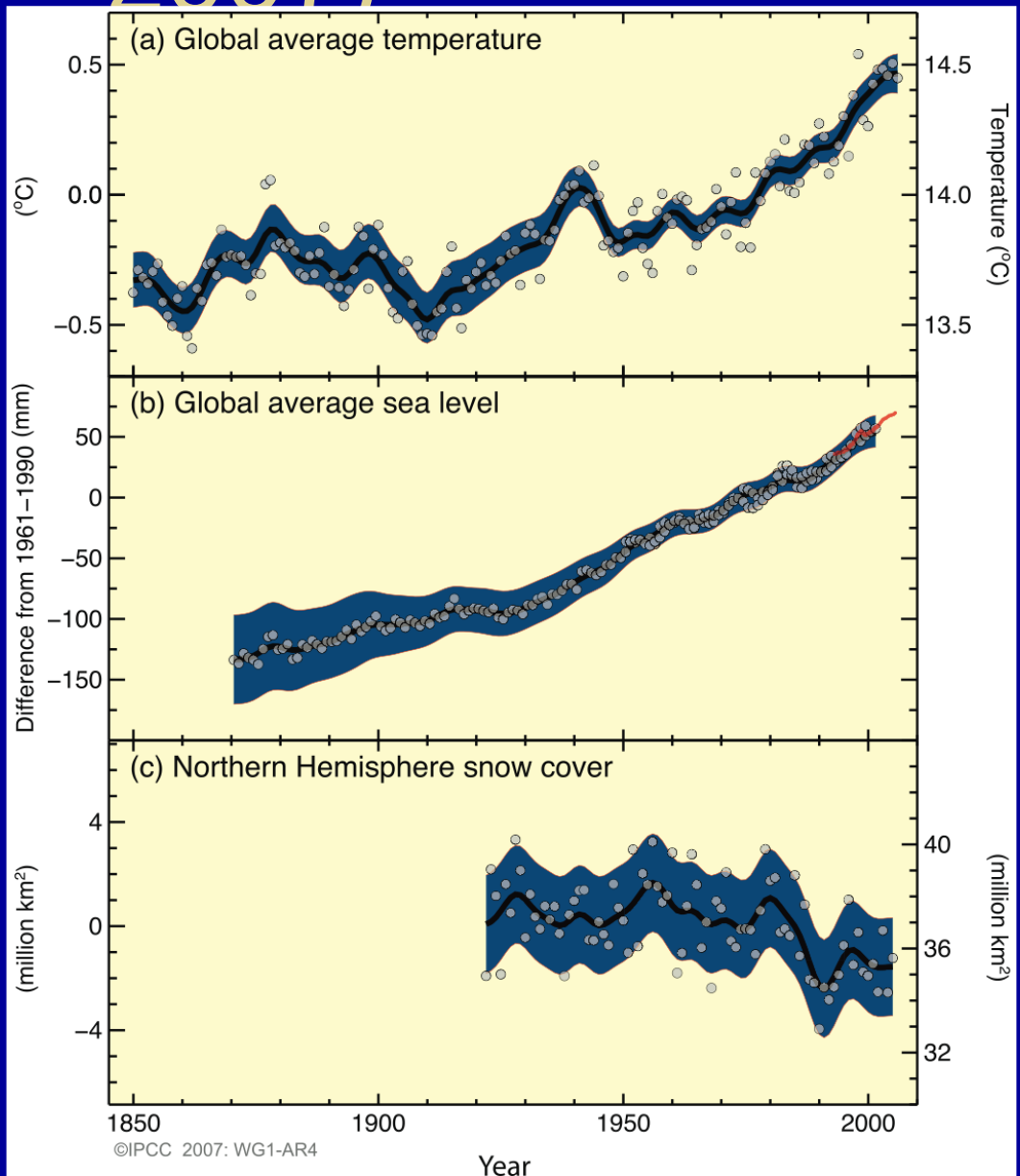
