include the following greenhouse gasses:

CO2: Carbon Dioxide
CH4: Methane
N2O: Nitrous Oxide

Different emitting activities each has their own eCo2 equivalent...

Per Gallon of Propane: .00544 Metric Tonnes of eCo2
Per KWh of Electricity: .000605 Metric Tonnes of eCo2

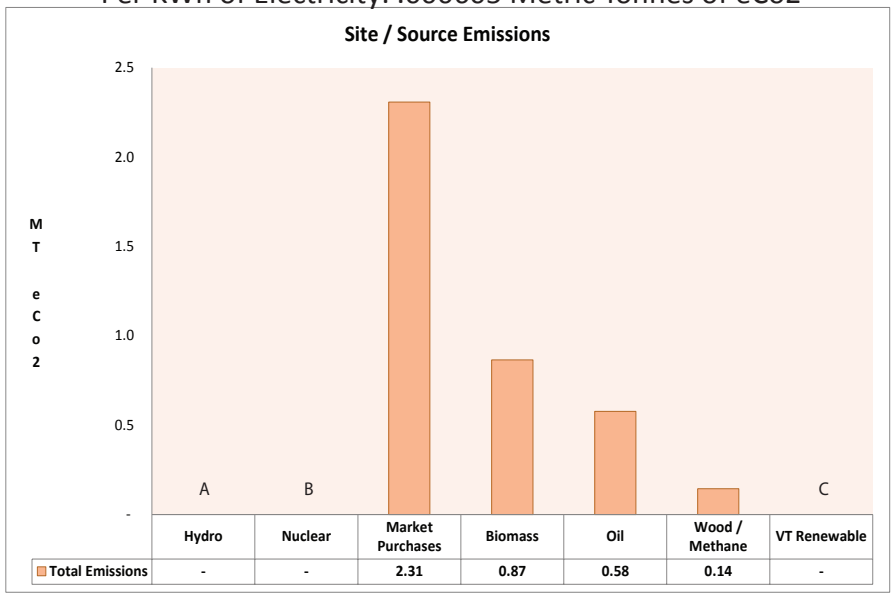


Figure 6

A: There are no emissions associated with hydro power.

B: There are no emissions associated with nuclear power.

C: Renewable energy produces no emissions.

All emissions numbers account for include transmission and distribution losses

Yestermorrow's Emissions (MT eCo2)

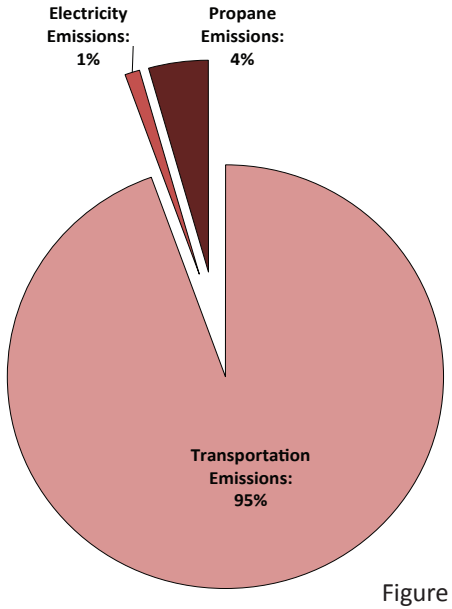


Figure 7

FY 2011	
	MT eCo2
Transportation Emissions	527
Electricity Emissions	2
Propane Emissions	25
Total	**553**

Total eCo2 Emissions Dominated by Travel

Emissions for Yestermorrow are dominated by travel, because of overall low energy use on campus and because of the fuel mix for energy production, including on-site solar and hydro and nuclear production in the grid.

Commuting Assumptions: *(See p. 16 for calculations of transportation emissions)*
Percentage of vehicle miles traveled assumes students outside New England travel by plane.

Staff emissions assumes each staff member works in the office 4 days a week, 50 weeks a year and travels 20 miles per day.

