Overview of the CoolClimate Calculator

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San Francisco, Ca.
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THE TEAM

Dan Kammen, Faculty PI
Dan McGrath, BIE Executive Director

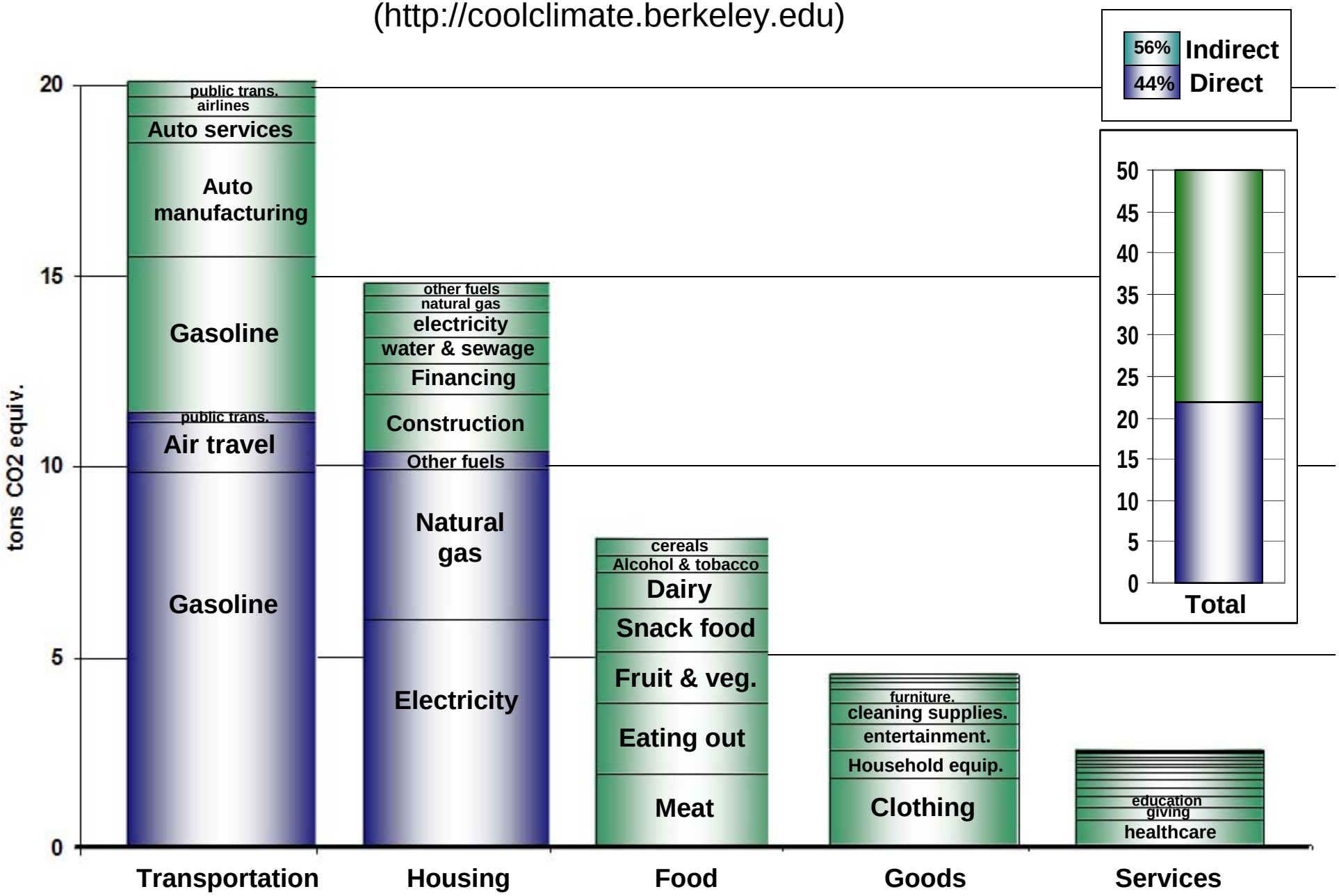
Chris Jones, Lead Developer

Graduate Students
Sally Maki: ’07-’08 – Version 2.0
Kate Foreman: Fall ‘08: GHG mapping – GIS
Jeremy Eddy, Fall ‘08: Recommendations Engine

Undergraduates
Mia Yamauchi, Fall ‘08: CoolSchools Calculator

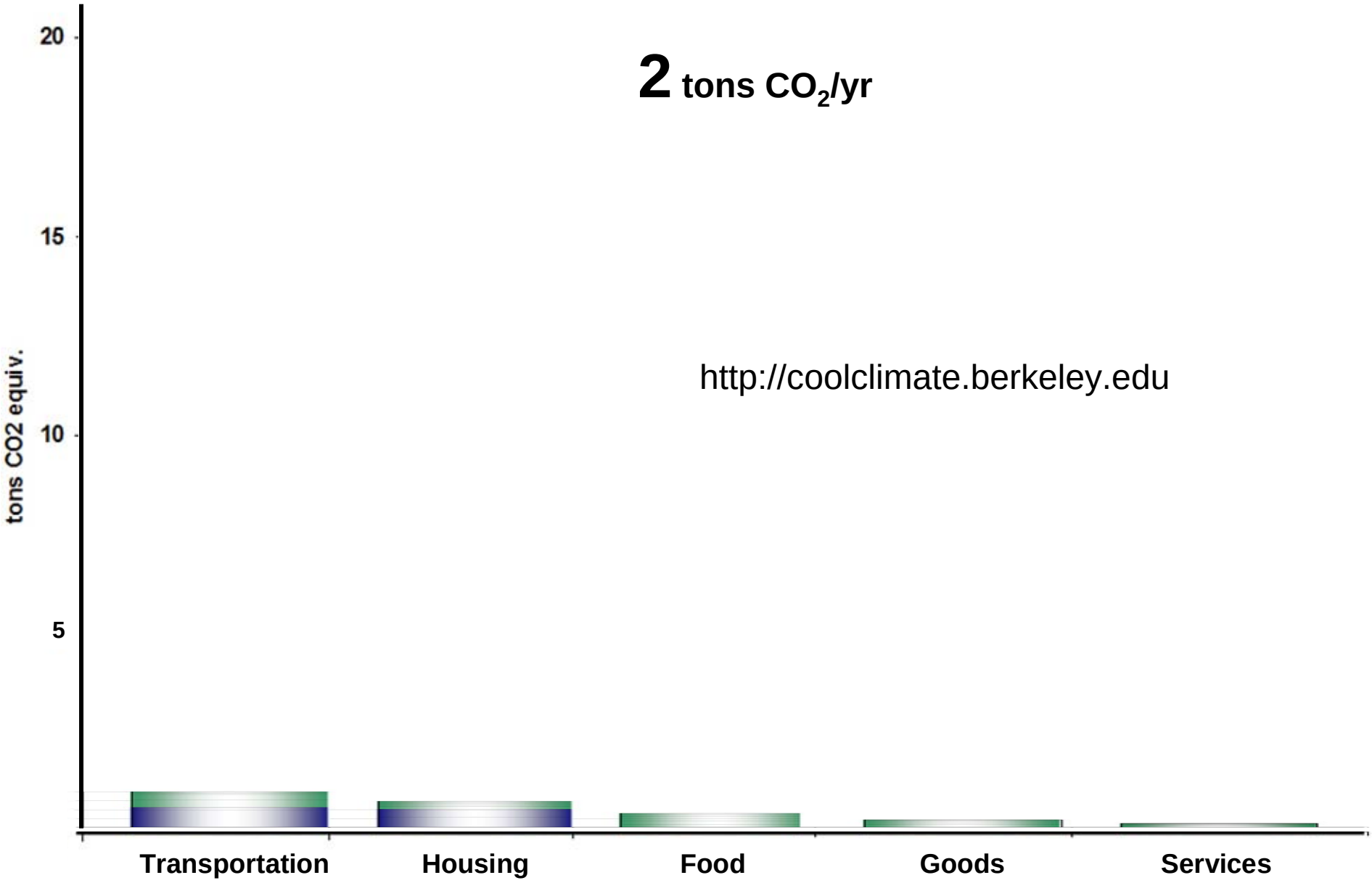
Climate Footprint of the typical US Household (50 tCO2e)

(http://coolclimate.berkeley.edu)



