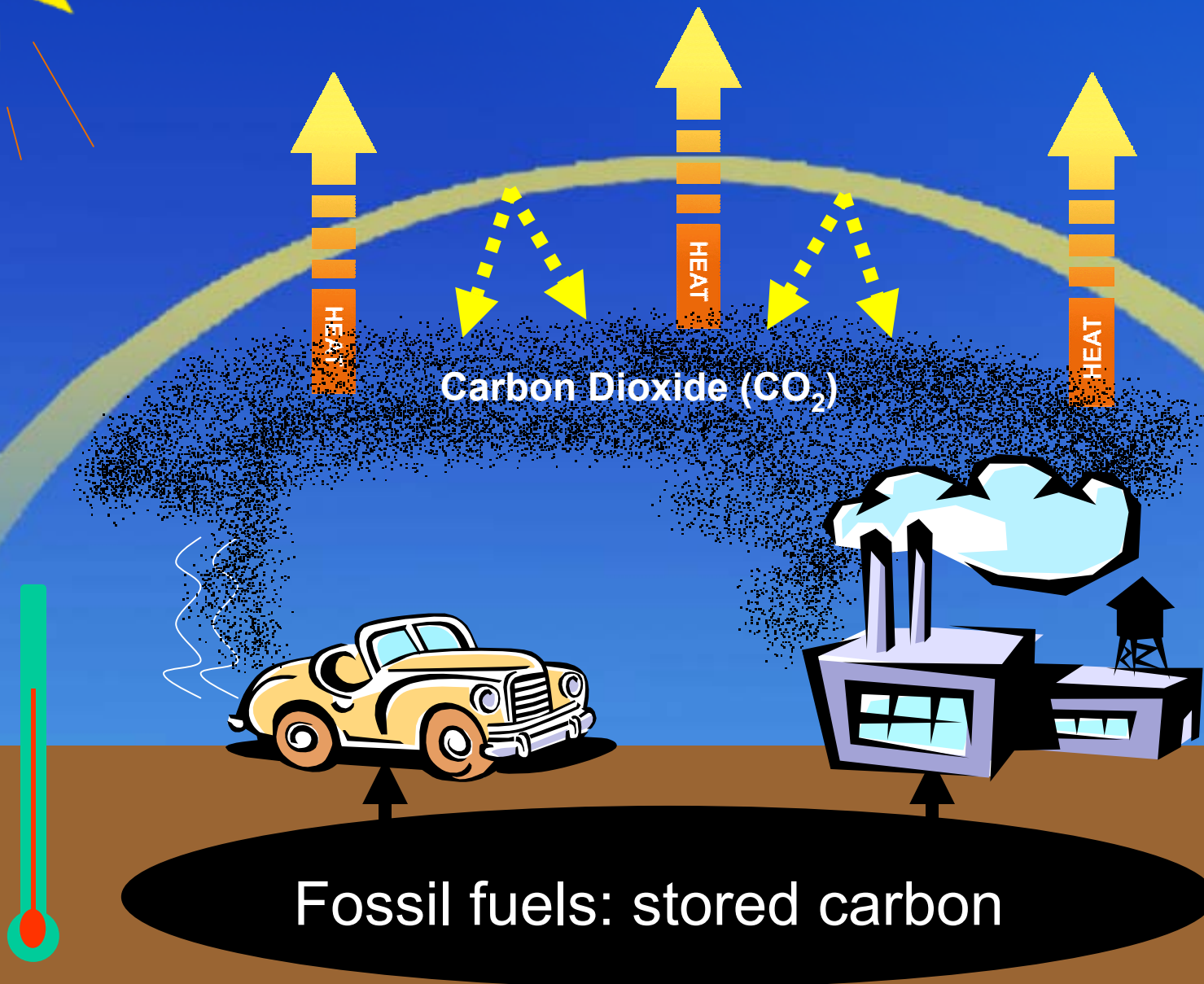


Taming the Climate Dragon

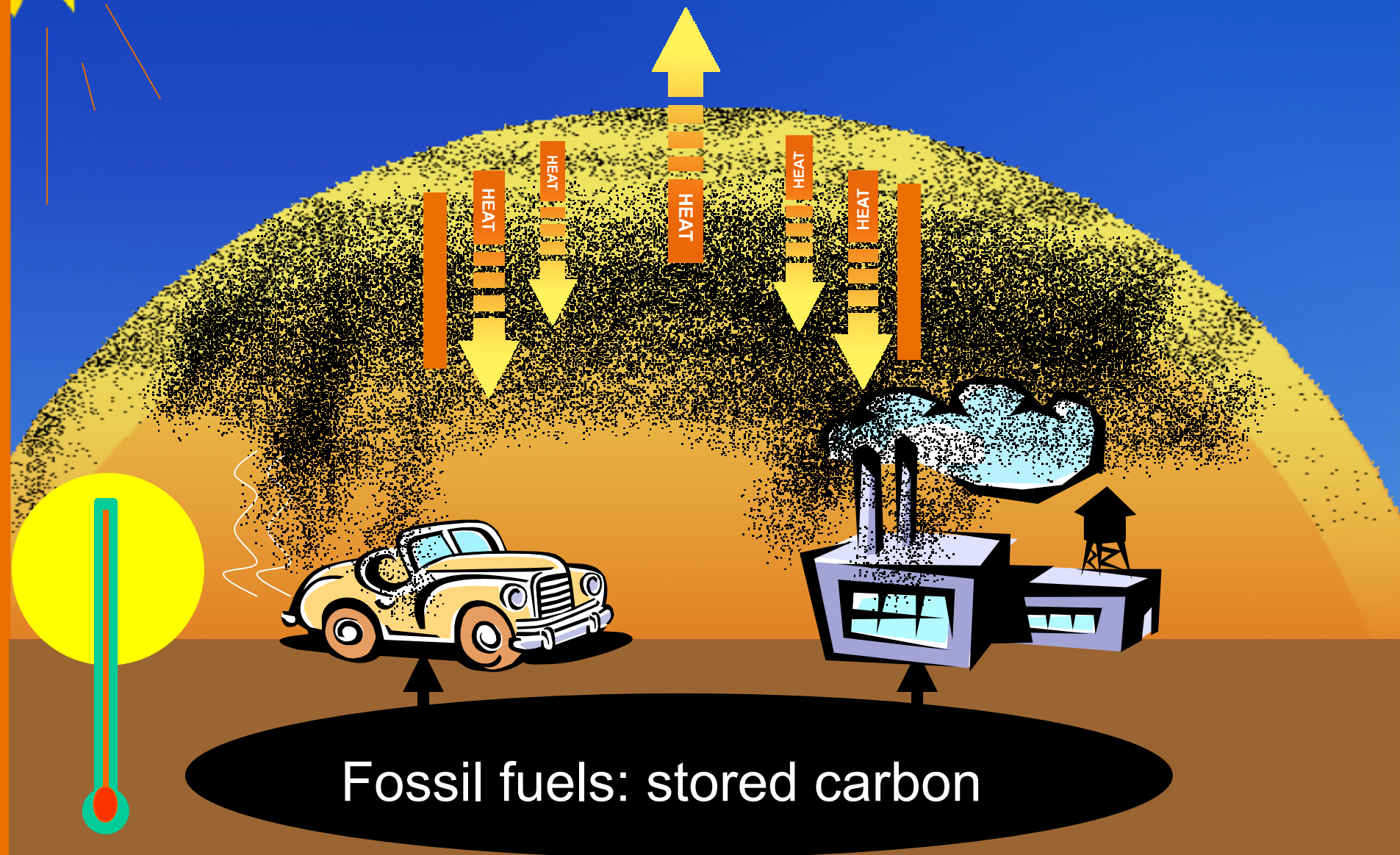


February 2006

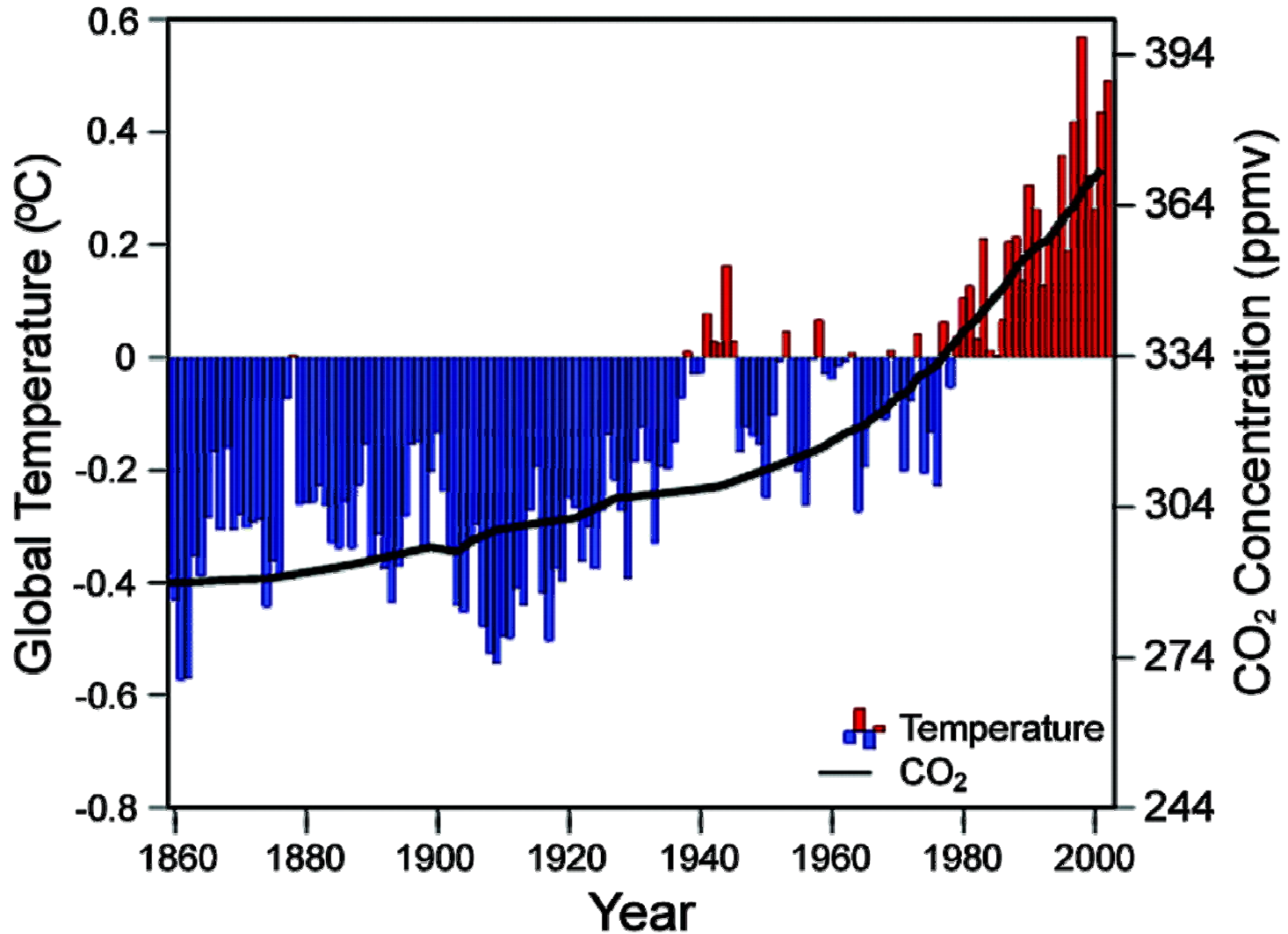
