

The Green Awakening: How Climate Change Concerns May Affect Future Business Operations

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Green Awakening - 1

Introduction and greetings from the University of Georgia



Topical Outline

- The Green Awakening
- How we got to where we are now
- Intergovernmental Panel on Climate Change - reports and history
- What do/can we do about it?
- "Carbonomics"
Cap and trade versus carbon tax
- Speculation on future

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The "Green Awakening"

Can you feel it?

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What is Being Green?

Why Do It?

And, is it easy to be green?

- Green \cong Sustainable Design(?)



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Is it just as easy as putting up a sign?



*Or, do you have to be a
"tree hugger"?*



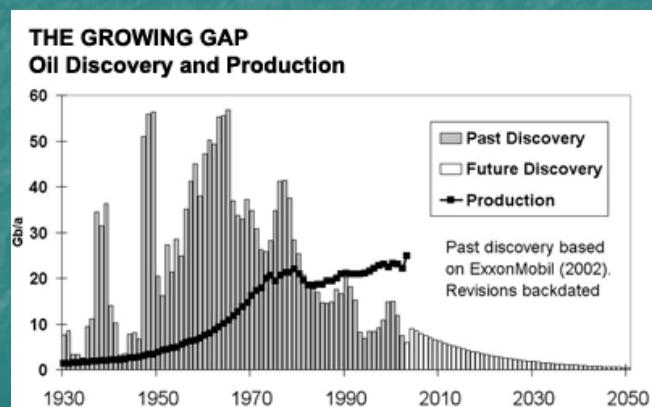
Short Term – Long Term

■ Now

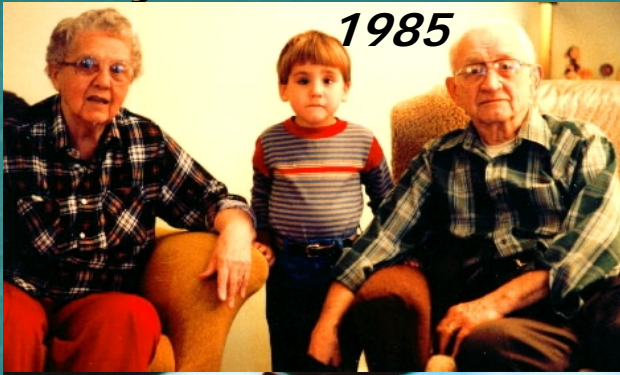


■ Future

- Energy resources, peak oil
- Climate change



Why be Green – A Personal Reason



1985



2001



2007

A Sustainable Society



Actual path

What's Different from Past Periods of Environmental Concern?

- Compare the 1960's & 70's to now



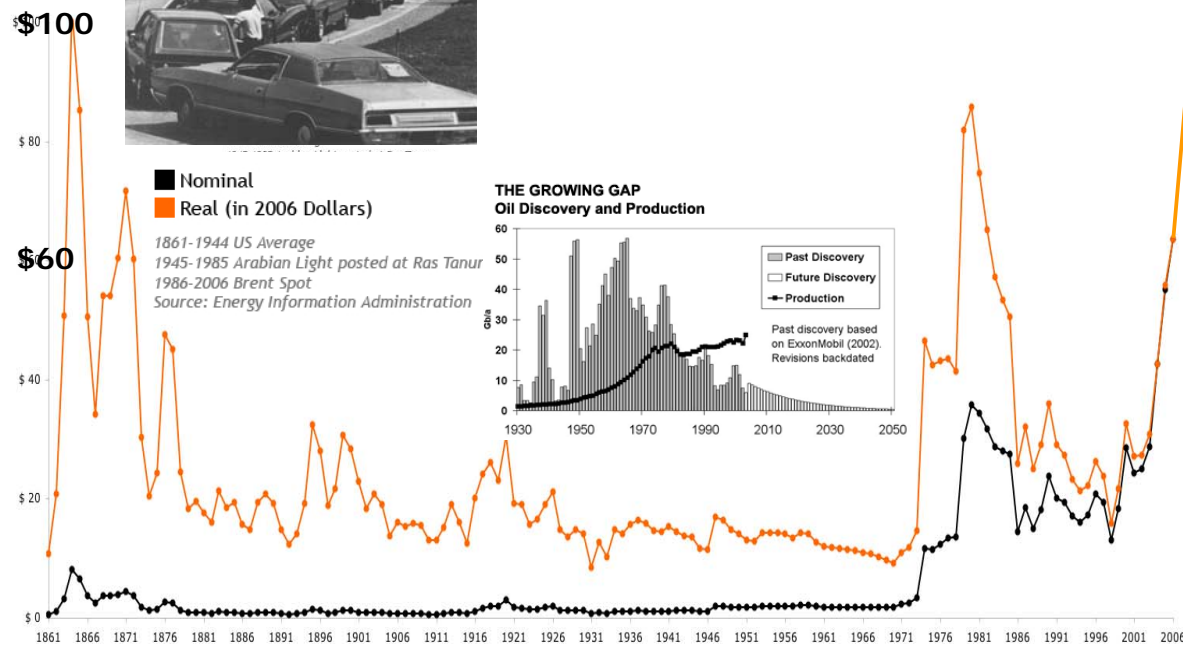
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Energy Issues: Then and Now