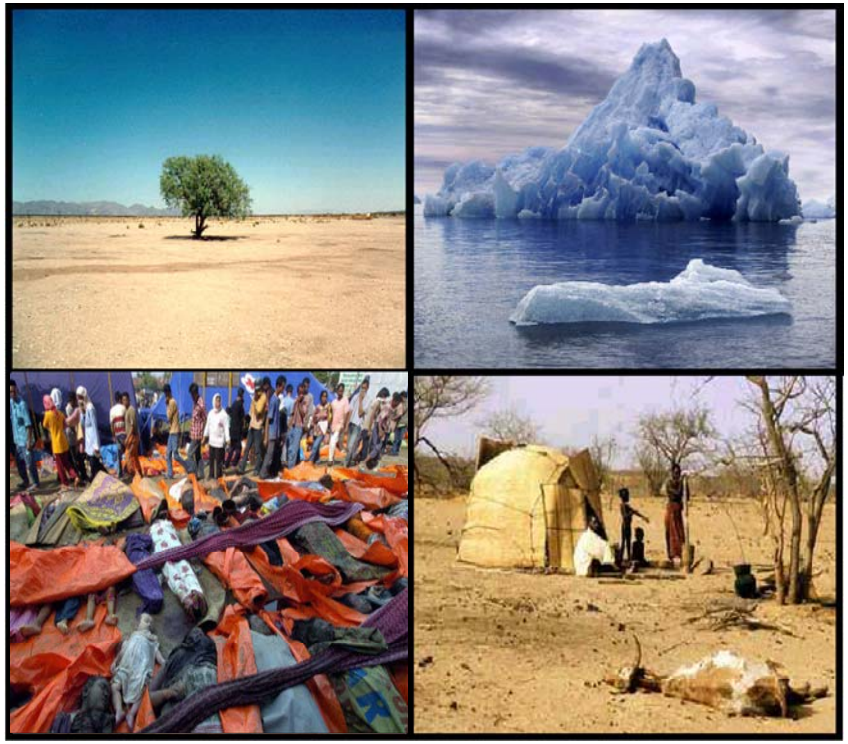
Globally, we need to reach:

2 tons CO_2/yr



http://coolclimate.berkeley.edu

Consequence of 2-3 degrees C warming:



1. Natural disasters (fire, flood, drought)
2. Sea level rise
3. Vector-borne diseases
4. Water shortages
5. Food shortages
6. Mass species extinction
7. Conflict