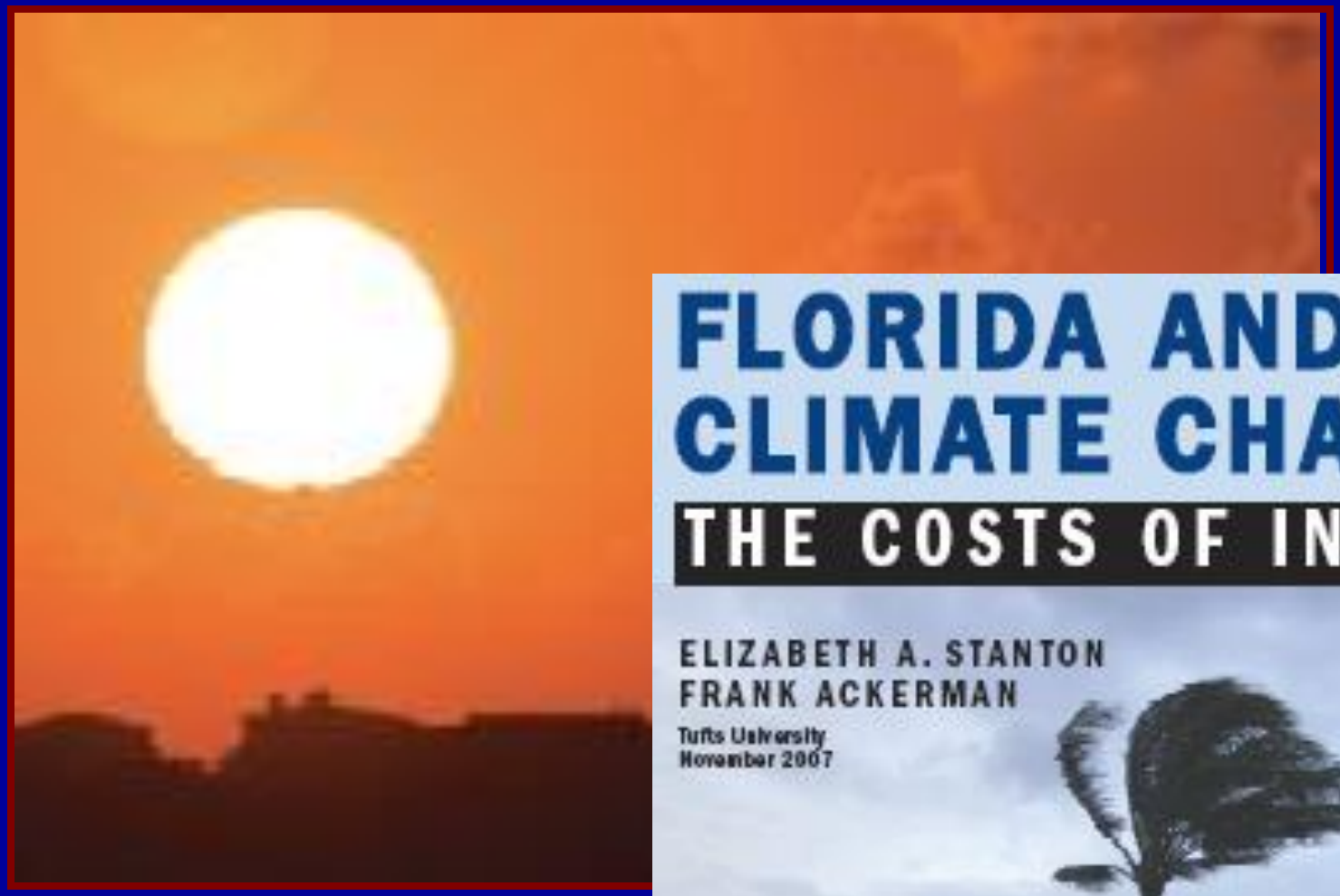
The latest evidence (IPCC, 2007)