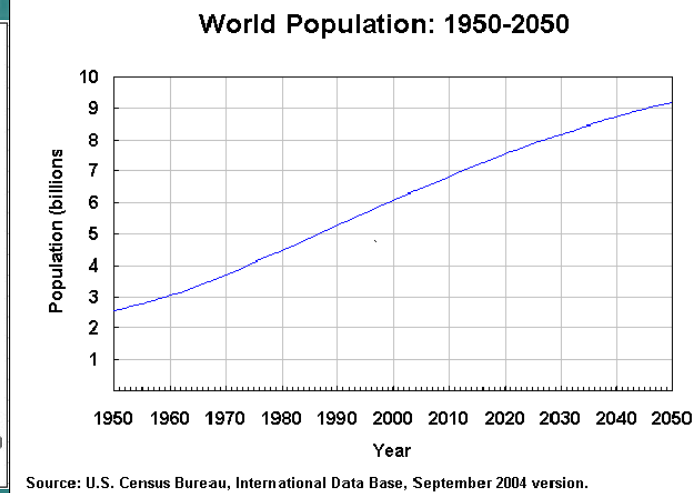
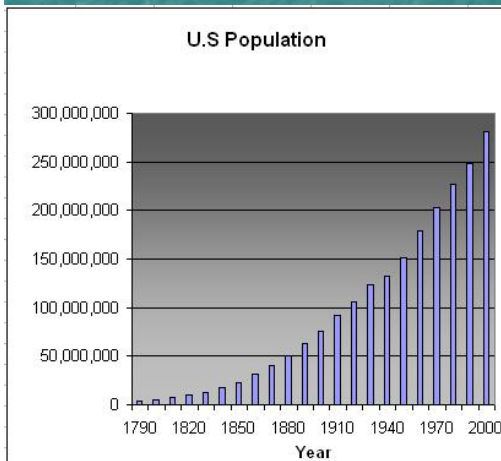
- 1970's: Political
- Now: Politics mixed with economic reality

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Energy Issues: Then and Now

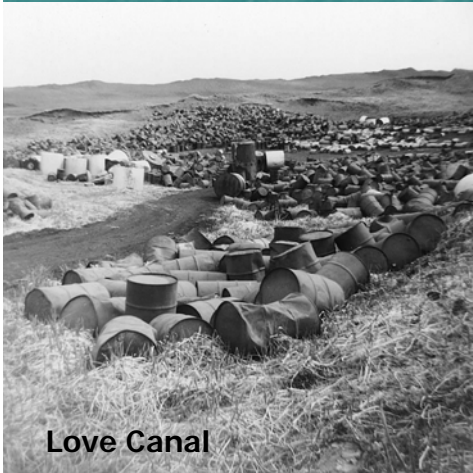


Population



Environmental Pollution Concerns

We've come a long way in past 40 years



Love Canal



Cuyahoga River Fire

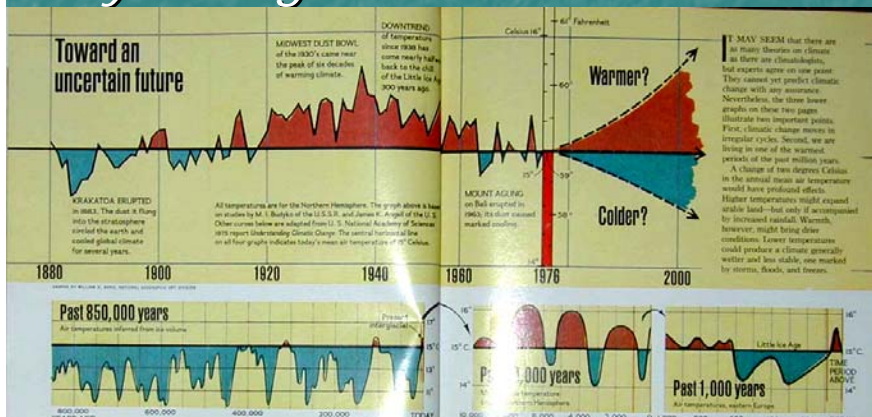
- Regulatory climate
- Emissions trading
- Society attitude
- Industrial attitude

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Not Long Ago ...

Global Cooling and Next Ice Age

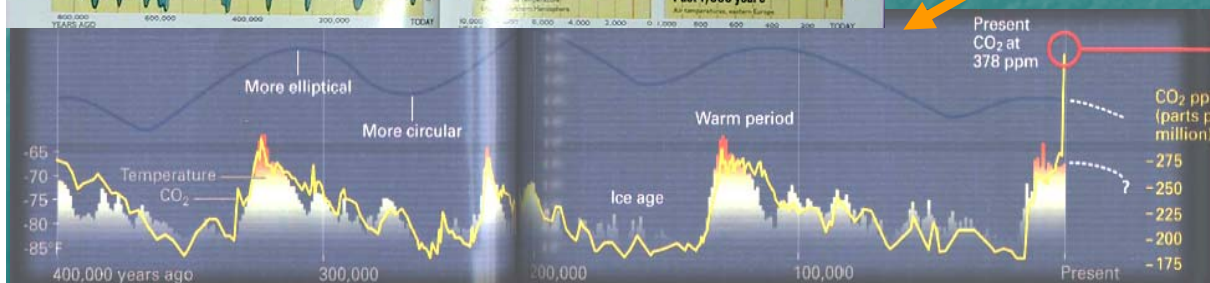
30 years ago one concern was a new Ice Age...