Hundreds of millions of lives at risk

Total cost: 5-20% of global GDP*

*Source: Stern Review on the Economics of Climate Change, 2006

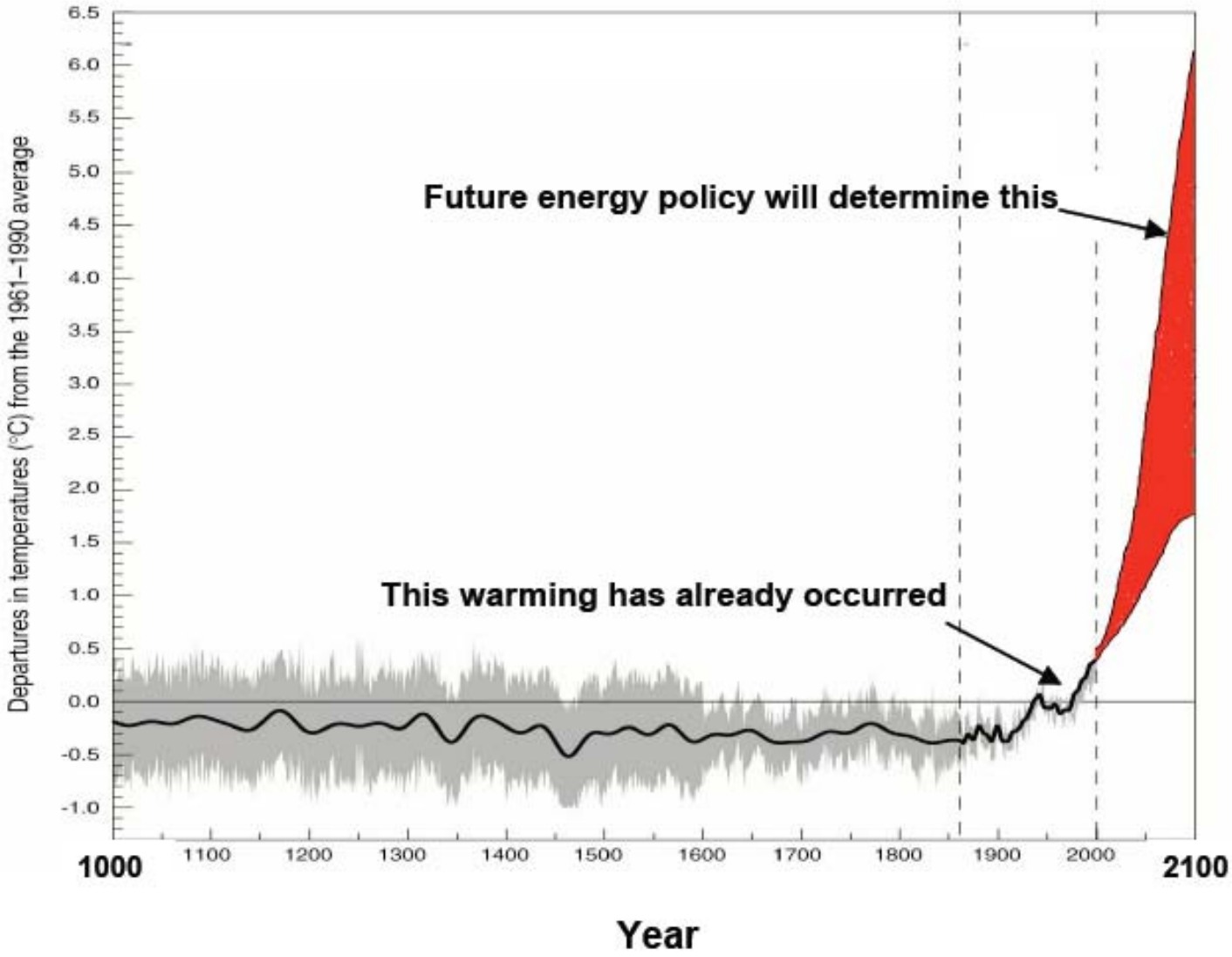


Figure courtesy of Prof. John Harte

Climate Action Planning Tools for: households, businesses & communities

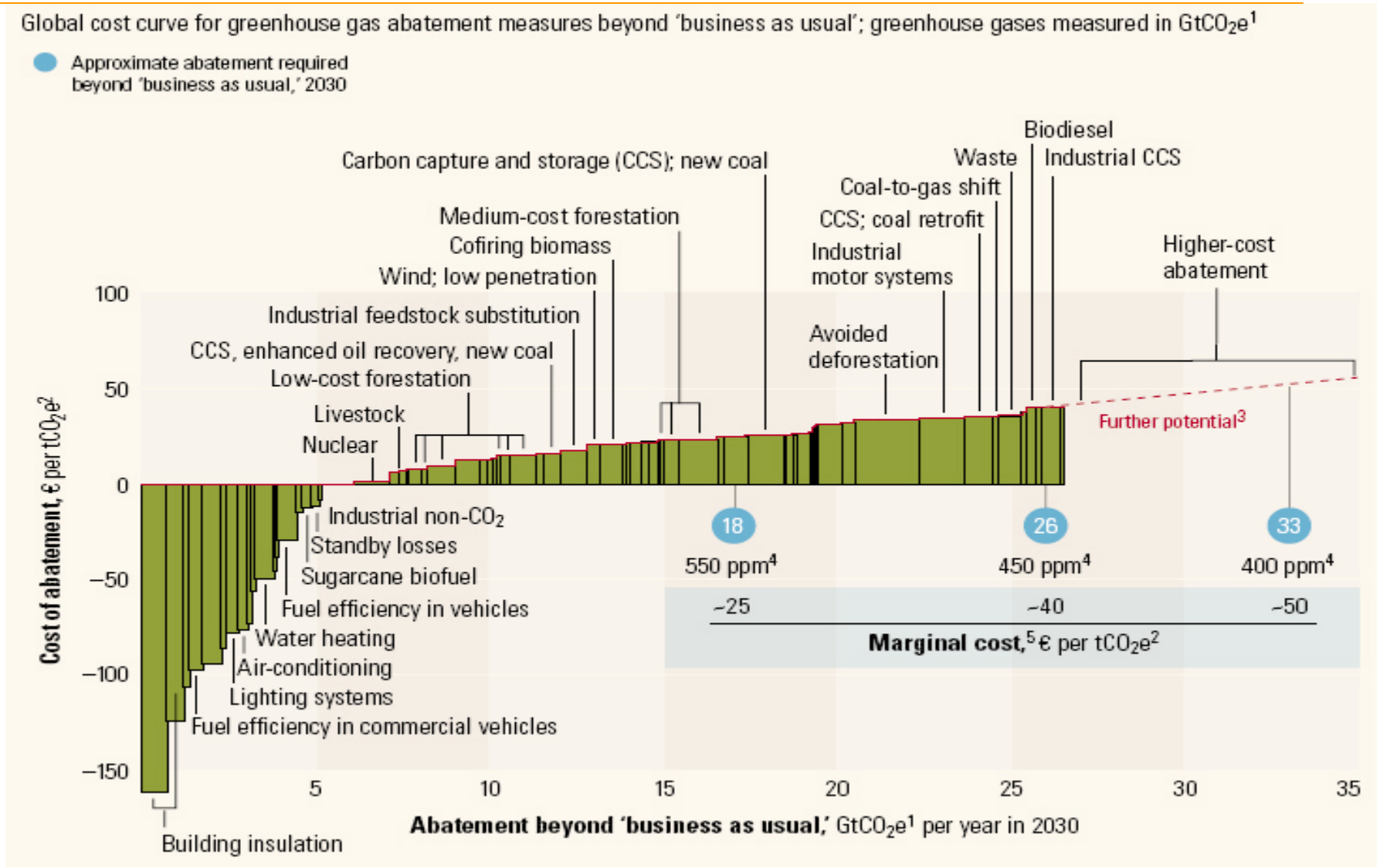
1. GHG benchmarking & mapping tools

   footprints of typical households or businesses with similar characteristics

2. GHG calculators

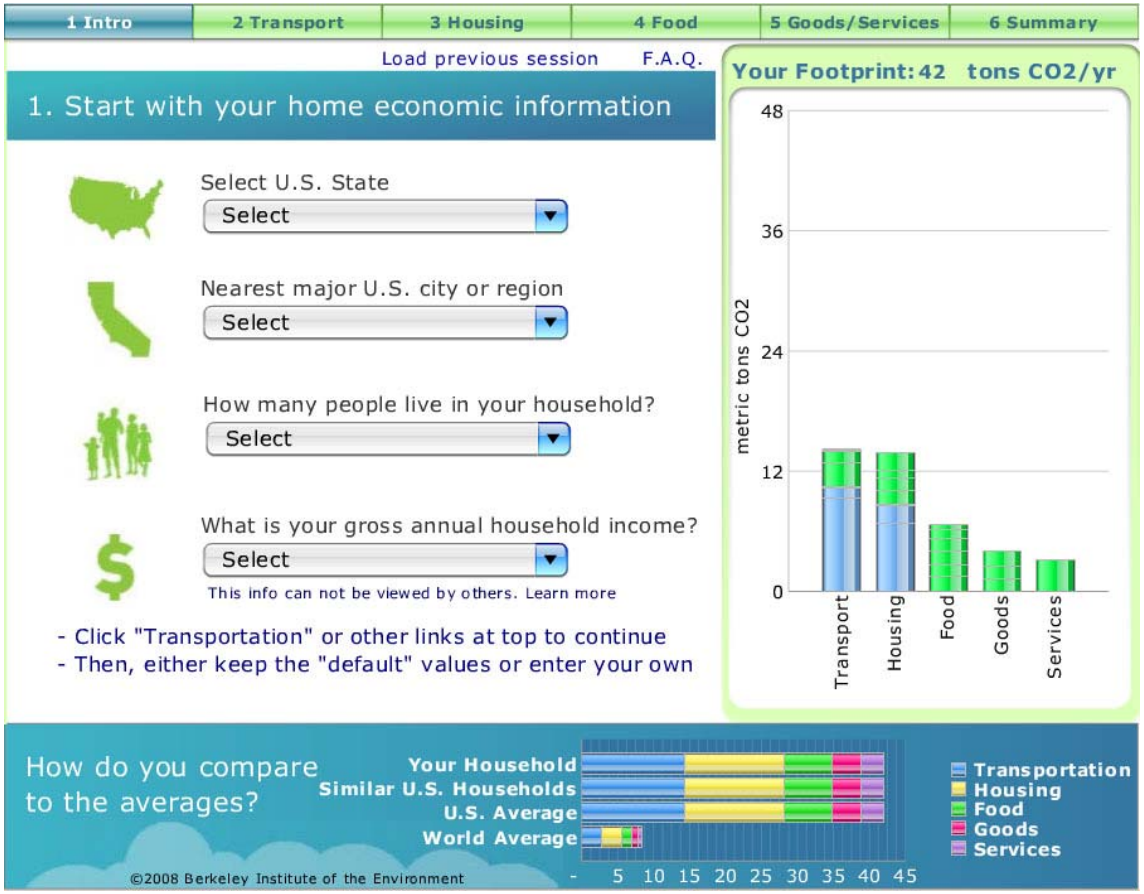
3. Climate action planning tools

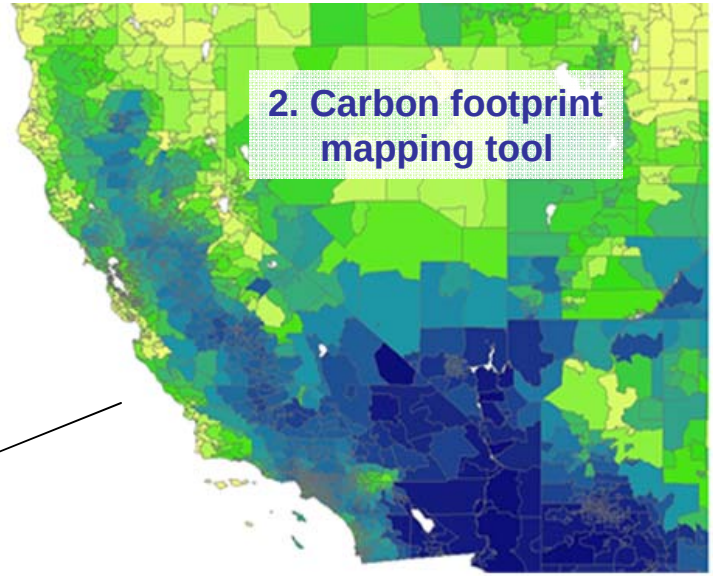
   estimate GHG reductions and cost/savings (NPV, IRR, payback, up-front cost, etc.)



