



# FY2013 Go-Green

Bowling Green State University



## Collected carbon emissions at BGSU

### Scope 1 – Direct GHGs

- On-Campus Stationary (Natural Gas; Fuel Oil)
- Vehicle Fleet
- Fertilizer
- Refrigerants

### Scope 2 – Upstream GHGs

- Purchased Electricity

### Scope 3 – Indirect GHGs

- Faculty/Staff/ Student Commuting
- Directly Financed Air Travel
- Study Abroad Travel
- Solid Waste
- Wastewater
- Transmission & Distribution Losses

# Institutional Profile

## GHG Emissions per Student



Stresses efficient use of space.

$$\frac{\text{Gross GHG Emissions}}{\text{Total Student FTE}}$$

## GHG Emissions per 1,000 GSF

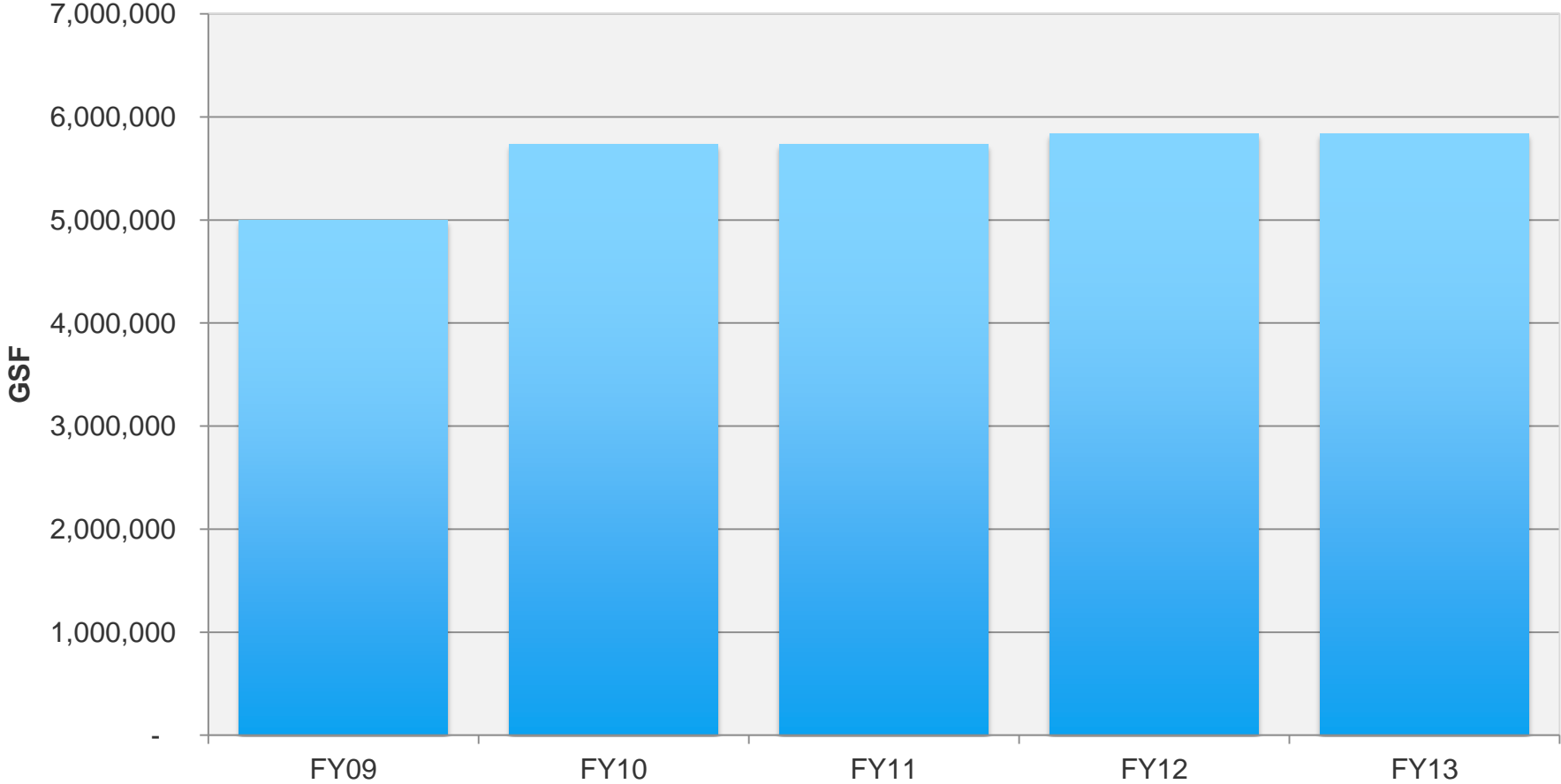


Stresses intensity of operations and commuting.

$$\frac{\text{Gross GHG Emissions}}{\text{Total GSF in Footprint}} \times 1,000$$

Total campus GSF over time

## Total Building Space



*Fall FTEs of each year*

<b>FTE</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Residential Students	5,959	5,723	6,188	6,671	6,444
Non-Residential Students	10,178	10,157	9,746	9,338	9,370
Faculty	908	853	841	841	837
Staff	1,315	1,874	1,747	1,747	1,747

# Scope I

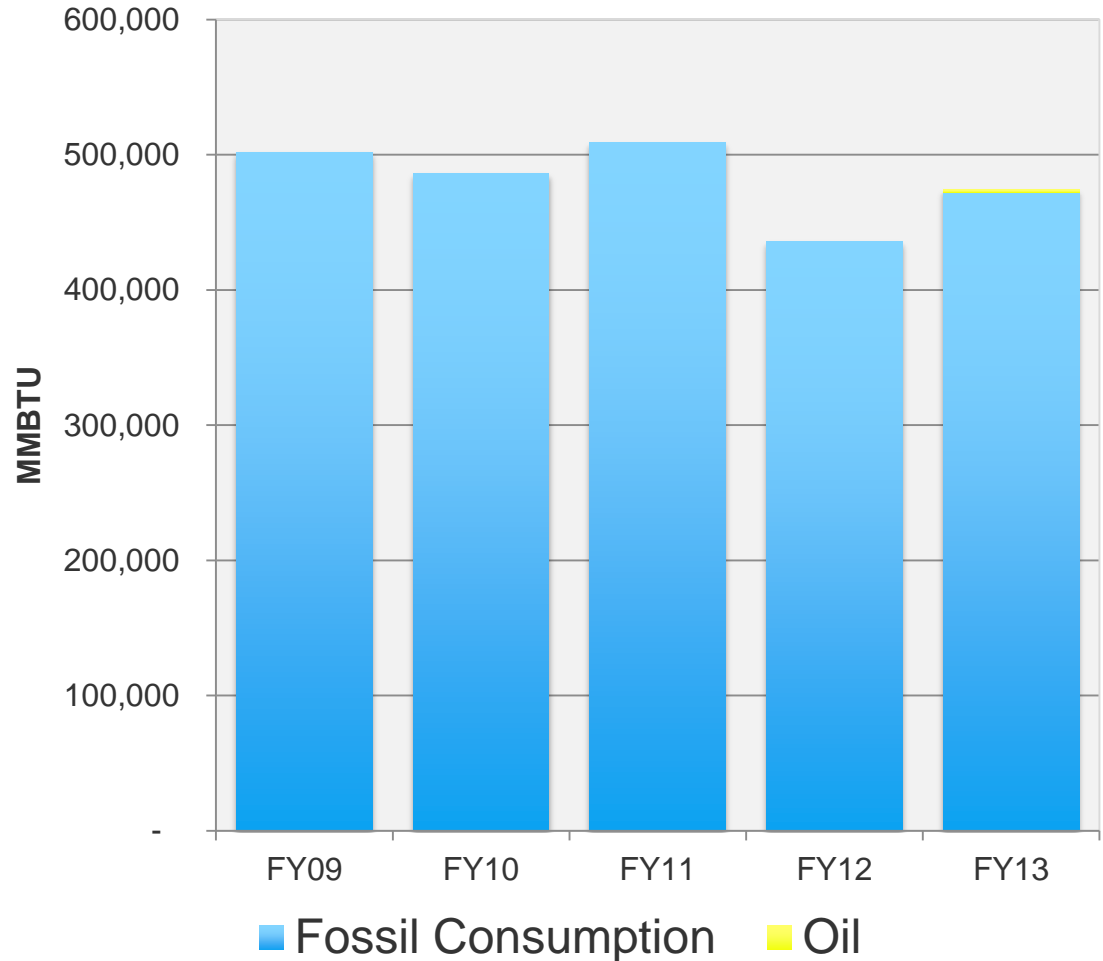
# On-campus stationary sources

*Is natural gas the only fuel source used?*

## Example of Data Collected

Total Utility Costs			
2008-09	Gas	Elec	Water
Jul	20,703		
Aug	22,290		
Sep	24,826		
Oct	38,370	8,248,566	2,514,770
Nov	51,610	6,169,443	1,913,875
Dec	66,924	6,527,563	1,490,671
Jan	74,725	5,843,338	1,617,669
Feb	58,933	5,174,235	1,568,365
Mar	51,463	6,624,597	1,755,118
Apr	41,133	6,652,970	2,132,467
May	25,438	7,040,627	1,799,946
Jun	20,321	7,129,445	1,891,083
	<b>496,736</b>	<b>59,410,784</b>	<b>16,683,964</b>

