

The economics of 350:

Can we afford to respond to climate change?

Frank Ackerman

Stockholm Environment Institute-US Center

Tufts University

Society of Environmental Journalists

Madison, Wisconsin

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**The Economics of 350:
The Benefits and Costs of Climate Stabilization**

Frank Ackerman, Elizabeth A. Stanton, Stephen J. DeCanio, Eban Goodstein,
Richard B. Howarth, Richard B. Norgaard, Catherine S. Norman, Kristen A. Sheeran

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www.e3network.org



We're doomed, perhaps

- Climate policy is finally moving forward
 - Serious discussion of emission reductions underway
 - More or less (almost) heading for 450 ppm CO₂
- Climate science is moving faster
 - More and more evidence of potential harm at lower temperatures and concentrations
 - Hansen (1): doubling of CO₂ causes 6°C of warming, not 3°C as previously believed
 - Hansen (2): 450 ppm is the threshold for an ice-free earth, disastrously higher sea levels, disruption of water supply
- If climate protection requires 350 ppm, can we afford to get there from here?

IN CASE OF GLOBAL WARMING

1. MAKE SURE EVERYONE IN THE BUILDING AGREES THERE'S A FIRE.
2. BRING IN A FEW OUTSIDE SKEPTICS AND LET THEM TALK A LONG WHILE.
3. CONSIDER THAT IT MAY JUST BE A SMALL FIRE.
4. REALIZE THAT CALLING THE FIRE DEPT. ISN'T FREE, YOU KNOW.
5. LIFT HAMMER.
6. REPLACE HAMMER AND REPEAT STEPS 1-4
7. LIFT HAMMER AGAIN.
8. PAUSE TO THINK ABOUT WHO'S GOING TO CLEAN UP ALL THE BROKEN GLASS

TLS

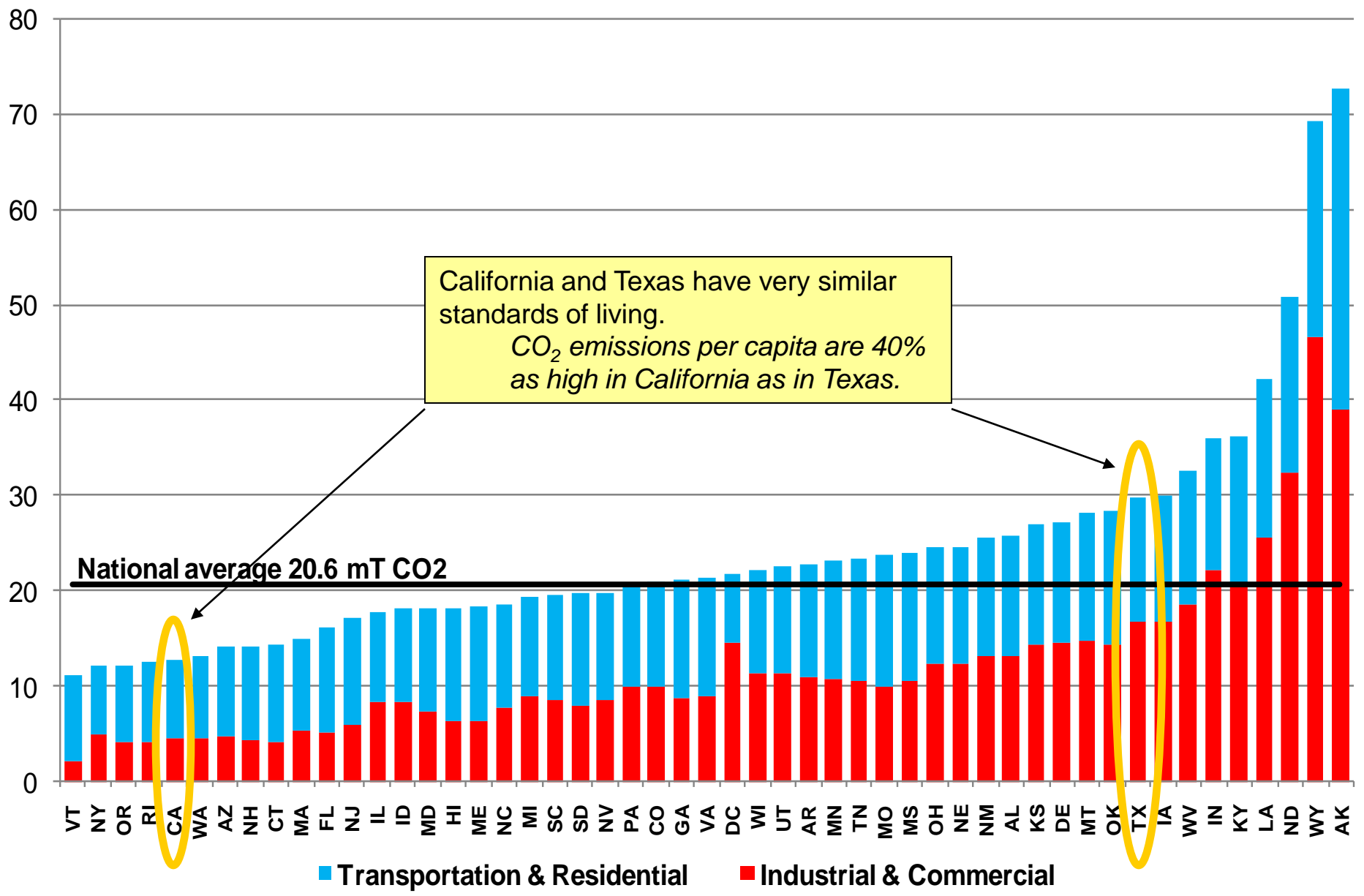
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350 ppm by when?