Source: McKinsey & Company, 2008

1. CoolClimate Calculator: http://coolclimate.berkeley.edu





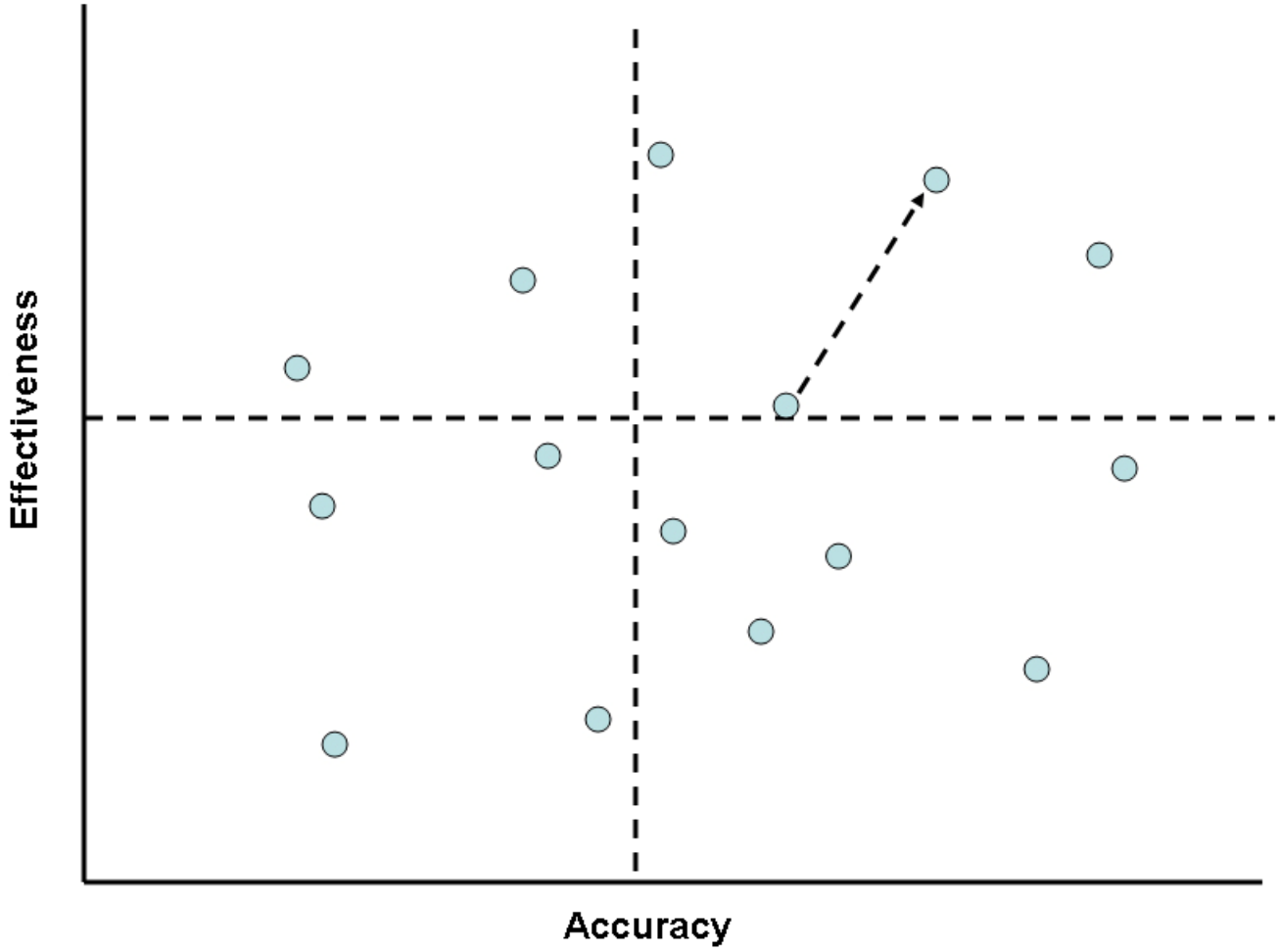
CoolClimate Tools

3. Climate Action Plan - Recommendations Engine - ranks GHG and $ savings of actions

Adjustable Assumptions:
11,000 mi/year
$4 per gallon
Lifetime = 16yrs
Dis. rate = 8%

		Up front cost	Current annual tCO2e	Annual CO2 saved tCO2e	Annual fuel saved ($)	Simple payback (yrs)	NPV	IRR
Buy more efficient vehicle by	10 mpg	$ 2,000	7.0	2.2	$ 760	2.6	$5,843	31%
Driving less per week by	20 miles		7.0	0.7	$ 211			
Reduce driving speedy by	5 mph		7.0	0.6	$ 207			
Keep tires inflated			7.0	0.2	$ 73			
Total		$ 2,000	7.0	3.6	$ 1,251	1.1	$ 10,825	55%

ACCURACY vs EFFECTIVENESS TRADEOFFS



1 Intro | 2 Transport | 3 Housing | 4 Food | 5 Goods/Services | 6 Action

Load previous session F.A.Q.

1. Start with your home economic information

Select U.S. State

Select

Nearest major U.S. city or region

Select

How many people live in your household?

Select

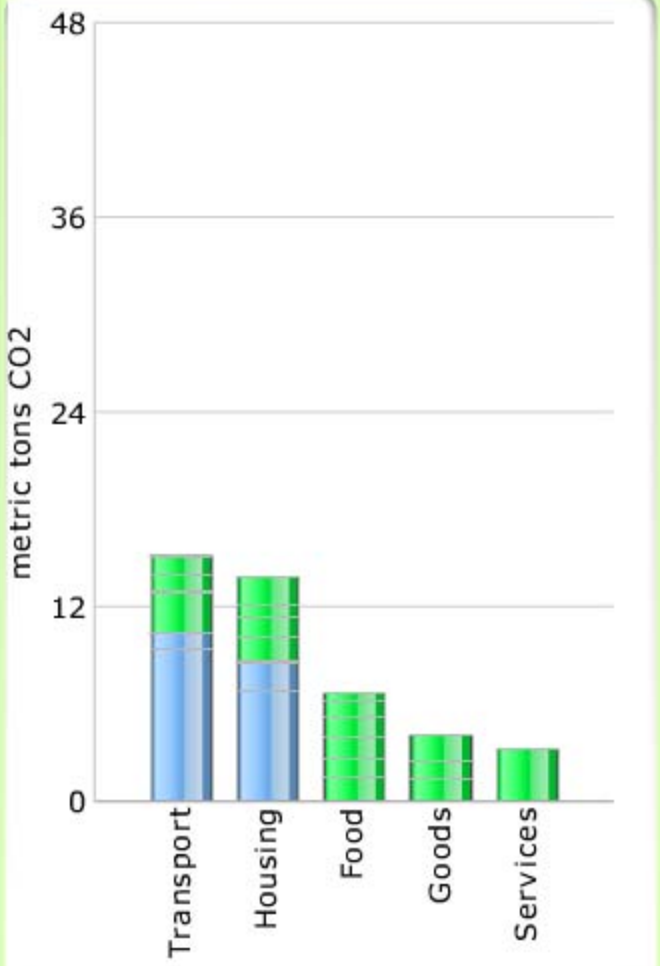
What is your gross annual household income?

Select

This info can not be viewed by others. Learn more

- Click "Transportation" or other links at top to continue
- Then, either keep the "default" values or enter your own

Your Footprint: 43 tons CO2/yr



How do you compare to the averages?

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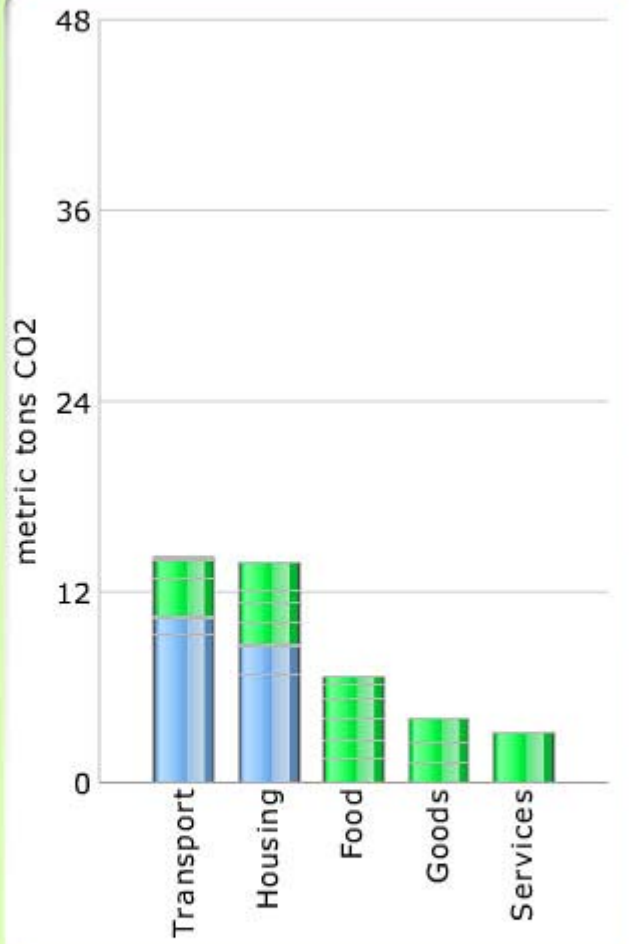

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Transportation CO2 Calculations F.A.Q.

2. How do you get around?

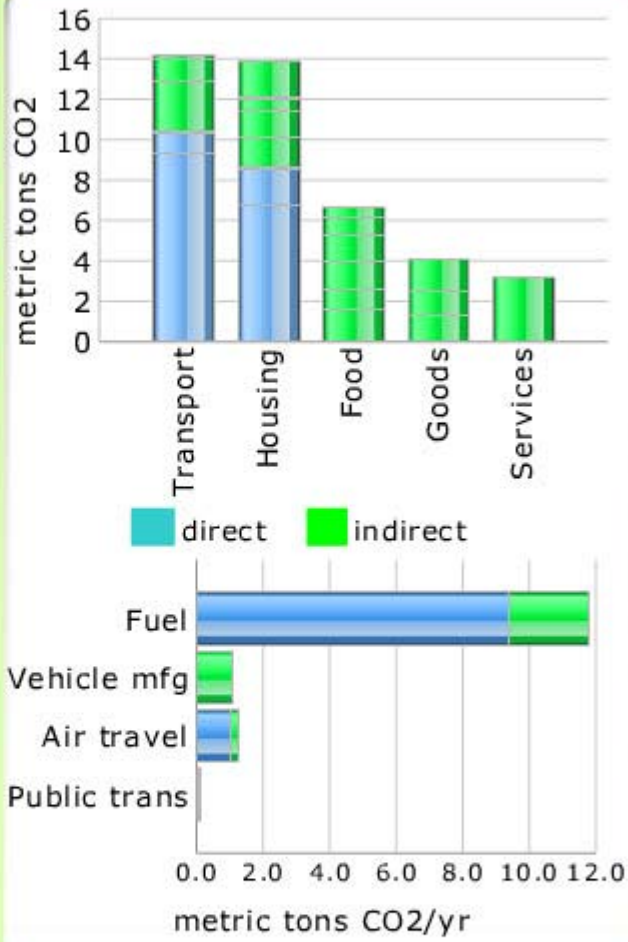
	Default / Enter		mpg	
Vehicle 1:	11200	miles/yr	20	gasoline
Vehicle 2:	9300	miles/yr	20	gasoline
Vehicle 3:	0	miles/yr	20	gasoline
Public Transit: (bus, train, metro)	450	miles/yr		