MCF's





# Other scope I sources- Refrigerants

Daikin Applied Refrigerant Log							
2009 - 2013							
LOCATION	BGSU NAME	QTY	MODEL #	MANUF	SERIAL #	TONS	EQUIP TYPE
Administration Building	CH 1	1	WDC050	McQuay	STNU030100084	270	Centrifugal
BT Student Union	CH 1	1	WSC087L	McQuay	STNU010300131	390	Centrifugal
BT Student Union	CH 2	1	WSC087L	McQuay	STNU010300132	390	Centrifugal
Central Chiller Plant		1	WSC100M	McQuay	STNU100400122	700	Centrifugal
Central Chiller Plant		1	WSC100M				
East Hall		1	ALS125A				
Education Building	CH 1	1	PEH050K				
Education Building	CH 2	1	PEH050K				
Eppler Complex	CH 1	1	PEH063K				
Eppler Complex	CH 2	1	PEH063K				
Harshman		1	WSC063J				
Ice Arena		1	AWS190AD				
Kreisher			PFS165A				
Library							
Life Scienc	CH 1	1	WSC063L				
Life Scienc	CH 2	1	WSC063L				
Math & Science	CH 1		WSC063L				
Math & Science	CH 2		WSC063L				
McFall Center		1	ALS125A				
Offenhauer	CH 1		PEH063J				

Dan, the following is a yearly breakdown of refrige

2009  
Refrigerant 22            90#

2010  
No refrigerant sales

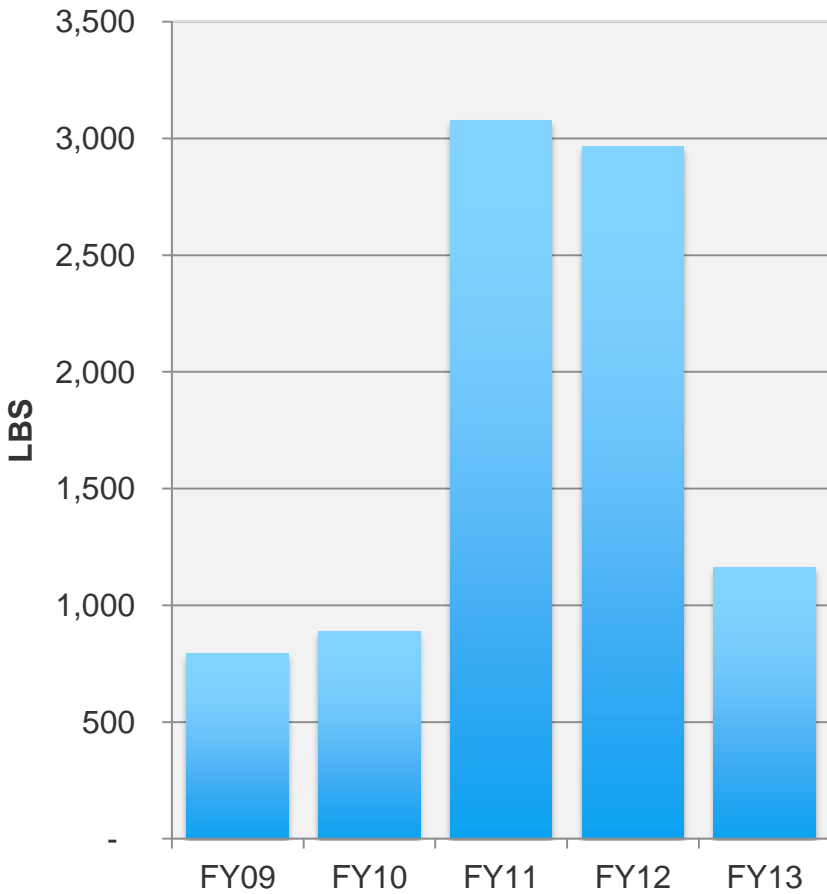
2011  
Refrigerant 22            787#  
Refrigerant 134A        30#

2012  
Refrigerant 22            790#  
Refrigerant 134A        120#

2013  
Refrigerant 22            544#  
Refrigerant 134A        37#

Allen E. Shreffler  
Project Manager/Estimator

## Refrigerants

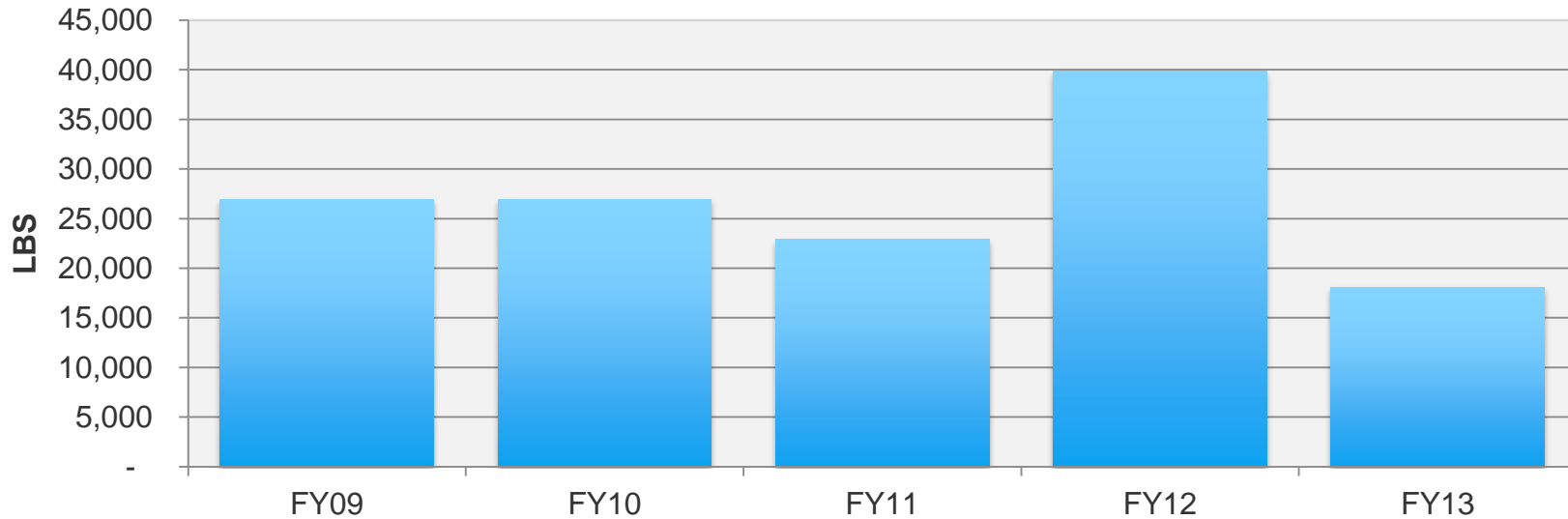


# Other scope I sources-Fertilizer

*Should we use the same amount from FY11 for FY10 and FY09?*

Date	Vendor	PO Amount	PO#	RFQ	Tons	Fertilizer Cost (50lb bags)	Description
4/21/2011	Trupointe	\$ 26,564.00	6051	RFQ 5609	14.5	580 bags at \$15.90 ea	Trimec 25%
					14.5	580 bags at \$14.80 ea	25-5011 50% FE
					14.5	580 bags at \$15.10 ea	29-2010 50% FE
3/23/2012	Andersons Lawn Fertilize	\$ 28,913.00	16906	RFQ 5747	18.1	725 bags at \$16.10 ea	30-20-3-3 90% Trimec
					14.5	580 bags at \$17.25 ea	50% Sulfate, 50% Muriate of Potash, Plus micro-nutrients
					14.5	580 bags at \$16.50 ea	50-30-3-90 50% PCSU, 2%
3/1/2013	Trupointe	\$ 33,933.60	30008596	RFQ 5870	13	520 bags at \$19.75 ea	17-2-5 .125 Dimension 100% Regain
					18	720 bags at \$18.40 ea	25-5-11 50% xCU 2% Fe
					13	520 bags at \$20.03 ea	18-24-12 30% XCU 2% FE