Site Use and Rainfall

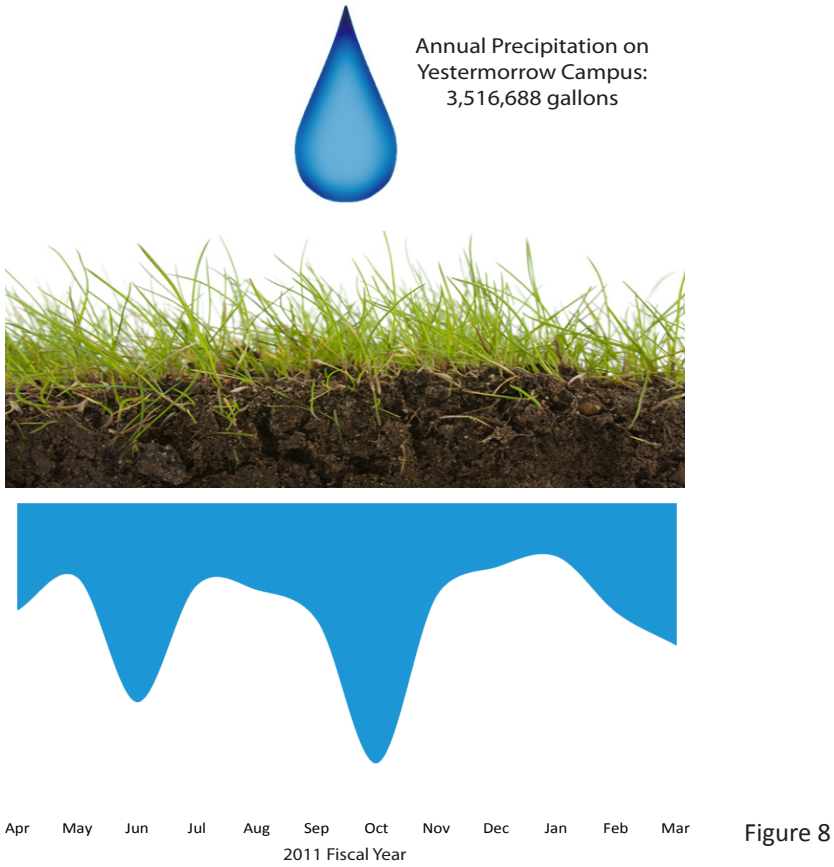


Figure 8

Yestermorrow Campus, Waitsfield, Vermont

Land Use Analysis

Total Campus Acres:	**38**
Developed:	**15%**
Forest / Wildlife:	**67%**
Wetland:	**10%**
Meadow / Agriculture:	**8%**

By comparison, the Omega Center sits on a 195 acre campus, 42% of which is developed.

Precipitation on the Yestermorrow campus averages 40 to 45 inches per year. This totals around 3.5 million gallons of water per year falling on the campus.

Site Water Absorption Characteristics:

67% forested land: EVT = 0.65 inches of water/day

-- Vermont forests average 175 trees per acre

18% marsh or meadow (including crops): 0.19 inches of water/day

15% impervious surfaces 0 inches of water/day

(note: Impervious surface includes buildings and paved areas. This area is called "hardscape" in the STARS comparison in the appendix on p. 19.)

During non-freezing months, essentially all of the precipitation that falls on the Yestermorrow campus is used by the vegetation in evapotranspiration (EVT) or is absorbed by the soil, except during heavy rains . During frozen months, this relationship is different, and leads to greater soil absorption and much more runoff into surrounding land and the Mad River.

Figure 9

Potable Water Use

2010 Water Use Analysis

Includes estimated Chalet consumption based on national household average

Total Potable Water Consumed on Campus:	**214,720 gallons**
Gallons per 'Weighted User'	
Per Year:	**5,237**
Per Day:	**14**

(note: a student in a 2-day class equals approx. 3% of a 'weighted user', as defined in STARS rating system.)

Annual Estimated Sewage Output (Gallons):	**161,040**
Per User Per Year:	**3,927**

By comparison, annual water use per weighted user at Middlebury College is 15,747 gal./user.

Assumptions:

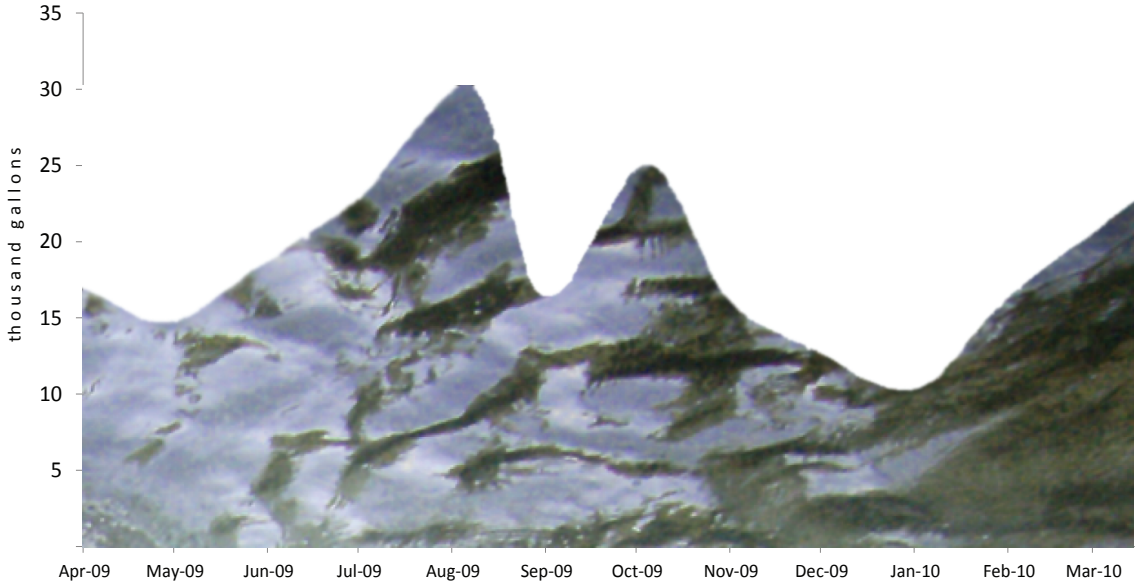
Water use in Chalet is estimated to be 20 gallons per day per occupant. There are 7 occupants for 350 days per year.

Average US household use is 45 gallons per person per day for an efficient household.

75% of water that is delivered to campus buildings leaves as sewage.

The national average for 'consumptive use' is 25.6%.

Water Consumption



This graph shows monthly water usage at the Yestermorrow campus in gallons for the 2010 fiscal year, ending in March 2010, the most recent data available.