How global warming works



How global warming works

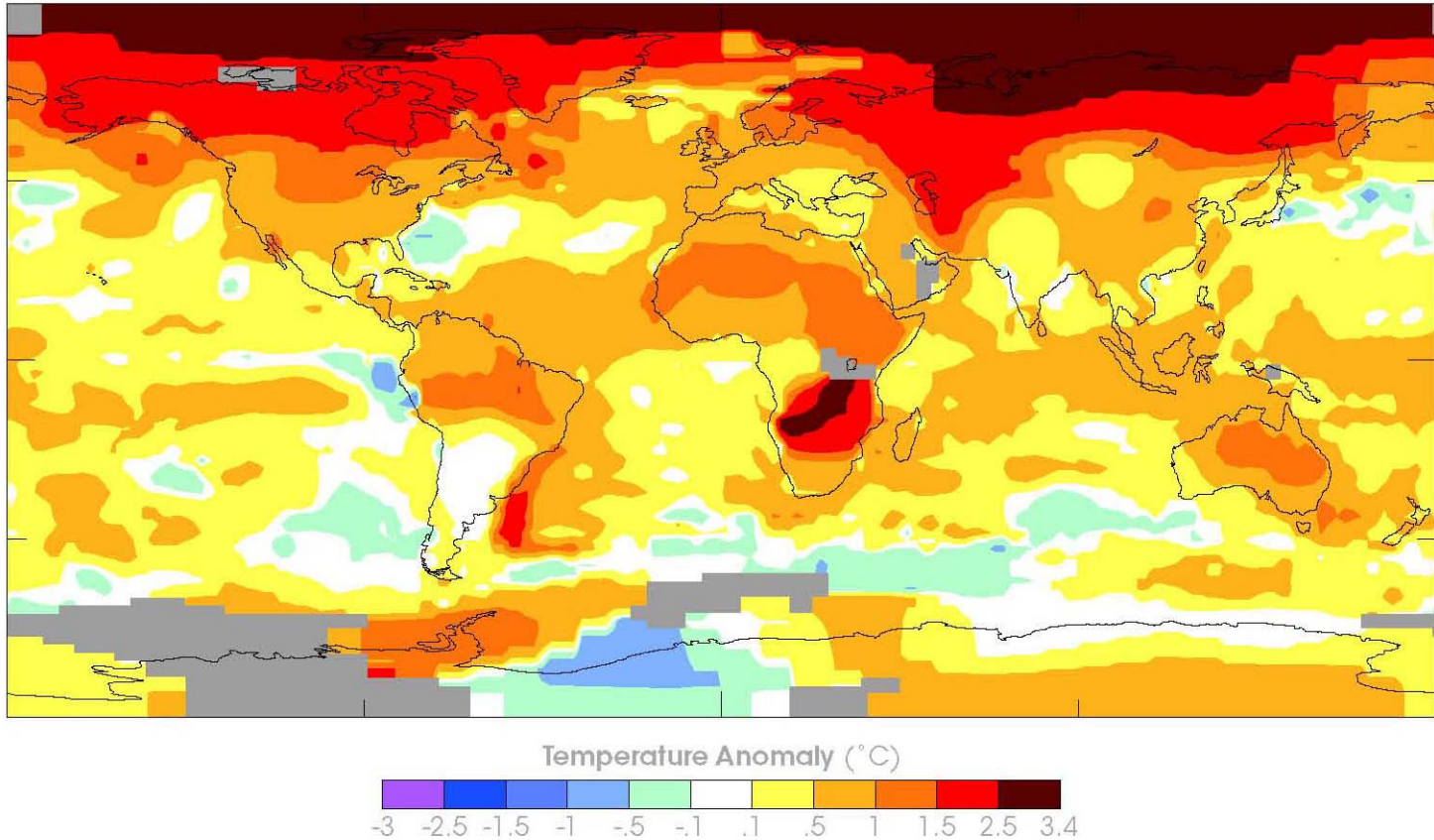


Temperatures are rising



Source: Karl and Trenberth, 2003.

