Instructor: Find the video below and play in class

http://www.lovethe1yourewith.com
Policy
• Industry focus
• Problem: Residential emits 1/3 CO2 & uses 1/3 energy

Technology
• Supply-side focus
• Problem: 10% reduction in energy would require 25x wind and solar, or 2x nuclear

Behavioral Solutions
Let’s try it...
BRAINSTORM
OVERVIEW

Human Energy Behaviors → CO₂ → Climate Change

Human Energy Behaviors → Fuel Demand → Energy Insecurity
OVERVIEW

Human Energy Behaviors → CO₂ → Climate Change

me

Carbon Demand → Energy Insecurity

link

problem
UNDERSTAND CLIMATE CHANGE

Intergovernmental Panel on Climate Change (IPCC)

Impacts, Cause, & Solutions
CLIMATE CHANGE: IMPACTS
California Fires
CLIMATE CHANGE: CAUSE

Total CO2 Emissions since 1950 (billions of tons)

- US: 186.1
- Canada: 14.9
- Mexico: 7.8
- EU: 127.8
- Russia: 68.4
- Ukraine: 21.7
- India: 15.5
- S. Africa: 8.5
- China: 57.6
- Japan: 31.2
- Australia: 7.6
CLIMATE CHANGE: CAUSE

Instructor: Find the video below and play in class

Falling elephants: Alliance for Climate Protection

http://www.youtube.com/watch?v=KCYYhEiTuro&feature=PlayList&p=31725EC6BD277A2F&index=61

Falling elephants
The Alliance for Climate Protection (Ecospot Grand Prize Winner 2007).
CLIMATE CHANGE: CAUSE

U.S. Energy Use by Sector

- Residential
- Commercial
- Industrial

Energy Used in Buildings

% of Total Building Energy Use
CLIMATE CHANGE: CAUSE

U.S. Energy Use by Sector

Energy Used in Transportation

% of Total Transportation Energy Use

Cars/Light Trucks

Med/Heavy Trucks

Air

Water/Rail/Pipe
COMBUSTION = BURNING

Fuel (e.g., Hydrocarbon Fuels like Methane, Coal, Gasoline) + Heat + Oxygen = Energy (from breaking molecular bonds) + CO₂ + Water Vapor.
How Many Balloons of CO$_2$ equal 1 lb?

$$\frac{454\text{g}}{1\text{ lb}} \times \frac{1\text{ mole}}{44\text{g}} \times \frac{22.5\text{L}}{1\text{ mole}} = 230\text{L CO}_2 / 1\text{ lb}$$

Molecular weight of CO$_2$ = 12+16+16=44

230 Balloons!
<table>
<thead>
<tr>
<th>Action</th>
<th>Class 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hang dry clothes instead of using a dryer (if of times)</td>
<td>900</td>
</tr>
<tr>
<td>Turn off appliances when not in use rather than leave them on (if of days)</td>
<td>200</td>
</tr>
<tr>
<td>Walk, bike, carpool, or bus rather than drive a car (if of miles per day)</td>
<td>700</td>
</tr>
<tr>
<td>Eat a vegetarian meal instead of one with meat (if of meals)</td>
<td></td>
</tr>
<tr>
<td>Eat a snack of whole foods rather than pre-processed or packaged foods (if of snacks)</td>
<td>40</td>
</tr>
<tr>
<td>Use a reusuable bottle rather than a disposable bottle or can (if of bottles replaced)</td>
<td>50</td>
</tr>
</tbody>
</table>

___ + ___ + ___ = Group Total

___ + ___ + ___ = Group Total
<table>
<thead>
<tr>
<th>Hang-dry clothes instead of using a dryer (# of times)</th>
</tr>
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<tr>
<td>Use a reusable bottle rather than a disposable bottle or can (# of bottles replaced)</td>
</tr>
<tr>
<td>Observed Behavior</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
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</table>

OBSERVATION WORKSHEET
<table>
<thead>
<tr>
<th>Habit Description</th>
<th>Class 1</th>
<th>1000</th>
<th>1200</th>
<th>1400</th>
<th>1600</th>
<th>1800</th>
<th>2000</th>
<th>2200</th>
<th>Group Total</th>
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</thead>
<tbody>
<tr>
<td>Hang dry clothes instead of using a dryer (# of times)</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>900</td>
<td></td>
<td>1800</td>
</tr>
<tr>
<td>Turn off appliances when not in use rather than leave them on (# of days)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Walk, bike, carpool or bus rather than drive a car (# of miles per day)</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>200</td>
<td>1200</td>
</tr>
<tr>
<td>Eat a vegetarian meal instead of one with meat (# of meals)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>700</td>
<td>4900</td>
</tr>
<tr>
<td>Eat a snack of whole foods rather than pre-processed or packaged foods (# of snacks)</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>40</td>
<td>320</td>
</tr>
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<td>Use a reusable bottle rather than a disposable bottle or can (# of bottles replaced)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

8270 + ___ + ___ = __________
Hang drying:
- I will hang dry the next load of laundry I do.
- I will hang dry one out of my next two loads of laundry.

Shutting off appliances:
- I will turn my computer off (or on sleep mode) before I get into bed each night this week.
- I will plug my TV, DVD player, and stereo into a power strip, which I will turn off at least 5 nights this week.