## Fertilizer- Lbs of Nitrogen

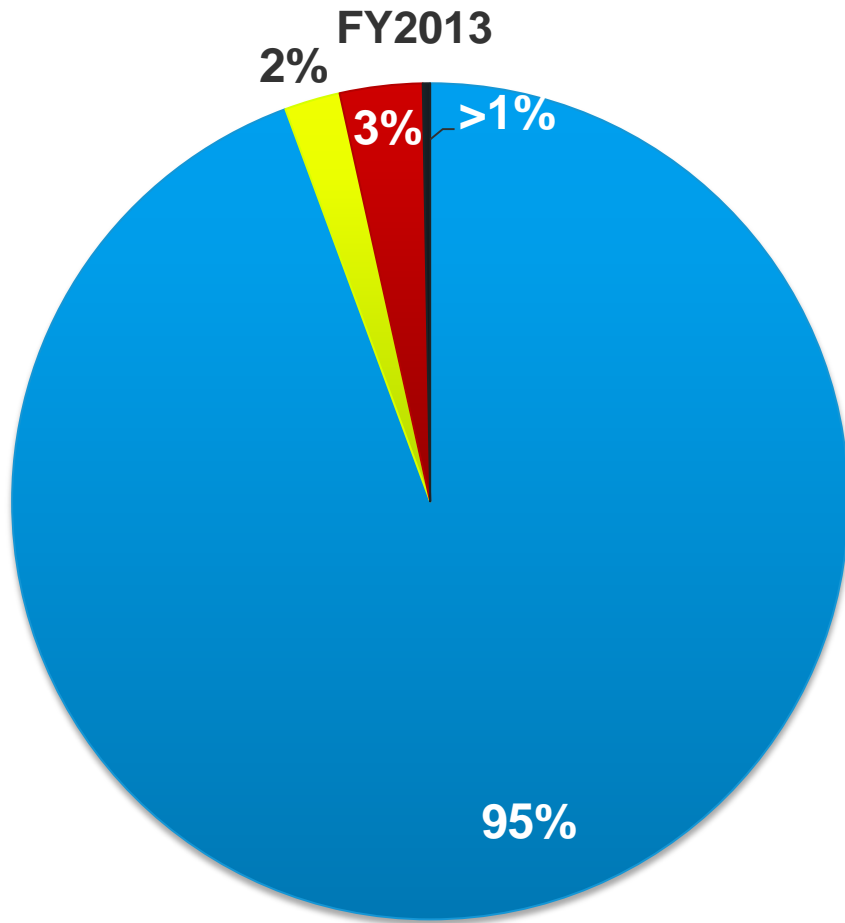


Fleet Fuel Usage	Data Source	FY09	FY10	FY11	FY12	FY13
Unleaded Fuel (Campus)	SUMMARY SHEET	51,708	43,883	32,000	40,000	,56,000
Lucky Farmers or Mid Wood	SUMMARY SHEET	0	0	0	9,075	6,457
<b>TOTAL</b>		<b>51,708</b>	<b>43,883</b>	<b>32,000</b>	<b>49,075</b>	<b>62,457</b>

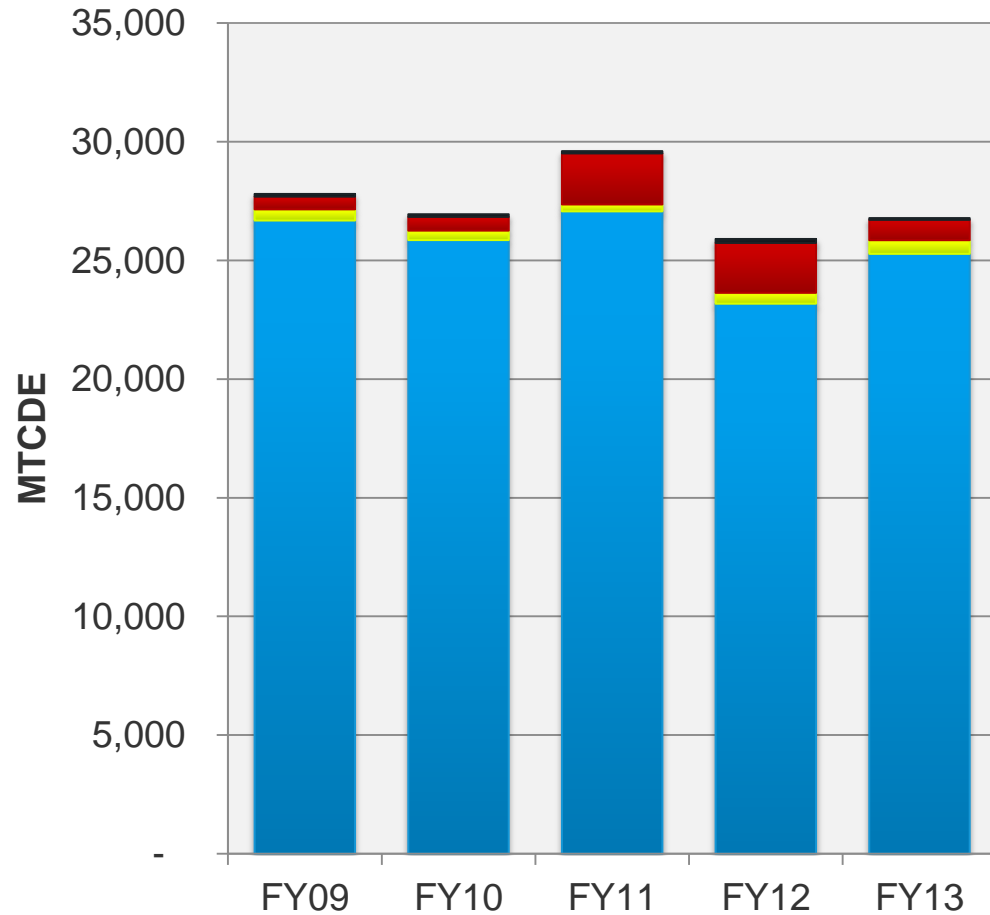
Other Scope 1:  
Assuming no animal husbandry on BGSU  
campus

# Scope 1 Summary

Greenhouse Gas distribution of Scope 1 sources



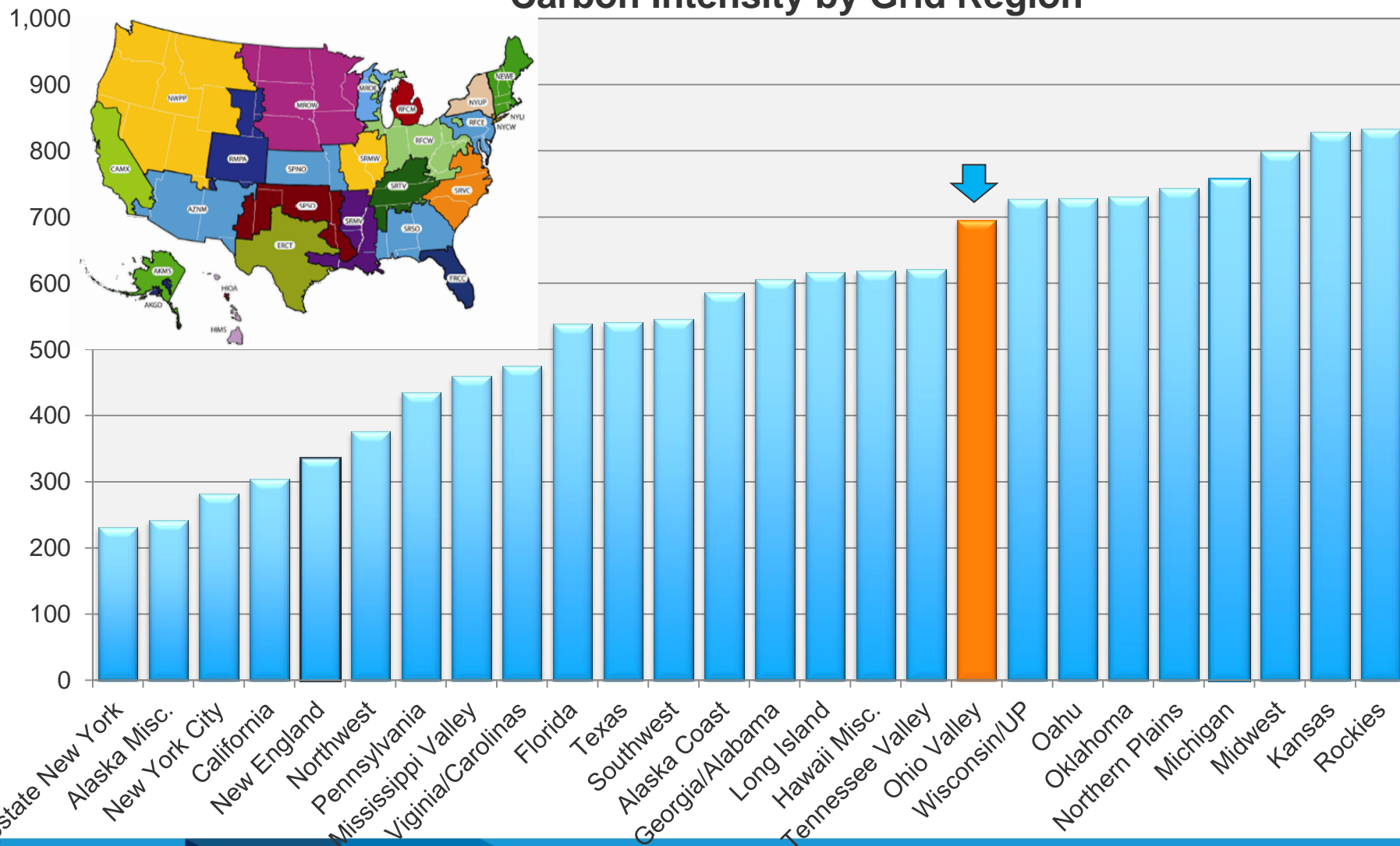
Metric Tons of Carbon Dioxide Equivalent



■ Fossil Fuels   ■ Direct Transportation   ■ Refrigerants & Chemicals   ■ Fertilizer