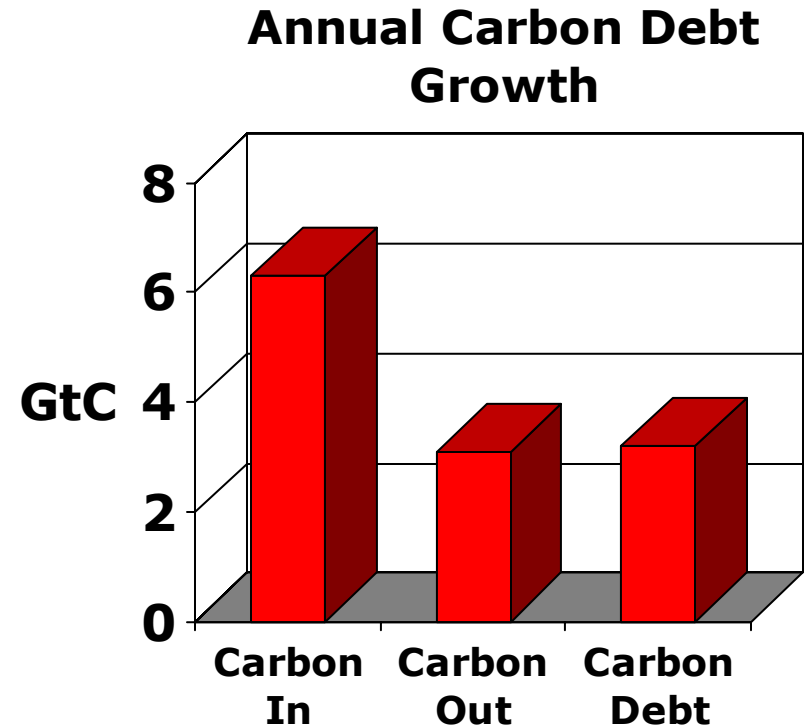
2005 Surface Temperature Anomaly

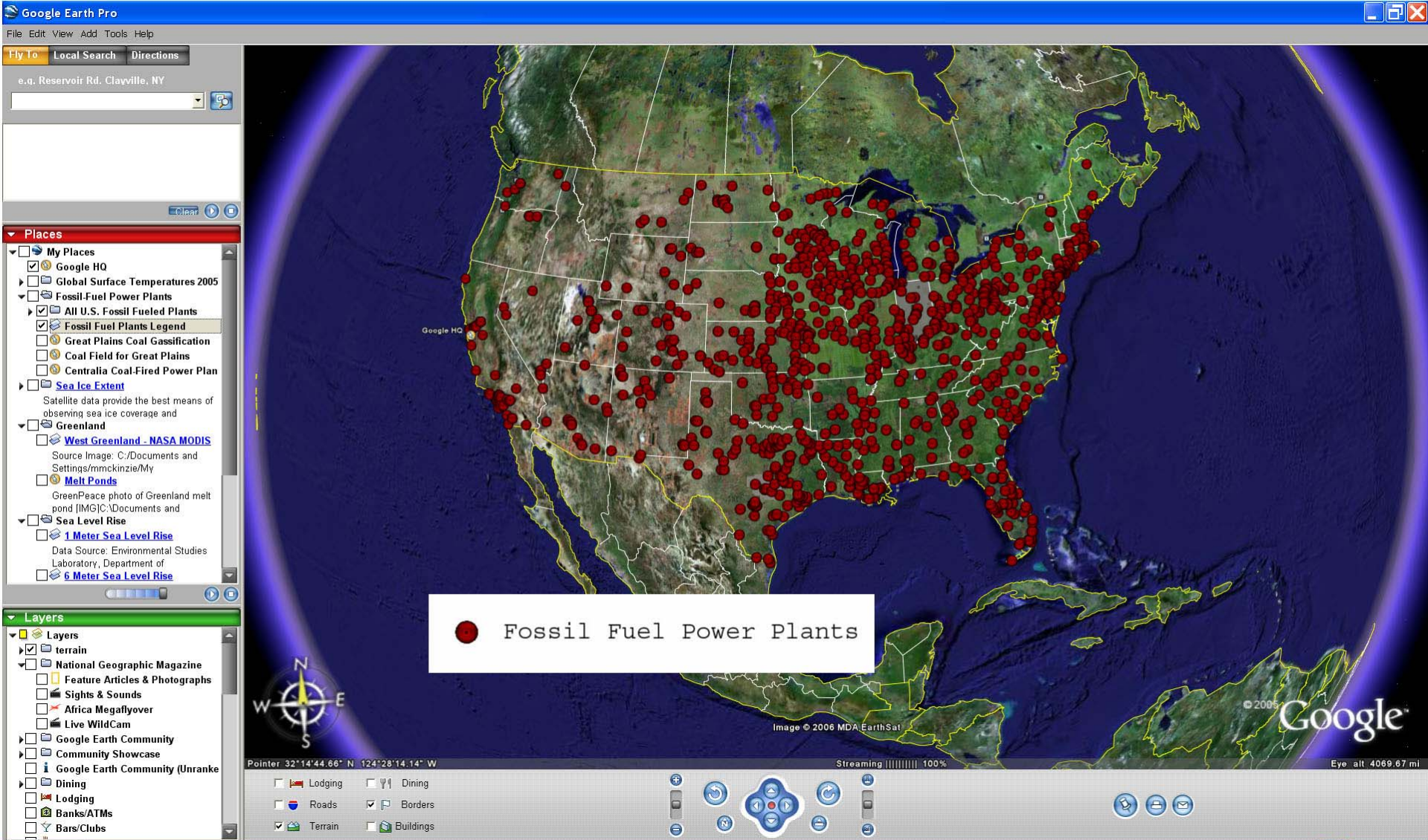


<http://data.giss.nasa.gov/gistemp/2005/>

Carbon deficit spending—Do the math

- Energy carbon emissions in year 2000 = 6.3 billion metric tons
- Removal to oceans, soils, trees = 3.1 billion metric tons
- Net buildup in air = 3.2 billion metric tons

