



Climate Change and Carbon Fee

Ethics, Environment, and Economics
Study Group

March 9, 2015

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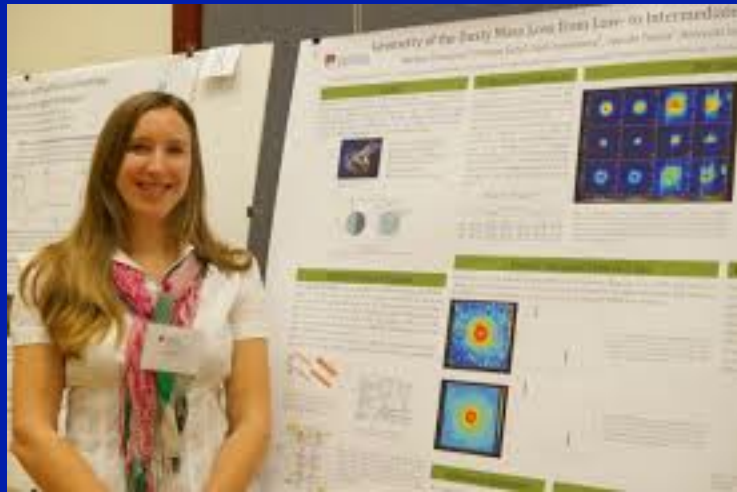
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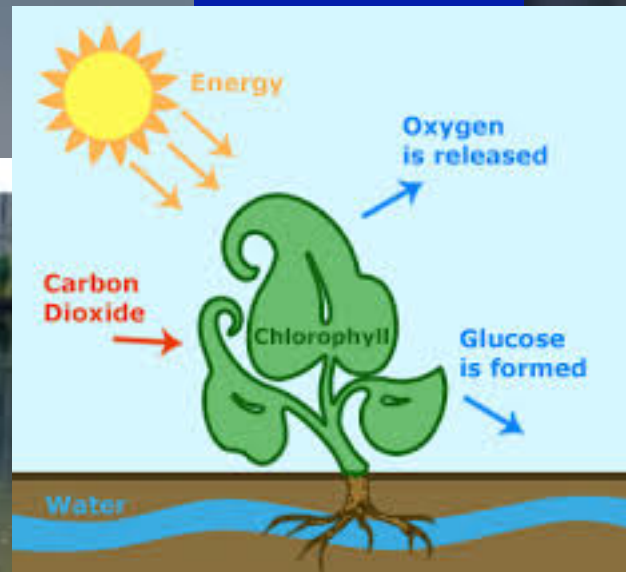
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Outline

- Define the Problem
 - Planet has a fever
- What is the Goal
 - Reduce and eventually eliminate CO₂ from humans burning fossil fuels
- Proposed important first step
 - Carbon fee and dividend

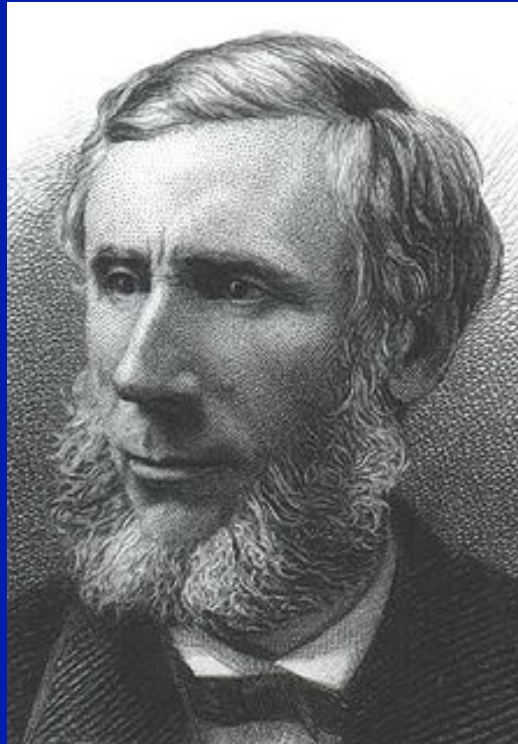
CO_2 is a natural gas.
It is released by breathing fauna and taken
up by plants during photosynthesis.
All life depends on it.



CO₂ keeps the planet habitable



Joseph Fourier computed that the Earth should be much colder than it is (1824, 1827)



John Tyndall, January 1863

Measured the absorption and emission of radiation by CO₂ in air (made the measurements of the physics.)



Svante Arrhenius, 1896

Calculated in detail effect of CO₂ on Earth's temperature.

One of our dilemmas

CO₂ is a good thing

Plants breath it and give back oxygen in exchange
Keeps the planet warm

CO₂ is a bad thing

Supreme Court ruled CO₂ can be regulated as a
pollutant under the Clean Air Act.

Examples of “too much of a good thing” are part of our lives:

A glass or two of wine at dinner is a good thing; a whole bottle
of wine might get you killed in an accident on the way home.