The world is getting hotter

Sea levels are rising

Snow cover is decreasing
(Northern Hemisphere, March-April)





FLORIDA AND CLIMATE CHANGE

THE COSTS OF INACTION

ELIZABETH A. STANTON
FRANK ACKERMAN
Tufts University
November 2007

In brief

Doing something about climate change may seem expensive, *but…*

- Doing nothing about climate change will be really expensive
- Four effects of inaction will amount to **5% of Florida state income by 2100**
- Many other critical impacts of climate change cannot be priced

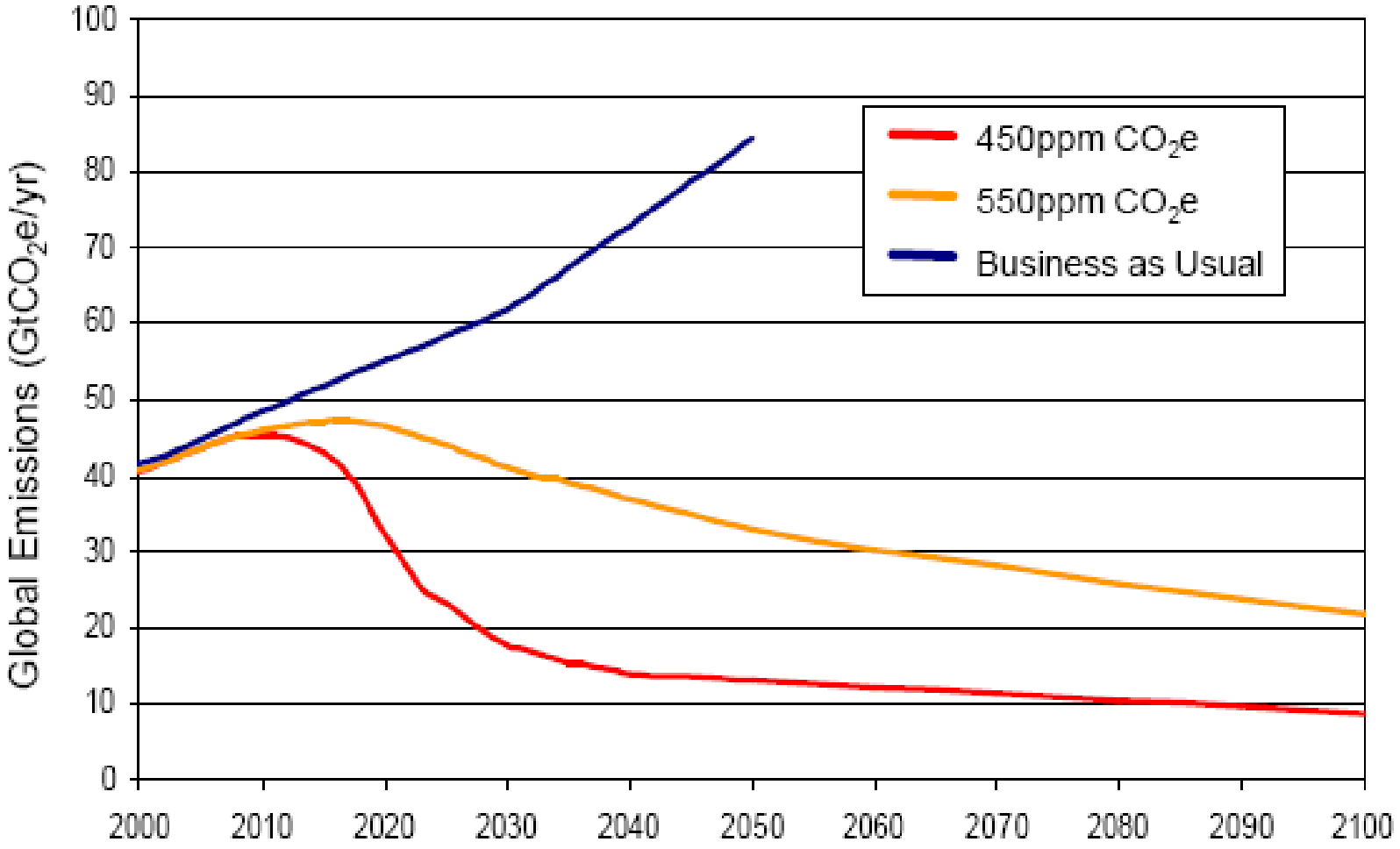
The Cost of Inaction

Our report describes the best and worst ***probable*** climate outcomes for Florida.

The “cost of inaction” is the difference between these worst and best cases.

