Everybody talks about the weather, but nobody does anything about it.

Mark Twain
Everybody talks about climate change, but what can I do about it?

Paul Beier
Symposium: Ecological responses to rapid climate change
The Good News
Modest expansion & more connectivity of our protected network may conserve most biodiversity.
Symposium: Ecological responses to rapid climate change

... but ...

... only if we start to REVERSE trends in GHG emissions TODAY.
So how do we reverse emissions of greenhouse gases (GHGs)?

**Estimate** your contributions to GHGs.

**Reduce** your GHG emissions.

**Replace** GHG-producing energy with clean alternatives.

**Offset** what you can’t replace or reduce (store the same amount of carbon).
Environmental mantras

Waste management: **Reduce, Re-use, Recycle**

Environmental impacts: **Avoid, Minimize, Mitigate**

Greenhouse gasses: **Reduce, Replace, Offset**
What do these mantras have in common?

Waste management: Reduce, Re-use, Recycle

Environmental impacts: Avoid, Minimize, Mitigate

Greenhouse gasses: Reduce, Replace, Offset

1. The most important action is listed first.

2. The most popular action is listed last.
Because I want to be popular, I’ll start with Offsets.

**Reduce** or avoid emissions of GHGs.

**Replace** GHG-producing energy with clean alternatives.

**Offset** what you can’t replace or reduce (by storing the same amount of carbon).
95% of GHG emissions from jet fuel burned to get 2,000 people to our annual meeting

Decided to offset starting with 2007 annual meeting

Also wanted a project with direct benefit to biodiversity

And poverty reduction

Chair of the new Carbon Offset Committee didn’t know the atomic weight of carbon
We found a win-win-win project!

Restoration of Thicket
Baviaanskloof MegaReserve,
Republic of South Africa
Baviaanskloof (‘Baboon Valley’) Megareserve

- South Africa’s 3rd largest natural area
- World Heritage Site
- The project will provide 3 benefits.
  - Store carbon
  - Enhance biodiversity
  - Reduce poverty
Demonstrated Carbon Storage

Most carbon will be stored in thicket vegetation dominated by *Portulacaria afra* (elephant bush)

Rigorous estimates of Carbon storage per hectare.
Subtropical thicket is a *globally* endangered plant community; 6,200 of its plant species are found nowhere else in the world (68% of its plants)
Areas overbrowsed by goats will not recover without active restoration.
Poverty Reduction

All workers are from poor villages (40% unemployment rate).
Invest *your* offset dollars in this project at [www.conbio.org](http://www.conbio.org)

More info on triple-benefit projects at Climate, Community, & Biodiversity Alliance [www.climate-standards.org](http://www.climate-standards.org)
A 2-person household can offset its GHG impact for about $500/year.

Wow! That seems too easy!

It *is* too easy!
We cannot offset our way out of climate change.

No offset stores carbon in a form as stable as coal!

$\text{CO}_2$ is not the only GHG – atmospheric chemistry is complex!

Offsets are a last resort for emissions we cannot avoid.
Quiz

(a) An offset is a last resort for GHG emissions I can’t avoid.

(b) An offset is a license to pollute.

(c) An offset is an excuse to avoid confronting my addiction to fossil fuel.
My household plan (May 2006-May 2009)

**Reduce** energy use by 50%.

**Replace** 80% of our remaining energy use with forms of energy that do not emit GHGs.

Pay $50/year to **offset** our remaining impact (air travel).
Reduce energy use by 50%

<table>
<thead>
<tr>
<th>Action</th>
<th>Reduction from 2005</th>
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<tbody>
<tr>
<td>Upgrade light bulbs, Energy Star appliances, windows</td>
<td>15%</td>
</tr>
<tr>
<td>Downsized house 2000 →1200 ft²</td>
<td>25 %</td>
</tr>
<tr>
<td>Bicycling to work</td>
<td>15%</td>
</tr>
</tbody>
</table>
Reduce energy use by 50%

Every dollar spent on reduction pays for itself, even when future savings are discounted to the present.

Reduction is NOT PAINFUL!! I have a better, healthier lifestyle. These are no-regret steps.
My household plan (May 2006-May 2009)

**Reduce** energy use by 50% - achieved 55%!

**Replace** 80% of our remaining energy use with forms of energy that do not emit GHGs.

Pay $50/year to **offset** our remaining impact.
**Replace** 80% of remaining energy with renewable sources

Solar panels (3 kW) in June 2008: our home produces more electricity than we use

Switch from gas heat to renewable heat by May 2009
The downside of replacing 20¢/kWh (versus 9¢ from APS).

Only rich people like me can make the up-front cash investments ($11,000 for 3kW).

The cost is not an excuse for me not to act – it’s the reason we need to make clean alternatives affordable for all.
Can I be done yet?

Household
- Reduce: ✔️
- Replace: ✔️
- Offset: ✔️

Employer
- Reduce: ⚠️
- Replace: ⚠️
- Offset: ⚠️

SCB
- Reduce: ⚠️
- Replace: ⚠️
- Offset: 🔴

Other orgs
- Reduce: ⚠️
- Replace: ⚠️
- Offset: ⚠️

City, county, state…
- Reduce: ⚠️
- Replace: ⚠️
- Offset: ⚠️

Make good options available to all.
Despite all this, CO$_2$ may still hit 540ppm, causing global disaster.

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<thead>
<tr>
<th></th>
<th>Reduce</th>
<th>Replace</th>
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<tbody>
<tr>
<td>Household</td>
<td>✅</td>
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<tr>
<td>China, India</td>
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<tr>
<td>Cheaters</td>
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We can’t control the outcome of our actions.
Me: “Oh no! I should’ve…”

Kathy: “I did all I could.”
What will you be saying in 30 years?

“Oh no! I should’ve…”

“I did all I could.”