National Geographic

1976

2004



Are Green Buildings "Mainstream"?

- Is 'Green' only for those who 'have to' (mandated) or those with corporate mission?
- 41% of U.S. based REITs actively pursuing energy efficiency and green building
- McGraw-Hill 2006 Smart-Market Report: **3.5% higher occupancy rates, 3% higher rents, 7.5% increase in building value** for "green".
- 15 of world's largest REITs developed UN *Principles for Responsible Investment*

"Real Estate Biz Getting Greener" *Solar Today*, July 2007

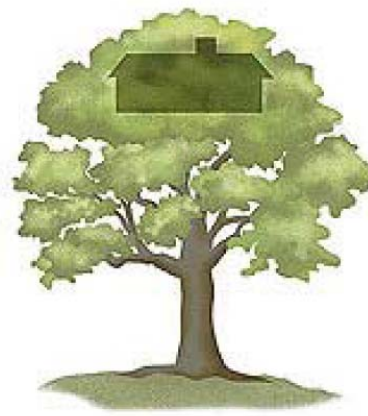
Is 'green' losing its luster?

Chief of marketing firm says environmental movement needs a simpler message aimed at everyday consumers

Wednesday, March 05, 2008

By Diana Nelson Jones, Pittsburgh Post-Gazette

A backlash brewing?



Anita Dufalla/Post-Gazette

Are consumers growing tired of "going green"?

Intergovernmental Panel on Climate Change (IPCC)

- Established in 1988 as part of the World Meteorological Organization (WMO) and UN Environmental Program (UNEP)
- All member countries of the WMO and UNEP
- First report in 1990 led to Rio Summit in 1992

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Fourth IPCC Reports (2007)

- **Led by science:** 450 lead authors, 800 contributing authors, 2500+ reviewers from 130+ countries
- Conclusive that the change is real and is “likely” man-induced
- Politics involved as usual