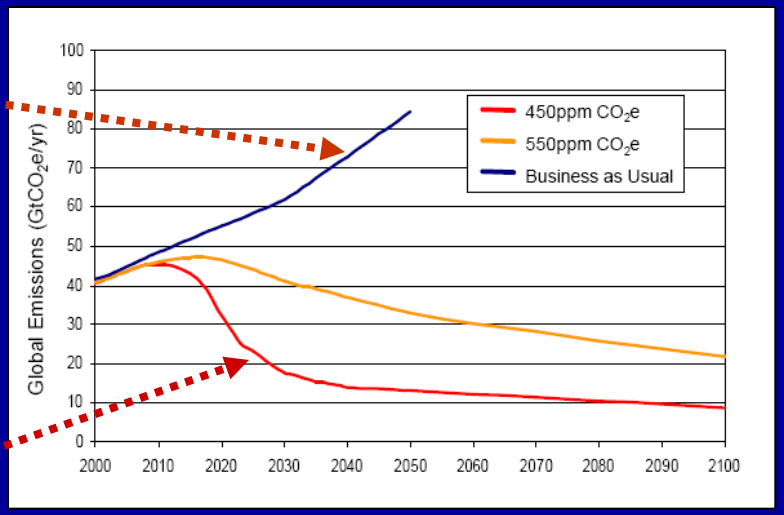
It’s the damage that we can avoid by acting to stop, or slow, climate change.

Emissions Paths to Stabilisation



Two scenarios for Florida's climate

- Business as usual
  - CO_2 emissions continue rising
  - 10°F temperature increase
  - 45 inches sea-level rise
  - 10% less rainfall
  - More intense hurricanes
- Rapid stabilization
  - Success in meeting state emission targets, comparable reductions nationwide, worldwide
  - 2°F temperature change, 7 inches sea level rise
  - No change in hurricanes, rainfall



Two scenarios for Florida's climate

Average Annual Temperature Increase

(in degrees Fahrenheit above year 2000 temperature)

	2025	2050	2075	2100
Rapid Stabilization Case	0.6	1.1	1.7	2.2
Business-As-Usual Case	2.4	4.9	7.3	9.7

Sea-Level Rise

(in inches about year 2000 elevation)

	2025	2050	2075	2100
Rapid Stabilization Case	1.8	3.5	5.3	7.1
Business-As-Usual Case	11.3	22.6	34.0	45.3

Florida's "Vulnerable Zone"

The ***vulnerable zone*** is the land area underwater at high-tide with 27 inches of sea-level rise – 2060 in the business-as-usual scenario.

This includes residential real estate now valued at over $130 billion, half of Florida's existing beaches, and 99 percent of its mangroves.

Population vulnerable to 27 inches of sea-level rise

	Vulnerable Population *(share of total population)*	**Vulnerable Population**	**Total Population**
Florida Total	9.4%	1,503,153	15,982,378
Miami-Dade	16.8%	379,511	2,253,362
Pinellas	16.5%	152,413	921,482
Volusia	20.8%	92,267	443,343
Brevard	18.7%	89,060	476,230
Monroe	94.9%	75,549	79,589
Duval	9.2%	71,843	778,879
Lee	15.7%	69,036	440,888
Palm Beach	6.1%	68,822	1,131,184
Broward	3.8%	60,920	1,623,018
Collier	22.3%	55,970	251,377

Florida's "Vulnerable Zone"

- 2 nuclear reactors;
- 3 prisons;
- 37 nursing homes;
- 68 hospitals;
- 74 airports;
- 82 low-income housing complexes;
- 115 solid waste disposal sites;
- 140 water treatment facilities;
- 171 assisted livings facilities;
- 247 gas stations;
- 277 shopping centers;
- 334 public schools;
- 341 hazardous-material cleanup sites, including 5 Superfund sites;
- 1,025 churches, synagogues, and mosques;
- 1,362 hotels, motels, and inns;
- and 19,684 historic structures.

Economic Impacts

Tourism, one of Florida's largest economic sectors, will be the hardest hit as much of the state's wealth of natural beauty – sandy beaches, the Everglades, the Keys – disappears under the waves. Annual costs of inaction are projected to total $9 billion by 2025, $40 billion by mid-century, and $167 at the end of the century.

Economic Impacts

Agriculture, forestry and fisheries will also suffer large losses. Well-known and economically important Florida products like orange juice and pink shrimp may become a thing of the past. And even as higher temperatures and more-irregular rainfall increase the demand for crop and livestock irrigation, freshwater supplies will become scarcer as saltwater intrusions contaminate them.

Economic Impacts

The **insurance industry** also will be affected by climate change, as it seeks to adjust to a new, riskier Florida. Florida's residents and businesses will continue to struggle to find affordable insurance coverage.