Figure 10

Occupancy Breakdown

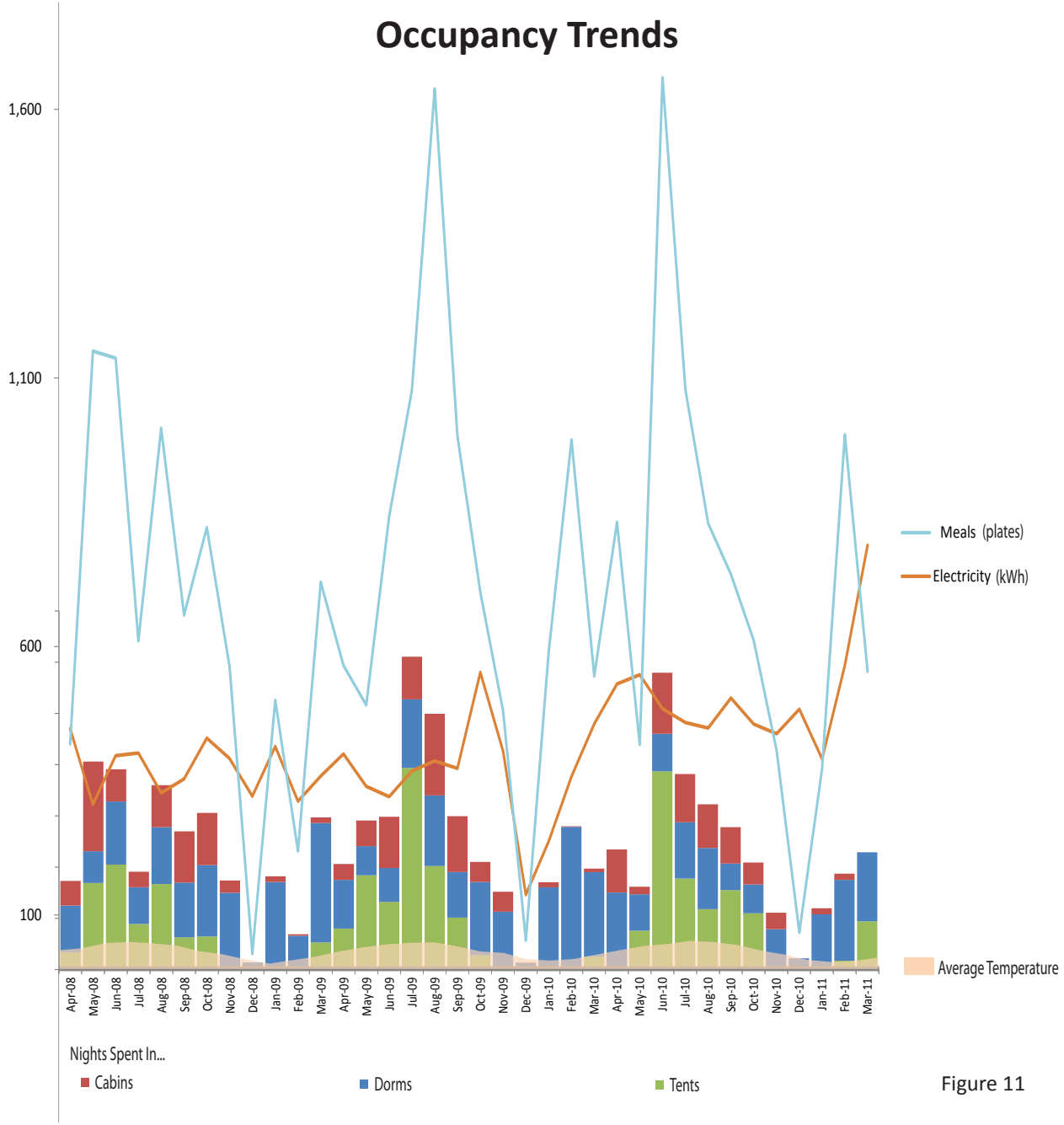


Figure 11

Population Averages

Derived from 3 years of data

Students: 943

Paying: 835

Comp: 156

Staff: 10

Interns: 17

Faculty: 118

Total Nights Spent In...

Cabins: 615

Dorms: 1,301

Tents: 1,050

Total Number of Meals: 14,592

Average Number of Nights Per Student: 3

(excluding interns)

Average Number of Meals Per Student: 9

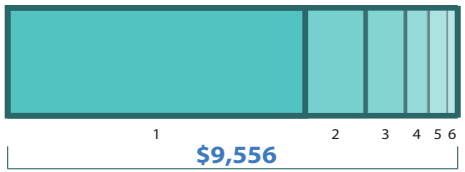
(excluding interns)

Purchasing Breakdown 2011

Yestermorrow's purchasing falls into two primary categories: food, for feeding students and interns, and construction materials for creating projects. This graph shows the relative amounts of locally sourced material in these two purchasing categories, relative to their totals.

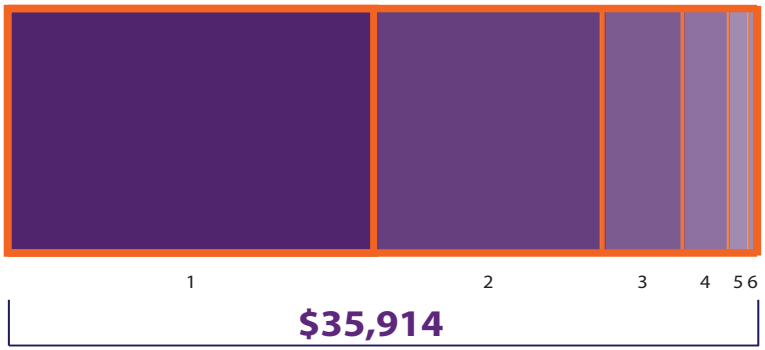
Yestermorrow Construction Purchasing

Raw Materials - Local Suppliers



1	Dave's Sawmill	$ 6,366.82
2	Authentic Log Homes	$ 1,209.20
3	Ward's mill	$ 855.00
4	Jeffersonville Quarry	$ 500.00
5	Fontaines	$ 425.95
6	Baird's Mill	$ 200.00