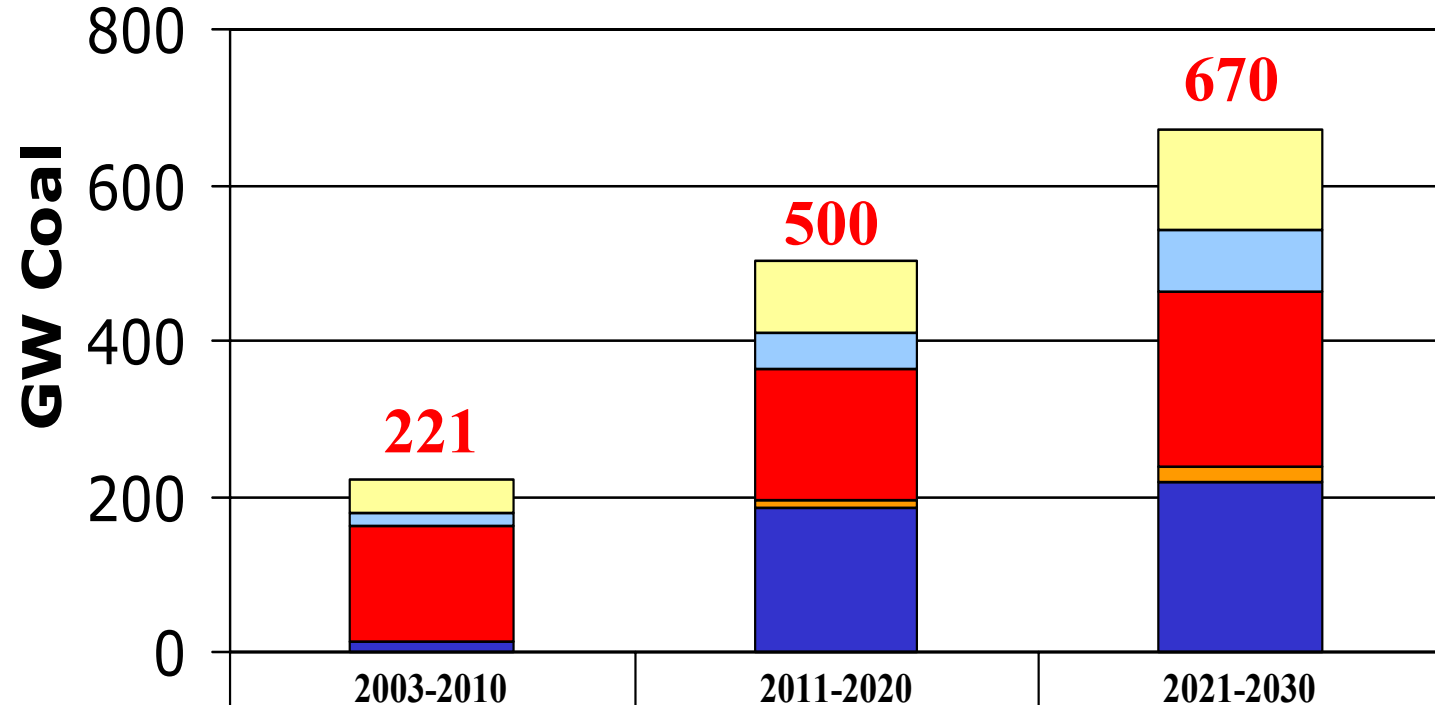




Investments today drive impacts tomorrow

- Investments drive emissions
- Emissions drive concentrations
- Concentrations drive temperature forcing
- Forcing drives impacts

New coal build by decade

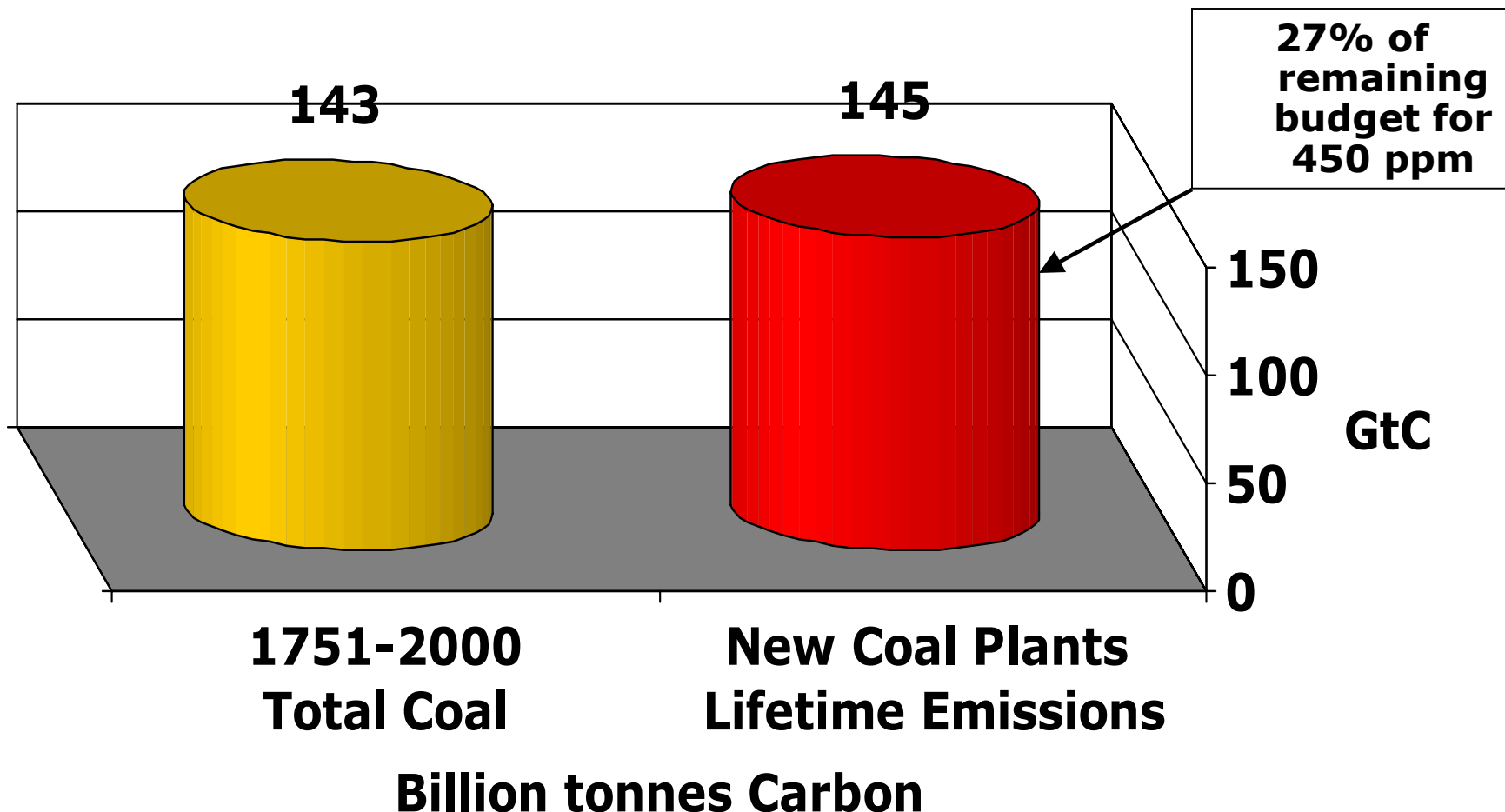


Other Developing	43	90	128
India	16	48	79
China	150	168	226
Transition	1	11	19
OECD	12	184	218

