EAS 3110: Energy, the Environment, and Society

get the facts behind our climate and energy future

featuring:

The Carbon Reduction Challenge

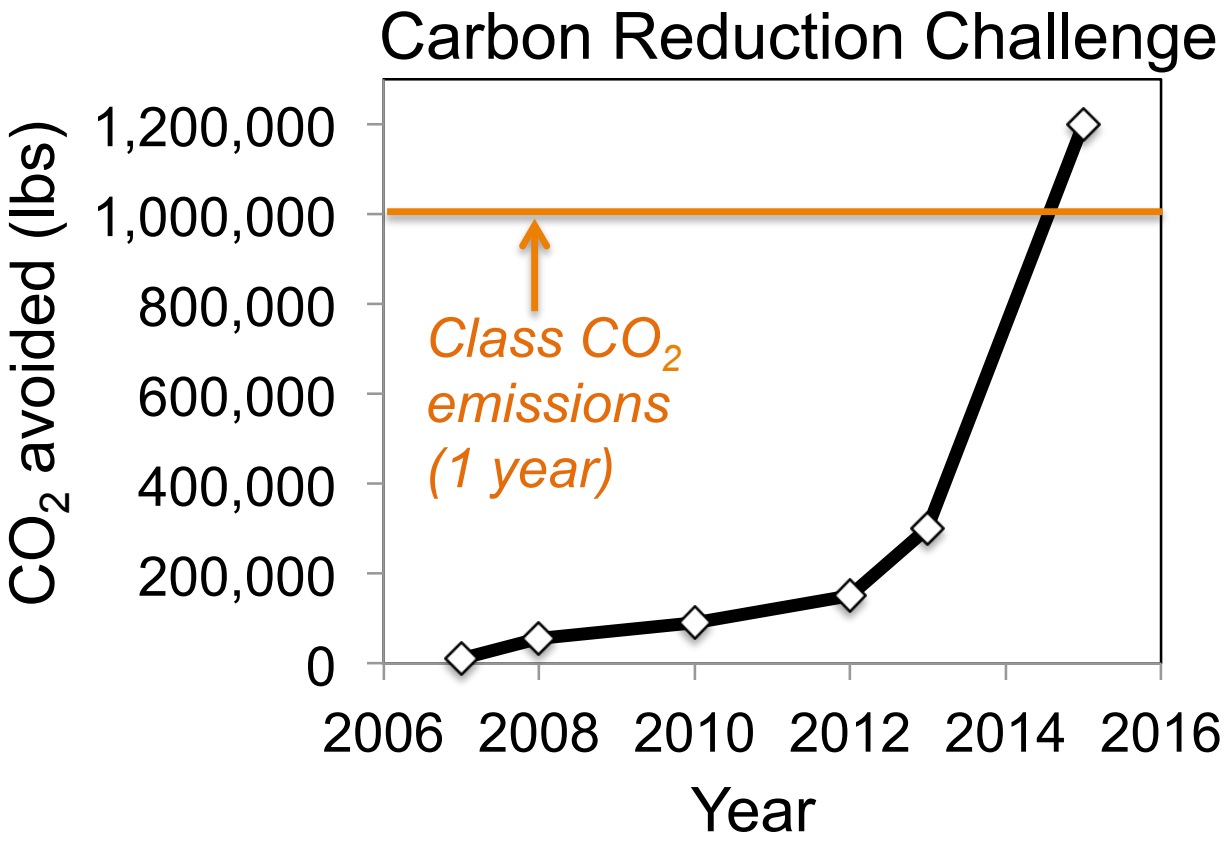
6 STUDENT TEAMS

8 WEEKS

1 PRIZE

Goal: 1,000,000 LBS CO_2 SAVED

Energy Education



saving CO_2 and $$$

training energy workforce

building new partnerships

Energy on the Hill Internship

What it is: an internship program funding GT students to engage with energy-related policy development on Capitol Hill for a semester

Who can apply: anyone with an interest in energy (supply, technology, economics, security, or policy)

Pay: $7,500 for spring/fall; $5,000 for summer

Benefits to Student:

- enrich education with hands-on experience
- build a professional network
- acquire unique skills for jobs in industry, governmental, or nonprofit sectors
- live and work in beautiful Washington DC

Apply: http://www.gov.gatech.edu/internships/dc

Deadline: May 1 for Fall 2016

Sustainable Communities: Systems Principles
GT 2803 HP1

(EAS 2803 HP1, MGT 2803 A and PUBP 2803 HP1)

Professors Kim Cobb (EAS), Richard Barke (PUBP),
Matthew Realff (ChBE) and Beril Toktay(MGT)

MWF 10-11am, Heffner 001

This course is an introduction to sustainable systems, focusing on understanding how sustainability relates to students' civic and professional lives, and how their actions in both those domains impact issues of sustainability. We will survey systems approaches including physical/resource balances, ecological/carbon cycle processes, economic/financial practices, and political/policy processes as they relate to communities in Atlanta and around the world. Case studies and exercises will demonstrate how these systems interact.

