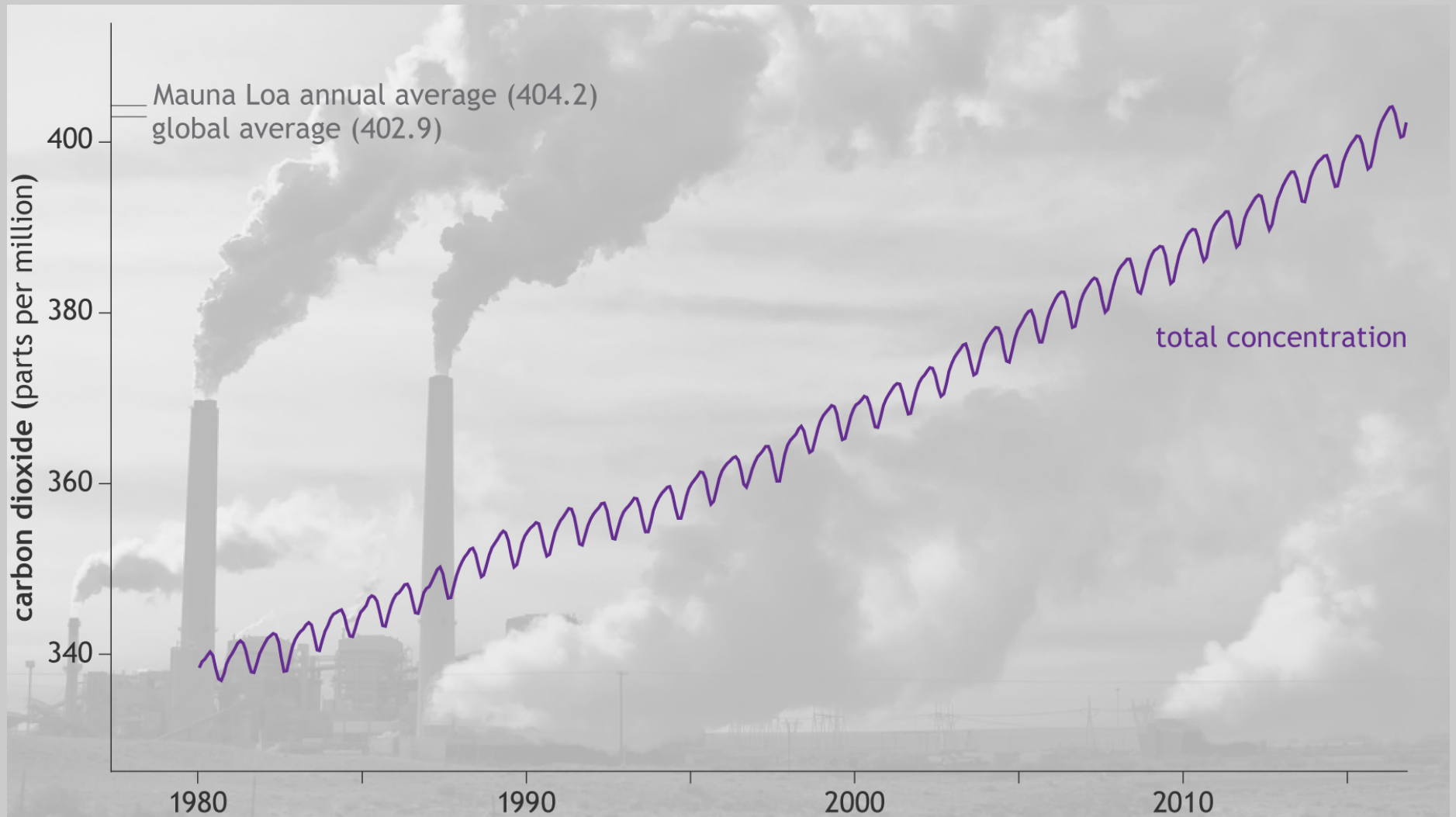


# SIGPLAN and Climate Change

A report from SIGPLAN's  
ad hoc committee on climate change

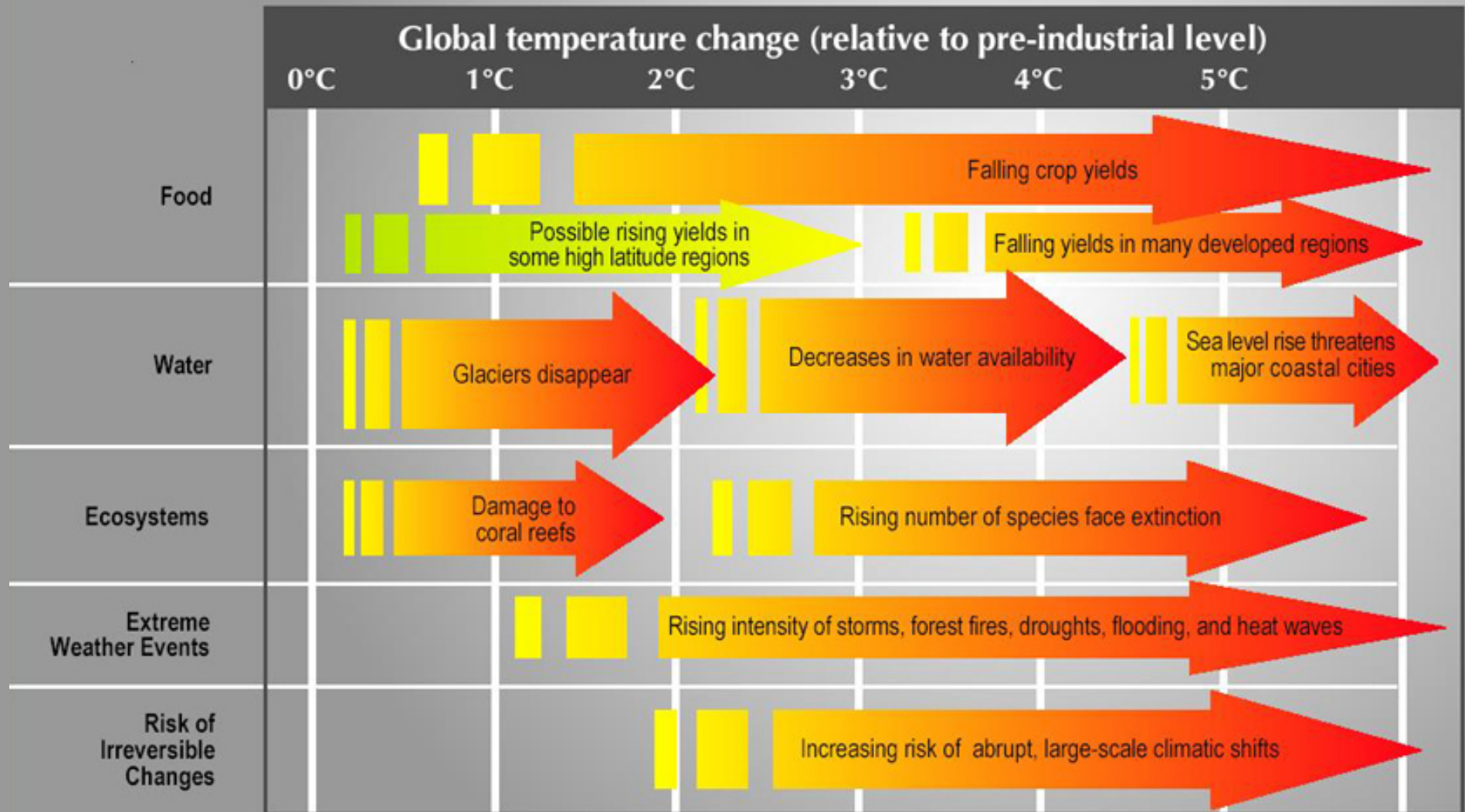
Michael Hicks  