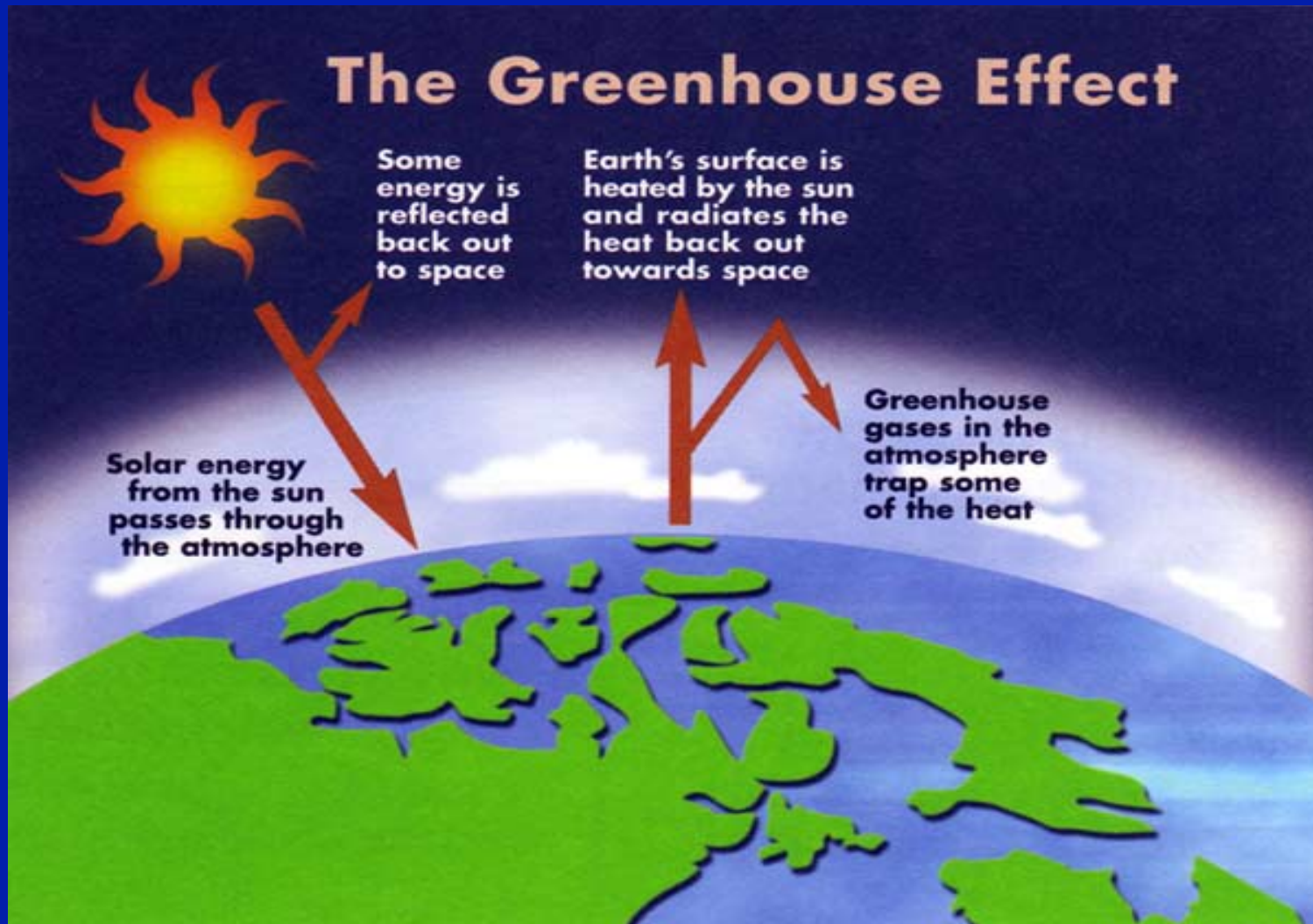
Proverbs 23:31-32

Do not look at wine when it is red, when it sparkles in the cup and goes
down smoothly. In the end it bites like a serpent and stings like an adder.