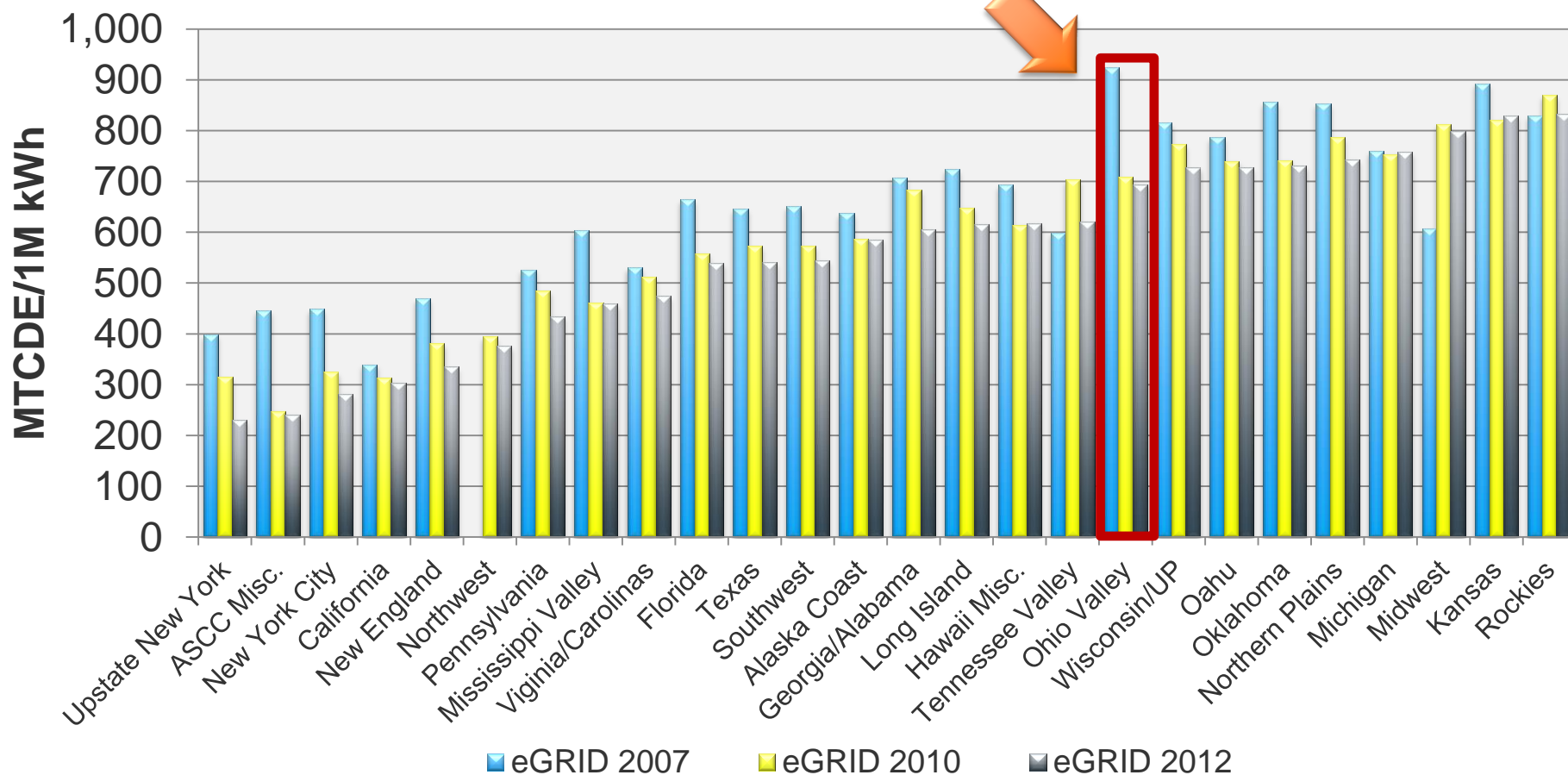
# Scope 2 - Purchased Electricity

## Carbon Intensity by Grid Region



Electrical grids getting "greener" since 2007

## Carbon Intensity by Grid Region



# Scope 2 Utilities

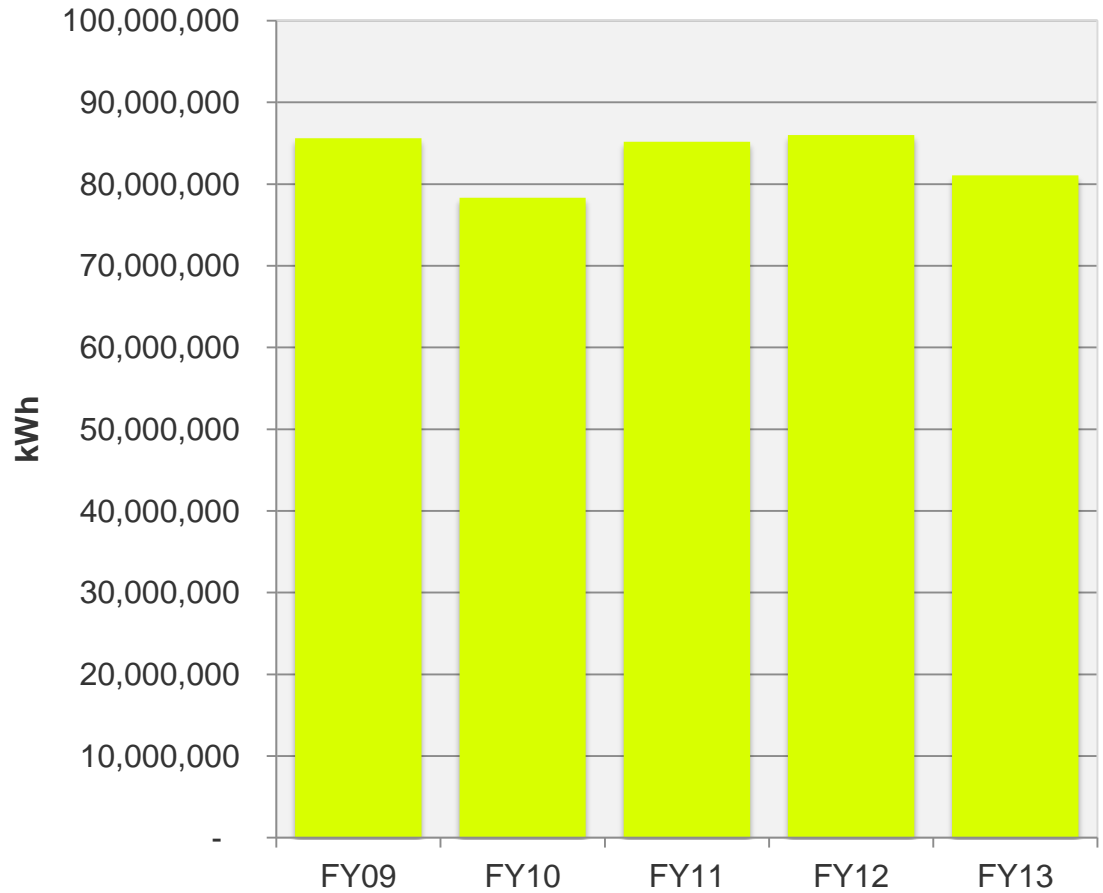
*Purchased electricity consumption*

## Total Utility Costs

2012-13	Gas	Elec	Water
Jul	16,503	8,289,156	3,658,244
Aug	23,400	9,263,499	2,719,406
Sep	26,082	7,282,282	2,845,230
Oct	38,258	7,230,118	2,175,134
Nov	49,622	6,311,058	1,843,553
Dec	50,343	5,104,497	1,318,745
Jan	62,690	5,748,871	1,722,150
Feb	56,875	5,641,980	1,751,818
Mar	54,800	5,788,099	1,524,201
Apr	41,575	6,334,738	2,002,456
May	25,606	7,052,835	1,596,035
Jun	21,936	7,052,835	1,596,035
	<b>467,690</b>	<b>81,099,968</b>	<b>24,753,007</b>