Jens Palsberg

Crista Lopes  
**Benjamin Pierce**



# Annual global temperatures from 1850 to 2017

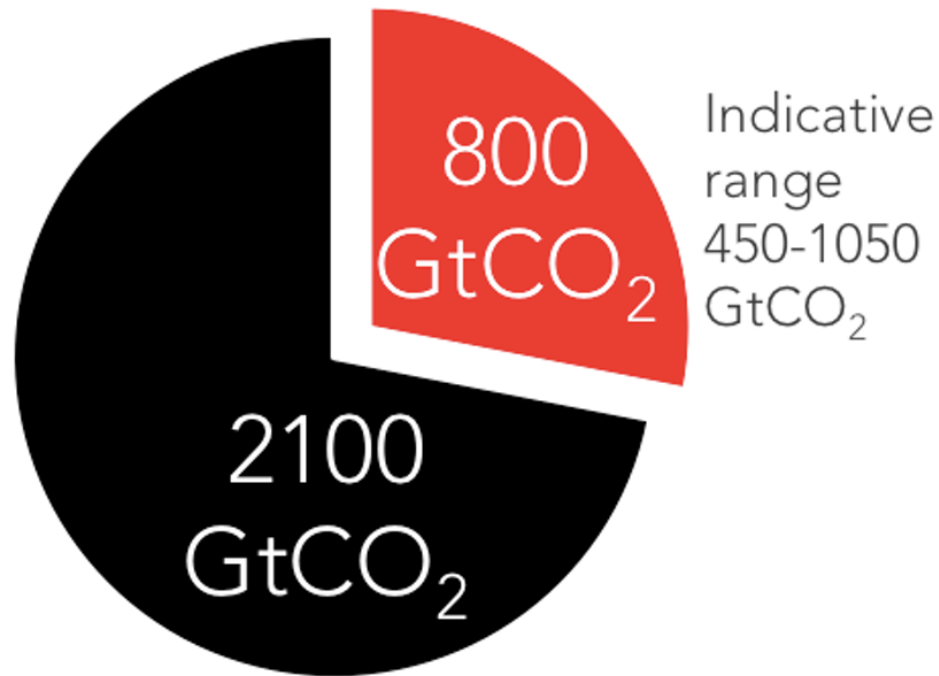
# Projected Impacts of Climate Change



adapted from Stern, 2006)



<2.0°C



Probability >66%

**For a 66% chance of keeping global temperature below 2° above pre-industrial levels, we can emit 2900 billion tons of CO<sub>2</sub>e total.**