The “Greenhouse Effect”
(aka global warming)
is based on
straightforward physics

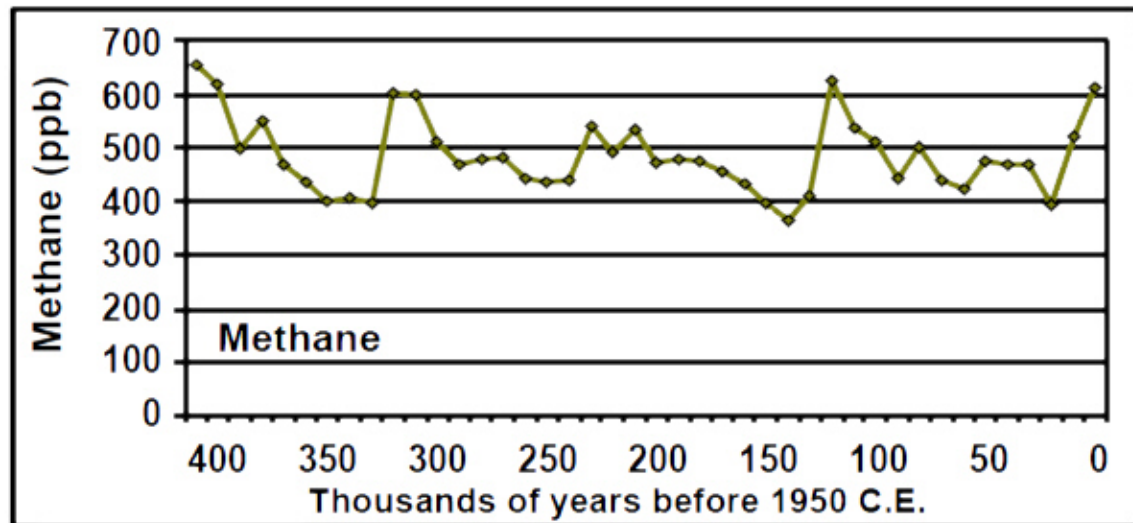
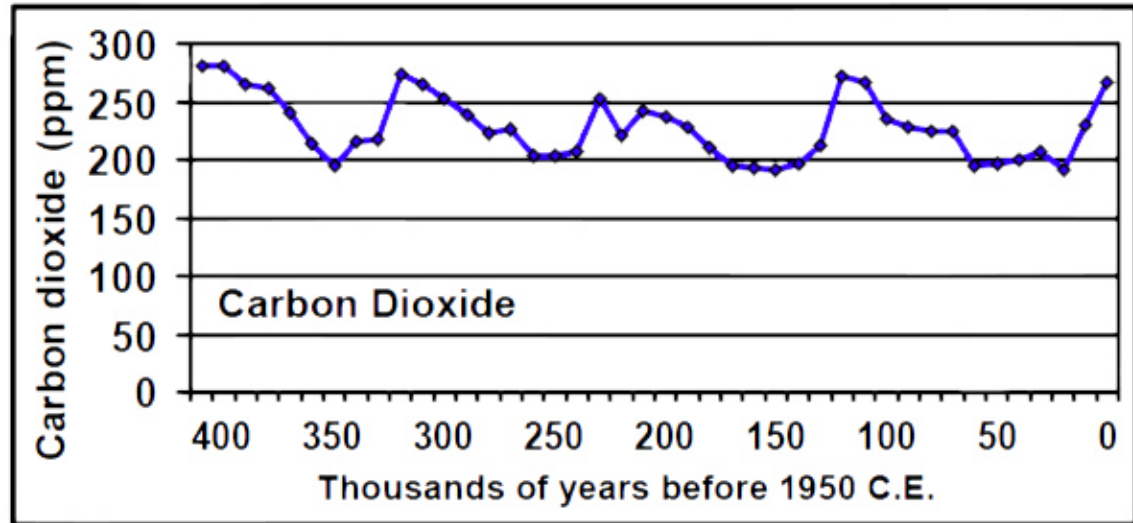
not computer models ...
not recent temperatures ...
not complicated!

CO₂ keeps the planet warm.
Without it, Earth would be an iceball.



Sure
climate
changes
all the
time.