Economic Impacts

High temperatures will increase demands for **electricity,** primarily to supply air conditioning. The same temperature increases will also degrade the performance of power stations and transmission lines, making them operate less efficiently; partly as a result, every additional degree Fahrenheit of warming will cost consumers an extra $3 billion per year by 2100.

Economic Impacts

The business-as-usual case will only intensify Florida's looming **water** crisis in other ways as well. Under hotter and drier conditions, agricultural and domestic users will need more water; the survival of irrigated winter agriculture in the state will be threatened. The one potentially vast source of fresh water, desalination of ocean water, is an expensive and technically complex process.

Florida's Natural Ecosystems

- Wholesale extinctions and ecosystem destruction are unavoidable in the business-as-usual future, and the strategy that could save the most species and ecosystems – allowing wetlands to migrate, taking over what are now dry lands – is extremely unlikely to occur, at least on a wide scale.
- Natural ecosystems in every corner of Florida will be affected.

Florida's Costs of Inaction

(billions of 2006 dollars, except percentages)

	2025	2050	2075	2100
Tourism	$9	$40	$88	$167
Hurricanes	$6	$25	$54	$104
Electricity	$1	$5	$10	$18
Real Estate	$11	$23	$33	$56
Summary: Costs of Inaction				
in billions of 2006 dollars	**$27**	**$92**	**$184**	**$345**
as percent of Florida GSP	**1.6%**	**2.8%**	**3.9%**	**5.0%**

Vladimir Putin

Mahmood Ahmadinejad

Hugo Chavez

Opportunity

“ I am persuaded the global climate change is one of the most important issues we face this century and we must make every effort to do what’s right” 2007 State of the State Address

Florida Today

- Florida is the 4th largest state.
- Has 1.5% of the nation's venture capital.
- Latest economic forecast anticipates that normal economic growth will not return to Florida until the latter half of Fiscal Year 2009-2010.
- Florida is losing jobs (-0.9, while the nation as a whole stayed weakly positive at +0.2). One estimate shows Florida has lost 74,000 jobs in the last year.

http://edr.state.fl.us/conferences/fleconomic/FEEC0807_execsumm.pdf

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Florida Today

- Imports 98% of its Fuel for Energy
- Almost 60% dependent on Natural Gas
- Less than 2% Renewable (most of that is waste to energy)
- Using Early Cost Recovery for Base Load Nuclear Power 10-15 years away

Sarasota Florida

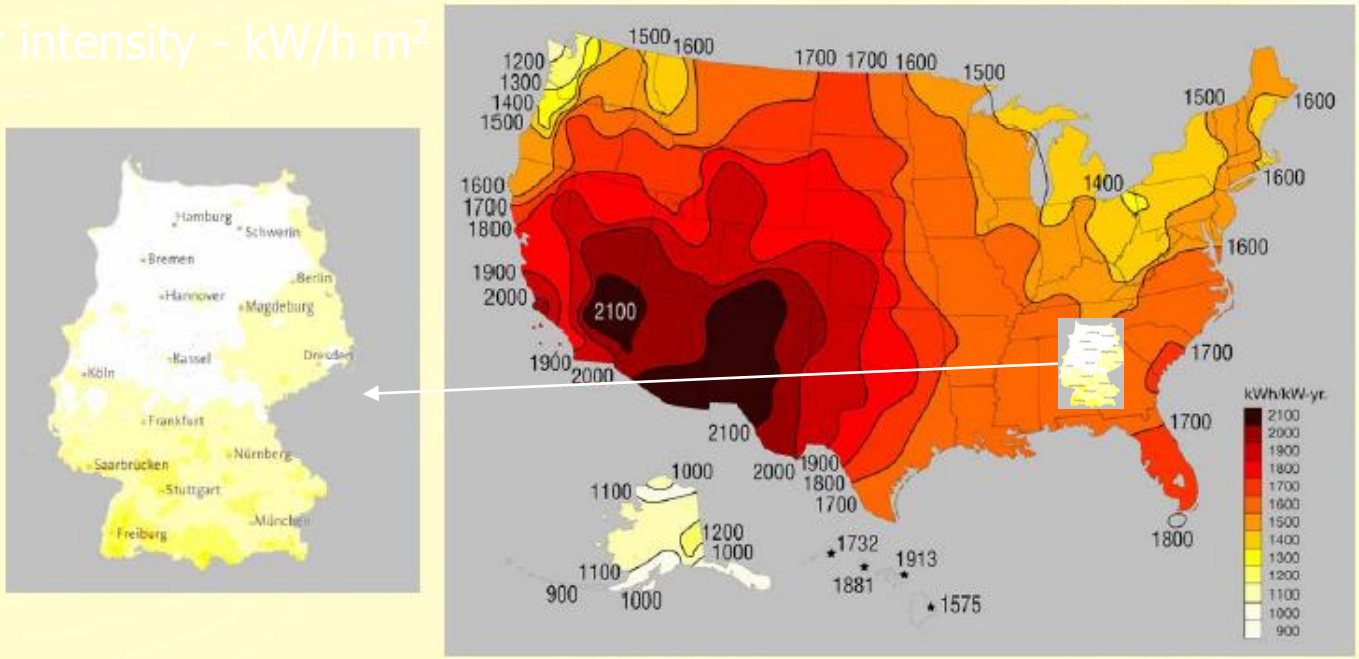
- 30 % Rentals Unoccupied
- 30,000 Student Decrease Public Schools
- Property Tax Revenue Down 25%
- Almost 10% Unemployment