Look up mpg

Air Travel:

- ○ Miles flown per year
- ◉ Number of one-way flights
  - Short (<400 mi)
  - Medium (400-1500 mi)
  - Long (1500-3000 mi)
  - Extended (>3000 mi)

Your Footprint: 42 tons CO2/yr



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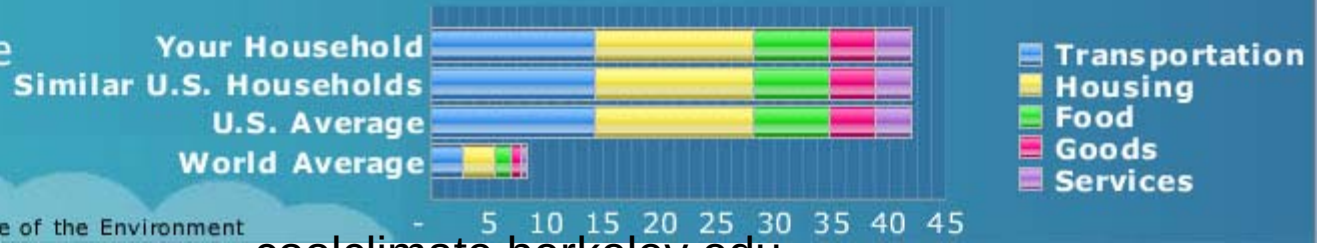

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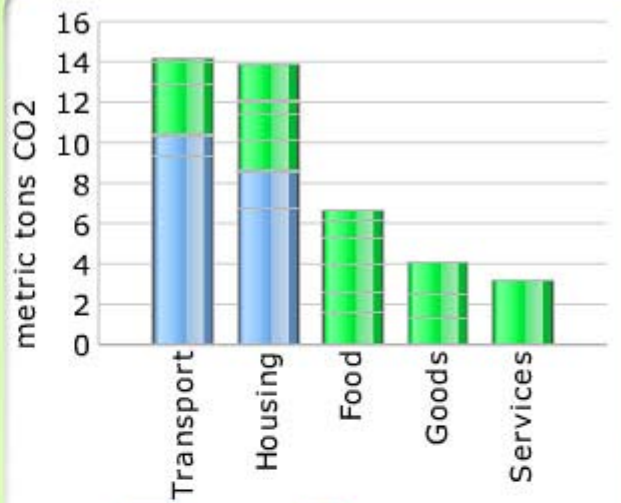
Housing CO2 Calculations F.A.Q.

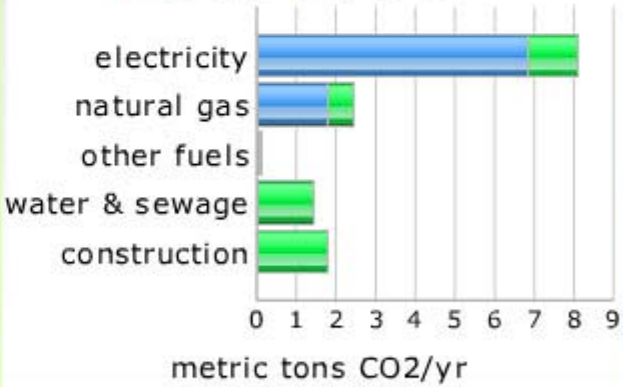
3. What do you spend Monthly on Utilitites?

	Default	You
Electricity	$ 90	
Natural Gas	$ 40	
Heating Oil or Other Fuels	$ 10	
Water & Sewage	$ 30	

Square feet in your living space: 1900

Your Footprint: 42 tons CO2/yr





How do you compare to the averages?

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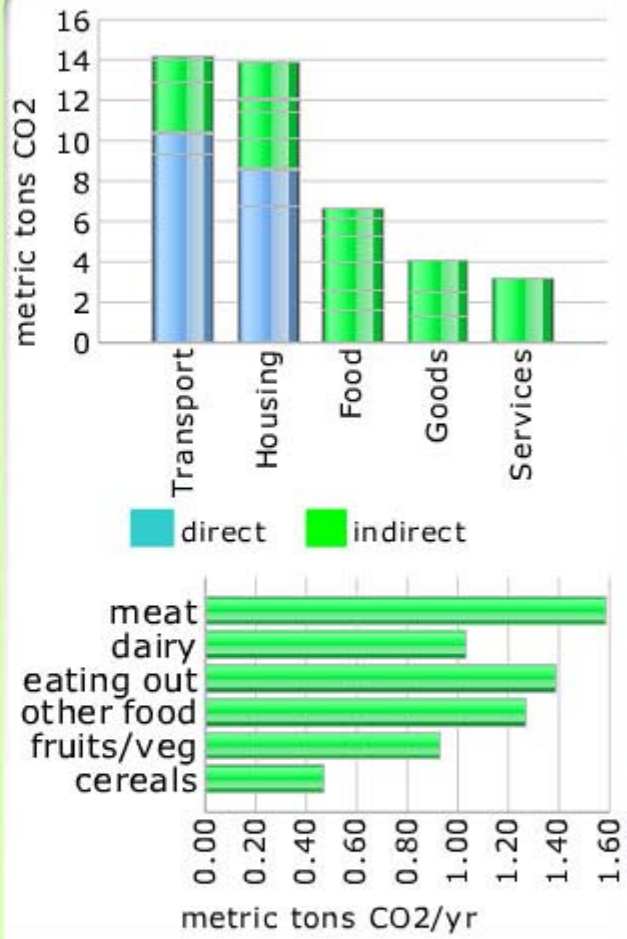
1 Intro | 2 Transport | 3 Housing | 4 Food | 5 Goods/Services | 6 Summary

Food CO2 Calculations F.A.Q.

4. How much do you spend Monthly on Food?

	Default	You
Meat, fish, & eggs	$ 90	
Dairy	$ 50	
Eating out	$ 310	
Other (snacks, drinks, etc.)	$ 230	
Fruits & vegetables	$ 70	
Cereals & bakery products	$ 50	

Your Footprint: 42 tons CO2/yr



How do you compare to the averages?

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1 Intro | 2 Transport | 3 Housing | 4 Food | 5 Goods/Services | 6 Summary

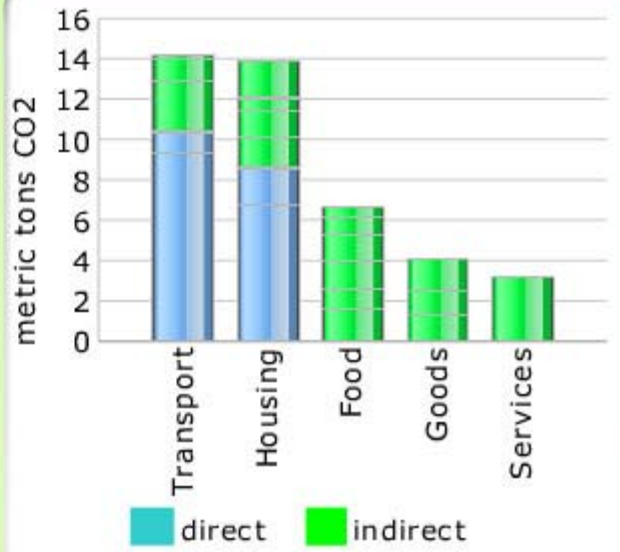
Goods/Services CO2 Calculations F.A.Q.

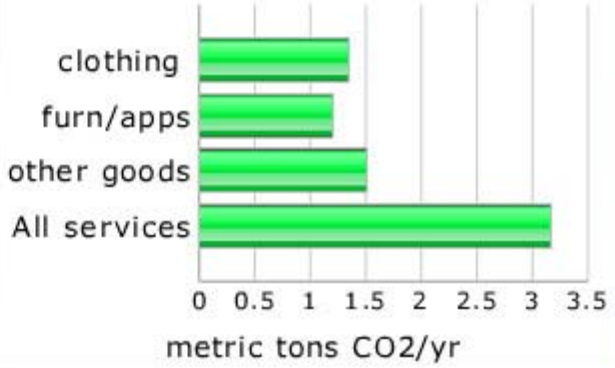
5. What do you spend Monthly on Goods & Services?

	Default	You
Clothing	$ 260	
Furniture & appliances	$ 220	
Other goods	$ 370	
All services	$ 1480	

Find out what's in each category here

Your Footprint: 42 tons CO2/yr





How do you compare to the averages?

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F.A.Q.

6. Emissions Summary (tons CO2/yr)

	World Average	U.S. Average	Similar U.S. Households	Your Household
Transportation	3	14	14	14
Housing	3	14	14	14
Food	1	7	7	7
Goods	1	4	4	4
Services	1	3	3	3
Total	8	42	42	42

How do you compare to other households?