Did you know?

Georgia Tech has an “Energy Minor”

6hrs Breadth courses (interdisciplinary;
this course will likely be added to list)

6hrs Depth courses (disciplinary)

capstone design course in Energy Systems

(EAS track here)

first, some energy basics

Basics of electricity

Current (I, measured in amperes) flows from – to +

Voltage (V, measured in volts) reflects the potential difference between a negatively and positively charged material

Resistance (R, measured in ohms) prevents flow of electrons; depends on material, distance, and temperature

Ohm's Law: V=R * I

Ex: US uses 120V; toaster is 15ohms, so I=120/15 = 8 amps of current going through toaster

Power = V * I

Voltage fixed at 120V; so toaster has power of 120*8 = 960Watts (joules/s)

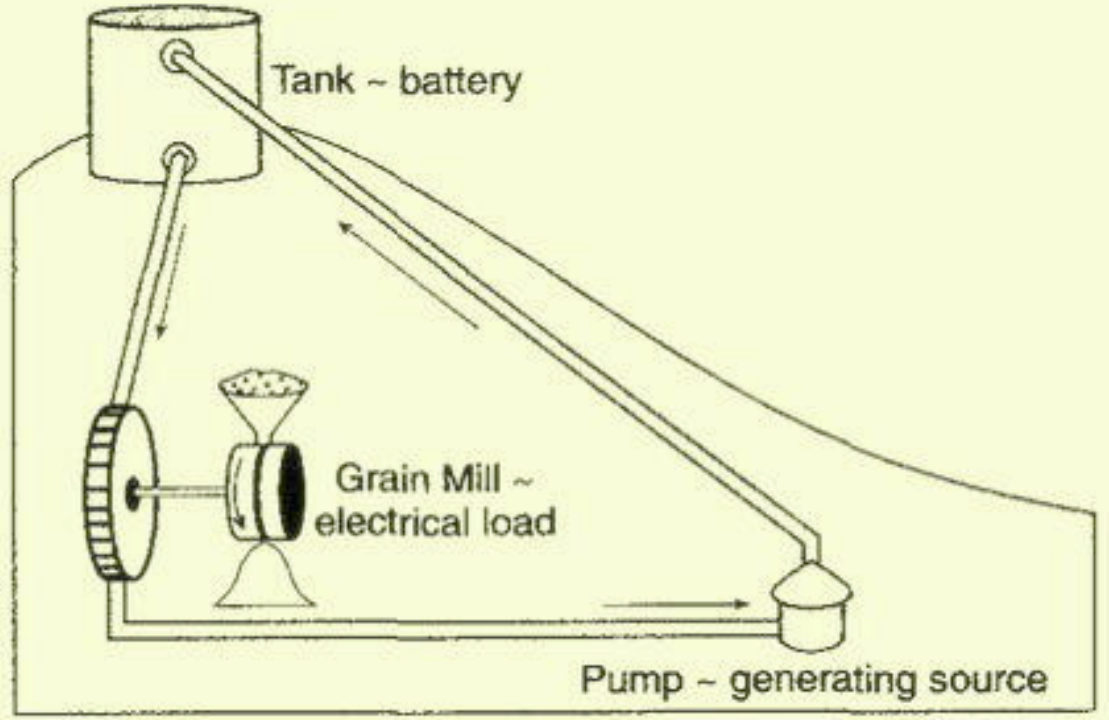
Energy = P * time (this is what you pay for)