CO₂ and
CH₄ for
the last
half
million
years



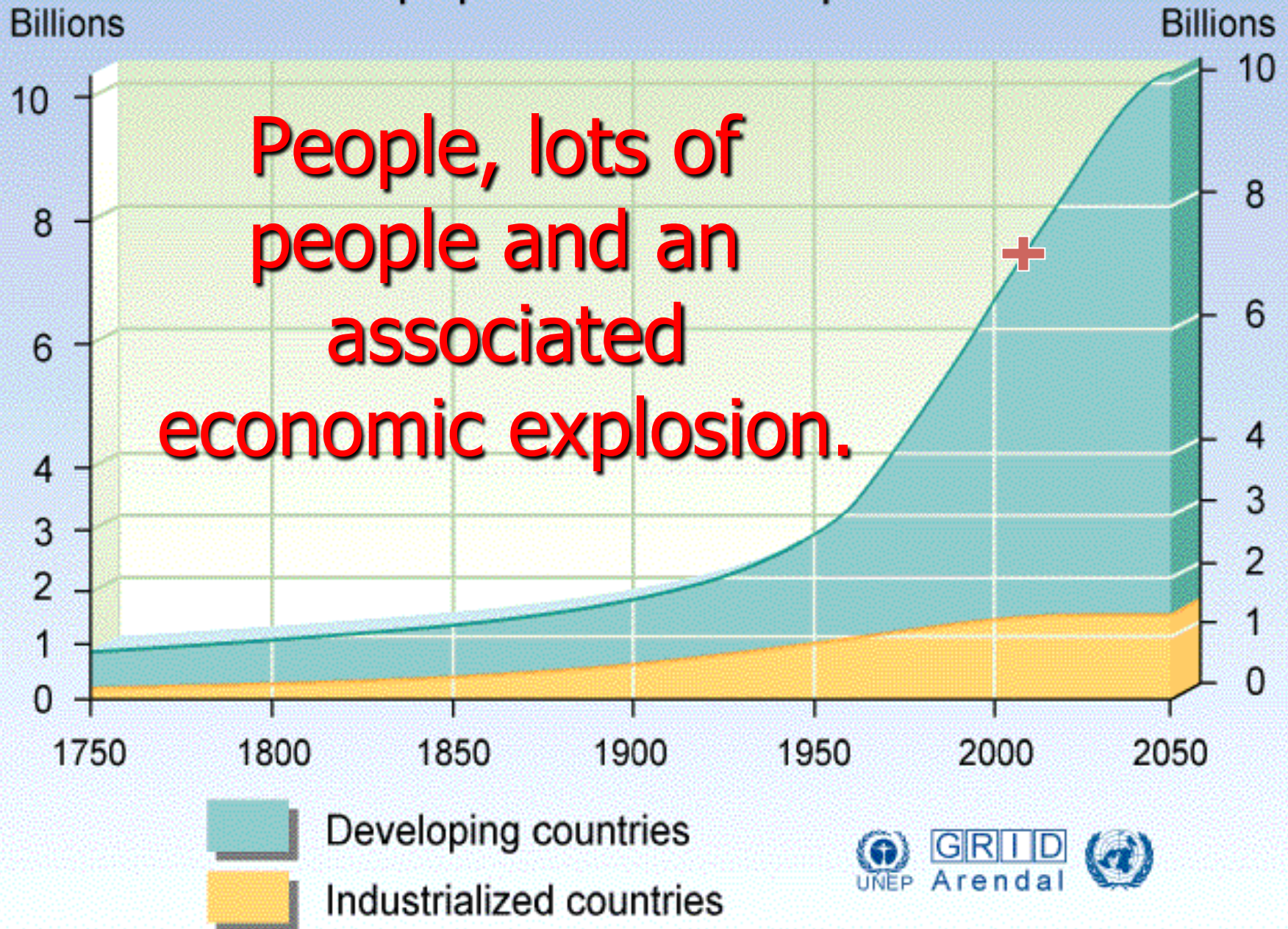
Atmospheric carbon dioxide (CO₂), and methane (CH₄) derived from air bubbles trapped in ice at Vostok Station, Antarctica. Units are parts per million (ppm) for CO₂ and parts per billion (ppb) for CH₄. Year zero is 1950 of the Christian Era (C.E.)

CO₂ is a greenhouse gas.
It is released by burning fossil fuels.



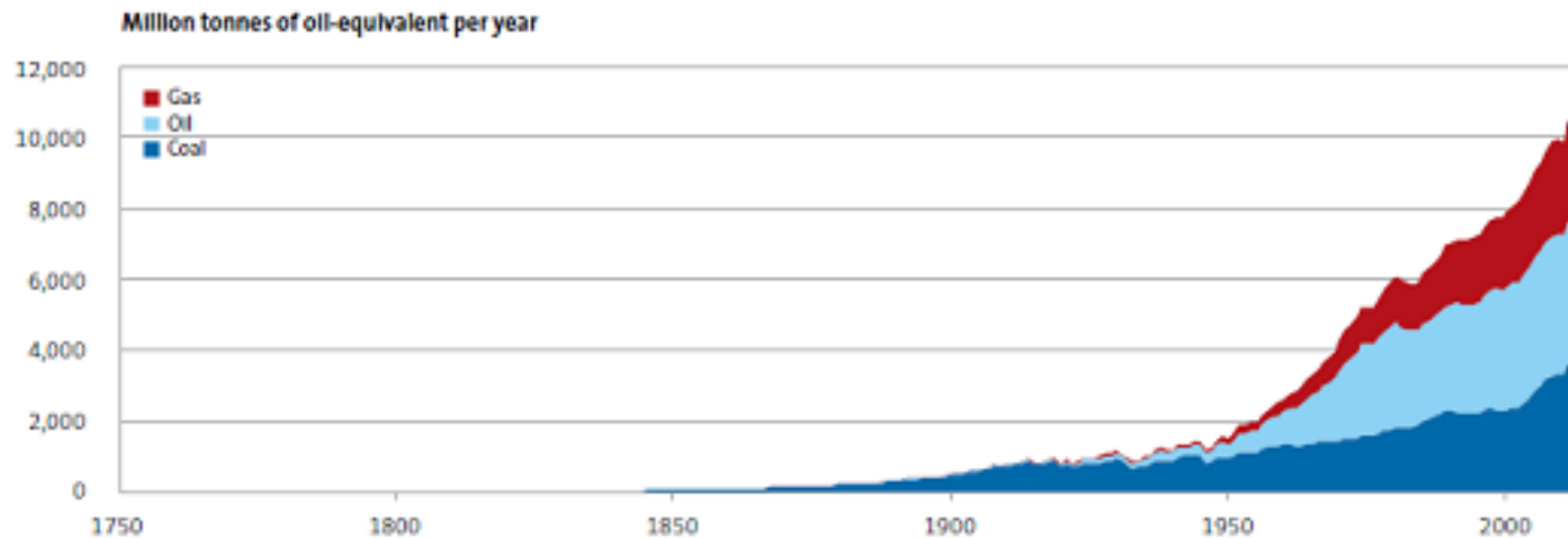
Fossil fuels drove an amazing expansion of human possibilities.
We have all benefitted greatly and don't want to lose what we have gained.