- We are now around 390 ppm CO₂, and rising
 - Reduction of CO₂ levels occurs very slowly
- Hansen: 350 by 2100
 - Coal eliminated, or used only with carbon capture and storage, by 2030
 - Stop deforestation / rapid reforestation
 - Negative net global emissions reached before 2050
- More gradual scenario: 350 by 2200
 - Fastest possible without negative net emissions?
 - Requires virtually all emissions eliminated by 2050-60
- More time above 350 = more risk, lower cost

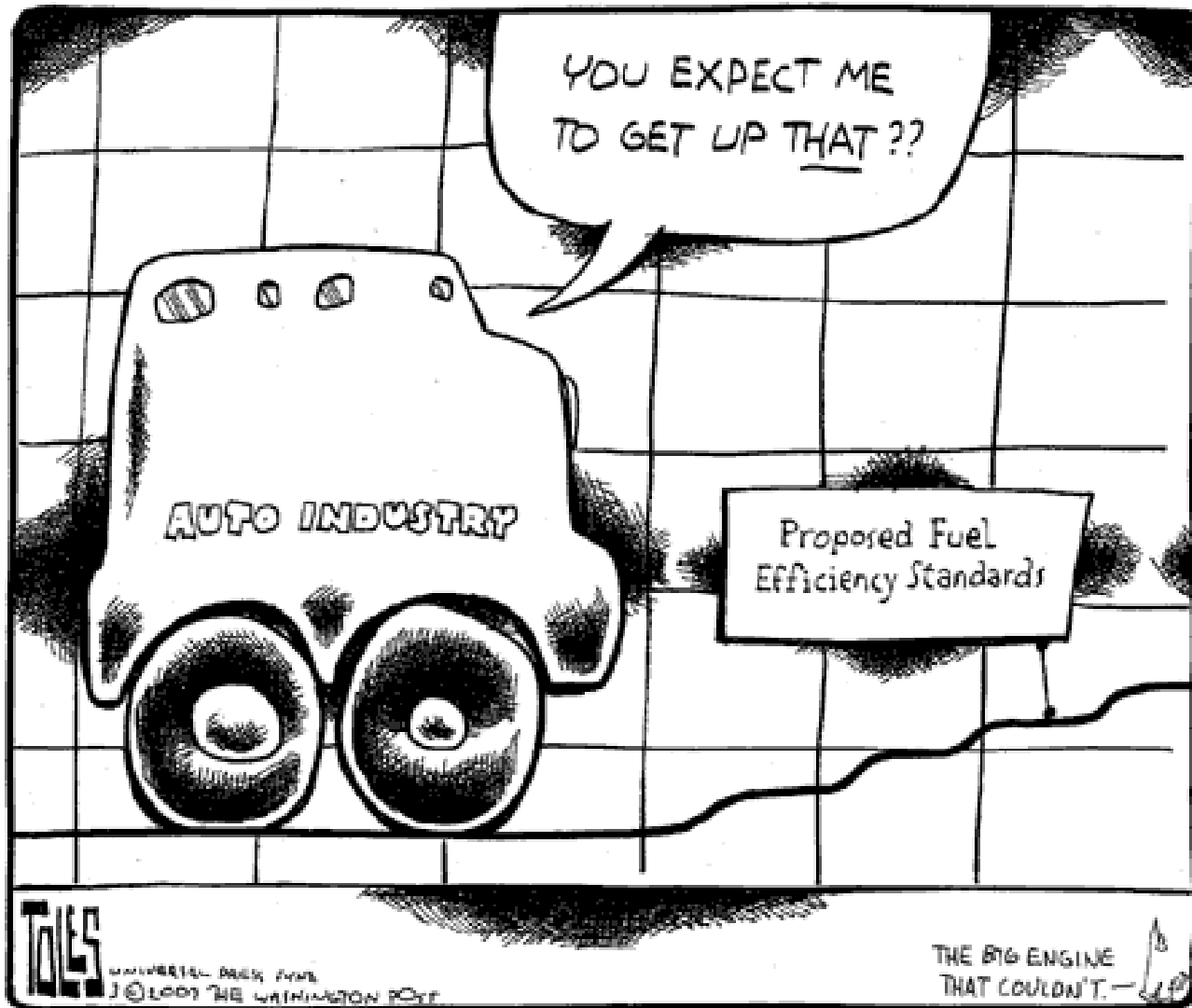
Per capita CO2 emissions by state, 2004



Cost estimates: US climate policies

- Chamber of Commerce / National Association of Manufacturers
 - Enormous, prohibitive costs for modest policies
 - Based on proprietary models (never published) and biased assumptions, market rigidity, no innovation
 - *No one else* finds costs remotely like these!
 - **See study by Eric Pooley (Harvard/Kennedy School)**
- Estimates from major modeling groups are much smaller
 - Most mainstream US policy proposals have little or no net effect on economic growth
 - They are too small to solve the climate problem – and too small to hurt the economy
 - **See survey by Keohane and Goldmark (EDF)**

Unbearable costs, in perspective



3-18-07

Modeling the costs of 350 ppm

- Most academic research to date addresses higher stabilization targets (450, 550 ppm)
- Four major modeling projects by academic research groups have projected costs of a 350 ppm target
 - One assumes starting point of high unemployment; climate policy creates jobs, speeds up economic growth
 - Others assume no change in employment; costs in the range of 1% - 3% of world output, for many years
- Varying technologies assumed to reduce emissions
 - Hydrogen fuel, carbon capture and storage, reforestation, cost reductions on renewable energy, etc.
 - None eliminate nuclear power – but none assume much expansion of it