OK, you emit 100% of similar US households,
but you emit 500% of the global average.

Your emissions are equivalent to:

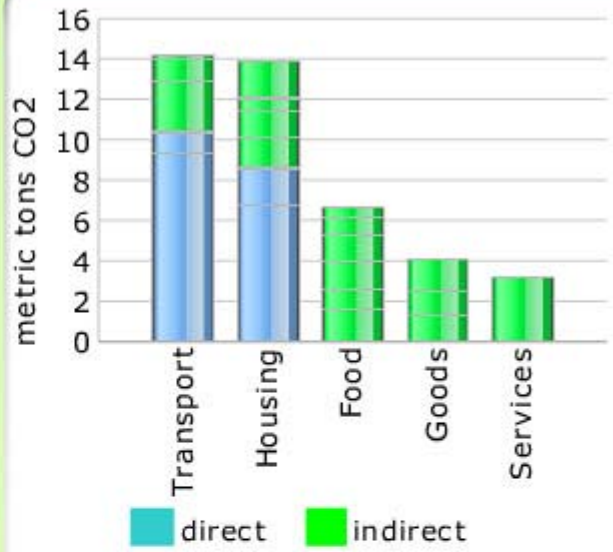
98 barrels of oil
planting & managing 8 acres of forest

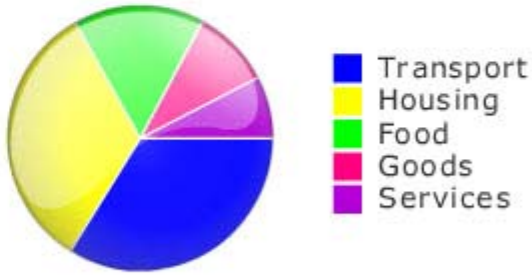
More equivalencies

save & load scenarios on your computer

More info

Your Footprint: 42 tons CO2/yr





How do you compare to the averages?

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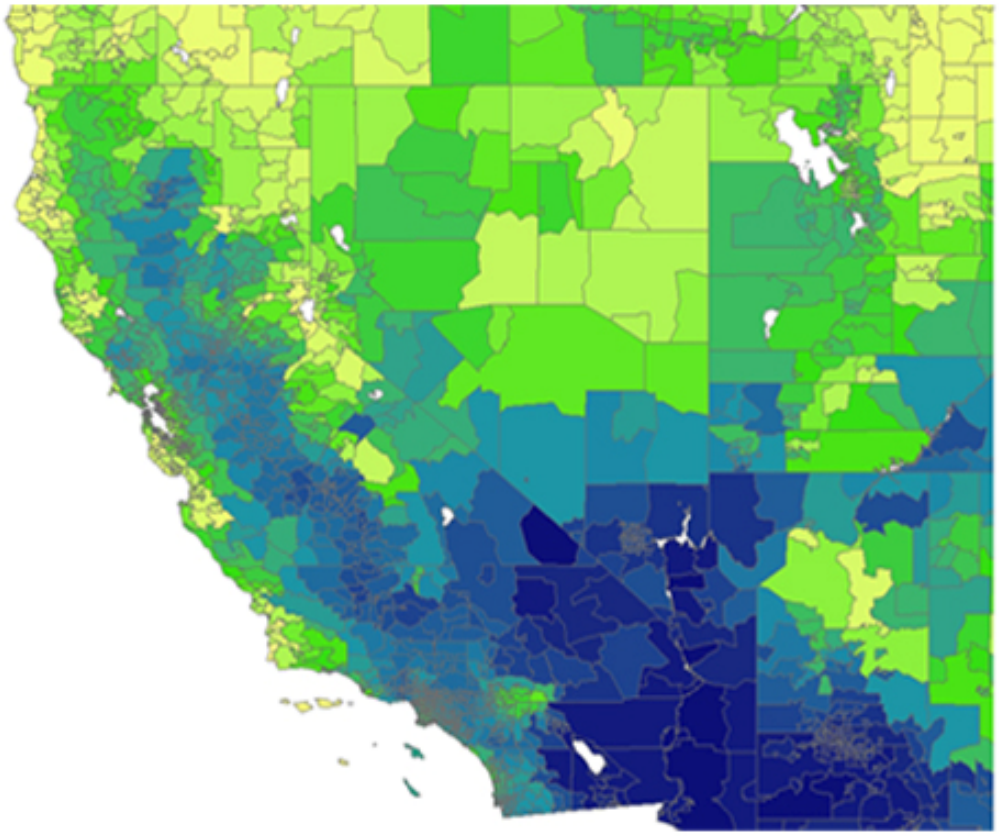
CARBON FOOTPRINT MAPPING TOOL

Type: Housing - Energy

Indicator: Heating Degree Days

Show data: % by county # by county # by zip code

Update Map Start Over



Map Tools **Pan**

Zoom in

Zoom out

Reposition

Print

Heating Degree Days
(by county)

- 0
- 1-99
- 100 - 499
- 500 - 999
- 1,000 - 4,999
- 5,000 - 19,999
- 20,000 - 49,999
- 50,000 - 99,999
- 100,000 - 499,999
- 500,000 - 999,999

Layers

- Cities 500K+
- Cities 100K+
- Highways
- Rivers & lakes
- State names
- County names

Update map

Tabular data

WHAT FACTORS INFLUENCE CARBON FOOTPRINTS?

Electricity & Natural Gas:
- Price of energy
- Temperature
- Size & structure of homes
- US State of Residence
- Energy Mix…

Vehicle Miles – Gasoline:
- Population density
- Access to PT
- Location of jobs
- Income
- # adult drivers…

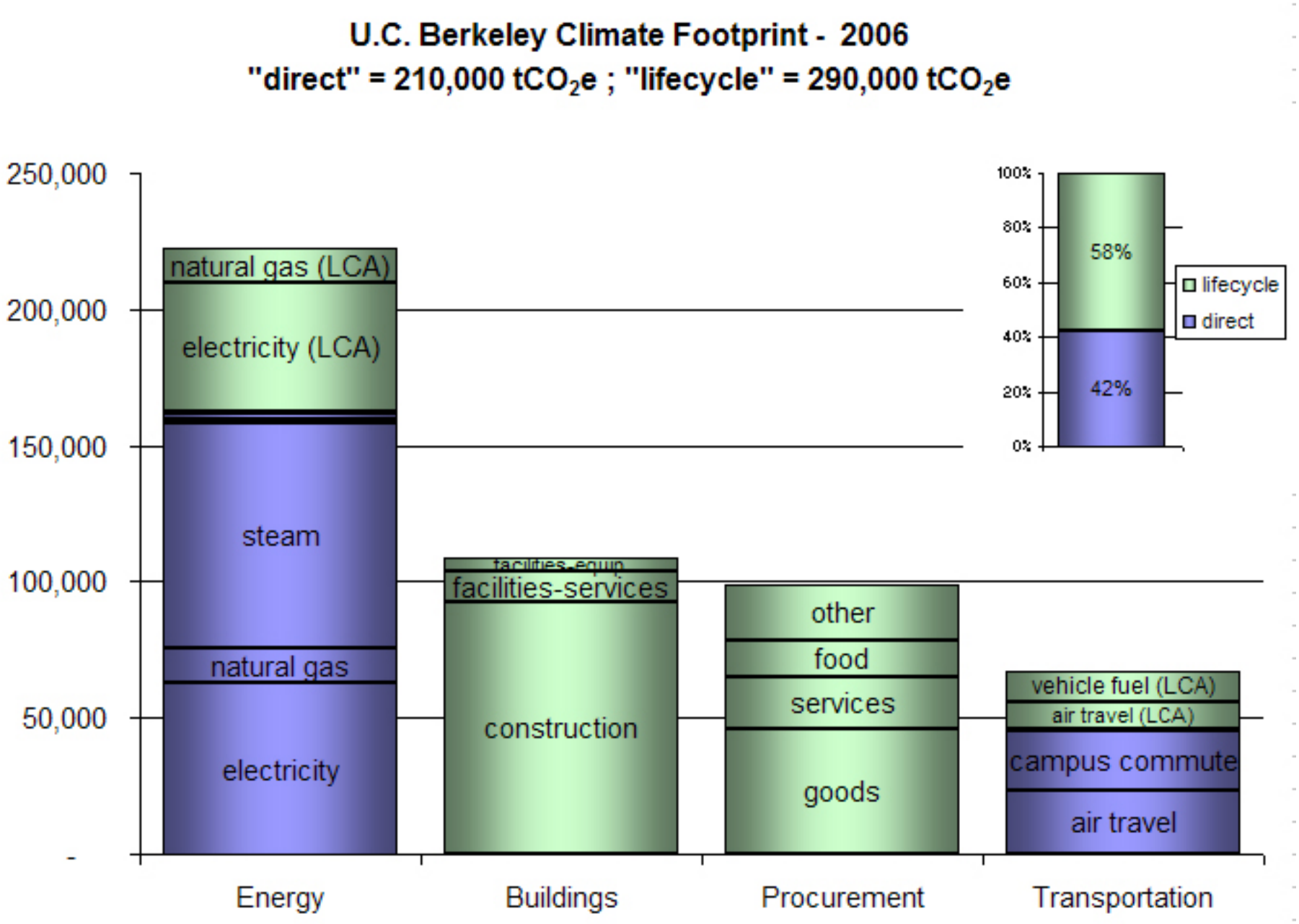
Food, Goods, Services
- Income
- Location…