Climate Change 2007
The Physical Science Basis

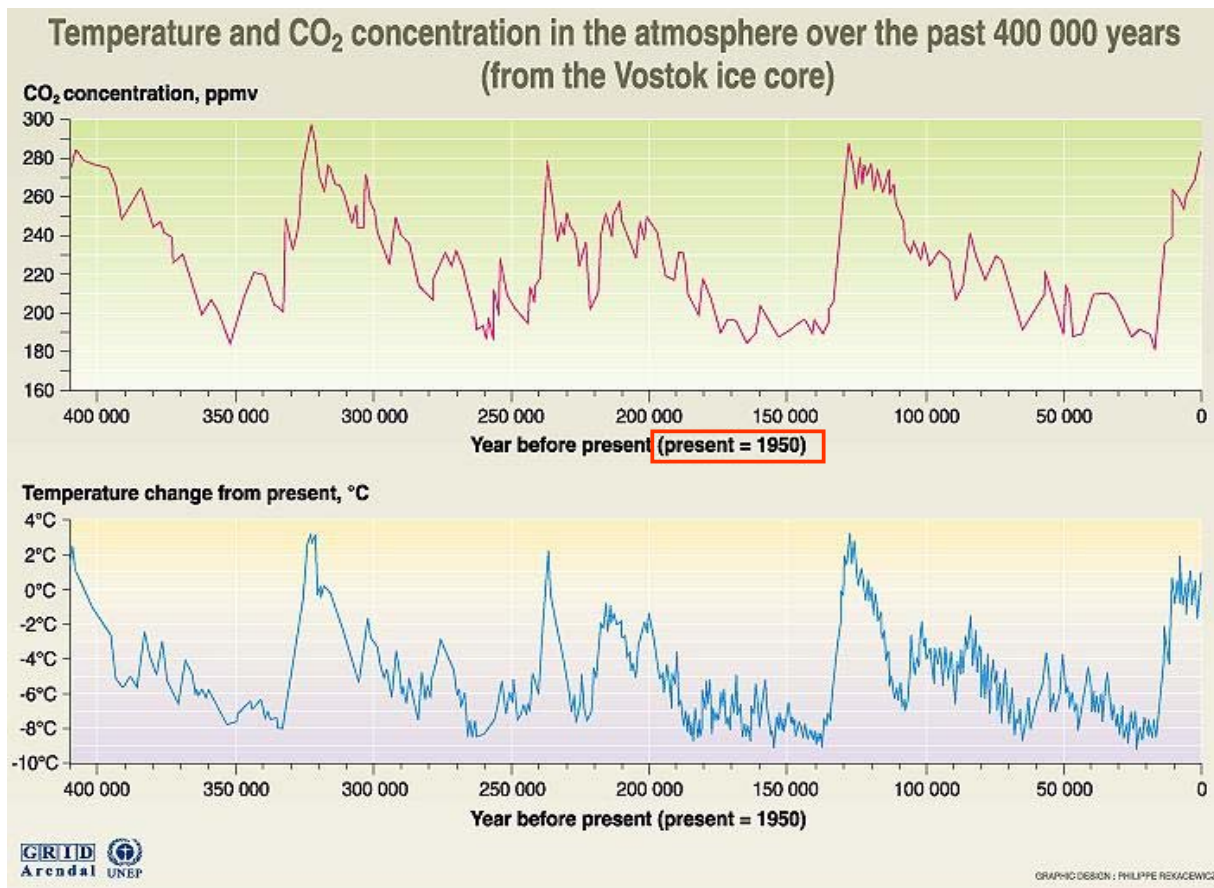
www.ipcc.ch

Climate Change 2007:
Impacts, Adaptation and Vulnerability

Climate Change 2007
Mitigation

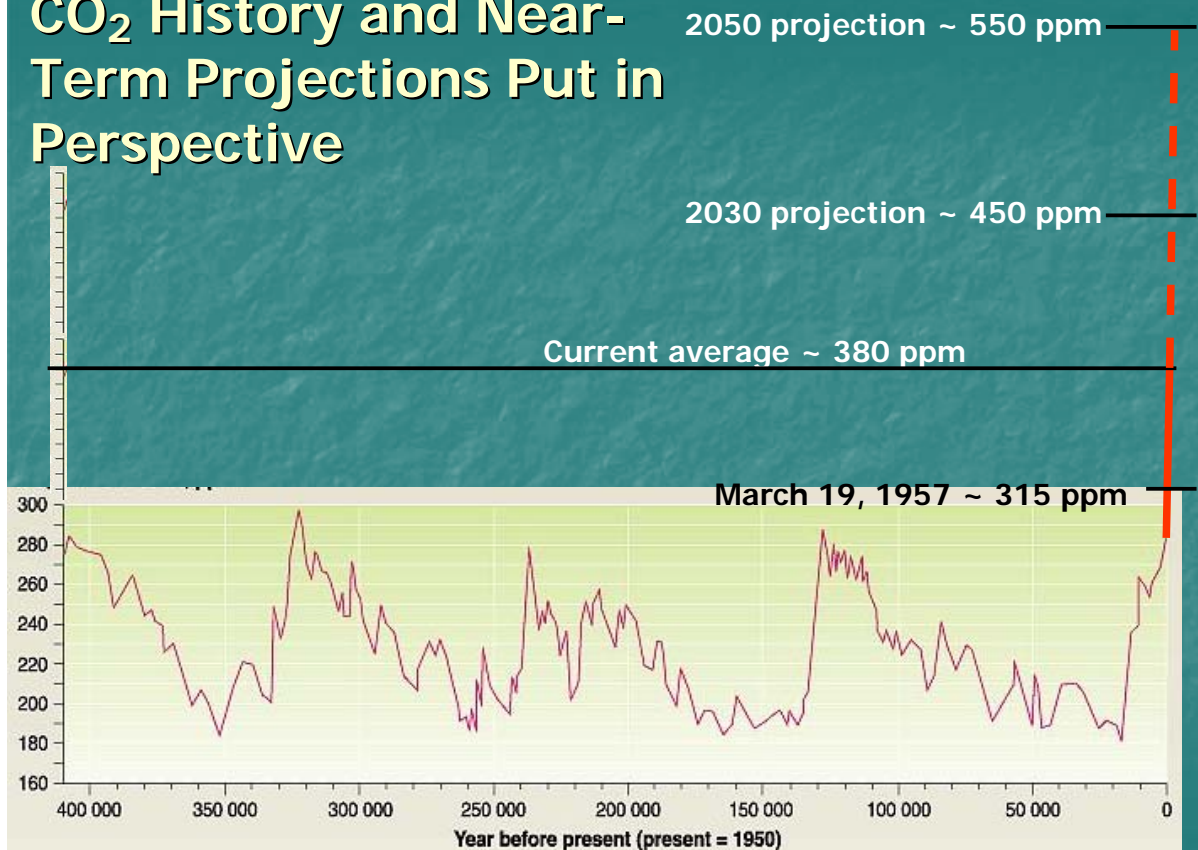


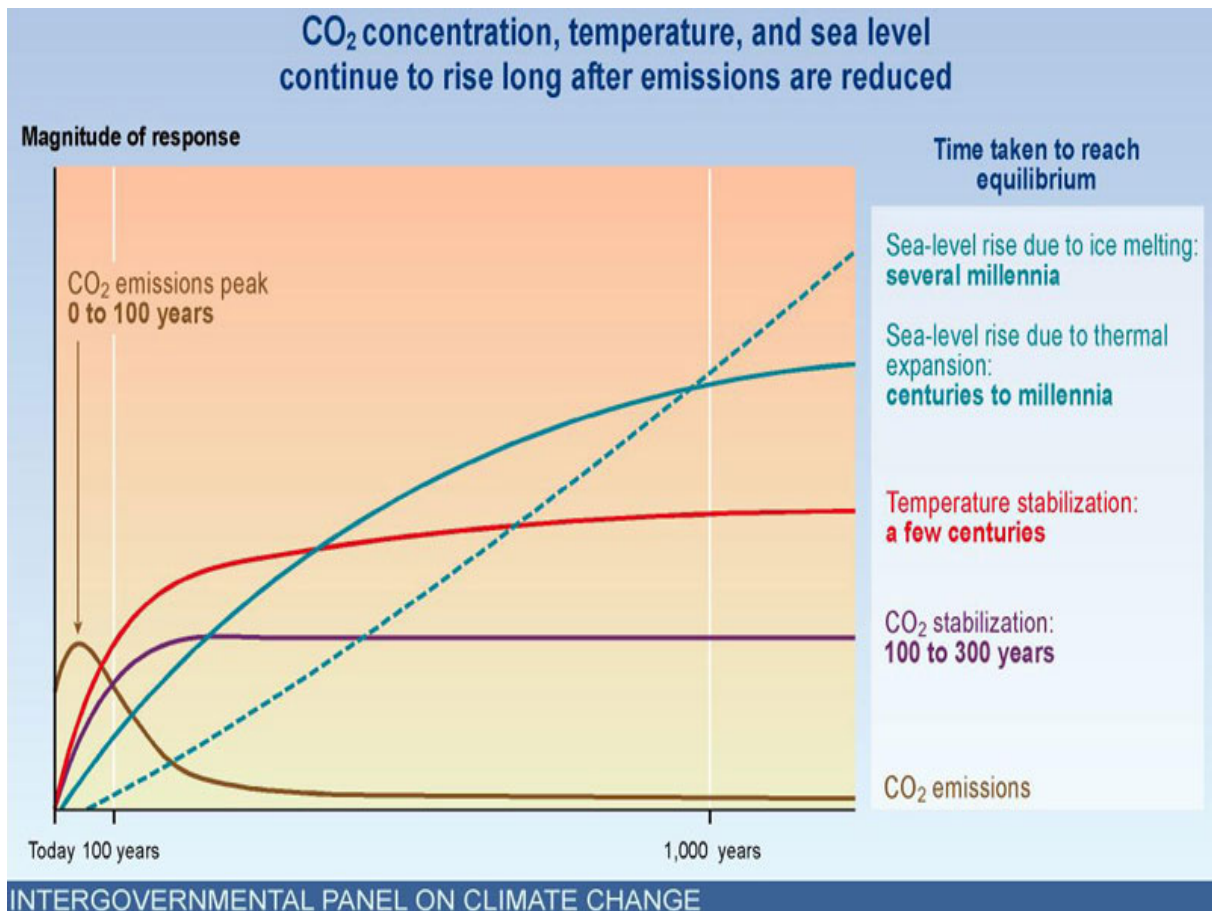