The optimists on climate costs

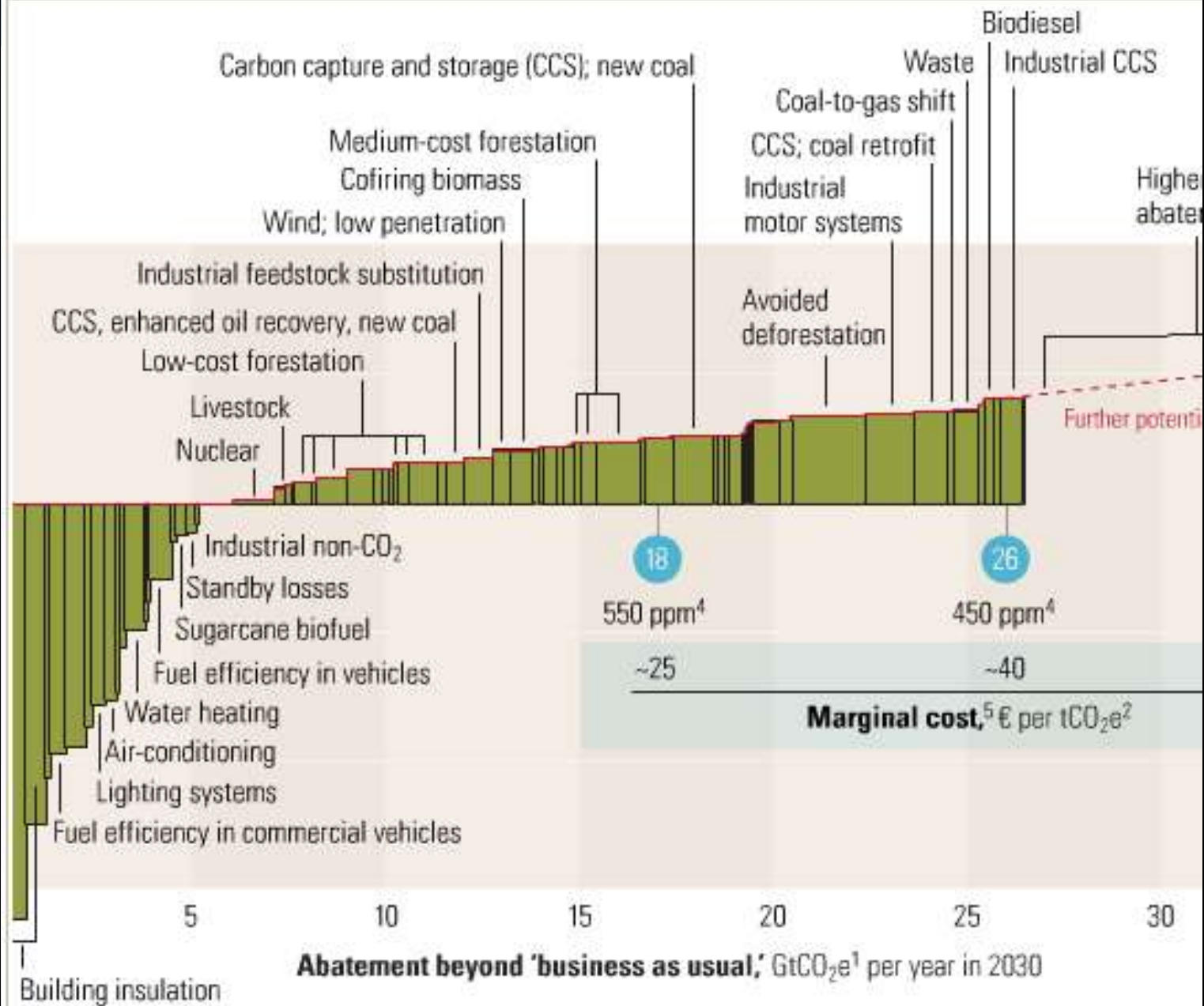
- McKinsey & co. abatement cost curves
 - Bottom-up analysis of hundreds of technical options
 - More than half of world emissions could be eliminated in 2030 at very low cost
 - Energy efficiency, low-carbon energy supplies, and forestry and agriculture – each roughly 1/3 of total potential
- Studies by environmental advocates
 - Greenpeace (global) and Union of Concerned Scientists (US) project economic savings outweigh abatement costs
 - High oil prices (lowering net cost of energy conservation)
 - Pervasive technological optimism, detailed descriptions
 - Greenpeace (alone among studies) also phases out nuclear power



What might it cost?

Costs exceed benefits

Benefits exceed costs



A big number, or a small one?

- Suppose that climate protection costs 2.5% of world output, for many years. Is that expensive?
 - Gloomy news from scientists is raising the cost of doing *nothing*, not the cost of doing something
- US economic growth averages more than 2.5% per year.
 - If we skip one year's growth, then resume, we would have 2.5% less, every year thereafter
 - Household income would double in 29 years, instead of 28
- At 10% annual growth (China), just skip 3 months' growth, then resume
 - Household income doubles in 86 months, instead of 83

Worst-case scenarios

- Average annual number of residential fires in the US = 0.4% of the number of housing units
 - The average home has a fire once every 250 years
 - But everyone buys fire insurance
 - Healthy young parents have even lower annual risks of death (0.1 – 0.2%) – but often buy life insurance
- You don't buy fire insurance because you are sure your house will burn down
 - You buy it because you *can't* be sure it *won't* burn down
- The reason to spend 1-3% of output on climate protection is similar
 - Without that spending, we can't be sure that climate disasters won't happen
 - As temperatures rise, catastrophic outcomes become less and less unlikely

This is rare. Why buy insurance?