Climate Action Planning Tools for Businesses

Benchmarking
- Sector of the Economy
- Annual Revenues
- Location of facilities

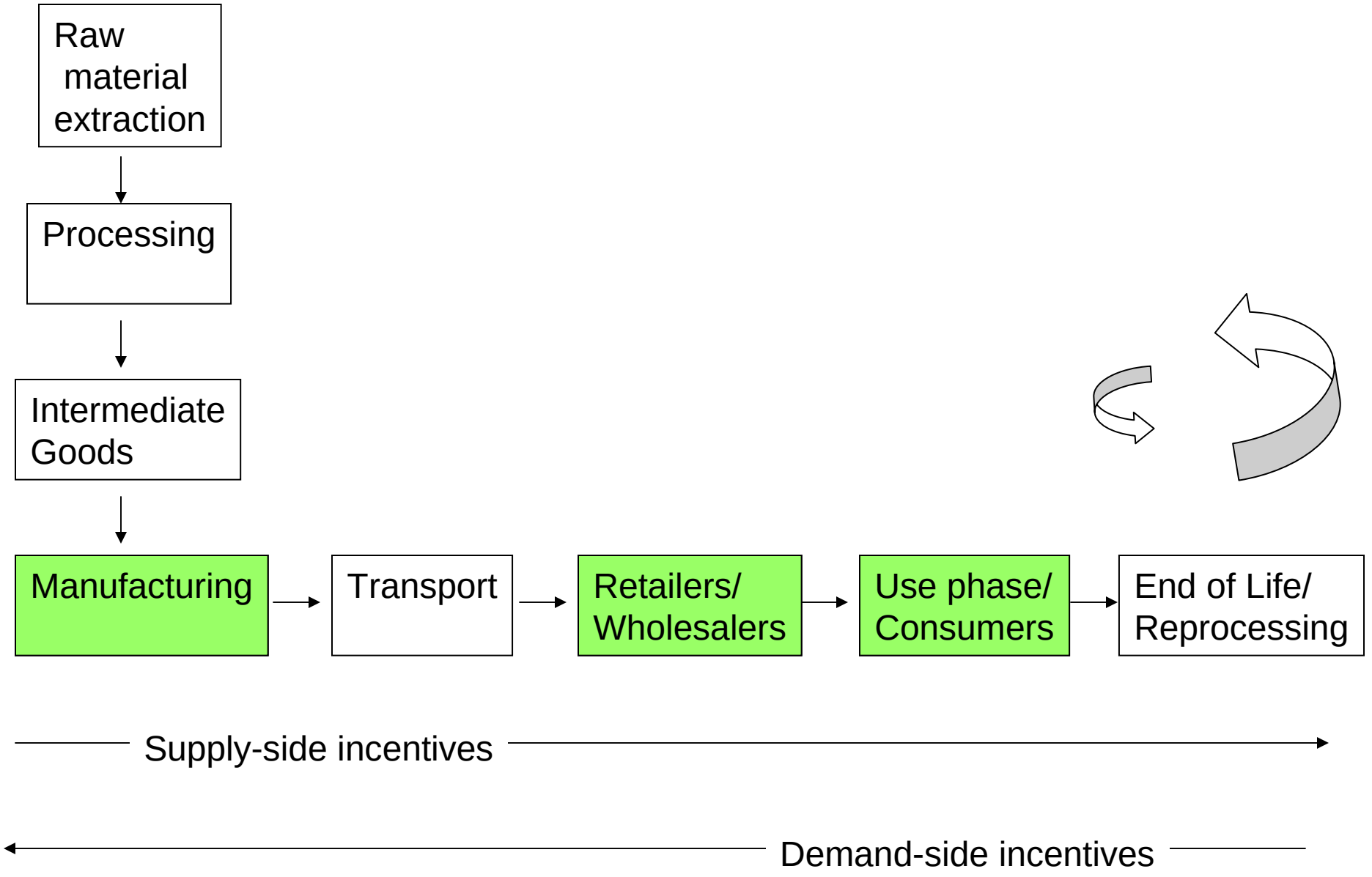
GHG Inventory:
Scope 1. Direct (boilers, vehicle fuel, etc.)
Scope 2: Purchased energy
Scope 3: Everything else (supply chain, commute, air travel, etc)

Climate Action Planning
- List of actions with quantitative assessment of GHG & $ cost/savings



Source: Economic Input-Output Life Cycle Assessment (eiolca). Green Design Institute, Carnegie Mellon U. www.eiolca.net
Working Paper: Jones, Kammen, McGrath, 2008. ***Consumer-oriented Life Cycle Assessment of Goods & Services***