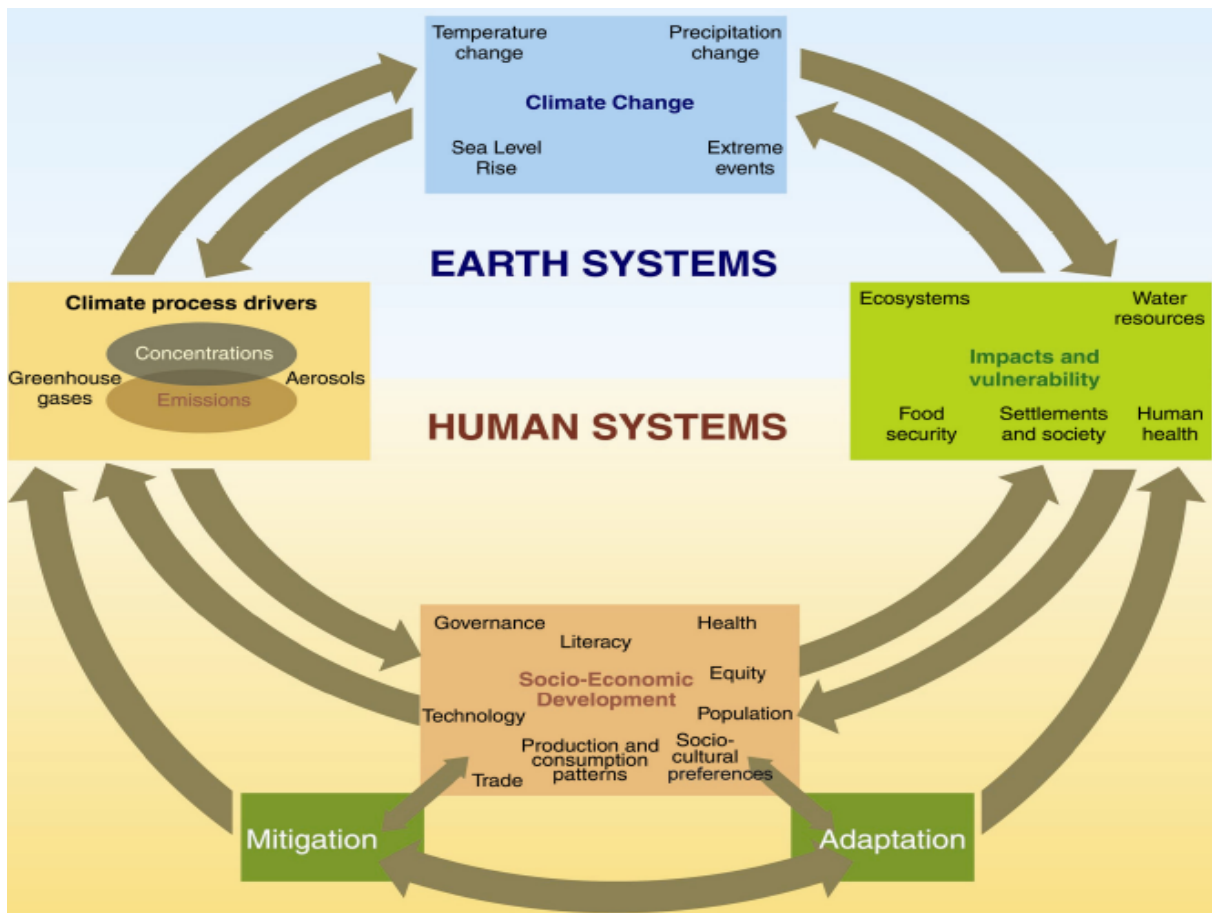
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Source: J.R. Petit, J. Jouzel, et al. Climate and atmospheric history of the past 420 000 years from the Vostok ice core in Antarctica, Nature 399 (3June), pp 429-436, 1998.