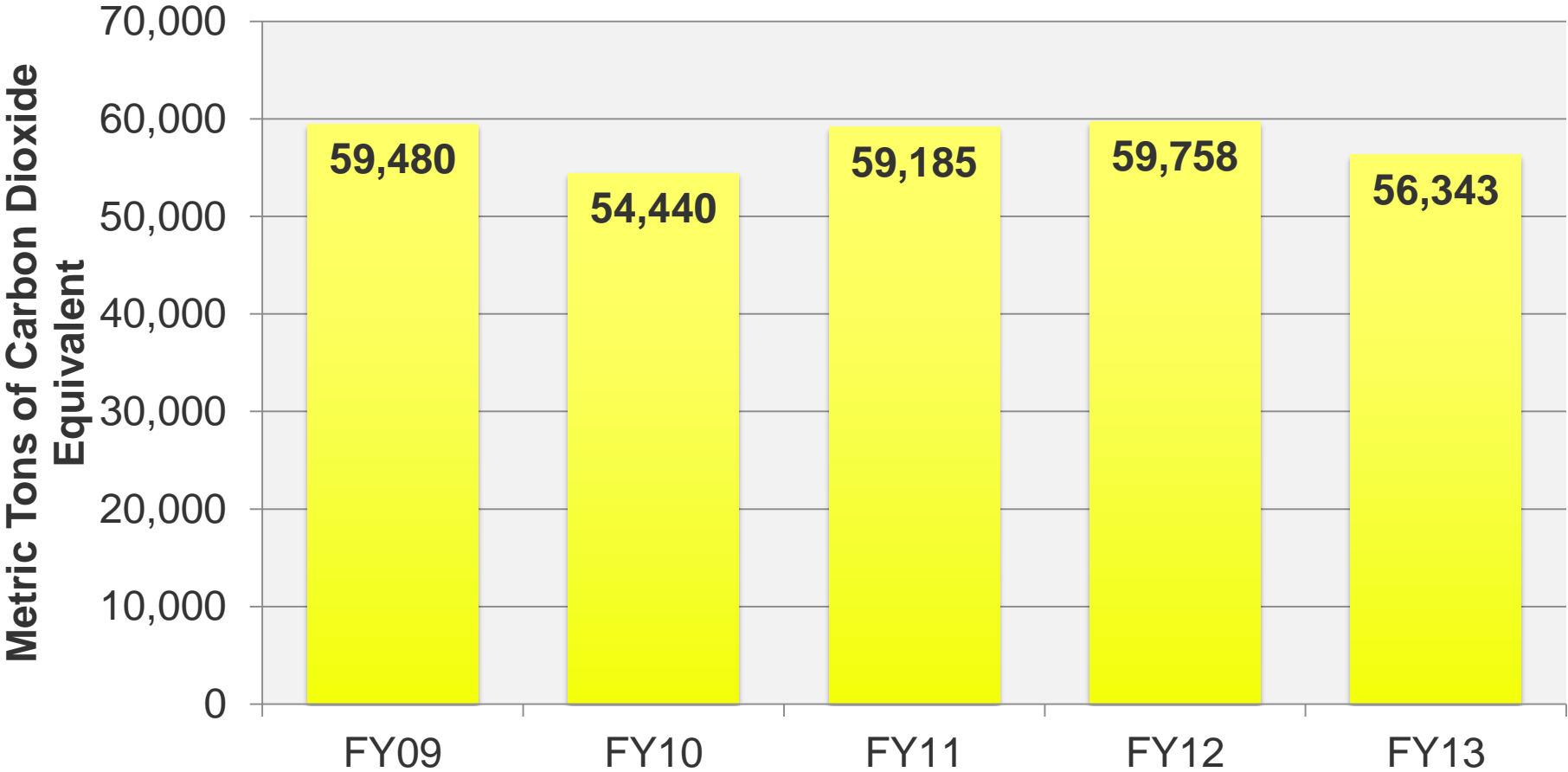
kWh's

## Purchased Electricity





## Metric Tons of Carbon Dioxide Equivalent



# Scope 3

# Directly financed air travel

## Bowling Green State University

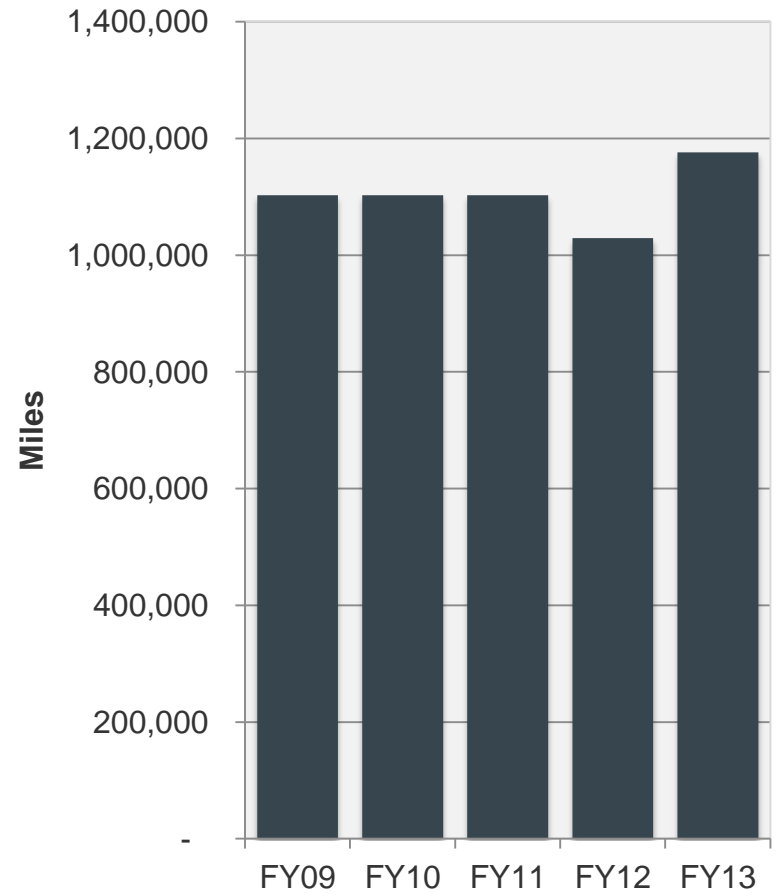
Summary for Specified Accounts, Departments, and Programs

Fiscal Year: 2013

Account: 54020 - Travel and Related Expenses

Department	Fund Code	Program	Amount
745000 Cross Country - Women	20400	2000	636.86
738000 Gymnastic - Women	20400	2000	5,654.67
742000 Softball - Women	20400	2000	7,074.57
739000 Tennis - Woman	20400	2000	2,416.74
732000 Soccer - Men	20400	2000	5,629.46
743000 Soccer - Women	20400	2000	7,164.95
740000 Track-Women	20400	2000	3,673.07
731000 Hockey	20400	2000	37,598.04
730000 Football	20400	2000	83,625.16
734000 Golf- Men	20400	2000	3,090.11
741000 Volleyball - Women	20400	2000	8,504.09
736000 Basketball - Women	20400	2000	40,124.00
735000 Cross Country - Men	20400	2000	7.00
733000 Baseball - Men	20400	2000	1,906.29
729000 Basketball-Men	20400	2000	32,679.91
737000 Golf-Women	20400	2000	1,174.48
744000 Swimming - Women	20400	2000	5,063.34
54020 - Travel and Related Expenses Total:			246,022.74

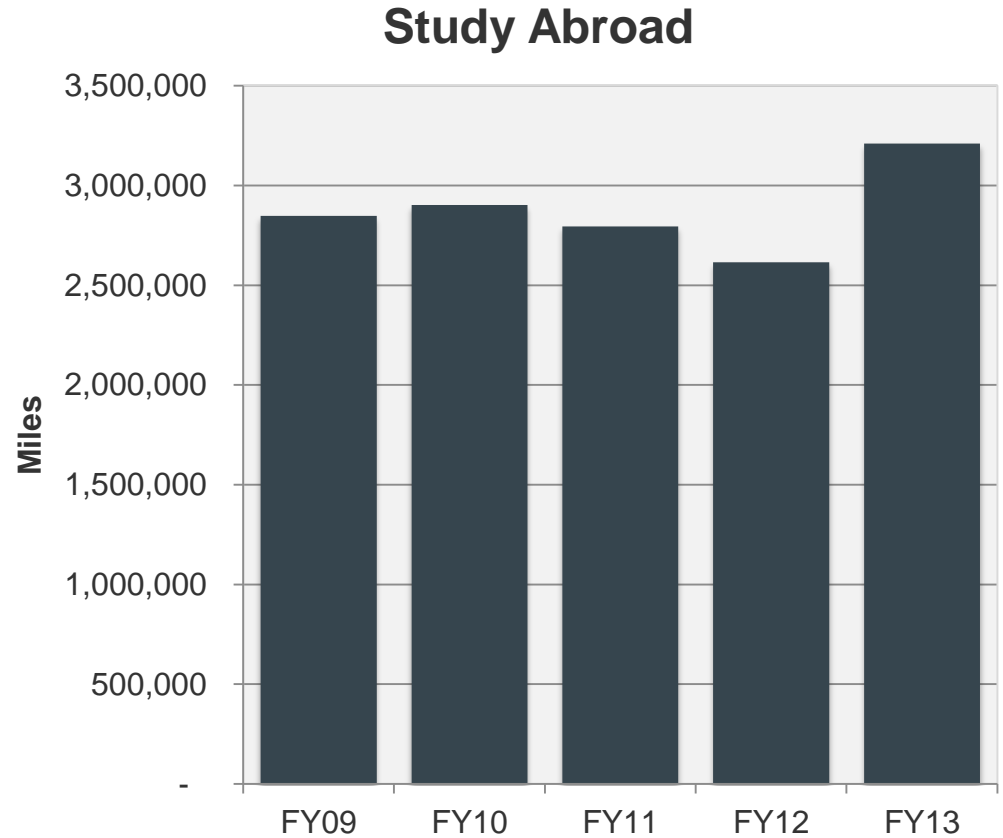
## Air Travel



Any other directly financed travel?

*We use the average trip distance for Multi-Country Study Abroad*

Breakdown by Country	
Australia	2
Austria	29
Brazil	4
Burkina Faso	3
Chile	1
China	23
Costa Rica	3
Cuba	10
France	71
Greece	8
Haiti	5
Ireland	1
Italy	28
Japan	19
Jordan	1
Kenya	1
Morocco	1
Multi-Country	50
New Zealand	3
Peru	9
Poland	8
Russia	8
South Africa	11
South Korea	2
Spain	41
United Kingdom	63



	FY09	FY10	FY11	FY12	FY13
Count	328	330	340	338	405

Commercial Front Load Trash from 9/1/2012 to 6/30/2013 1514.64 tons almost all to Evergreen.  
 Roll Off Totals  
 Trash to Wood County 105.98 tons  
 Compost to Wood County 174.49 tons  
 Trash to Evergreen 945.32 Tons  
 Commercial Front Load Cardboard To Gateway Recycling Total Tons for the period 286.16  
 The Football Games Nick should already have.