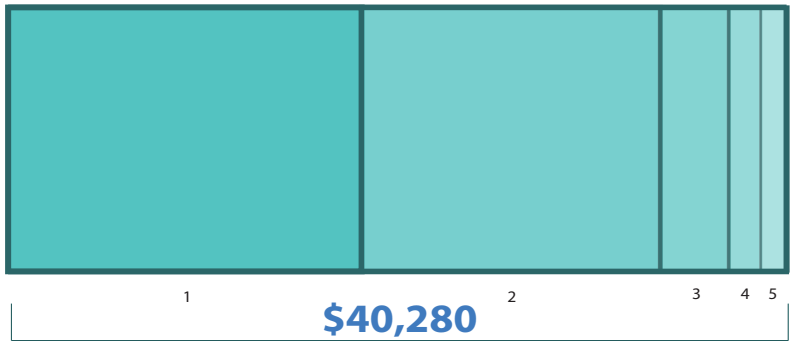
Building Materials (manufactured, non-local)



1	Allen Lumber	$17,634.79
2	Bisbee's Hardware	$10,949.41
3	Kenyon Enterprises, Inc.	$ 3,769.14
4	New Frameworks Natural Building, LLC	$ 2,168.15
5	North Pacific Baltic Birch	$ 1,000.00
6	Northend Hardwoods	$ 393.50

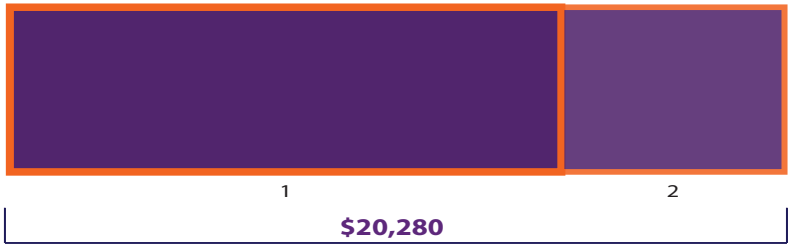
Yestermorrow Food Purchasing

Vermont Raised / Grown Food



1	Black River Produce	$ 18,533
2	Local Farms	$ 15,646
3	Food Works at Two Rivers	$ 3,545
4	Misty Knoll	$ 1,368
5	Manghis Bread	$ 1,188

Non-Local Food Suppliers



1	Associated Buyers	$ 14,488
2	Mehuron's	$ 5,810

Figure 12

Sustainability Tracking, Assessment and Rating System (STARS) Comparison

Yestermorrow		
2011 Energy Performance		
Total Mmbtu	**EUI**	**Gross Sq Ft**
	37.98	13,250
623	**Energy/User**	**Users**
	15	41
Water Performance		
Total Gallons	**Gal/User**	**Users**
	4,008	41
164,320	**Gal/acre**	**Total Acres**
	4,324	38
Waste Performance (tons)		
Avoided Garbage	**Total Waste**	**Composted**
	1.18	0.01
0.8	**Garbage**	**Recycled**
	0.39	0.78
Human Performance		
Total Users	**Faculty+Staff**	**Users/Sq Ft**
		0.003
41	**Students**	**Annual Users**
	36	1,102
Land Use Metrics		
Campus Acres	**% Hardscape**	**Users/Acre**
	15%	1.08
38	**Parking Space**	**Users/Parking**

Weighted Users as Defined by STARS

"*Weighted User*" helps define full year resident student equivalents on campus at Yestermorrow. Although there are many different students that each stay for a few nights on campus, a resident equivalent number was derived using the STARS rating system's "weighted user" calculation in combination with the average number of student nights per week for each month.

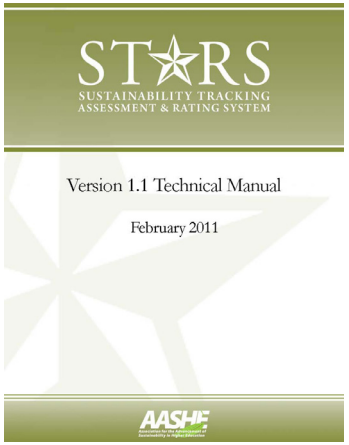
Weighted User = (On-campus residents X 1)
+ (non-resident, commuter student, faculty, staff X .75)
+ (non-resident, part time student, faculty, staff X .5)

DePauw University		
Energy Performance		
Total Mmbtu	**EUI**	**Gross Sq Ft**
	61.54	1,410,000
86,765	**Energy/User**	**Users**
	30	2,901
Water Performance		
Total Gallons	**Gal/User**	**Users**
	18,642	2,901
54,075,000	**Gal/acre**	**Total Acres**
	1,081,500	50
Waste Performance (tons)		
Avoided Garbage	**Total Waste**	**Composted**
	Garbage	**Recycled**
Human Performance		
Total Users	**Faculty+Staff**	**Users/Sq Ft**
		0.002
2,901	**Students**	**Annual Users**
		3,112
Land Use Metrics		
Campus Acres	**% Hardscape**	**Users/Acre**
		58.02
50	**Parking Space**	**Users/Parking**
STARS Rating:		
Bronze		