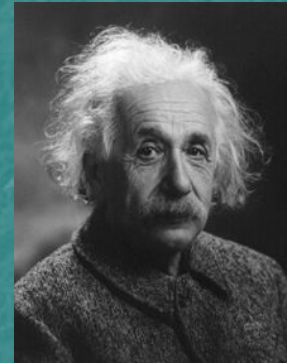
CO₂ History and Near-Term Projections Put in Perspective





What Can We Do About It?

- As a society?
- As a company or organization?
- As an individual?

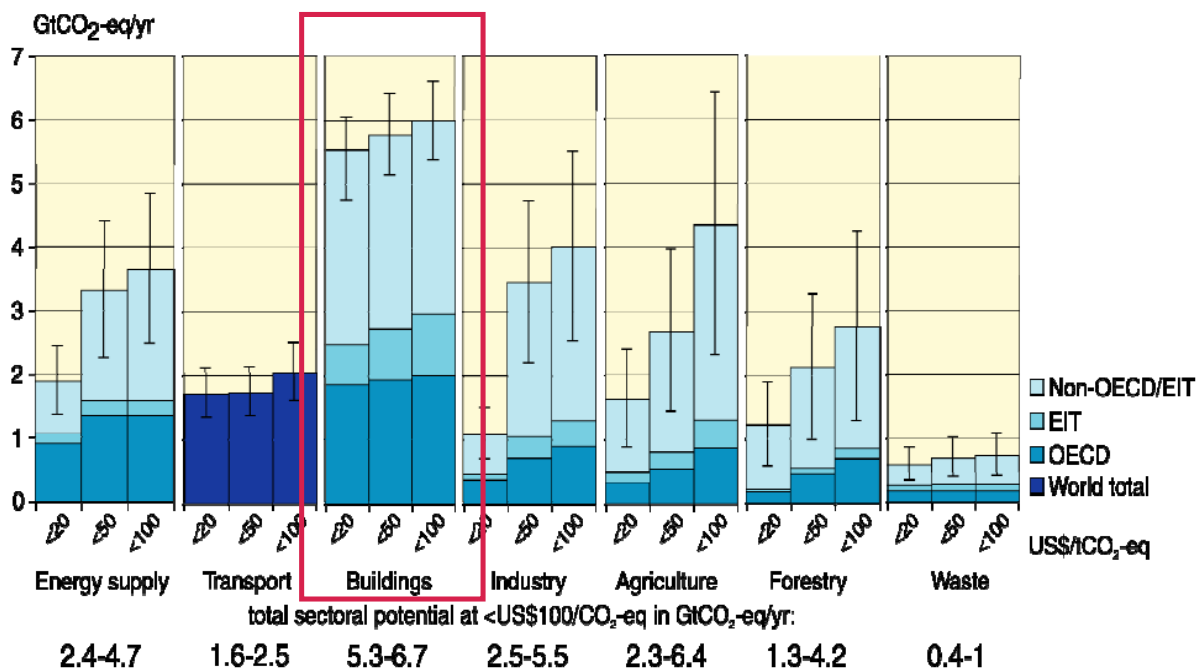


"No problem can be solved from the same level of consciousness that created it."

Albert Einstein

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Economic mitigation potential by sector in 2030



■ "Every problem is just an opportunity in disguise"

- Individuals
- Companies, organizations
- Nations



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THE WALL STREET JOURNAL.

Find the Opportunities

As of 11:47 p.m. EDT Sunday, March 23, 2008

Set My Home Page | Customer Service

News

Today's Newspaper

My Online Journal

Multimedia & Online Extras

Markets Data & Tools

Classifieds

Home
News
Technology
Markets
Personal Journal
Opinion
Leisure
Small Business
Autos
Careers
Real Estate
SmartMoney

ENVIRONMENTAL CAPITAL

A special report on the intersection of energy, the environment and business.

ECO:nomics: Creating Environmental Capital



The push to curb global-warming emissions is starting to redraw the industrial landscape, and in doing so it has already begun to create new winners and losers. Job One for a CEO: Exploit the opportunities and shift the costs to someone else.