But can we really afford it?

- Can we afford to spend 2.5% of output protecting against a remote, dangerous threat to our way of life?
 - We already do
- 68 countries spend at least 2.5% of GDP on military
 - U.S., and China: military spending is over 4% of GDP
- Would anyone invade the U.S., or China, if they had only one-third of their current military budgets?
 - Would both countries be safer if they diverted two-thirds of their military budgets to climate protection?
- Which is a greater threat to you and your family: climate change or military conflict?

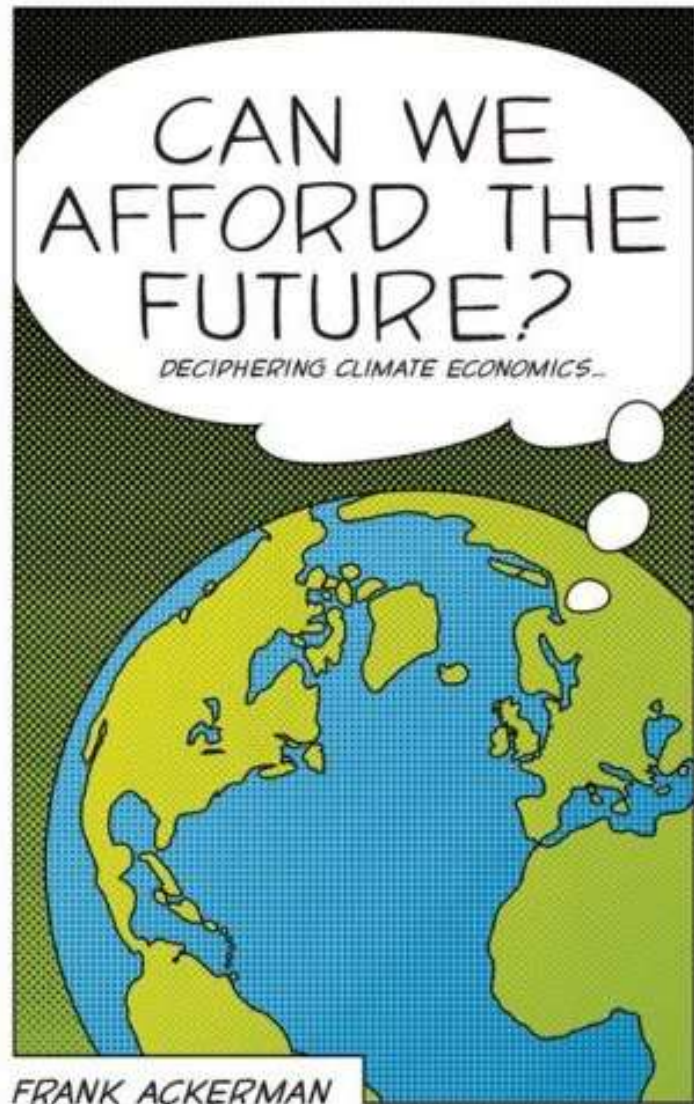
What will we spend the money on?

- Both short-run and long-run plans are needed for climate protection
 - It is crucial to adopt all the low-cost / no-cost emission reduction opportunities identified by McKinsey and others
 - New technologies are also needed; government must play leading role in funding, directing research effort
- Recipe for a world-changing technological revolution (or, how the Pentagon invented microelectronics)
 - Detect a fundamental threat to our way of life
 - Announce a massive mobilization to defeat the threat
 - Set impossible performance targets for new technologies
 - Spend vast amounts of money to meet those targets

Your grandparents' taxes at work



To read even more...



www.E3Network.org

www.RealClimateEconomics.org

www.sei-us.org

*(Stockholm Environment Institute-
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[Frank.Ackerman "at" tufts.edu](mailto:Frank.Ackerman@tufts.edu)