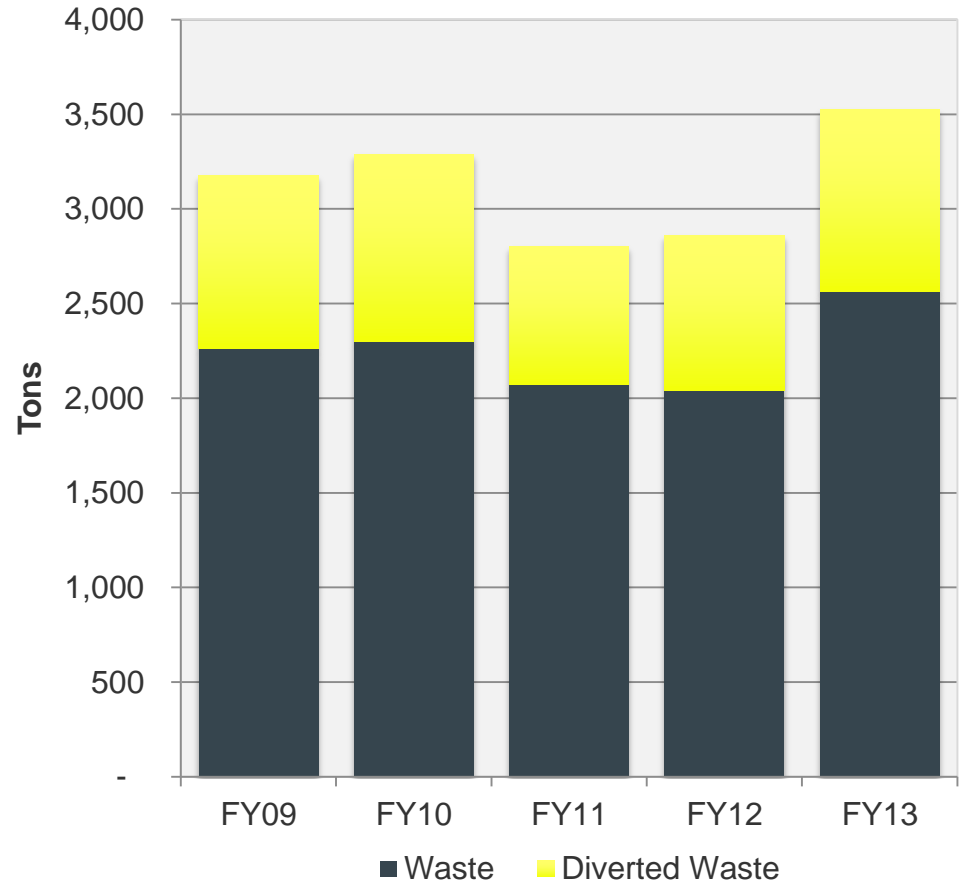
Traditional Recyclables											
	Aluminum	Glass	Other*	Plastic	Office Paper (SOP)	Shredded Paper	Newspaper	Scrap Metal	Pallets	Cardboard (OCC)	Totals
	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS
2008-09	6.4	0.0	4.6	65.7	134.8	0.0	55.5	158.2	0.0	197.0	622.2
2009-10	4.0	0.0	30.6	64.4	145.3	0.0	60.5	292.2	0.0	203.9	800.9
2010-11	13.4	0.0	35.0	49.9	102.3	0.0	34.9	202.2	0.0	186.4	624.1
2011-12	4.1	0.0	39.4	32.9	112.1	0.0	23.7	276.6	0.0	147.6	638.4
2012-13	3.1	0.0	54.3	17.3	78.0	0.0	41.1	204.7	0.0	77.2	475.7
<b>Totals:</b>	<b>31.0</b>	<b>0.0</b>	<b>163.9</b>	<b>230.2</b>	<b>572.5</b>	<b>0.0</b>	<b>215.7</b>	<b>1,133.9</b>	<b>0.0</b>	<b>812.1</b>	<b>3,159.3</b>

\* = Other is almost always used fryer grease. We also use this category for pick-up fees, but those aren't included in this dataset.  
 2012-13 - WM took over during September 2013. Pat has that data.

Compostable Material, Recycled			
	Leaves, Grass, Wood Chip	Brush	Totals
	TONS	TONS	TONS
2008-09	128.1	162.6	290.7
2009-10	92.4	93.6	186.0
2010-11	67.0	39.8	106.8
2011-12	124.1	56.9	181.0
2012-13	6.3	15.2	21.5
<b>Total 2008-2013</b>			<b>786.0</b>

Landfill Waste		
Landfill:	Total Solid Waste:	Percent Recycled:
2008-09	2264.01	3173.1
2009-10	2300.08	3272.4
2010-11	2071.9	2803.7
2011-12	2041.37	2858.7
2012-13	2041.37	2538.4
<b>Totals:</b>	<b>10719</b>	<b>26151.03</b>

## Total Waste



# Scope 3 – Paper

How does BGSU stack up?

Purchased Paper		2010	2011	2012	2013
<b>Total Paper (lbs.)</b>	<b>% Recycled</b>	110,071	271,500	265,852	217,231
Paper from Purchasing	0%	88,082	210,001	187,519	154,508
Paper from Purchasing	30%	17,043	56,137	65,120	38,877
Paper from Purchasing	50%	2,049	5,075	6,929	7,212
Paper from Purchasing	100%	2,896	286	6,284	16,633



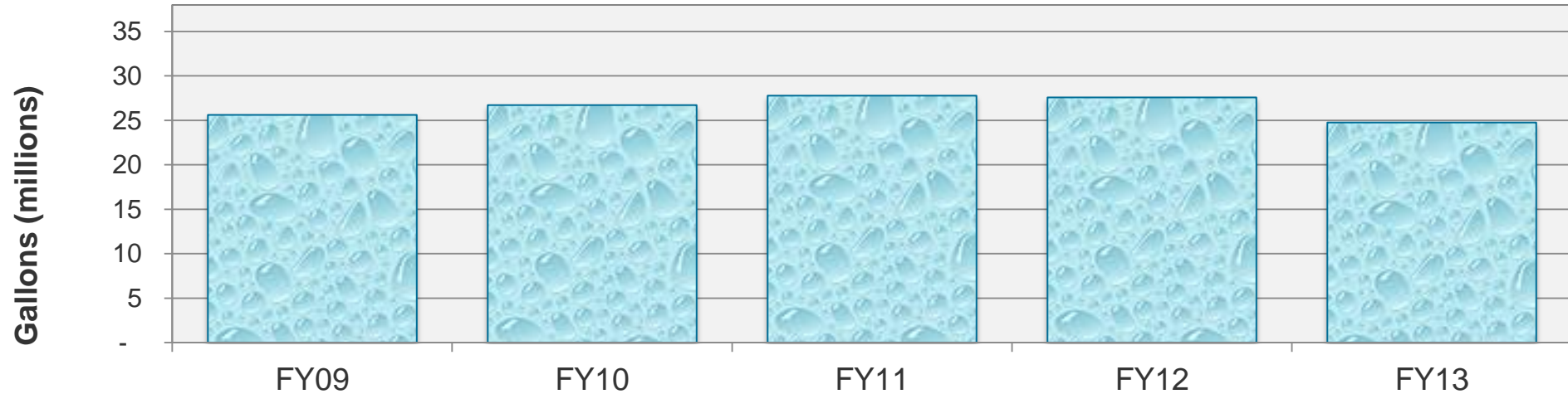
C/I	N	PROD NUMBE	NID	PROD DESCRIPTION	VENDO	UO	Uni	Size	Q	Sheet Count	Quantity	PROD TOT	PRICE	FR	RECYCLED IN
	P1	ACC-8011	124566	ASPEN100 COLOR COPY CVR 8.5X11	BOISE	PK		8.5" X 11"	2	500	1000	\$34.26	\$17.13	1	Recycled
	P1	BCC-8011	903440	PPR CVRLSR 80# 8.5X11 WE	BOISE	PK		8.5" X 11"	2	500	1000	\$28.82	\$14.41	1	Not Rcylid
	P1	BCC-8017	903451	PPR CVR LSR 80# 17X11 WE	BOISE	PK		11" X 17"	12	500	6000	\$357.84	\$29.82	7	Not Rcylid
&	P1	BCP-2811	257550	8.5X11 COLOR COPY PAPER	BOISE	RM	Reams	8.5" X 11"	135	500	67500	\$922.05	\$6.83	10	Not Rcylid
	P1	BCP-2814	903260	28 LB COLOR COPIER PPR	BOISE	RM	Reams	8.5" X 11"	5	500	2500	\$88.60	\$17.72	2	Not Rcylid
	P1	BCP-2817	257553	11X17 COLOR COPY PAPER	BOISE	RM	Reams	11" X 17"	18	500	9000	\$501.66	\$27.87	4	Not Rcylid
	P1	BCP2811-CTN	116477	PPR,LASER,28#,8.5X11,WE	BOISE	CT	Cases	8.5" X 11"	1	5000	5000	\$80.66	\$80.66	1	Not Rcylid
	P1	BPC-1180	468205	LSR WHITE 11" 80# COVER	BOISE	PK		8.5" X 11"	3	500	1500	\$29.52	\$9.84	1	Not Rcylid
	P1	BPL-RC14	475913	BOISE ASPEN LASER 30 14"	BOISE	RM	Reams	8.5" X 14" (Legal)	1	500	500	\$10.98	\$10.98	1	Recycled
	P1	BPL-RC17	220788	BOISE ASPEN LASER 30 17"	BOISE	RM	Reams	11" X 17"	1	500	500	\$17.27	\$17.27	1	Recycled
&	P1	BPL-0111	112381	8-12X11 LASER PAPER 24LB	BOISE	RM	Reams	8.5" X 11"	8	500	4000	\$38.64	\$4.83	3	Not Rcylid
	P1	BPL-0117	112487	11X17 LASER PAPER 24LB	BOISE	RM	Reams	11" X 17"	8	500	4000	\$134.80	\$16.85	1	Not Rcylid
	P1	BPL-0218	112539	8-1/2X11 LASER PAPER 32LB	BOISE	RM	Reams	8.5" X 11"	10	500	5000	\$106.70	\$10.67	1	Not Rcylid
&	P1	BPL-2411-RC	384361	RECYC. 8.5X11 LSR PPR	OFFICE	RM	Reams	8.5" X 11"	32	500	16000	\$158.24	\$4.94	2	Recycled
&	P1	CC2241	472522	CASCADE XEROGRAPHIC PAPER	BOISE	RM	Reams	8.5" X 11"	3	500	1500	\$11.22	\$3.74	1	Not Rcylid
	P1	CTP1W	136827	SW CERTIFICATE SLVER&WHT 15CT	SOUTHW	PK	Sheets	8.5" X 11"	5	15	75	\$20.10	\$4.02	2	Not Rcylid