Earlham College		
Energy Performance		
Total Mmbtu	**EUI**	**Gross Sq Ft**
	26.43	936,996
24,765	**Energy/User**	**Users**
	19	1,288
Water Performance		
Total Gallons	**Gal/User**	**Users**
	35,304	1,288
45,462,109	**Gal/acre**	**Total Acres**
	283,077	160.6
Waste Performance (tons)		
Avoided Garbage	**Total Waste**	**Composted**
	Garbage	**Recycled**
Human Performance		
Total Users	**Faculty+Staff**	**Users/Sq Ft**
		0.001
1288	**Students**	**Annual Users**
		1,435
Land Use Metrics		
Campus Acres	**% Hardscape**	**Users/Acre**
		8.02
160.6	**Parking Space**	**Users/Parking**
STARS Rating:		
Reporting		

Royals Road University		
Energy Performance		
Total Mmbtu	**EUI**	**Gross Sq Ft**
	32.36	387,993
12,555	**Energy/User**	**Users**
	14	873
Water Performance		
Total Gallons	**Gal/User**	**Users**
	10,968	873
9,575,180	**Gal/acre**	**Total Acres**
	25	387,993
Waste Performance (tons)		
Avoided Garbage	**Total Waste**	**Composted**
	Garbage	**Recycled**
Human Performance		
Total Users	**Faculty+Staff**	**Users/Sq Ft**
		0.002
873	**Students**	**Annual Users**
		2,255
Land Use Metrics		
Campus Acres	**% Hardscape**	**Users/Acre**
387,993	**Parking Space**	**Users/Parking**
STARS Rating:		
Silver		

University of Houston		
Energy Performance		
Total Mmbtu	**EUI**	**Gross Sq Ft**
	72.38	9,673,987
700,189	**Energy/User**	**Users**
	21	34,067
Water Performance		
Total Gallons	**Gal/User**	**Users**
	10,909	34,067
371,627,000	**Gal/acre**	**Total Acres**
		0
Waste Performance (tons)		
Avoided Garbage	**Total Waste**	**Composted**
	2,433	100
941	**Garbage**	**Recycled**
	1,492	841
Human Performance		
Total Users	**Faculty+Staff**	**Users/Sq Ft**
		0.004
34,067	**Students**	**Annual Users**
		45,972
Land Use Metrics		
Campus Acres	**% Hardscape**	**Users/Acre**
0	**Parking Space**	**Users/Parking**
STARS Rating:		
Silver		



STARS is a rating system created by the Association for the Advancement of Sustainability in Higher Education (AASHE) to allow colleges and universities to compare their progress towards their sustainability goals against other institutions.

Institutions self-report a wide ranging set of indices into the STARS online system. Data and overall ratings for each participating institution are posted publicly online. There is currently data from 39 institutions posted online.

"The Sustainability Tracking, Assessment & Rating System™ (STARS) is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance."

https://stars.aashe.org/

Appendix:

Detailed Data and Calculations

Monthly Electricity Usage - FY 2011

Electricity Consumption

Month	GMP bill main bldg		GMP bill chalet			
	kWh	$$	kWh	$$	TOTAL KWH	TOTAL PAID
Apr-10	4,880	$ 655.25	596	$ 95.51	5,476	$ 750.76
May-10	4,400	$ 597.76	402	$ 70.16	4,802	$ 667.92
Jun-10	4,000	$ 540.27	586	$ 94.19	4,586	$ 634.46
Jul-10	4,560	$ 641.71	485	$ 84.00	5,045	$ 725.71
Aug-10	3,400	$ 457.33	629	$ 103.71	4,029	$ 561.04
Sep-10	4,520	$ 608.10	521	$ 88.93	5,041	$ 697.03
Oct-10	3,880	$ 536.78	677	$ 109.91	4,557	$ 646.69
Nov-10	3,880	$ 545.63	496	$ 86.53	4,376	$ 632.16
Dec-10	4,560	$ 641.87	275	$ 56.07	4,835	$ 697.94
Jan-11	3,440	$ 491.99	467	$ 83.06	3,907	$ 575.05
Feb-11	3,960	$ 567.63	576	$ 182.08	4,536	$ 749.71
Mar-11	4,720	$ 666.07	516	$ 90.59	5,236	$ 756.66
TOTAL	50,200	$ 6,950.39	6,226	$ 1,144.74	**$ 56,426**	**$ 8,095.13**

Monthly Solar Production - FY 2011

Solar Production

	TOTAL Credit	Paid to AER	TOTAL KWH	Kbtu
			1,863	6,356.71
		$ 217.14	5,066	17,290.26
		$ 592.20	3,781	12,904.89
	$ (2,241.19)	$ 592.20	4,978	16,988.89
	$ (805.67)	$ 592.20	4,833	16,496.05
	$ (825.92)	$ 592.20	2,901	9,900.09
	$ (497.55)	$ 592.20	2,552	8,711.00
	$ (418.07)	$ 592.20	1,597	5,450.56
	$ (267.72)	$ 592.20	879	3,000.37
	$ (165.50)	$ 592.20	1,174	4,007.54
	$ (195.14)	$ 592.20	2,084	7,114.06
	$ (471.55)	$ 592.20	3,391	11,572.46
FY 2011 Total	(5,888)	6,139	35,099	119,793