World population development



We are burning fossil fuels.
The CO₂ is going into the atmosphere and oceans

Fig. 5.1: World fossil fuel consumption since 1750*



* Source: Tullett Prebon calculations and estimates from various sources

When did scientists get alarmed?



Raising the alarm on CO₂ began in the late 1950s. The first was Gilbert Plass¹.

Scientists were morally obligated to sound the alarm, even if they were ill suited to carry a message many people didn't want to hear.

Earthrise photo 1968.

First Earth Day 1970.

First IPCC Report commissioned in 1988.

Plass, G.N., 1956, Carbon Dioxide and the Climate, *American Scientist* **44**, p. 302-16. Plass, G.N., 1956, Effect of Carbon Dioxide Variations on Climate, *American J. Physics* **24**, p. 376-87. Plass, G.N., 1956, The Carbon Dioxide Theory of Climatic Change, *Tellus VIII*, **2**. (1956), p. 140-154.

Way too much CO₂!!

Atmospheric CO₂ rates

Volcanoes: 0.13 gigaton to 0.44 gigaton per year

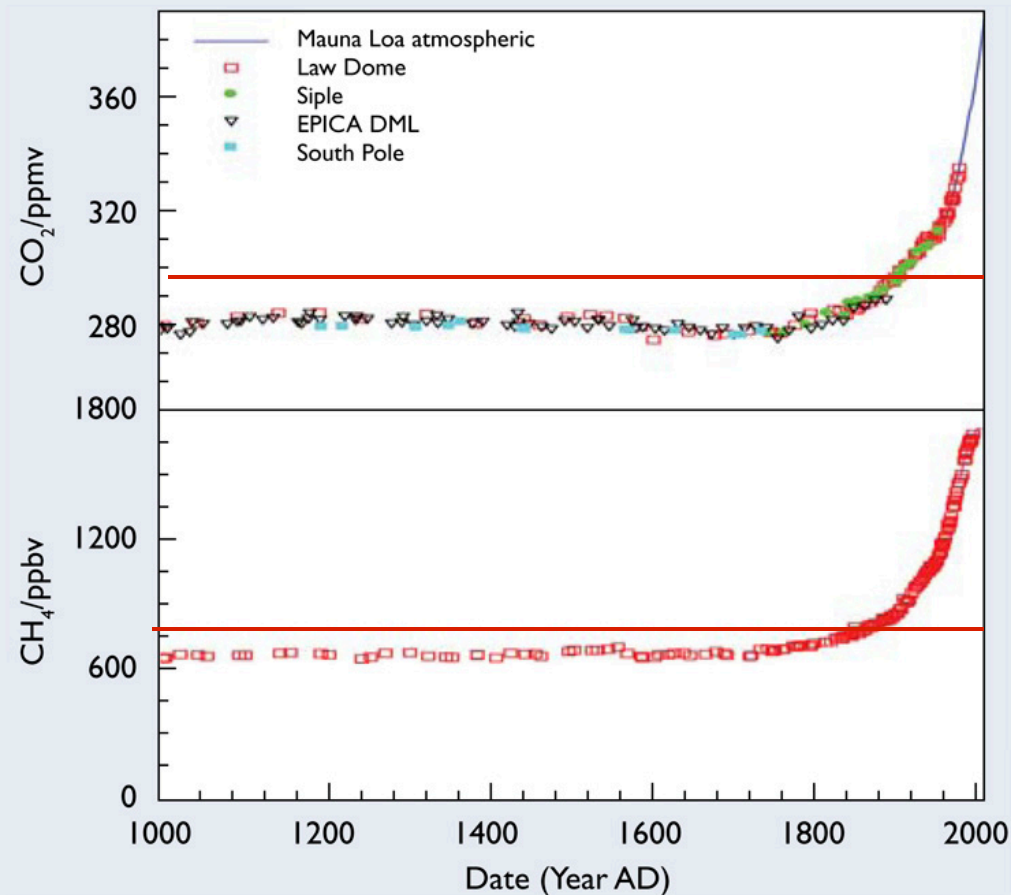
Human activities: 35 gigatons (2010)