Florida

Germany

Florida vs. Germany

Solar intensity - kW/h m^2



Florida Sunshine Resource 2X Today's Largest Market - Germany

Sez Who!

Climate Edition

"Climate change poses clear, catastrophic threats… . we may not agree on the extent, but we certainly can't afford the risk of inaction."

A. Janet Robinson, CEO of *The New York Times*

B. John Mackey, founder and CEO of Whole Foods

C. Ray Anderson, founder of Interface, Inc.

D. Rupert Murdoch, owner of Fox News

“Global warming seems to be catching up with us pretty quickly. What may happen to the dollar, and what may happen to growth in China or whatever pale into insignificance compared with the question of what happens to this planet over the next 30 or 40 years if no action is taken.”

A. Robert Rubin, Former Secretary of the Treasury

B. Paul Volcker, former Chairman of the U.S. Federal Reserve

C. Lawrence Summers, Former Secretary of the Treasury

D. Ben Bernake, Chairman of the Board of Governors of the US Federal Reserve

“the science is quite compelling. Human activity, including the burning of fossil fuels, is contributing to climate change. Now is the time we need a national mandated framework to deal with climate change. Voluntary programs are not going to meet the challenge of climate change.”

A. Dr. Robert Watson, Chief Scientist at the World Bank

B. John Browne, former CEO of BP

C. James J. Mulva, Chairman and CEO of ConocoPhillps

D. Fred Krupp, President, Environmental Defense

“The modeling has gotten better. We know enough now – or, society knows enough now – that the risk is serious and action should be taken.”

A. Katsuaki Watanabe, CEO of Toyota

B. Kenneth Cohen, Vice President of Public Affairs, Exxon Mobil Corporation

C. Jim Donald, CEO of Starbucks

D. John Dingell, Chair of House Energy and Commerce Committee

“We will pay for this one way or the other. We will pay to reduce greenhouse gas emissions today …. Or we will pay the price later in military terms. And that will involve human lives.”

A. Gen. Anthony Zinni, USMC (ret.)

B. Marc Levy, Columbia University’s Earth Institute

C. Donald Rumsfeld, former Secretary of Defense

D. Vice Adm. Richard J. Truly, (ret.), former NASA administrator

“[The impact of greenhouse gases on climate change] used to be controversial, but the science is in, and it’s overwhelming.”

A. Jeffrey Immelt, CEO of General Electric

B. Bill Gates

C. Lee Scott, CEO of Wal-Mart

D. Yves Couette, CEO of Ben & Jerry’s


CHRYSLER
Jeep
DODGE
The Nature Conservancy
GM
Duke Energy
bp
MARSH
DOW
ALCOA
CATERPILLAR
JOHN DEERE
NRG
Boston Scientific
Ford
AIG
Johnson
XEROX
FPL GROUP
PEW CENTER ON Global CLIMATE CHANGE
RIO TINTO
GE
ConocoPhillips
$2 Trillion