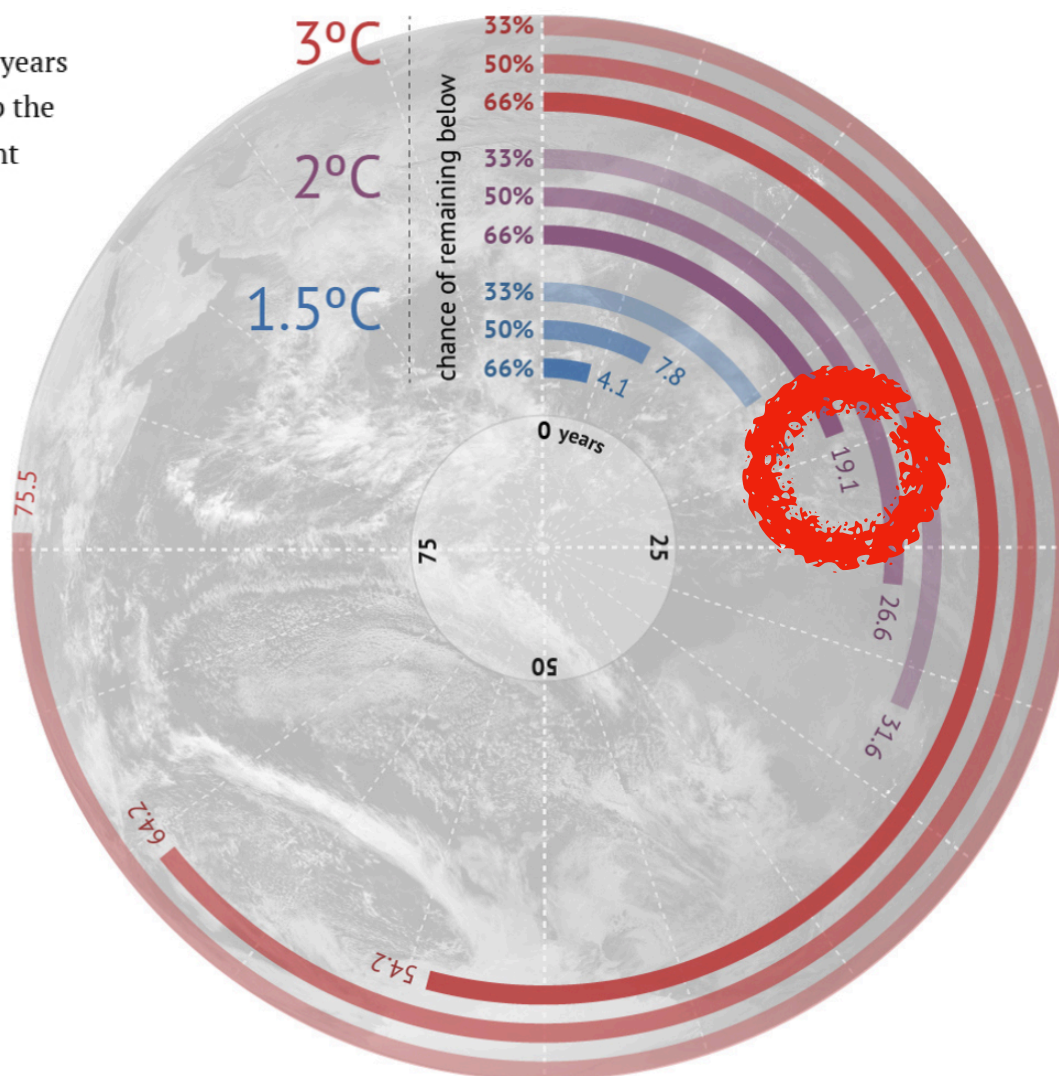
**We've already emitted 2100 billion tons.**

**We have 800 billion left.**

**800,000,000 t**

**How much is that?**

As of the start of 2017, how many years of current emissions would use up the IPCC's carbon budgets for different levels of warming?