Incremental new coal capacity by decade

Source: IEA, WEO 2004

New coal plant emissions equal all historic coal CO₂



Source: ORNL, CDIAC; IEA, WEO 2004

Melting arctic ice



Photo NASA © NRDC 2005

Peril for polar bears



Melting glaciers & ice sheets



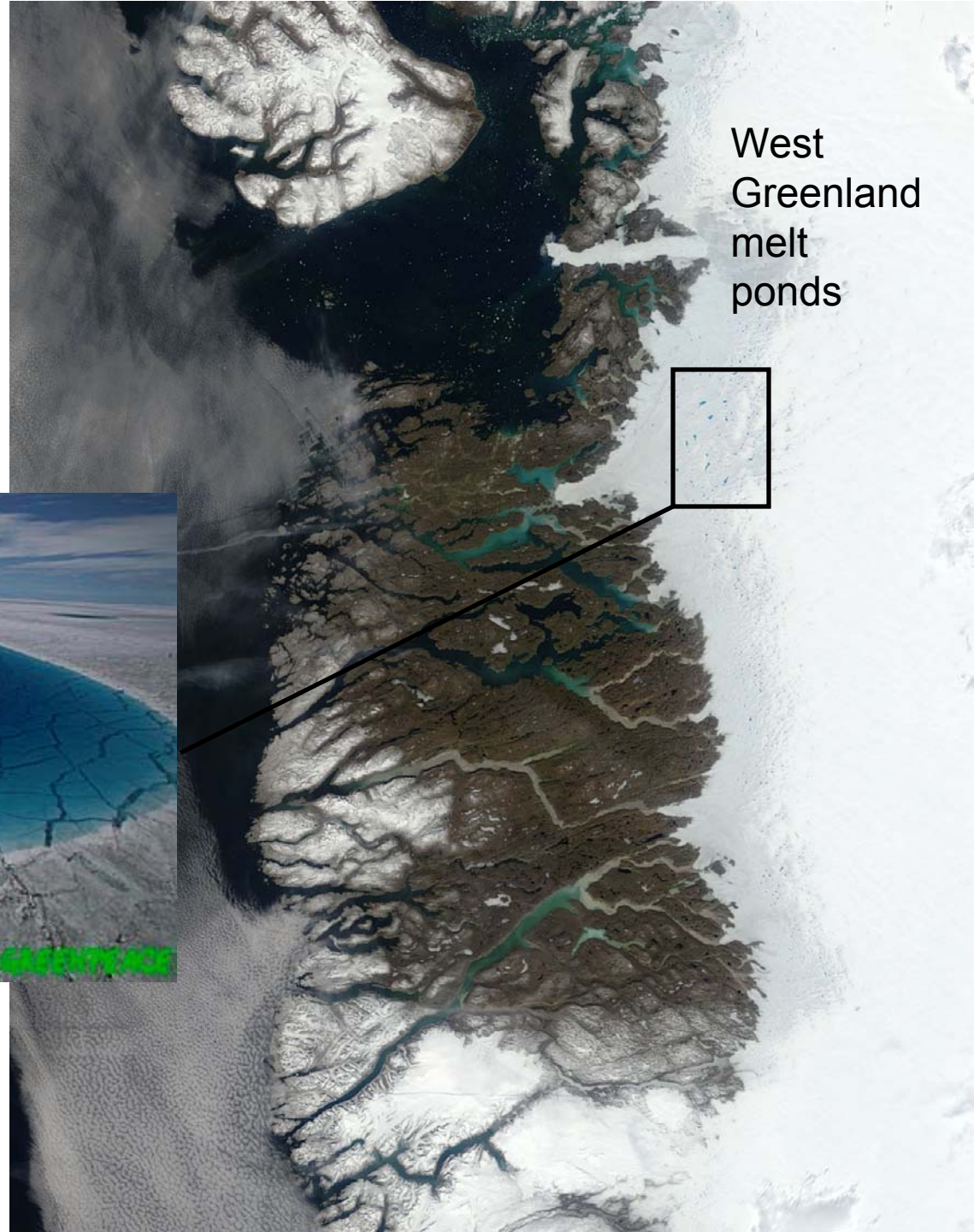
Melt Area



1992

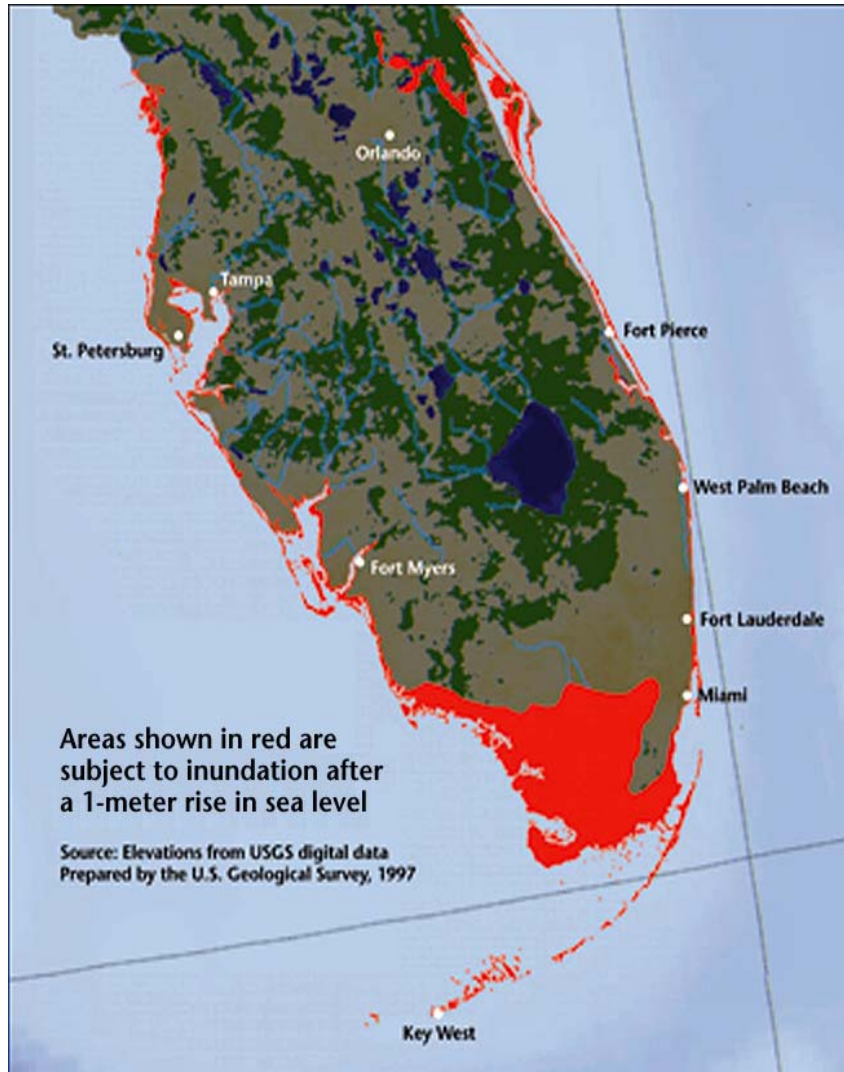
2002

Greenland Ice Sheet Melt