Product Life Cycle Framework



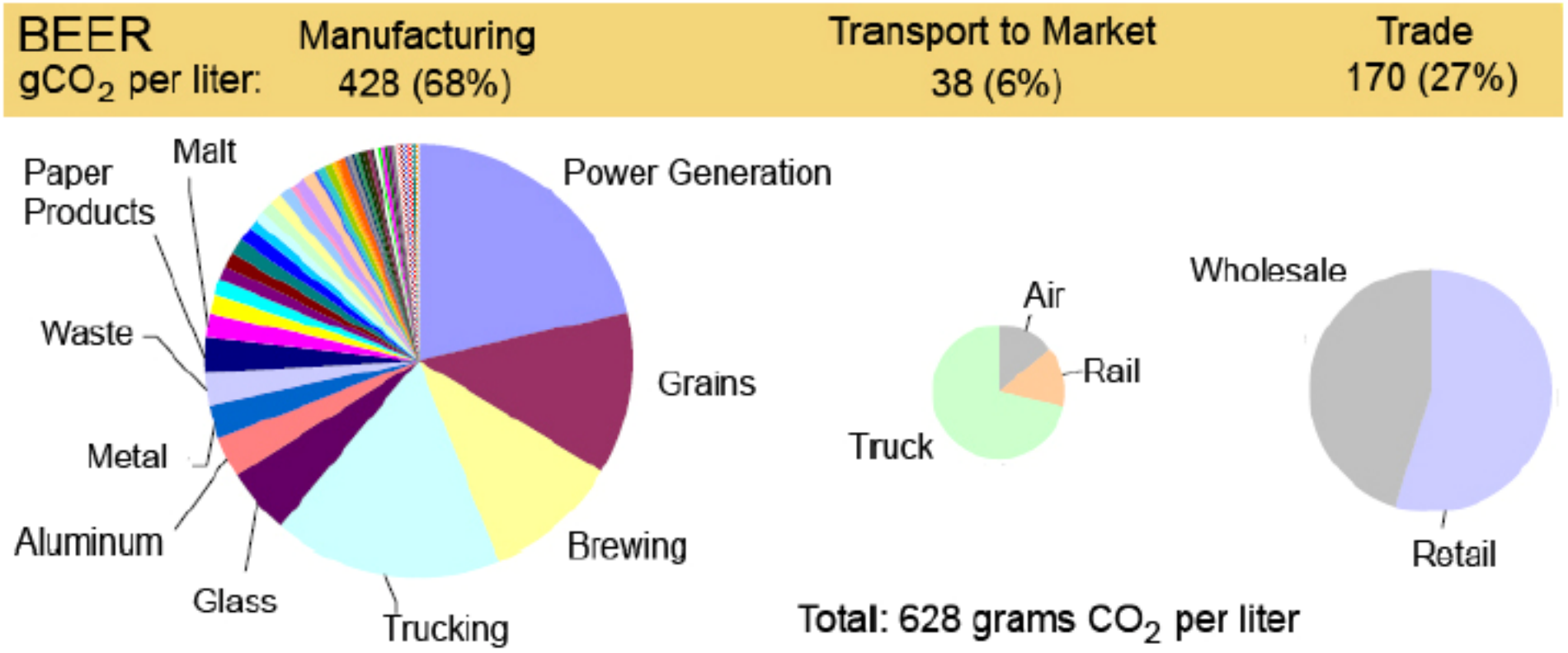
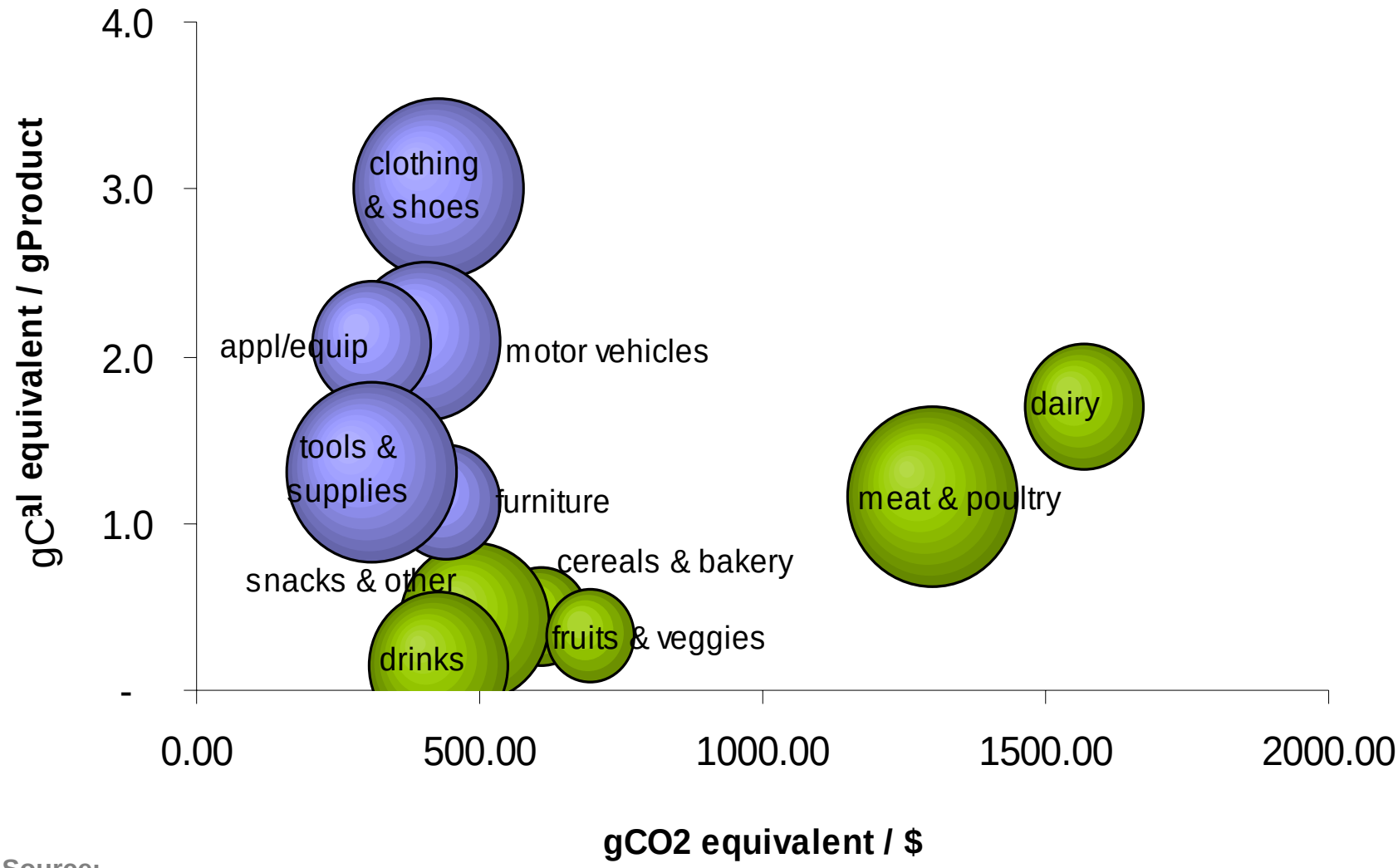


Figure 5. Greenhouse gas emissions from manufacturing, transport and sale of beer

Source:
Economic Input-Output Life Cycle Assessment (eiolca). Green Design Institute, Carnegie Mellon U. www.eiolca.net
Working Paper: Jones, Kammen, McGrath, 2008. *Consumer-oriented Life Cycle Assessment of Food, Goods & Services*

Greenhouse Gas Emissions from Food, Goods & Services



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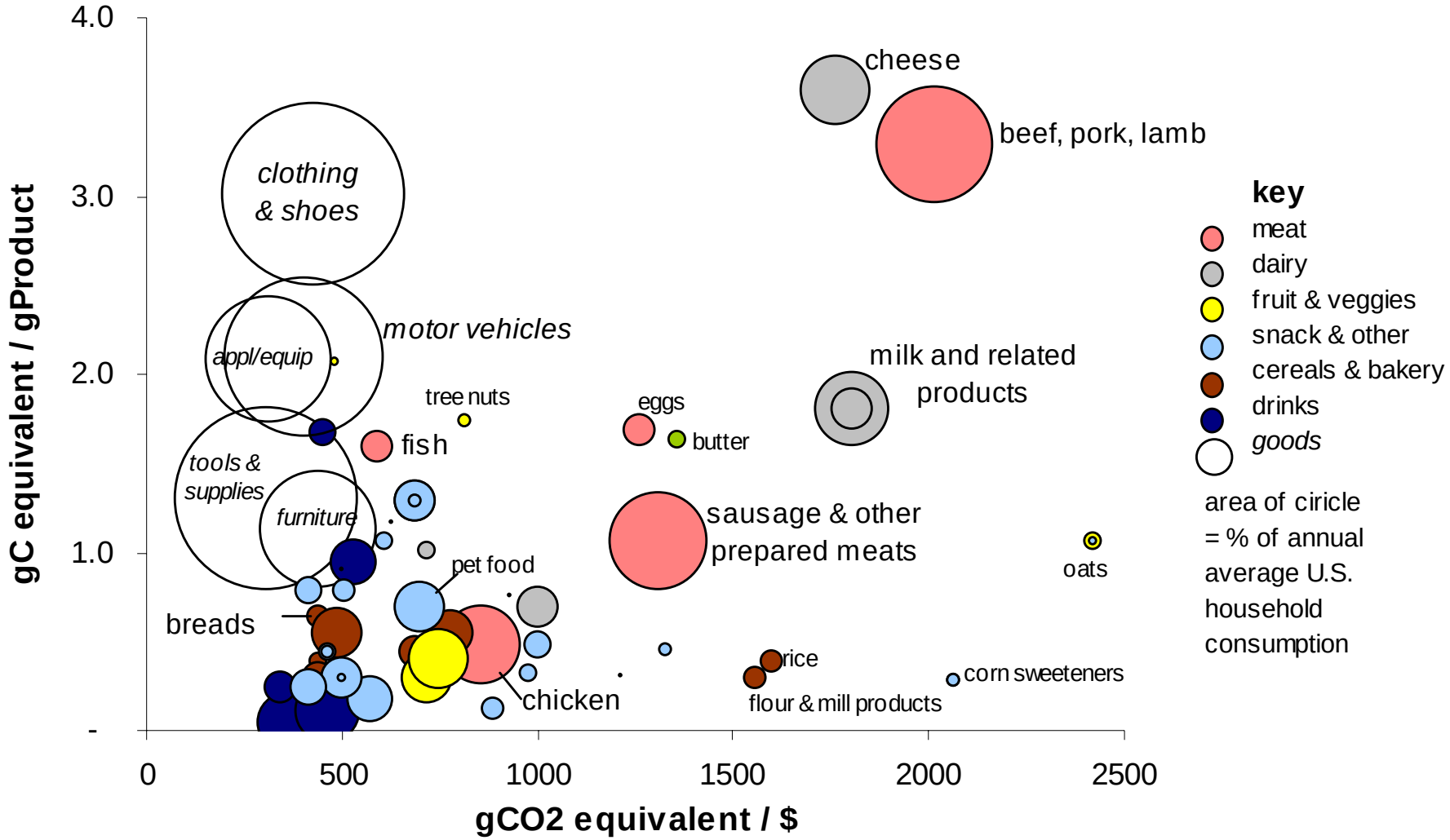

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COOLCLIMATE NETWORK

1. **CoolClimate Webservice & templates**
2. **Pre-publication carbon reduction strategies**
3. **Networking events (Fall and Spring)**
4. **Online database and community**
5. **Sponsored research**
6. **Licensing opportunities**

http://coolclimate.berkeley.edu

Thank you!

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http://coolclimate.berkeley.edu

THE BERKELEY INSTITUTE OF THE ENVIRONMENT

UNIVERSITY OF CALIFORNIA, BERKELEY

CoolClimate

Carbon Footprint Calculator

Overview of the CoolClimate Calculator

http://coolclimate.berkeley.edu

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