**CarbonBrief**  
CLEAR ON CLIMATE

Photo: NASA Goddard Space Flight Center  
Stopwatch icon: T-Kot/Shutterstock.com

$$\frac{800 \text{ Gt}}{7 \text{ G people}} = 114 \text{ t / person}$$

**How fast am I using up my budget?**

**19 t / year**

$$\frac{114 \text{ t}}{19 \text{ t / year}} = 6 \text{ years}$$

$$\frac{114 \text{ t}}{19 \text{ t / year}} = 6 \text{ years}$$

**Yikes**

**Nothing?**

**Hope for a  
technological  
breakthrough?**

**What to do?**

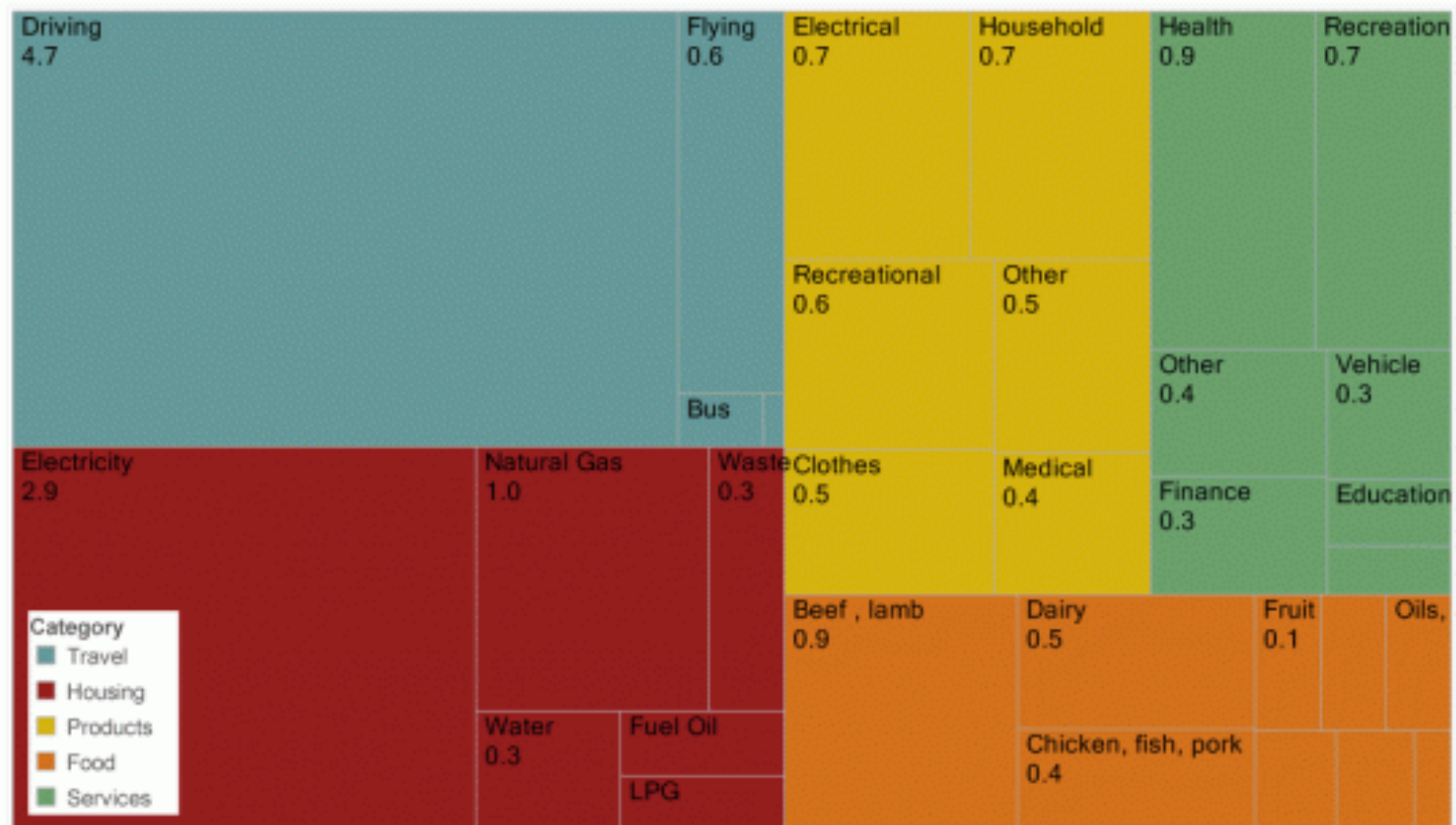
**Vote?**

**Figure out what action I  
can take that will make  
the most difference**



## Average American Carbon Footprint (2010)

**Total: 19t CO<sub>2</sub>e**

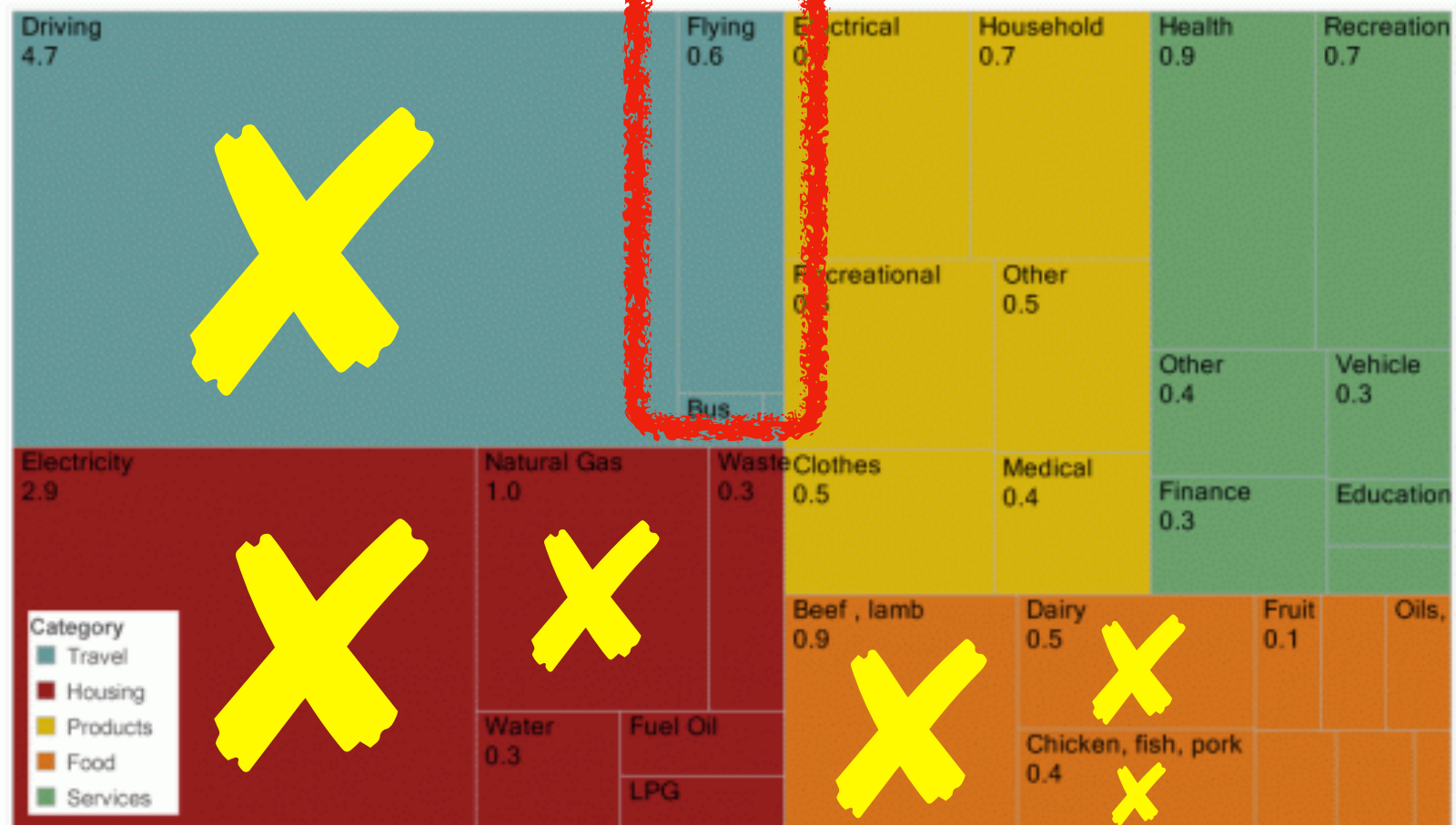


Note: these are emissions from personal consumption. Government and capital expenditure account for a further 5 t CO<sub>2</sub>e.

[shrinkthatfootprint.com](http://shrinkthatfootprint.com)