# Scope 3 – Wastewater

*Wastewater is currently the same amount as water consumed*

Gallons	FY09	FY10	FY11	FY12	FY13
Total Water Consumed	25,609,167	26,710,801	27,775,466	27,575,920	24,753,007
Aerobically Treated Water	25,609,167	26,710,801	27,775,466	27,575,920	24,753,007

### Total Domestic Water Consumption



# Commuting



*Assumed trip distance based on collect Zip Code data*



Welcome,

Sustainability has become a focal point within institutions of higher education. We are currently conducting a campus-wide assessment of BGSU's operational sustainability.

Part of this evaluation is a quantification of our greenhouse gas emissions – our "carbon footprint". While we are also assessing the impact of energy use; air travel; campus vehicles and other sources, a key component of our footprint is the daily commuting habits of the campus community.

With this in mind, we are asking you to help us by completing this short, anonymous and confidential commuting survey. Your answers will help us estimate the baseline impact of commuting emissions and identify potential strategies to make our school more sustainable. This should only take about five minutes to complete.

Simply click on the "continue" button below to begin the survey. Please feel free to contact me with any questions you may have.

Thank you for participating in this effort.

Best,

[SIGNATURE INFORMATION]

## Student Commuters:

- Assuming 100% drive alone
- 10 One-Way Trips/Week
- Average trip distance 11.9 miles

## Faculty Commuters:

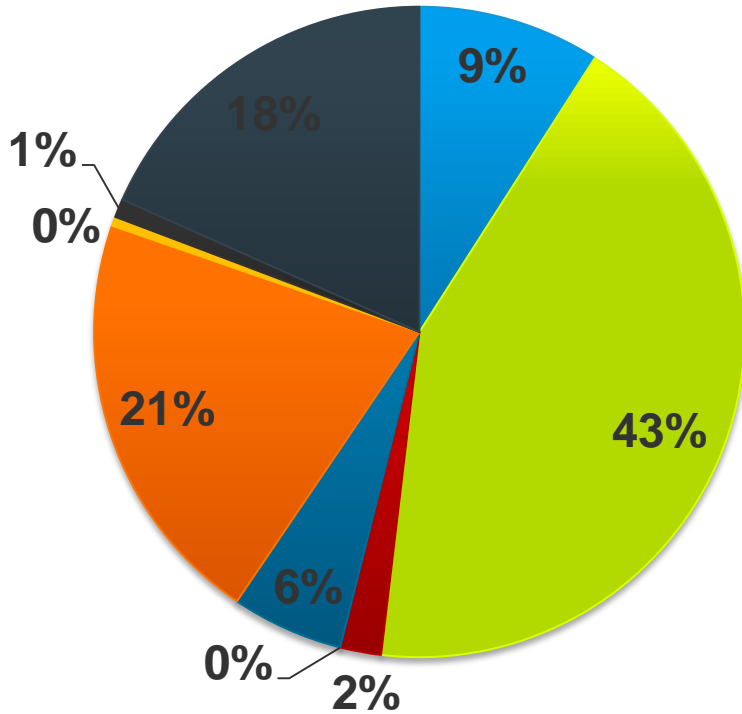
- Assuming 100% drive alone
- 10 One-Way Trips/Week
- Average trip distance 10.1 miles

## Staff Commuters:

- Assuming 100% drive alone
- 10 One-Way Trips/Week
- Average trip distance 9.1 miles

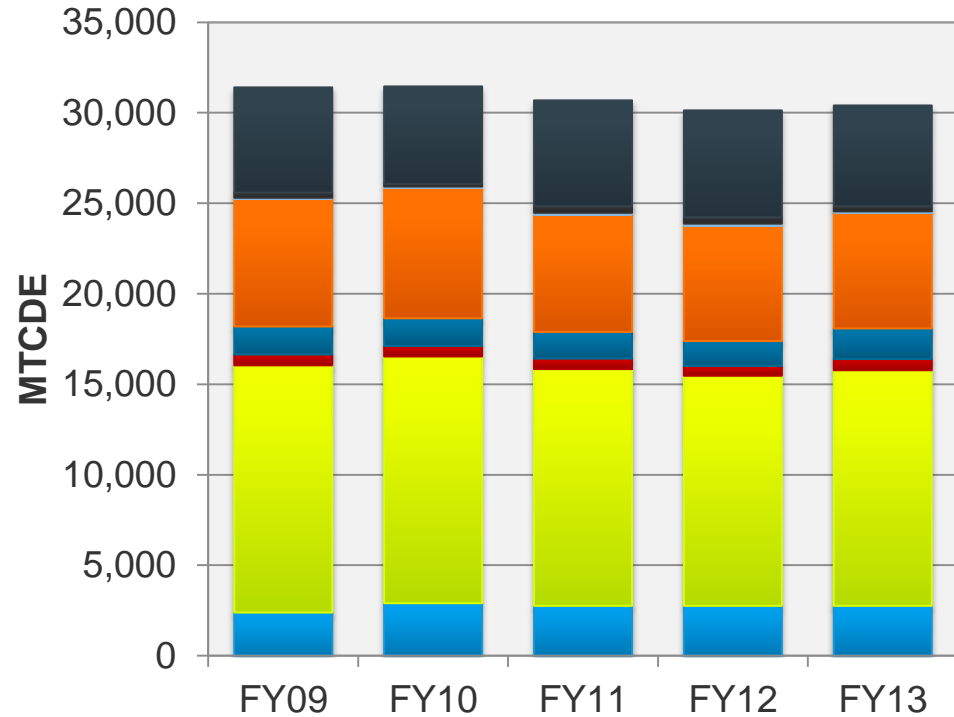
*Breakout will change with paper and waste data*

### FY13 Scope 3 Summary



- Faculty / Staff Commuting
- Directly Financed Air Travel
- Study Abroad Air Travel
- Wastewater

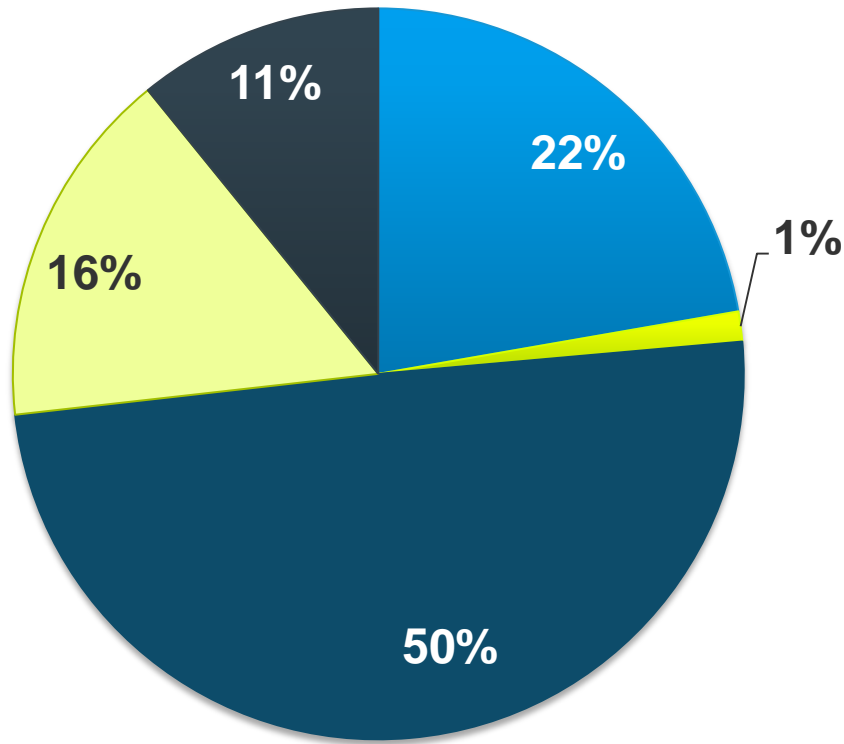
### Historical Scope 3 Summary by Source