Monthly Cloud Cover and Insolation for Solar Production - FY 2011

Cloud Coverage				Average Sunlight Hours			Electricity Consumption	Electricity Production
		(average based on daily inputs)						
		Visibility (miles)	*Metric (x1,000)*		***Hours***	*Metric (x50)*	**TOTAL KWH**	**TOTAL KWH**
April	2010	8.6	8,600	April	206	10,300	5,476	1,863
May	2010	9.09	9,090	May	251	12,550	4,802	5,066
June	2010	7.43	7,430	June	270	13,500	4,586	3,781
July	2010	7.9	7,900	July	302	15,100	5,045	4,978
August	2010	8.09	8,090	August	258	12,900	4,029	4,833
Septembe	2010	8.61	8,610	September	201	10,050	5,041	2,901
October	2010	8.41	8,410	October	159	7,950	4,557	2,552
Novembe	2010	8.6	8,600	November	91	4,550	4,376	1,597
Decembe	2010	6.9	6,900	December	92	4,600	4,835	879
January	2011	6.2	6,200	January	127	6,350	3,907	1,174
February	2011	6.3	6,300	February	147	7,350	4,536	2,084
March	2011	7.79	7,790	March	191	9,550	5,236	3,391

source: http://www.wunderground.com/history/airport/KMPV/2010/4/2/MonthlyHistory.html

source: http://www.currentresults.com/Weather/Vermont/sunshine-by-month.php

Propane Consumption and Price

= estimated

Date		Gallons		Combined Gallons		Rate		Amount		Combined		Balance	
Main Bldg	*Chalet*	*Main Bldg*	*Chalet*	*Main Bldg*	*Chalet*	*Main Bldg*	*Chalet*	*Main Bldg*	*Chalet*		**Annual**		
4/16/2008	04/16/2008	221.10	60.90	**282.00**		$ 1.75	$ 1.75	$ 386.93	106.58	**$ 493.51**		$ 386.93	$ 106.58
6/30/2008		628.04		**628.04**		$ 1.75		$ 1,099.07		**$ 1,099.07**		$ 1,486.00	
10/1/2008		482.07		**482.07**		$ 2.35		$ 1,132.86		**$ 1,132.86**		$ 2,664.05	
11/1/2008	11/30/2008	340.75	131.70	**472.45**		$ 2.35	$ 2.35	$ 800.76	309.50	**$ 1,110.26**		$ 3,464.81	$ 416.08
12/31/2008	12/31/2008	414.00	102.00	**516.00**		$ 2.35	$ 2.35	$ 972.90	239.70	**$ 1,212.60**		$ 4,437.71	$ 655.78
1/31/2009	01/31/2009	1,020.10	96.90	**1,117.00**		$ 2.35	$ 2.35	$ 2,397.24	227.01	**$ 2,624.25**		$ 6,834.95	$ 882.79
2/28/2009	02/28/2009	409.40	114.20	**523.60**		$ 2.35	$ 2.35	$ 962.09	268.37	**$ 1,230.46**		$ 7,797.04	$ 1,151.16
3/31/2009	03/31/2009	322.50	61.70	**384.20**	**4,405.36**	$ 2.35	$ 2.35	$ 757.88	145.00	**$ 902.88**	**9,805.89**	$ 8,554.92	$ 1,296.16
4/30/2009	04/30/2009	268.00	60.40	**328.40**		$ 2.36	$ 2.35	$ 631.45	141.94	**$ 773.39**		$ 9,186.37	$ 1,438.10
5/31/2009		221.10		**221.10**		$ 1.66		$ 368.11		**$ 368.11**		$ 9,554.48	
6/2/2009		408.50		**408.50**		$ 0.90		$ 367.19		**$ 367.19**		$ 9,921.67	
7/31/2009		268.00		**268.00**		$ 1.89		$ 506.52		**$ 506.52**		$ 10,428.19	
11/4/2009		652.70		**652.70**		$ 1.46		$ 952.94		**$ 952.94**		$ 11,381.13	
12/15/2009	12/15/2009	413.60	144.10	**557.70**		$ 1.46	$ 1.46	$ 603.86	210.39	**$ 814.25**		$ 11,984.99	$ 1,648.49
1/31/2010	01/31/2010	573.80	147.80	**721.60**		$ 1.46	$ 1.46	$ 837.75	215.79	**$ 1,053.54**		$ 12,822.74	$ 1,864.28
2/28/2010	03/31/2010	530.60	196.70	**727.30**	**3,885.30**	$ 1.46	$ 1.51	$ 774.68	297.02	**$ 1,071.70**	**5,907.64**	$ 13,597.42	$ 2,161.30
4/21/2010	04/21/2010	477.60	63.50	**541.10**		$ 1.46	$ 1.46	$ 697.15	92.71	**$ 789.86**		$ 14,294.57	$ 2,254.01
6/22/2010	10/28/2010	628.20	81.70	**709.90**		$ 1.46	$ 1.62	$ 917.17	132.35	**$ 1,049.52**		$ 15,211.74	$ 2,386.36
11/26/2010	11/30/2010	199.10	112.30	**311.40**		$ 1.62	$ 1.62	$ 322.54	181.93	**$ 504.47**		$ 15,534.28	$ 2,568.29
12/27/2010	12/22/2010	1,064.30	90.30	**1,154.60**		$ 1.62	$ 1.62	$ 1,724.17	146.29	**$ 1,870.46**		$ 17,258.45	$ 2,714.58
1/21/2011	01/20/2011	533.10	125.50	**658.60**		$ 1.04	$ 1.62	$ 552.58	203.31	**$ 755.89**		$ 17,811.03	$ 2,917.89
2/9/2011	02/08/2011	371.80	94.40	**466.20**		$ 1.62	$ 1.62	$ 602.32	152.93	**$ 755.25**		$ 18,413.35	$ 3,070.82
3/12/2011	03/12/2011	560.90	125.60	**686.50**	**4,528.30**	$ 1.62	$ 1.62	$ 908.66	203.47	**$ 1,112.13**	**6,837.58**	$ 19,322.01	$ 3,274.29

Monthly Propane Consumption and Price - FY 2011

Note that propane deliveries are not made every month. This table show the actual deliveries and places them in the month in which they were billed. This gives a somewhat distorted picture of propane use, because use precedes the delivery of more propane. A certain amount of guess-work was involved in turning this data into a readable graph. However, the overall picture is correct.

