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

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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

The “Green Awakening”

Can you feel it?
What is Being Green?

Why Do It?

And, is it easy to be green?

- Green $\equiv$ Sustainable Design(?)

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

![Graph showing the growing gap between oil discovery and production](chart.png)
Why be Green - A Personal Reason

1985

2001

2007

A Sustainable Society

Actual path

Time
What’s Different from Past Periods of Environmental Concern?

- Compare the 1960’s & 70’s to now

Energy Issues: Then and Now

- 1970’s: Political
- Now: Politics mixed with economic reality
Energy Issues: Then and Now

- Nominal
- Real (in 2006 Dollars)

1861-1944 US Average
1945-1985 Arabian Light posted at Ras Tanura
1986-2006 Brent Spot
Source: Energy Information Administration

THE GROWING GAP
Oil Discovery and Production

Past discovery based on ExxonMobil (2002)
Revisions back tested

Population

World Population: 1950-2050

Source: U.S. Census Bureau, International Data Base, September 2004 version.
Environmental Pollution Concerns

We’ve come a long way in past 40 years

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

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 Dianne Nelson Jones, Pittsburgh Post-Gazette

A backlash brewing?

Are consumers growing tired of "going green"? 

Anita Dufalla/Post-Gazette
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

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

[Links: www.ipcc.ch]

Climate Change 2007: The Physical Science Basis
Climate Change 2007: Mitigation
Climate Change 2007: Impacts, Adaptation and Vulnerability
Temperature and CO₂ concentration in the atmosphere over the past 400,000 years (from the Vostok ice core)

Current average ~ 380 ppm
2030 projection ~ 450 ppm
2050 projection ~ 550 ppm
March 19, 1957 ~ 315 ppm

CO₂ concentration, temperature, and sea level continue to rise long after emissions are reduced.

**Magnitude of response**

- CO₂ emissions peak 0 to 100 years

**Time taken to reach equilibrium**
- Sea-level rise due to ice melting: several millennia
- Sea-level rise due to thermal expansion: centuries to millennia
- Temperature stabilization: a few centuries
- CO₂ stabilization: 100 to 300 years

*INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE*
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*
“Every problem is just an opportunity in disguise”

- Individuals
- Companies, organizations
- Nations

Find the Opportunities

ENVIROMENTAL CAPITAL

ECONomics: 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.

Search the Wall Street Journal for:

- Communities: Creating Environmental Capital
- ECO:nomics: Creating Environmental Capital
- ECO:nomics: Creating Environmental Capital

Watson, CEQ, GM: Lead the Charge

- General Motors: Leading the Charge
- Toyota: Leading the Charge
- BMW: Leading the Charge

Environmental Capital Blog

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

Environmental Capital Video

- Capitallism and Carbon
- Emissions
- T.J. Rodgers, CEO of Cypress Semiconductor, says the government should not...
Carbon Economics (Carbonomics)

- “Cap and Trade”
- Carbon Tax
- Hybrid alternates

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
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

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
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, perfluorcarbons and SF₆ (converted through Global Warming Potential)
- **Offset projects** include methane and soil carbon management, renewable energy, forestry, energy efficiency

CCX Project Types

- Soil: 63%
- Ag & Landfill Methane: 12%
- Waste Disposal - HFC Destruction: 6%
- Fuel Switching: 6%
- Forestry: 3%
- RE - Wind: 1%
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

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<th>2006 Volume (Million tCO₂)</th>
<th>2006 Value (US$ Million)</th>
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<tr>
<td>Voluntary CTC Offset Market</td>
<td>13.4</td>
<td>54.9</td>
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<td>CCX</td>
<td>10.3</td>
<td>36.1</td>
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<td>Total Voluntary Market</td>
<td>23.7</td>
<td>91</td>
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<td>Other GHG Trading Schemes</td>
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<td>EU ETS Trading Scheme</td>
<td>1,101</td>
<td>24,357</td>
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<td>Primary Clean Development Mechanism</td>
<td>450</td>
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<td>Secondary Clean Development Mechanism</td>
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<td>444</td>
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<td>Joint Implementation</td>
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<tr>
<td>New South Wales</td>
<td>20</td>
<td>225</td>
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### 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

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?
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

Recommendations for Near-Term

- Look at emissions reduction potentials
- Identify market opportunities
- Do: what is verifiable ...
  verify it ... document it!
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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