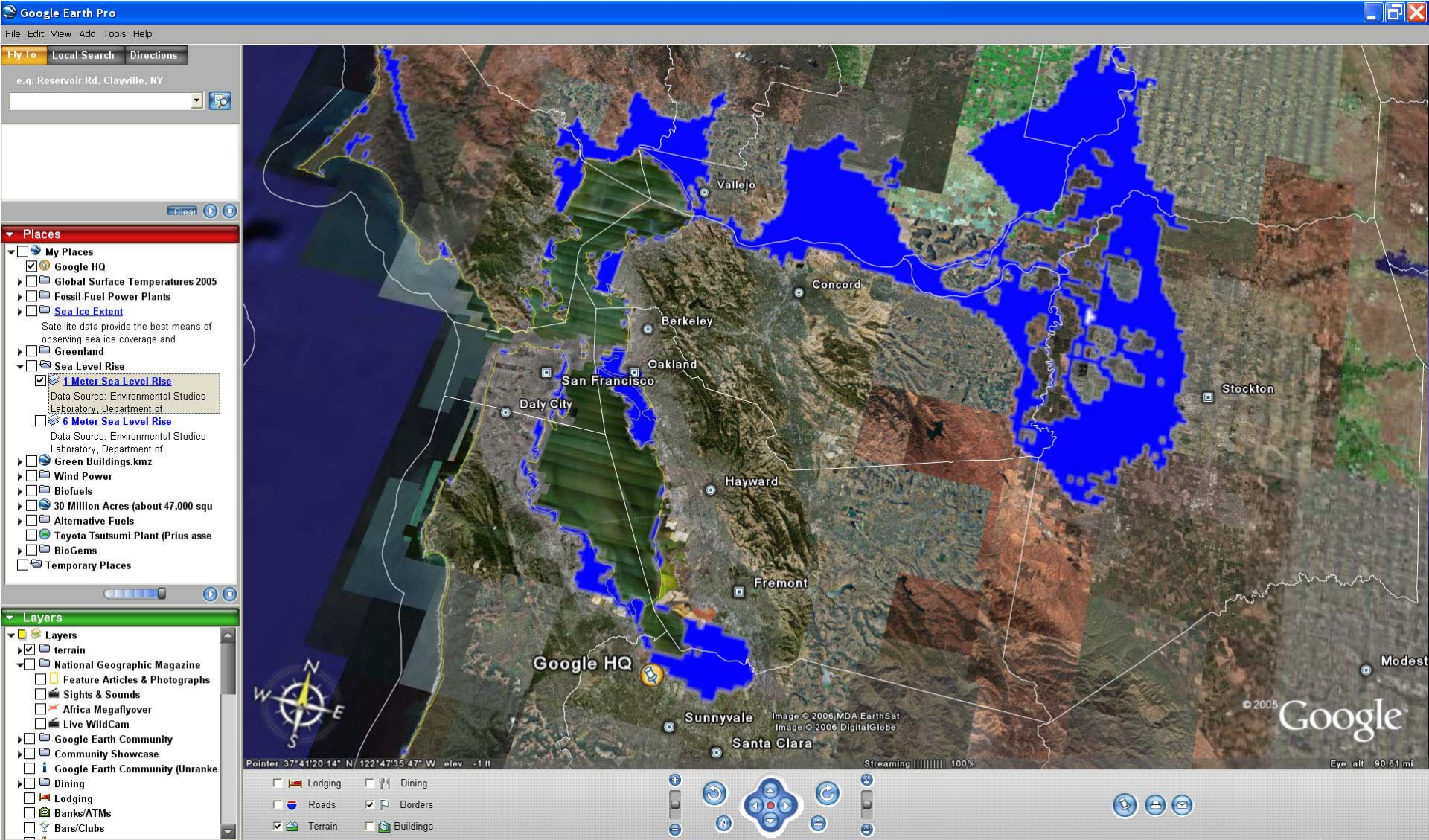


West
Greenland
melt
ponds

Rising sea levels

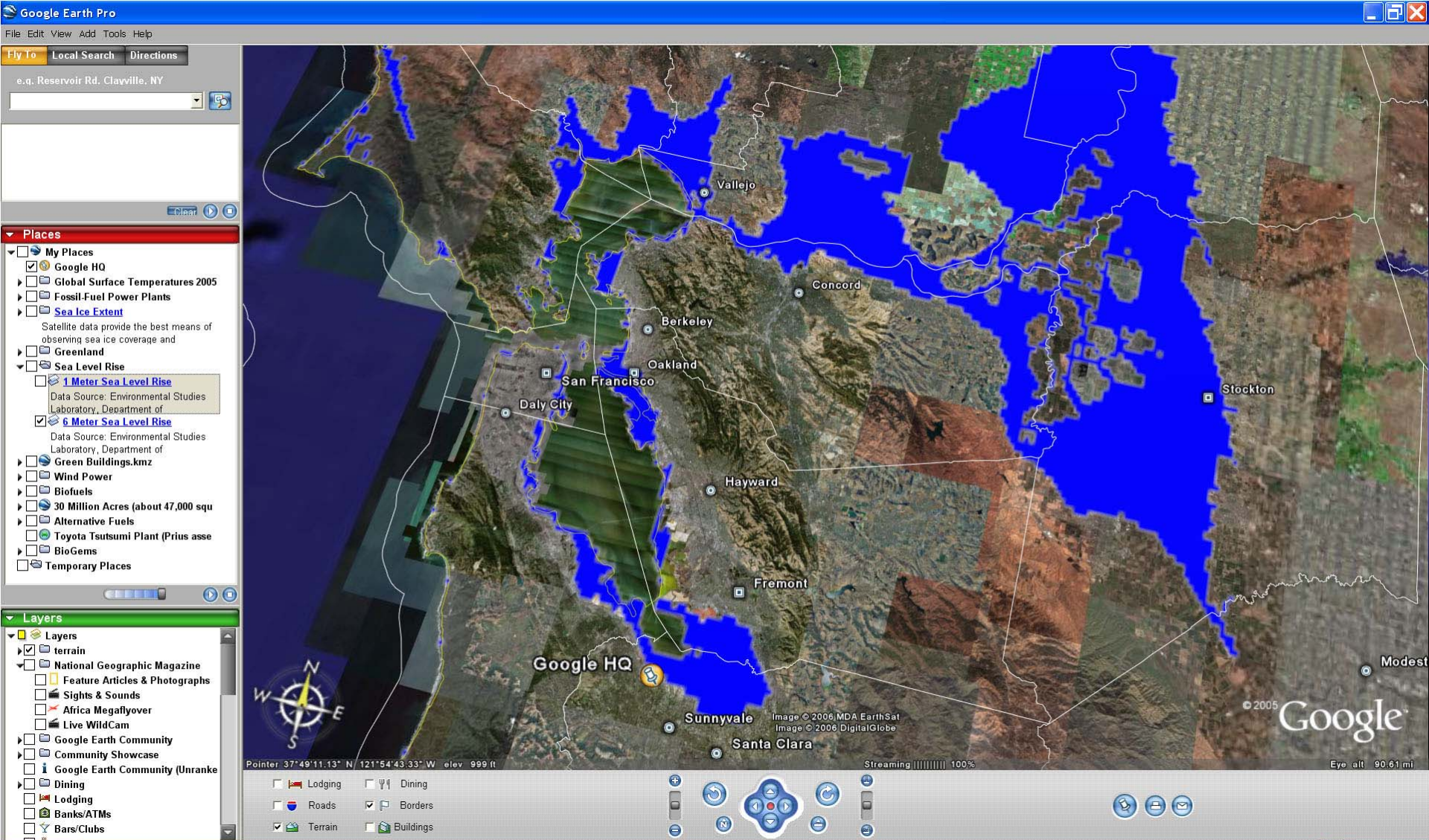


- Beach erosion
- Everglades inundation
- Saltwater intrusion
- Storm surge



1 meter sea level rise

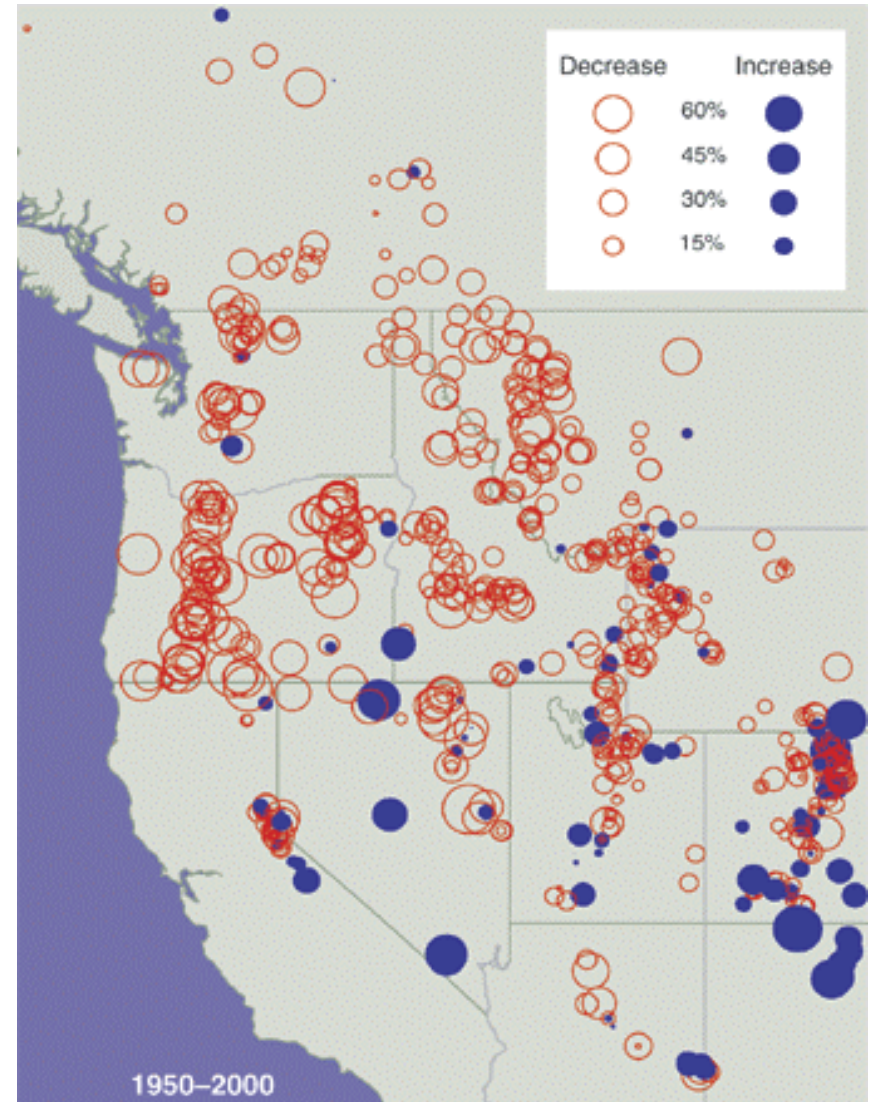
Data Source: Environmental
Studies Laboratory,
Department of Geosciences,
University of Arizona