1000 years

CO₂

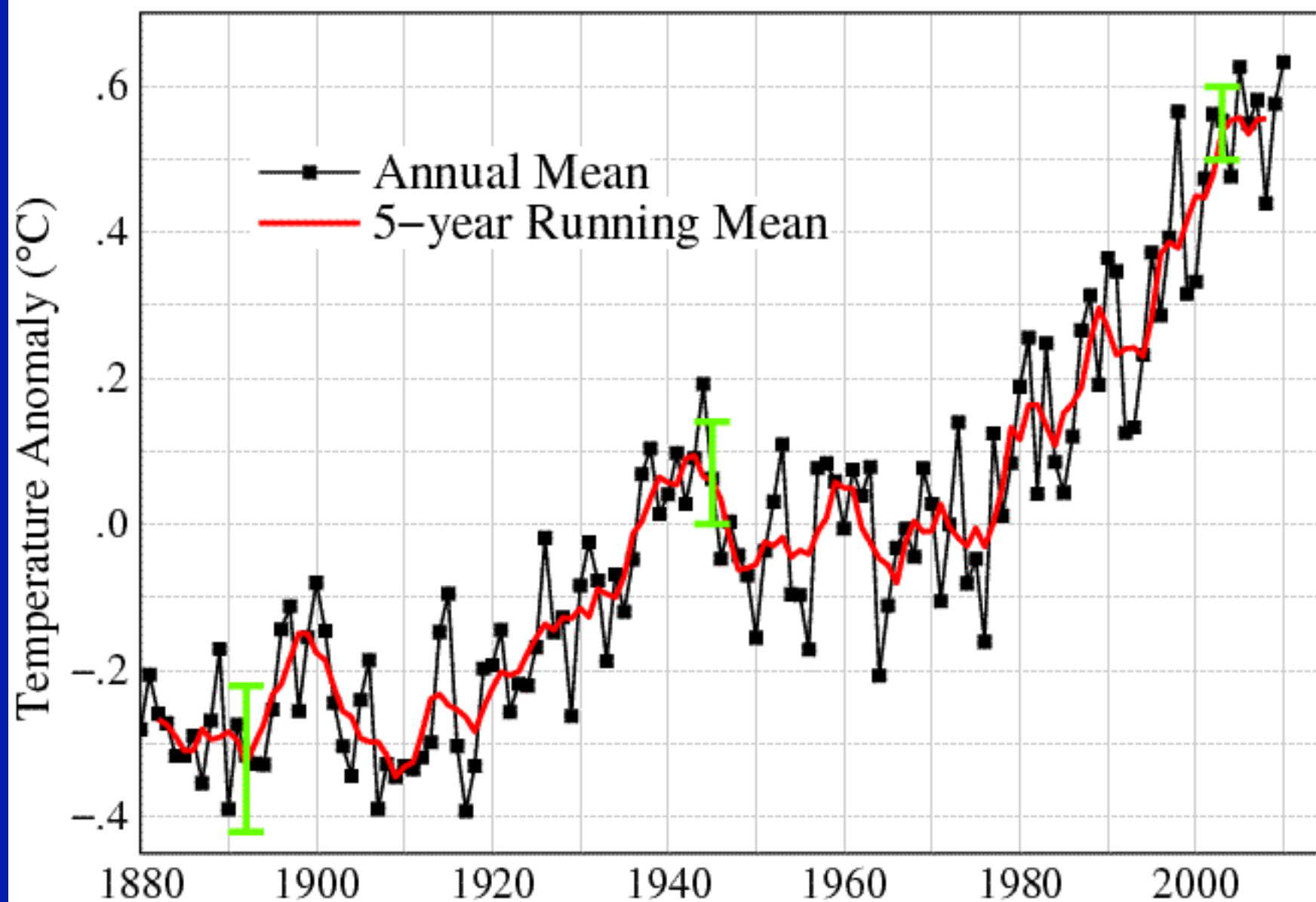
CH₄

Fig. 2: CO₂ and CH₄ over the last 1,000 years⁽¹⁻⁴⁾



red lines indicate
maximum for last
1/2 million years

Global Land–Ocean Temperature Index



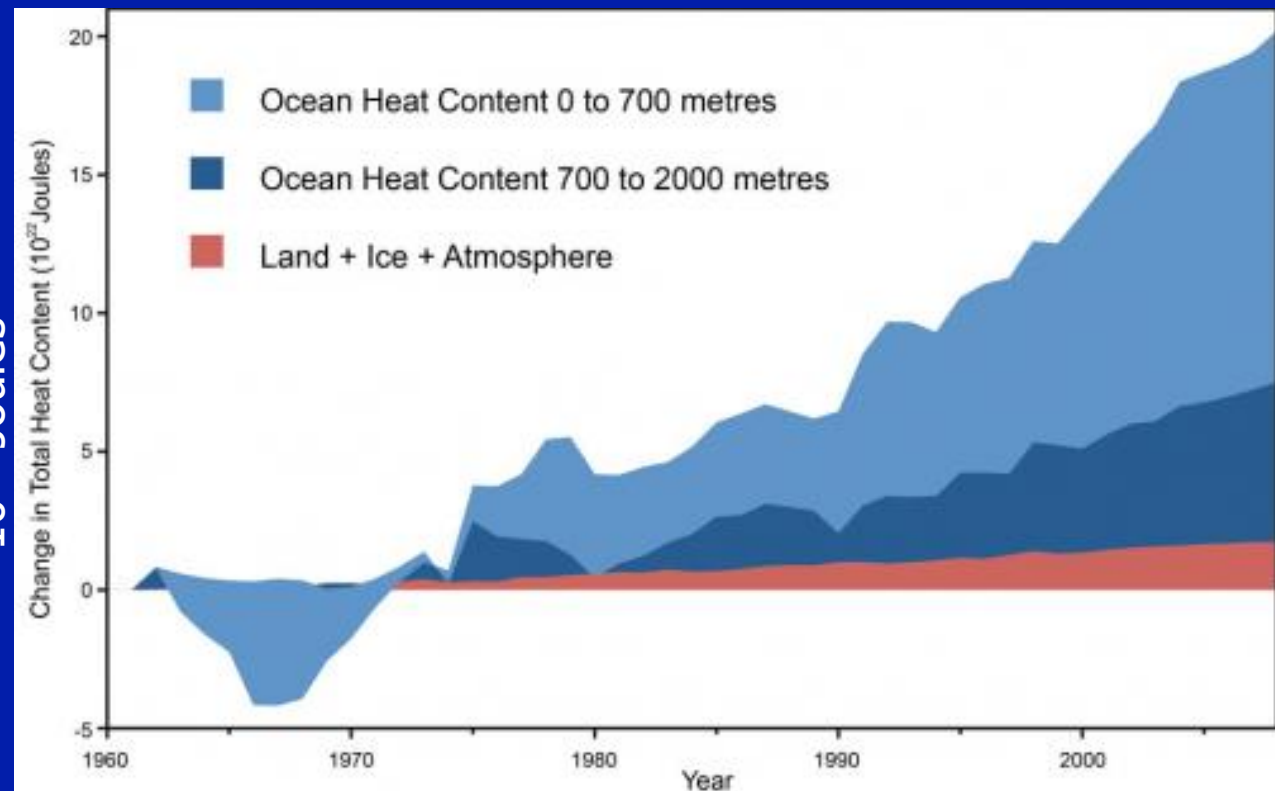
Excess heat is prodigious

Our climate is accumulating
4 Hiroshima atomic bombs
worth of heat every second.



Most of the
energy is
going to heat
the oceans.

10^{22} Joules



What to do?

Stop hunting for and burning fossil fuels already!

Home, Transportation, Food, Investments and Policy

- Convert to wind and solar
- Carbon tax to help incentivize renewables
 - Citizen's Climate Lobby (CCL) Carbon fee and dividend
- Use less energy (your favorite here)
 - LED bulbs
 - Eat vegan, eat local, grow local
 - Recycle
- Develop sustainable economics

Leave ancient hydrocarbons in the ground already!

- No Arctic exploration
- No offshore drilling
- No coal mining permits
- No transporting of fossil fuels on railroads
- No more pipelines
- No more oil spills
- No fracking

Creative obsolescence.

Lest you think I'm too negative

- Yes to wind power
- Yes to rooftop solar
- Yes to solar collectors (with energy storage)
- Yes to nuclear energy (safer than coal)
- Yes to reforestation
- Yes to geothermal
- Yes to research (e.g. into geo-engineering)

Continue antipoverty work (empower women)

A plethora of new economic opportunities to replace the fossil fuel industry.



Citizens Climate Lobby

- A non-profit, non-partisan, grassroots advocacy organization focused on national policies to address climate change.
- Working to pass Carbon Fee and Dividend
 - train and support volunteers to engage elected officials, the media and the public

Advisory board

- George Schultz, Secretary of State
- Dr. James Hansen, climate scientist, activist
- Bob Inglis, Energy and Enterprise Institute
- Dr. Katharine Hayhoe, climate scientist, author
- Sam Daley-Harris, microcredit guru
- Dr. Daniel Kammen, renewable energy
- Jose Aguto, Native American & Quaker activist