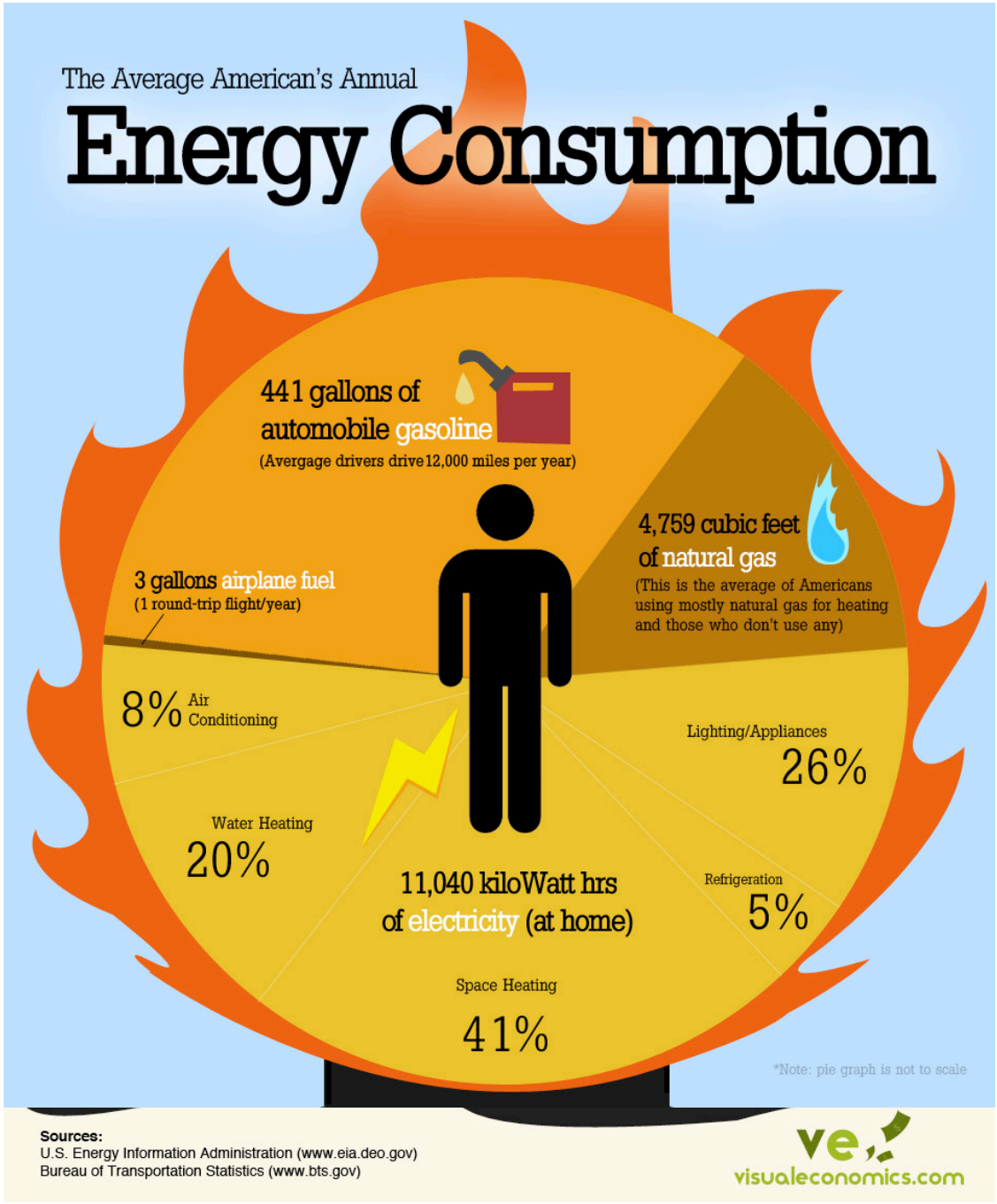
Leave toaster on for 30min, then E = 960Watts * 0.5hr = 0.480 kilowatt hours

A clever analogy

voltage
resistance
current

Volts ~	water pressure
Ohms ~	resistance of the pipe, fittings, and mill
Amps ~	gallons per minute
Amp-hours ~	total gallons through the mill
Watts ~	grain ground per minute
Watt-hours ~	total grain ground




The Average American's Annual
Energy Consumption
441 gallons of automobile gasoline
(Avergage drivers drive 12,000 miles per year)
4,759 cubic feet of natural gas
(This is the average of Americans using mostly natural gas for heating and those who don't use any)
3 gallons airplane fuel
(1 round-trip flight/year)
8% Air Conditioning
Lighting/Appliances 26%
Water Heating 20%
11,040 kiloWatt hrs of electricity (at home)
Refrigeration 5%
Space Heating 41%
*Note: pie graph is not to scale
Sources:
U.S. Energy Information Administration (www.eia.deo.gov)
Bureau of Transportation Statistics (www.bts.gov)
ve
visualeconomics.com