6 meter sea level rise

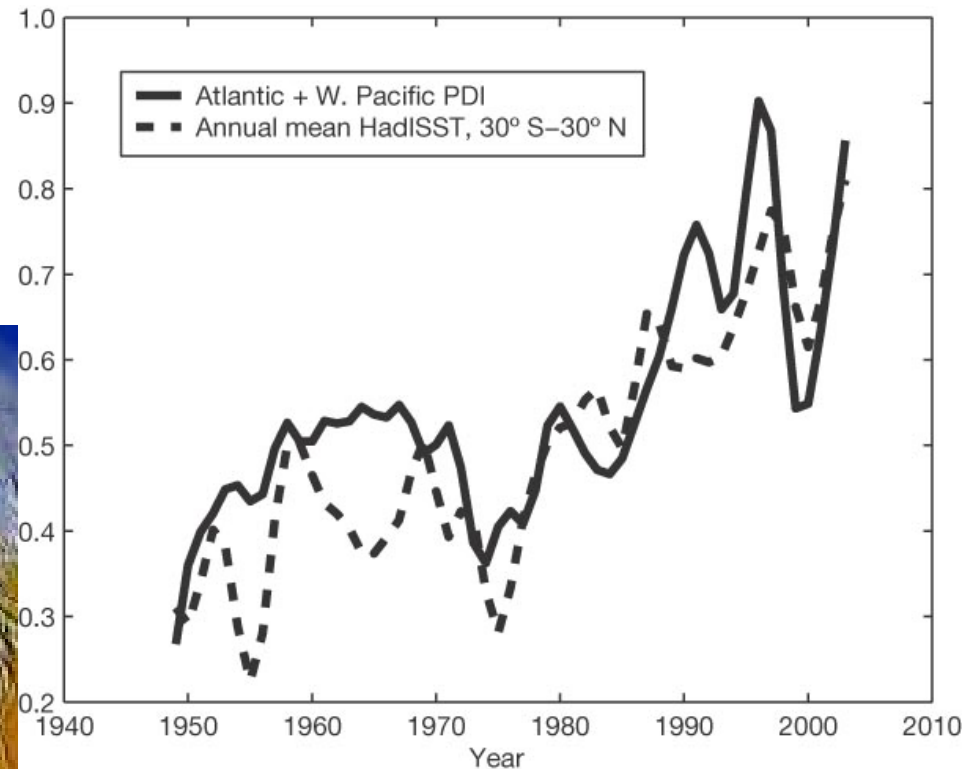
Data Source: Environmental
Studies Laboratory,
Department of Geosciences,
University of Arizona

Declining snowpack



Source: P. Mote, U. of Washington

Stronger hurricanes



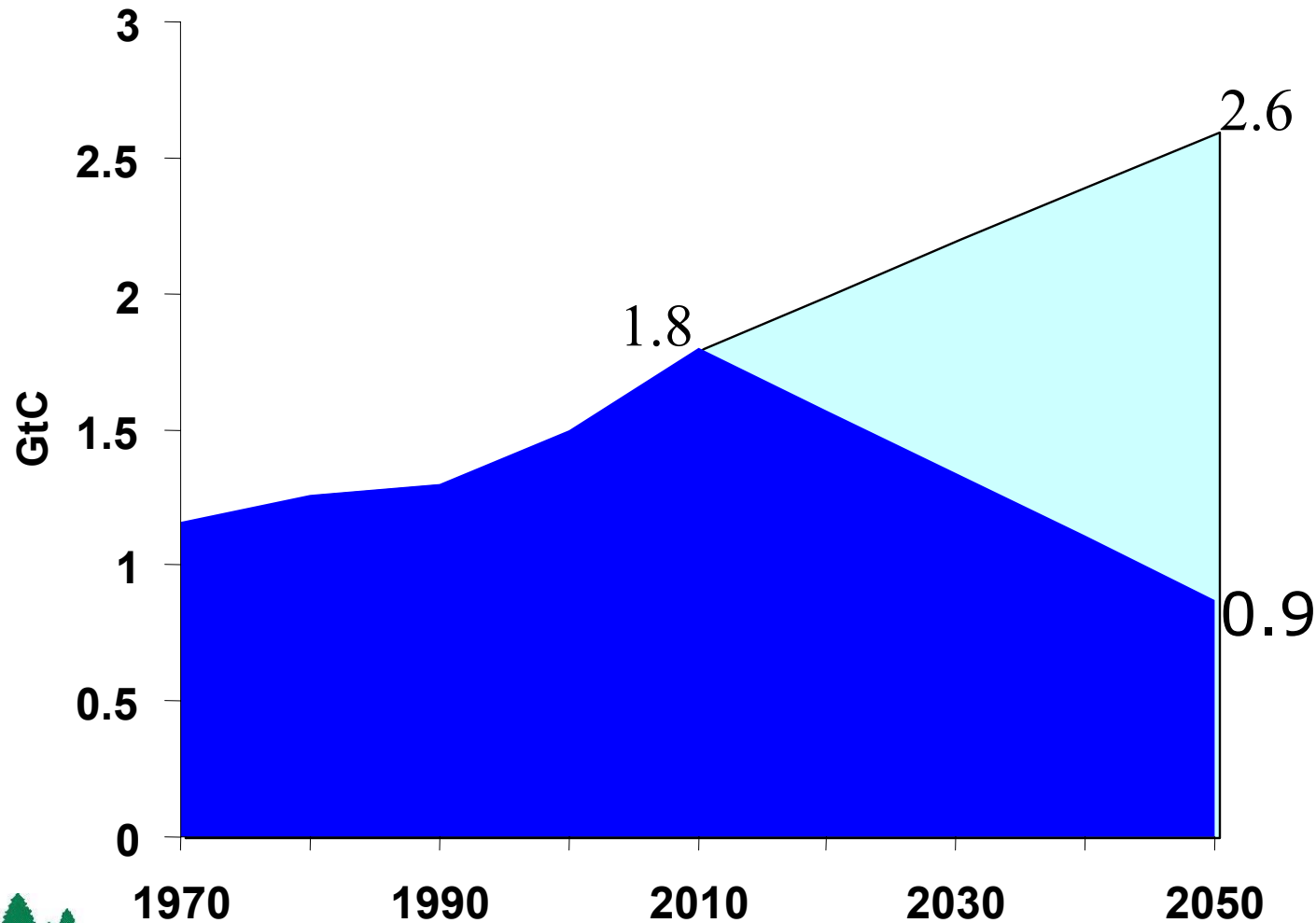
Source: Kerry Emanuel, Nature 436, 686-688 (4 August 2005)