See interviews and videos from The Wall Street Journal's first annual conference on the business of the environment.

- GE's Immelt on why it's business, not personal | Video
- Wal-Mart's Scott: Reduce carbon footprints | Video
- Schwarzenegger: New gold rush in California | Video
- Daimler's Zetsche, GM's Lutz: Reduce gas thirst | Video
- ADM's Woertz, BP's Lukefahr: Alternative fuels
- Begley: Living the green life
- Doerr: Venture investments
- Khosla and Cavaney on how to replace oil and gas

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MORE FROM THE JOURNAL REPORT

You Are How You Live

Across the country, thousands of communities are trying to fight urban sprawl and global warming from the ground up. Instead of adding eco-friendly touches to existing neighborhoods, developers are building whole new

Environmental Capital Blog

Mar 24, 8:14 am
Green Ink: Return of the Limits of Growth

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NEW Community Groups
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▶ ENVIRONMENTAL CAPITAL VIDEO



Capitalism and Carbon Emissions
T.J. Rodgers, CEO of Cypress Semiconductor, says the government should not...

▶ PLAY

Touring a Sustainable

Carbon Economics (*Carbonomics*)

- "Cap and Trade"
- Carbon Tax
- Hybrid alternates

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The Great Debate of 2009

Cap and Trade:

- Set overall maximum of carbon emissions allowed, reduce over time
- Permitting
- Market for buying, selling of allowances

Carbon Tax:

- Taxing of carbon emissions or production
- Ideally, money used to offset price increases severe impact
- Coal most impacted, natural gas lower impact

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The Great Debate – A Paradox

Cap and Trade:

- Tends to be the favorite of politicians
- Obscures the costs
- May give political 'cover' to decision makers
- (Some think) may be only method that guarantees reductions

Carbon Tax:

- Tends to be the favorite of economists
 - One estimate*:
 - \$15 / ton of carbon
 - \$80 billion revenue
 - 1.63 ¢/kWh increase electricity
 - Gasoline increase \$0.14 / gallon
- * American Electric Power Institute*

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Carbon Markets

- Carbon offsets
 - Increasingly popular as voluntary means to "do good"
- Offset markets exist for voluntary and compliance schemes
- Voluntary market preparation for future

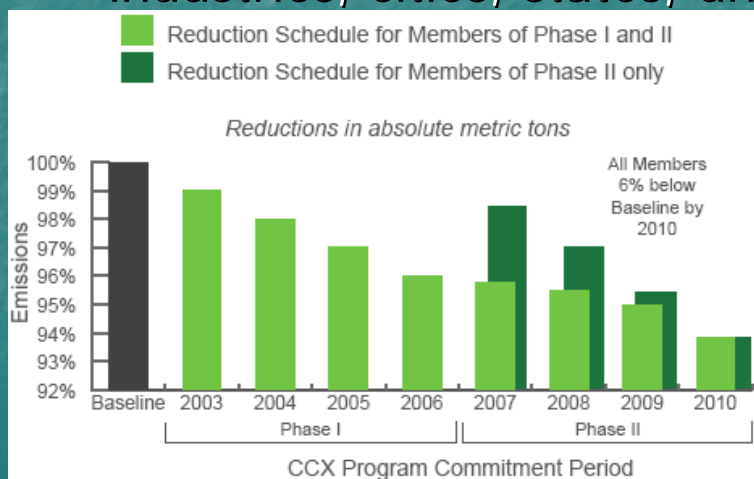


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Chicago Climate Exchange



- Founded 2003
- Voluntary membership: industries, cities, states, universities



Baseline:

**Avg. of 1998-
2001 emissions**

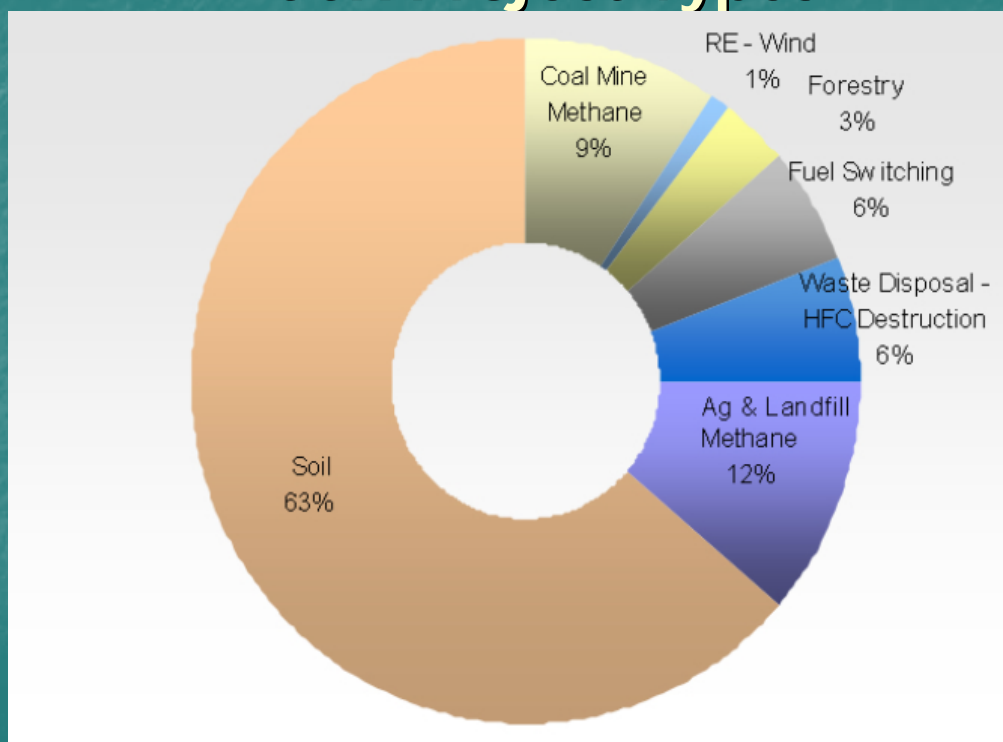
Chicago Climate Exchange



- Key element: **Carbon Financial Instrument**, a tradable commodity
- **More than just CO₂**, includes methane, nitrous oxide, HFCs, perfluorocarbons and SF₆ (converted through Global Warming Potential)
- **Offset projects** include methane and soil carbon management, renewable energy, forestry, energy efficiency

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CCX Project Types



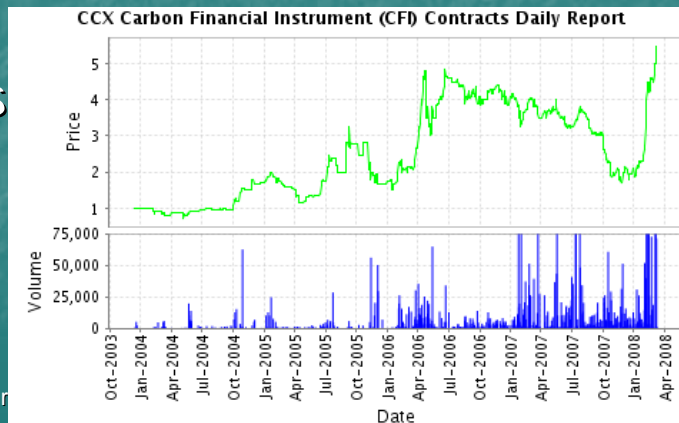
Chicago Climate Exchange



- High profile members include:
Ford Motor, American Electric Power,
Motorola, United Technologies
- Other stakeholders include associate
members,
offset aggregators
and providers

*1 CFI contract =
100 metric tons*

Price in \$/ton



European Trading Programs

- European Union Emissions Trading Scheme (EUTS)
- European Climate Exchange:
Founded by CCX in 2006
- Current (March 2008) European price of
around €20 per ton
- March 14, 2008 futures trading began



Compare Context of Scale

	2006 Volume (Million tCO ₂)	2006 Value (US\$ Million)
Voluntary OTC Offset Market	13.4	54.9
CCX	10.3	36.1
Total Voluntary Market	23.7	91 \$3.84 / ton
Other GHG Trading Schemes		
EU ETS Trading Scheme ²	1,101	24,357 \$22.12 / ton
Primary Clean Development Mechanism	450	4,813
Secondary Clean Development Mechanism	25	444
Joint Implementation	16	141
New South Wales	20	225

² The World Bank. *State and Trends of the Carbon Market*, 2007.
http://carbonfinance.org/docs/Carbon_Trends_2007-_FINAL_-_May_2.pdf.

Source: K. Hamilton, et al., 2007. "State of the Voluntary Carbon Market 2007: Picking up Steam" www.ecosystemmarketplace.com

Carbon Tax Comments

- British Columbia recently adopted a "revenue neutral" carbon tax
 - Effective July 1, 2008 @ \$10/ton
 - Rises by \$5 per year up to \$30 in 2012
 - How to integrate with cap and trade (Western Regional Climate Initiative)?
- What is the real price elasticity?

Speculation on Future

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The Crystal Ball

- Nothing happens in U.S. until 2009
- One estimate: U.S. carbon market could reach \$1 trillion by 2020
- Beyond the original Kyoto Protocol
 - Montreal 2005 – Agree to create plan for beyond Kyoto end in 2012
 - Bali, Dec. 2007 – outlines the deal
"Lead, follow or get out of the way"
 - Who caused the problem? Who fixes it?



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World vs. Country vs. Regional

- A common approach worldwide will not work
- In the U.S., most action to date by the various states in 3 groups
 - Western Regional Climate Initiative (AZ, NM, CA, OR, WA, MT + BC and Manitoba)
 - Regional Greenhouse Gas Initiative (CT, DE, ME, NH, NJ, NY and VT) with other observers
 - Midwest (IL, IA, KS, MI, MN and WI)
 - But, preferred action through federal government

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Recommendations for Near-Term

- Look at emissions reduction potentials
- Identify market opportunities
- Do:

what is verifiable ...

verify it ...

document it!

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Barriers to Implementation and ASHRAE Member's Opportunities

- In your opinion, what are barriers?

- Economic?
- Technical?
- Political?
- Managerial?



- Can these be changed?

- Opportunities?



Thank you!

- Comments, questions, concerns, advice ...

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