**Estimated calculations were made based on given monthly price and estimated rates in order to determine correlating gallons.*

Water Consumption and Assumptions					
Date	Meter Read	**Main Bldg Consumption**	Chalet Consumption (estimate)	**Estimated Total**	Annual Sum
	cumulative	(1,000 gal)	(1,000 gal)	(1,000 gal)	Gallons
Sep-08	853.33				
Oct-08	866.86	13.53	4.2	17.73	
Nov-08	876.46	9.6	4.2	13.8	
Dec-08	880.21	3.75	4.2	7.95	
Jan-09	891.27	11.06	4.2	15.26	
Mar-09	900.10	8.83	4.2	13.03	
Apr-09	912.16	12.06	4.2	16.26	
May-09	922.00	9.84	4.2	14.04	
Jun-09	935.67	13.67	4.2	17.87	
Jul-09	953.70	18.03	4.2	22.23	
Aug-09	978.95	25.25	4.2	29.45	
Sep-09	990.50	11.55	4.2	15.75	
Oct-09	1,010.71	20.21	4.2	24.41	
Nov-09	1,022.17	11.46	4.2	15.66	
Dec-09	1,030.10	7.93	4.2	12.13	
Jan-10	1,035.50	5.4	4.2	9.6	
Feb-10	1,046.70	11.2	4.2	15.4	
Mar-10	1,064.42	17.72	4.2	21.92	**214,720**

Potable Water Consumption on Campus

Yestermorrow uses a relatively low amount of water per annualized student equivalent ("weighted user"), even lower than many other campuses that (also) do not irrigate their grounds.

Note that the Chalet is not metered for water, so those numbers are estimated, as noted on page 8.

Yestermorrow's Campus	
	Square Feet
Main building	10,000
Chalet	1,800
Cabins (3 occupied)	1,200
Storage Shed	150
Garden Shed	100
Total	**13,250**
38 Acres Owned by Yestermorrow	
Built Footprint:	1%
no utilities in cabins, sheds	
Roughly 15% of campus developed (campsites, roads, etc.)	
Square Feet in 38 Acres:	1,655,280

Estimated Waste				
Assumed per year				
	1 yd=	36 cubic ft=	7.4 gallons=	.0039 tons
Average	*yards*	*tons*		
Trash	100	0.39		
Recycling	200	0.78		
Compost	236	0.92		
Compost assumes 5 gallons per day				

Estimated Annual Solid Waste

Yestermorrow is exemplary in how it handles solid waste, producing very little hauled waste and recycling and composting at a very high rate. However, records are not kept on this, so these are estimates.

Waste is included to provide a snapshot of secondary environmental issues.

Monthly Meals and Accommodation for FY 2009 thru FY 2011

**Not including Interns*

	Meals	Dorms		Cabins		Camping	
		Monthly	Weekly	Monthly	Weekly	Monthly	Weekly
Apr-08	419	92	9	48	24	33	8
May-08	1150	62	6	175	25	169	24
Jun-08	1137	123	10	63	7	205	19
Jul-08	611	72	12	30	6	89	15
Aug-08	1007	111	14	82	8	167	17
Sep-08	659	107	11	100	8	63	7
Oct-08	822	139	10	102	9	65	7
Nov-08	562	145	12	24	5	5	5
Dec-08	28	9	5	0	0	5	5
Jan-09	500	171	19	11	6	0	0
Feb-09	219	61	7	3	3	5	5
Mar-09	720	233	21	11	4	53	9
Apr-09	565	95	8	31	6	80	11
May-09	491	57	8	50	10	184	15
Jun-09	842	66	11	100	13	132	15
Jul-09	1077	134	13	83	17	394	39
Aug-09	1638	138	10	159	18	202	40
Sep-09	992	89	15	109	22	102	17
Oct-09	701	143	12	39	5	28	5
Nov-09	480	113	10	39	10	0	0
Dec-09	53	13	7	1	1	0	0
Jan-10	588	161	16	10	10	0	0
Feb-10	985	279	56	1	1	0	0
Mar-10	545	165	28	7	2	25	25
Apr-10	831	151	13	84	12	0	0
May-10	418	71	9	15	4	76	13
Jun-10	1659	73	9	119	15	387	28
Jul-10	1078	110	8	94	12	178	20
Aug-10	829	120	12	85	9	118	10
Sep-10	735	52	10	71	24	155	31
Oct-10	612	56	6	43	11	110	16
Nov-10	407	73	7	32	5	6	3
Dec-10	68	21	11	0	0	1	1
Jan-11	373	106	35	12	12	2	2
Feb-11	995	158	20	12	12	18	18
Mar-11	554	134	34	0	0	94	31
Annual Total							
2009	7,832	1,325		649		859	
2010	8,958	1,452		629		1,146	
2011	8,557	1,124		567		1,144	