Further info at: <https://citizensclimatelobby.org/about-ccl/#Advisory-Board>

Carbon Fee and Dividend



Collect fee
\$15 per ton of
CO₂ at wellhead
or port of entry
[fee rises \$10/yr]



\$\$\$

U S Dept. of the Treasury: Trust Fund

All monies returned to households
1 share per adult
0.5 shares per child <18yrs
maximum 3 shares per family





Net + \$



Net - \$



Net + \$

2 of 3 households have net gain of \$.

CO₂ emissions are reduced



Renewable energy sources
are stimulated.
Market will choose
the best.



Purpose of a Carbon Tax

To take the costs associated with fossil fuels and bundle them into the price of such fuels so that the individuals using them have a more accurate idea of how much a specific activity truly costs.

For example, when drivers understand how expensive gasoline really is when all the attendant costs are taken into account, then they'll treat it accordingly.

Increased cost of hydrocarbon fuels/energy reflecting true costs will spur carbon-reducing investment.

Border adjustments will discourage businesses from relocating and encourage other nations to put a fee on carbon.

- Import fees: countries without a carbon fee
 - Motivate them to adopt carbon taxes
- Rebates to industries exporting to those countries
 - to keep US companies competitive
- Use existing tax and trade systems
 - avoid complex new institutional arrangements

Dividends are taxable

- CLEAR Act returned 75% of the funds
 - they did not know how to get around the 2010 pay-as-you-go act, and the 25% automatic haircut the CBO would attach to any tax.
- CCL proposal avoids problem by taxing dividends
- Modeled after a proposal by Jim Hanson in *Storms of My Grandchildren*
 - Original Bill submitted by Rep. John Larson, CT, 2007; most recent version HR 5307

REMI study

- reduces CO₂ emissions 50% below 1990 levels in 20 years
- adds 2.8 million jobs to the economy
- does not increase size of government
- increases real disposable income
- gives clear guidance for business planning

KISS: Keep It Simple, Stupid

Why no compensation for those adversely affected?

