



CarboKnights



“An 8 Week Quest to Fight Carbon Emissions”

EAS 3110: Energy, Environment, and Society

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Introduction

As a team, we were challenged to reduce 10,000 lbs. of carbon emissions over a two month period. We chose to approach this challenge with small changes made on a large scale. We partnered with IBM Barfield, friends, and family to complete this challenge.

3 PART PLAN

1. Lighting Reduction at IBM Barfield

2. HVAC Reduction at IBM Barfield

3. Red-Meat Reduction Challenge



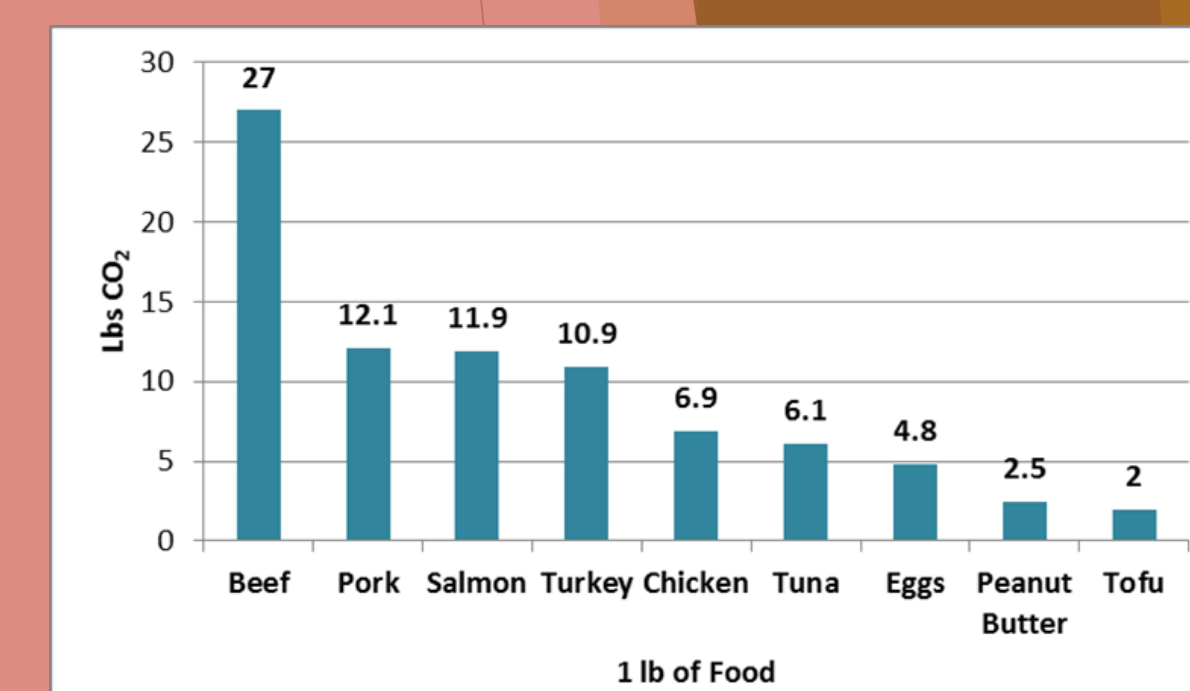
Lighting + HVAC

- We worked with Randy Reutzel, director of site operations for IBM Southeastern division
- Found areas of energy use that could be altered to be even more efficient at the IBM Barfield location
- Took advantage of previously revised janitorial schedule in which staff moved to daytime hours vs. nighttime hours
- As a result, lighting and HVAC systems could be turned off one hour earlier each night, from 8:30 pm to 7:30pm
- 1.333 lbs. CO₂ per kWh ⁽²⁾

Total CO₂ Reduction: 29,729 lbs.

Red Meat

- Used social networking to contact friends and family of CarboKnight team members
- Enlisted volunteers to reduce their consumption of red meat by a certain percentage for a chosen period of time
- Exit-survey sent at the end of the implementation period to confirm reductions
- 21.28 lb. CO₂/ lb. red meat ⁽¹⁾
- 22 of the original 47 participants that signed up completed the challenge, giving a 45% success rate
- Average 169 lbs. CO₂ per participant



Total CO₂ Reduction: 3,717 lbs.

IBM BARFIELD REDUCTIONS			TOTAL
	Lighting	HVAC	
kWh Saved	11,800	10,503	22,303 kWh
lbs. CO ₂ /kWh	1.333	1.333	
lbs. CO ₂ Saved	15,729	14,000	29,729 lbs. CO ₂
Electric Rate	\$0.07	\$0.07	
Money Saved	\$768.18	\$683.76	\$1,451.94

Scale Up the Savings: Building Size

- The Bank of America building has a floor area of 1,253,500 sq. ft. while the IBM building is 200,000 sq. ft.
- If this building followed the same lighting and HVAC reduction plan it would increase our reductions by 186,400 lb. of CO₂
- Monetary savings would be \$9,100



Scale Up the Savings:

- Number of Participants
- If all 21,500 of the students here at Georgia Tech participated in the Red-Meat Reduction Challenge with similar reductions, 3,504,500 lbs. of CO₂ could be avoided over the 8 week period
- With just only our 45% success rate this is still over 1.5 million lbs. of CO₂

RESULTS		
Plan	Carbon Reduction	Monetary Savings
Lighting Reduction	15,729 lbs.	\$768.18
HVAC Reduction	14,000 lbs.	\$683.76
Red-Meat Reduction	3,717 lbs.	~
Total	33,446 lbs.	\$1,451.94

Scalability: 33,446 lbs. of CO₂ is equivalent to...



Driving an average car around the Earth over 1 time



The weight of 4.8 elephants



Removing a car off the road for 2 years

References:

1. <http://www.ewg.org/>
2. US Environmental Protection Agency eGRID2009 - Greenhouse Gases Version 1.0, April 2012