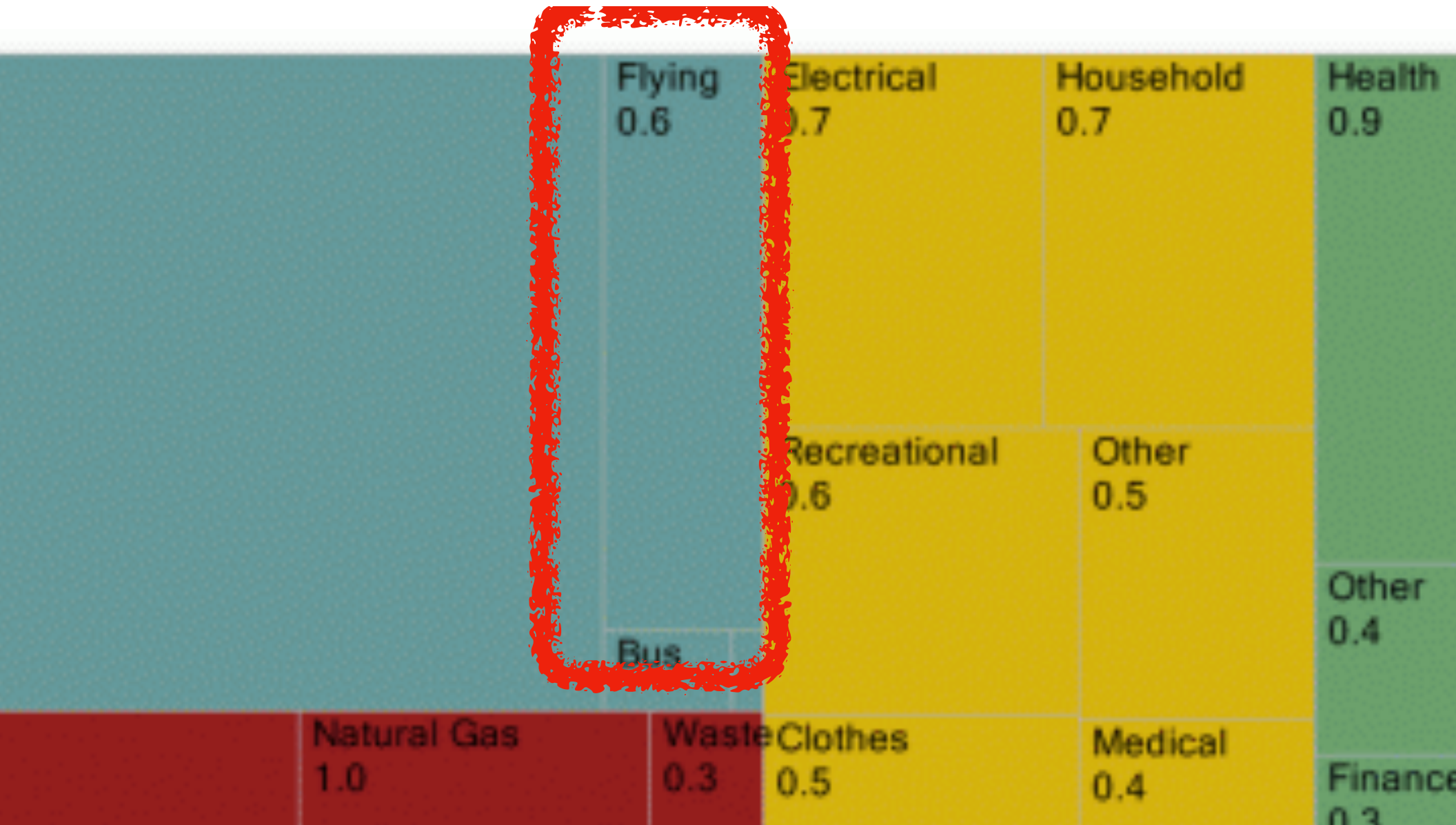
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**.6 t ?**

**.6 t ?**

**Philly ↔ Chicago**

**.5 t**

**Philly ↔ San Francisco**

**1.2 t**

**Philly ↔ Paris**

**1.7 t**

**Philly ↔ Tokyo**

**3 t**

**Philly ↔ Melbourne**

**4.7 t**

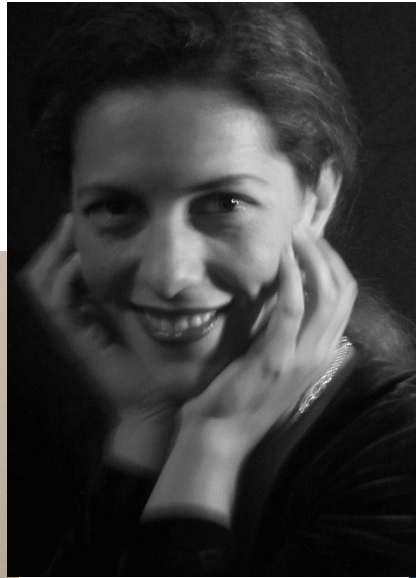


a useful  
Is SIGPLAN the right  
place to address this  
problem?