Commuting Emissions		
	MT eCo2	
Mode of Transportation	*per passenger mile*	
Automobile	0.000404	
Bus	0.000254	
Airplane	0.000776369	
Student / Faculty Commuting Assumptions		
Assume everyone outside New England travels by plane…		
New England Miles Traveled by Car:	58,848	
Percentage of Travel	8%	
Emissions (MT eCo2)	**23.77**	
Air Travel	611,927	
Percentage of Travel	85%	
Emissions (MT eCo2)	**475.08**	
Bus Travel	50,394	
Percentage of Travel	7%	
Emissions (MT eCo2)	**12.80**	
Total Miles	721,169	
Total Emissions (MT eCo2)	**512**	
Emissions Factor: MT eCo2 per student mile	0.00070948	
Total Student / Faculty Transportation Footprint	**511**	
Staff Commuting Assumptions		
Staff Members	10	
Typically works	4	days a week
	50	weeks per year
Typically Travels	20	miles a day
Total Miles per Year by Car	40,000	*assumed miles*
Total Staff Emissions (MT eCo2)	**16.16**	
Staff accounts for 3% of total transportation footprint		
COMBINED EMISSIONS (MT eCo2)	**527**	

Food and Project Materials Monthly Totals for FY 2011

	Materials Summary	**Food Summary**	**Combined Purchasing**	**Food as % of Total**
2009	$46,413.00	$ 58,300.00	**$ 104,713.00**	56%
2010	$47,035.00	$ 59,187.00	**$ 106,222.00**	56%
2011	$33,536.00	$ 60,578.00	**$ 94,114.00**	64%
2011				
Apr	$ 4,375.00	$ 5,423.00	**$ 9,798.00**	55%
May	$ 2,865.00	$ 5,429.00	**$ 8,294.00**	65%
Jun	$ 6,823.00	$ 8,277.00	**$ 15,100.00**	55%
Jul	$ 1,358.00	$ 6,188.00	**$ 7,546.00**	82%
Aug	$ 2,018.00	$ 6,490.00	**$ 8,508.00**	76%
Sep	$ 1,404.00	$ 5,262.00	**$ 6,666.00**	79%
Oct	$ 2,379.00	$ 4,455.00	**$ 6,834.00**	65%
Nov	$ 3,299.00	$ 3,726.00	**$ 7,025.00**	53%
Dec	$ 3,255.00	$ 1,387.00	**$ 4,642.00**	30%
Jan	$ 2,743.00	$ 4,629.00	**$ 7,372.00**	63%
Feb	$ 1,767.00	$ 4,396.00	**$ 6,163.00**	71%
Mar	$ 1,244.00	$ 4,911.00	**$ 6,155.00**	80%

Site-Source Energy Calculations							
FY 2011							
		Site Generation Kbtu	*Site Generation kWh*				
Electricity	Consumption	208,009	60,946				
	Generation	119,792	35,099				
Electricity Consumed from Grid		88,217	**25,847**				
Propane		**414,792**					
		Vermont Fuel Mix	kWh from Grid	**Site Energy**	**Source Energy Factor**	**Source Energy**	**Total Emissions**
Electricity	*2010*			*kbtu*		*kbtu*	*MT eCo2*
	Hydro	46%	11,890	40,580	3.365	136,551	-
	Nuclear	40%	10,339	35,287	3.365	118,740	-
	Market Purchase	8%	2,068	7,057	3.365	23,748	**2.31**
	Biomass	3%	775	2,647	3.365	8,906	**0.87**
	Oil	2%	517	1,764	3.365	5,937	**0.58**
	Wood / Methane	0.5%	129	441	3.365	1,484	**0.14**
	VT Renewable	0.5%	129	441	3.365	1,484	-
Heating	**Propane**			203,558	1.165	242,330	**24.63**
	Total			**208,851**		**260,141**	**26.21**
1 kWh = 3.413 kbtu							**Electricity Emissions**
1 gal. propane = 91.6 kbtu							1.59
							Propane Emissions
							24.63
source: http://www.greenmountainpower.com/about/fuel_mix.html							
source: http://www.buildingscience.com/documents/digests/bsd151-understanding-primary-source-site-energy/files/BSD-151%20Source-Site_Energy.pdf							
source: http://www.carbontrust.co.uk/cut-carbon-reduce-costs/calculate/carbon-footprinting/pages/conversion-factors.aspx							

Weather Data

Average Monthly Temperature

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2008	25	22.3	28.5	49.1	54	67.7	70.7	67	61.3	46.6	38.2	24.7	**46.26**
2009	14	23.2	32.4	46.1	56.5	64.4	68.2	69.8	59.3	45.9	41.8	25.5	**45.59**
2010	22	26	38	49.3	60.1	65.3	73.5	70.1	62.7	47.7	37.6	23.5	**47.98**
2011	18.2	21.1	29.8	45.4									

source: http://www.erh.noaa.gov/btv/climo/BTV/monthly_totals/avgtemp.shtml

Heating Degree Days

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	x	x	x	472	330	42	2	23	155	562	796	1240
2009	1575	1166	1002	567	266	75	13	31	174	582	685	1216
2010	1325	1087	829	470	196	68	11	11	135	530	817	1280
2011	1446	1226	1087	585								

source: http://www.erh.noaa.gov/btv/climo/BTV/monthly_totals/hdd.shtml

2011 Precipitation (inches per square foot)

Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
3.16	2.18	5.87	2.41	2.55	3.46	7.68	2.73	1.87	1.56	3.23	4.2

Average	Sum		Annual Precipitation on Yestermorrow Campus:			
3.41	40.9		67,700,952	inches		(38 acres = 1,655,280' * 40.9" per sq ft)

source: http://www.wunderground.com/history/airport/KMPV/2011/3/1/MonthlyHistory.html