- CCL bill leaves the poorest better-off.
 - income is the best predictor of CO₂ emissions
 - dividend is the most progressive way of returning the revenue (e.g. vs. tax offsets)
- 60-66% of American households ending up even or better with a 100% dividend
 - these are the poorest 60-66%.
- About 20% of the revenue returned to the poorest 40% would compensate them (i.e. make them whole)

CCL's "Marketing summary"

Carbon Fee and Dividend is

- elegant in its simplicity,
- transparent in its accessibility to public scrutiny, &
- clear in its signals and benefits

One reaction

Naomi Klein (neoliberal author): *The Shock Doctrine* & *This Changes Everything: Capitalism vs. the Climate*

"You know, I've been making these arguments around economics, but there is nothing more powerful than a values-based argument. We're not going to win this as bean counters. We can't beat the bean counters at their own game. We're going to win this because this is an issue of values, human rights, right and wrong. We just have this brief period where we also have to have some nice stats that we can wield, but we shouldn't lose sight of the fact that what actually moves people's hearts are the arguments based on the value of life."

Other carbon fee proposals

- Dale Jorgenson, Harvard, *Time to Tax Carbon*
 - <http://harvardmagazine.com/2014/09/time-to-tax-carbon>
 - \$44/metric ton
 - Capital gains tax reduction -> economic growth
 - International agreement
 - win, win, win for China (reduction of pollution -> health benefits)
 - Book: *Double Dividend: Environmental Taxes and Fiscal Reform in the United States*
- CLEAR Act, 2009 (cap and trade w/ price collar)
 - Sen. Maria Cantwell, D-Wash., Sen. Susan Collins (R-Maine)
- McDermott Bill in the house
 - *Managed Carbon Price Act of 2014*
- Many other bills and articles

Recent developments

- Paulson article: The Coming Climate Crash
 - http://www.nytimes.com/2014/06/22/opinion/sunday/lessons-for-climate-change-in-the-2008-recession.html?_r=0
- BP: Put A Price on Carbon, Let The Market Cut Emissions
 - <http://www.triplepundit.com/2015/02/bp-put-price-carbon-let-market-cut-emissions/>
- Exxon-Mobil
 - <http://corporate.exxonmobil.com/en/current-issues/climate-policy/climate-policy-principles/overview>
- Shell Oil Self-Imposes Carbon Pollution Tax High Enough To Crash Coal, Erase Natural Gas's Value-Added
 - <http://thinkprogress.org/climate/2013/11/21/2978021/shell-oil-carbon-pollution-tax/>

Lots on the CCL web site

- REMI report
 - <http://citizensclimatelobby.org/REMI-report/>
- Monthly talks: David Hone, Climate Change Advisor for Shell
 - <http://citizensclimatelobby.org/monthly-international-conference-calls/>
- Laser talks: all kinds of details discussed
 - <https://citizensclimatelobby.org/laser-talks/>

Comments from one economist, 1

1. REMI says they are an offshoot of a program at U-Mass Amherst from the 1970's. That's not a great pedigree.
2. The fee and dividend is really just a Pigouvian tax (Arthur Pigou)--a technique that has been around a long time as an idea, but rarely employed. Greg Mankiw at Harvard has proposed a Pigouvian carbon tax for a long time, but he makes no claims for economic stimulation. (Note: Mankiw is a big fish, Remi are minnows).
3. The only way I can think of modeling a gain from the fee and dividend proposal is:
 - A. They screwed up and forgot to deduct the money withdrawn by the fee.
 - B. They assumed an arbitrage effect from taking money from one group of taxpayers and giving it to another. This is alchemy in my opinion, but there are people out there making this argument. The idea is that the taxpayers are wealthier and would have saved the money had it not been taxed while the recipients are less wealthy and more inclined to spend the money. The driver here is a measure called the "Marginal propensity to consume". I consider this theory hogwash.
4. I couldn't quickly find the REMI explanation of growth, just statements that it happens. I'll keep looking.

Comments from one economist, 2

5. The beauty of a Pigouvian tax is that it (in theory) does not have any significant effect on the economy. Value is transferred from those who are disproportionately large users of the taxed fuels to those who use less. In theory, there is no impact on the economy arising directly from the redistribution of the taxed amounts.
6. The government has been handed a golden opportunity to tax the sale of fossil fuels at a time when consumers are enjoying a windfall of lower costs. Raising taxes when prices are high is difficult at best. If they want to impose a carbon tax, now is the time.
7. I have great faith in technology and innovation. I sincerely expect that geo-engineering or some other mitigating change will obviate the catastrophes that some foresee.
8. Whatever the net effects of climate change will be, I suspect, will be slow in coming. We can easily take an approach of watchful waiting and be prepared to adapt if necessary. I'm not prepared to reject the case that the results will be a net benefit to mankind rather than an apocalypse.