- Student Commuting
- Other Directly Financed Travel
- Solid Waste
- Paper Purchasing

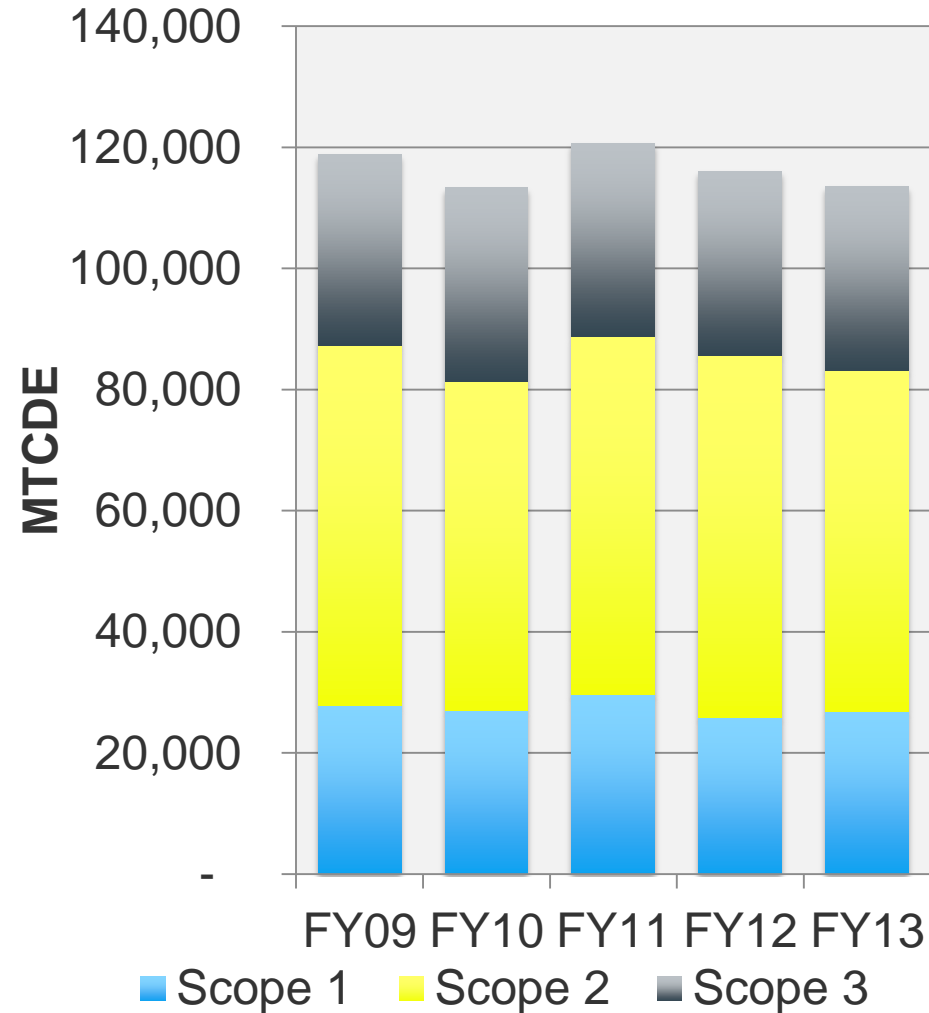
# Conclusion

### Source Summary FY13

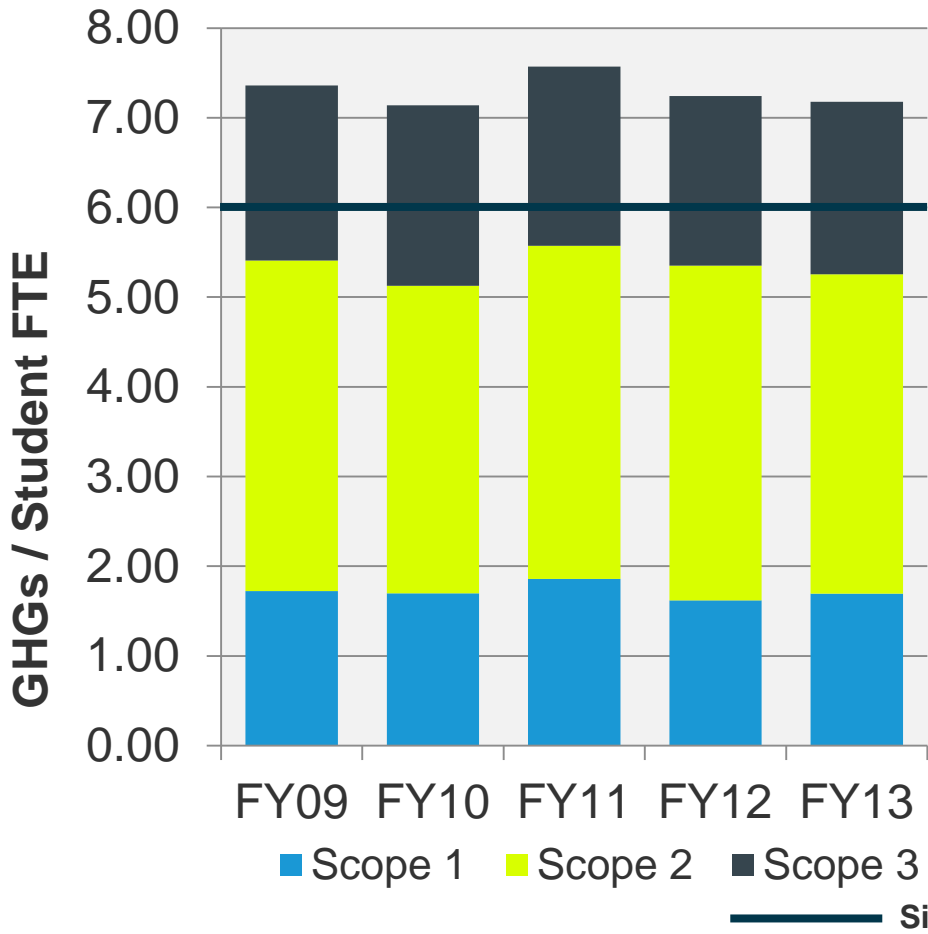


- On-Campus Stationary
- Purchased Electricity
- Other Scope 3
- Other Scope 1
- Travel

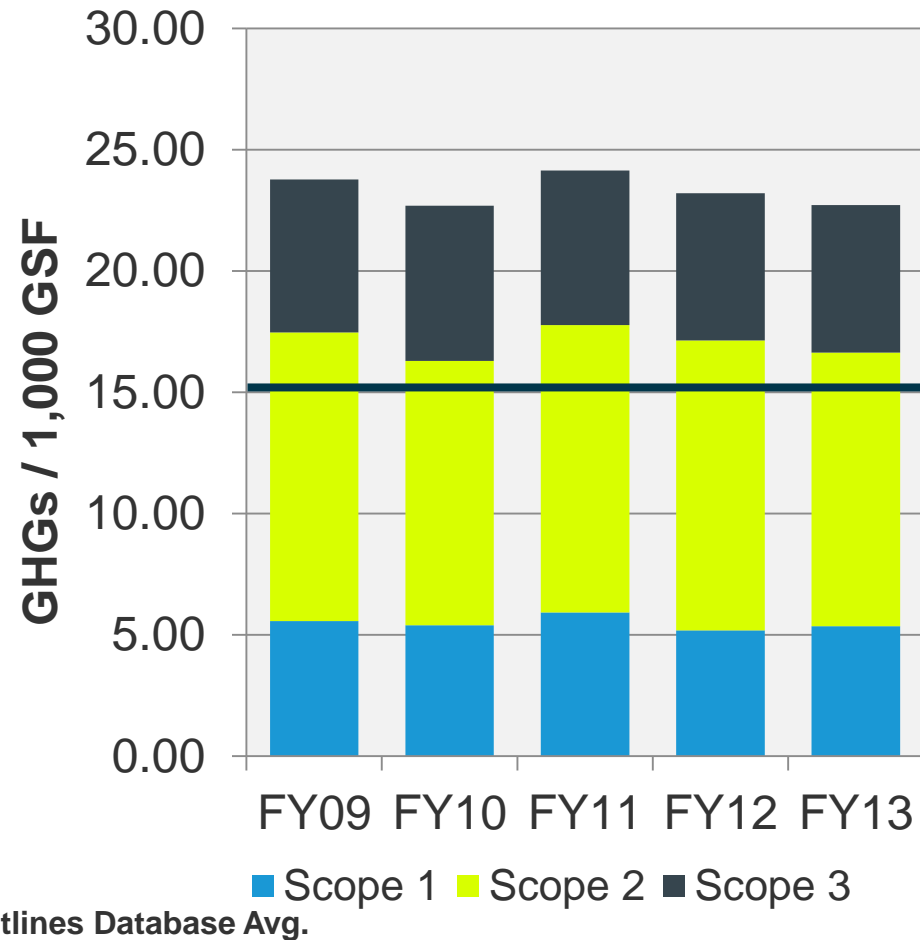
### Historical Scope Summary



### Historical GHGs / Student FTE



### Historical GHGs / 1,000 GSF



# Questions and Discussion

# Next Steps