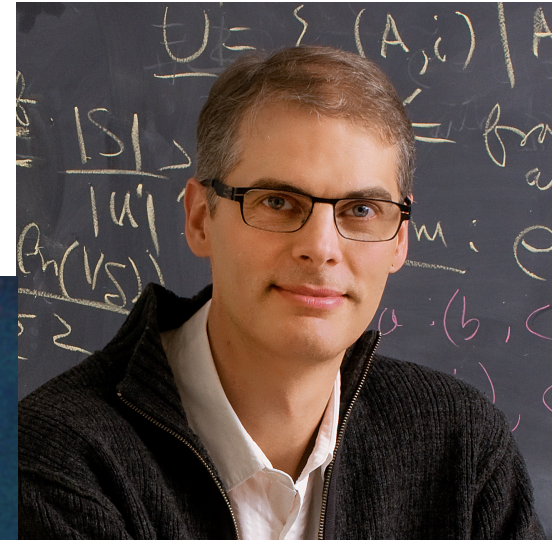
**Mike Hicks**



**Crista Lopes**



**Jens Palsberg**



**Benjamin Pierce**

## **The SIGPLAN climate committee**



# **Engaging with Climate Change: Possible Steps for SIGPLAN**

**Preliminary Report of the SIGPLAN Climate Committee**

Michael Hicks

Crista Lopes

Benjamin C. Pierce

## **Carbon Offsets**

**An Overview for Scientific Societies**

Richard Kim and [Benjamin C. Pierce](#)

# What are carbon offsets?

- An **offset provider** is willing to do something that will *prevent*  $X$  tons (of CO<sub>2</sub> or other greenhouse gases) from being emitted or *capture*  $X$  tons from the atmosphere
  - plant trees, capture methane from cows or natural gas extraction, give people cookstoves that they can use instead of open fires, etc., etc.
- I want to take a **flight**, which is going to emit  $X$  tons
- I **pay** them  $\$Y$  and take my flight

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  - (plant trees, capture methane from cows or natural gas extraction, give people cookstoves that they can use instead of open fires, etc., etc.)
- An **offset verifier** certifies that the offset is real (i.e., *permanent*, *additional*, and *verifiable*)
- An **offset vendor** aggregates these offset projects and collects money from individuals and organization that want to fund them
- I want to take a **flight**, which is going to emit  $X$  tons
- I **pay** the **vendor**  $\$Y$  and take my flight

## How would it work for SIGPLAN?

- PLDI registration fee is increased by (say) \$40, with an option to opt-out
- General chair chooses a carbon vendor and gives them this money
- PLDI 2019 is carbon-neutral

# Why is this a good idea?

- Short-term action that makes a concrete difference
- Buys time for developing longer-term strategies
- No other way for (physical) conferences to get to zero net emissions
- Puts a price on carbon emissions

## **SIGPLAN and ACM have a *responsibility* and an *opportunity* to lead in this area...**

- Because our scientific activities have a significant carbon footprint, which must be balanced against the benefits of what we're doing
- Because we as scientists have a special responsibility to take the warnings of other scientists seriously, as well as a special ability to evaluate them
- Because we can be a model for other scientific (and non-scientific) organizations

# How can I help?

Questions?

- **Talk to us!**
  - *Especially if you disagree with any or all of the above!!*
- Fill out the post-PLDI **survey** (with support, concerns, suggestions, etc.)
- Take a look at our **reports**, leave comments, contribute ideas
- Join the **acm-climate mailing list**
- **Calculate** your own carbon footprint
- **Offset** your travel to PLDI
- Lots more / bigger projects... **Talk to us!!**