Solutions

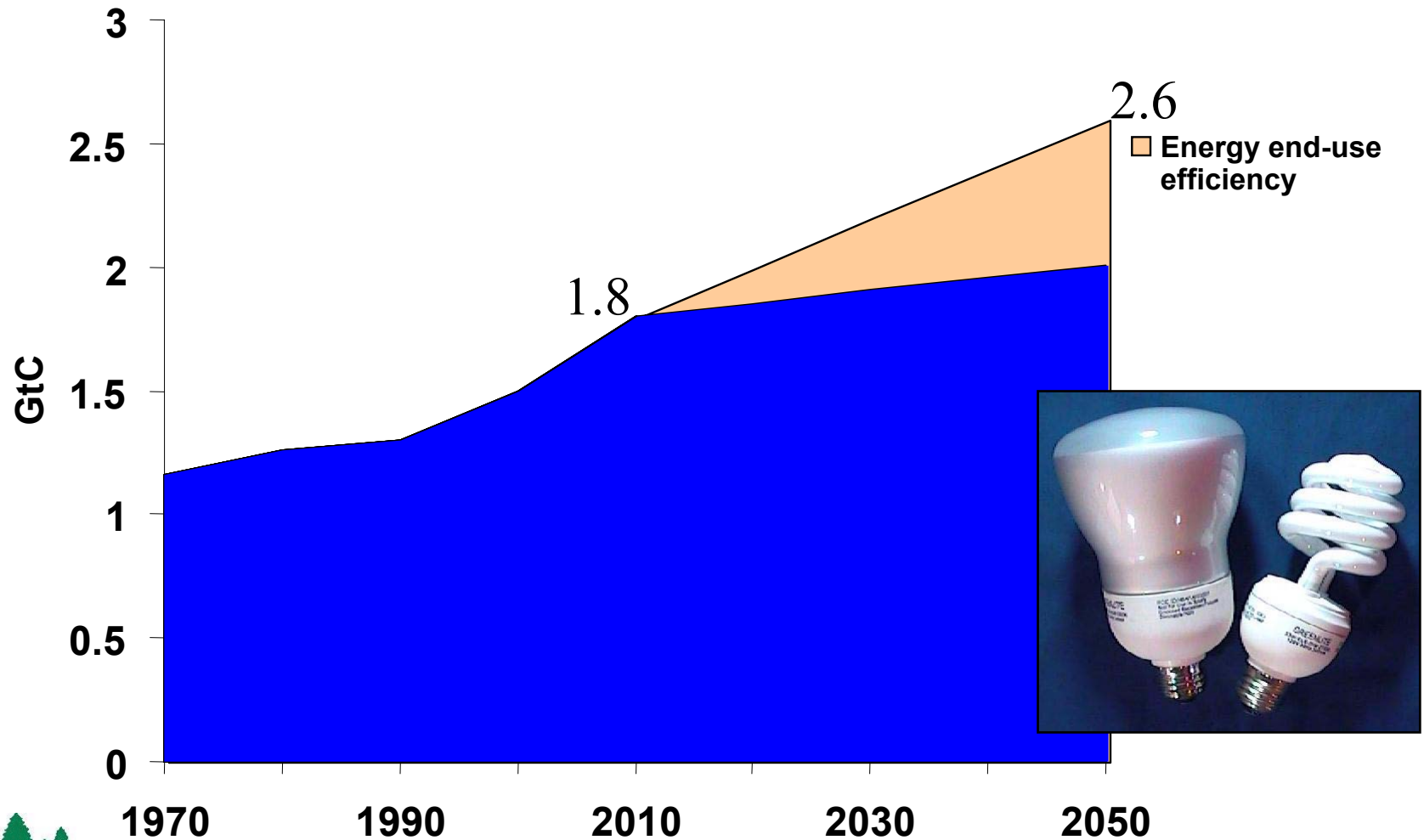
The Big Players:

- Energy Efficiency
- Renewable Energy
- CO₂ Capture & Geologic Storage

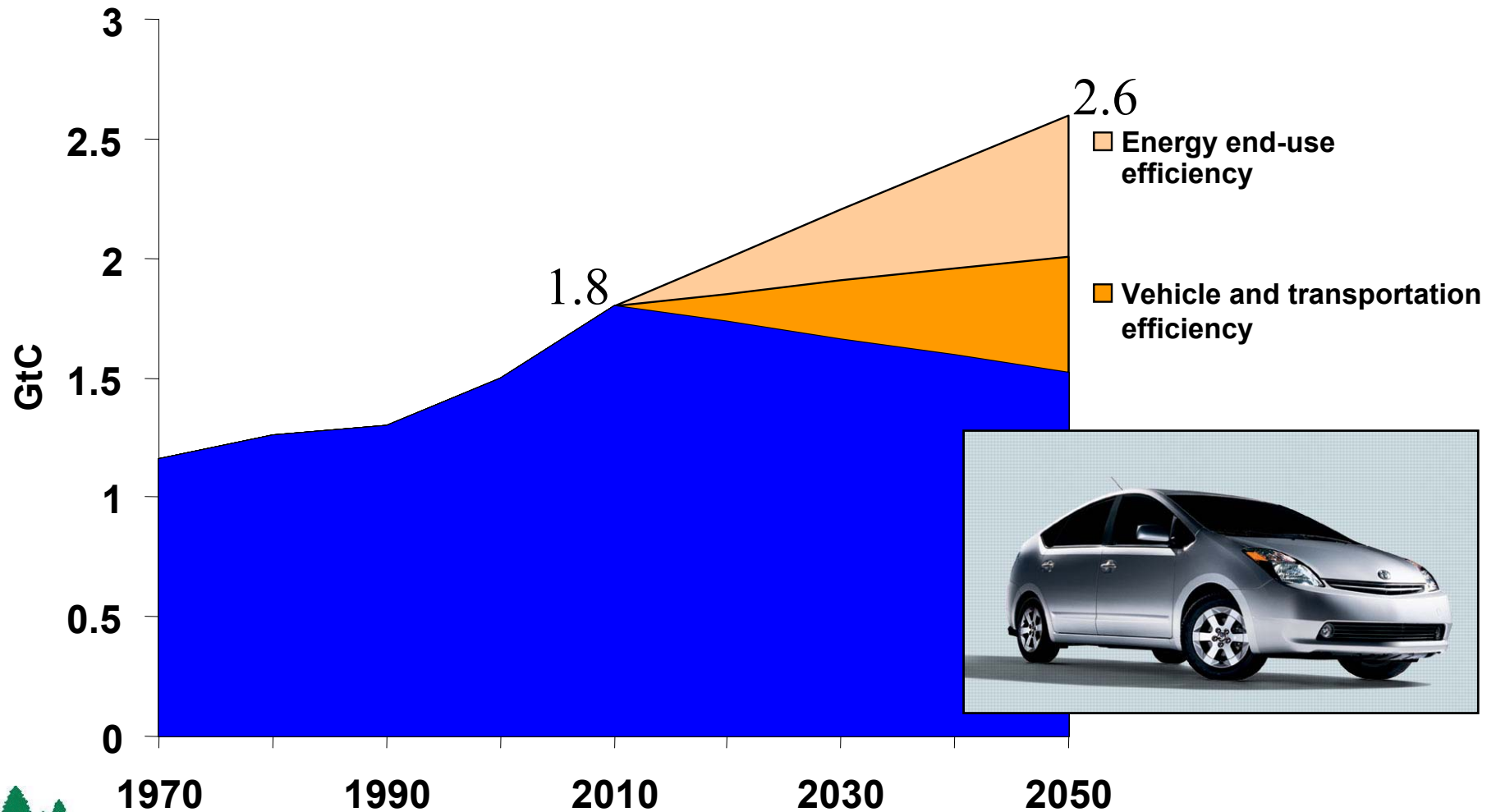
Cutting U.S. emissions in half



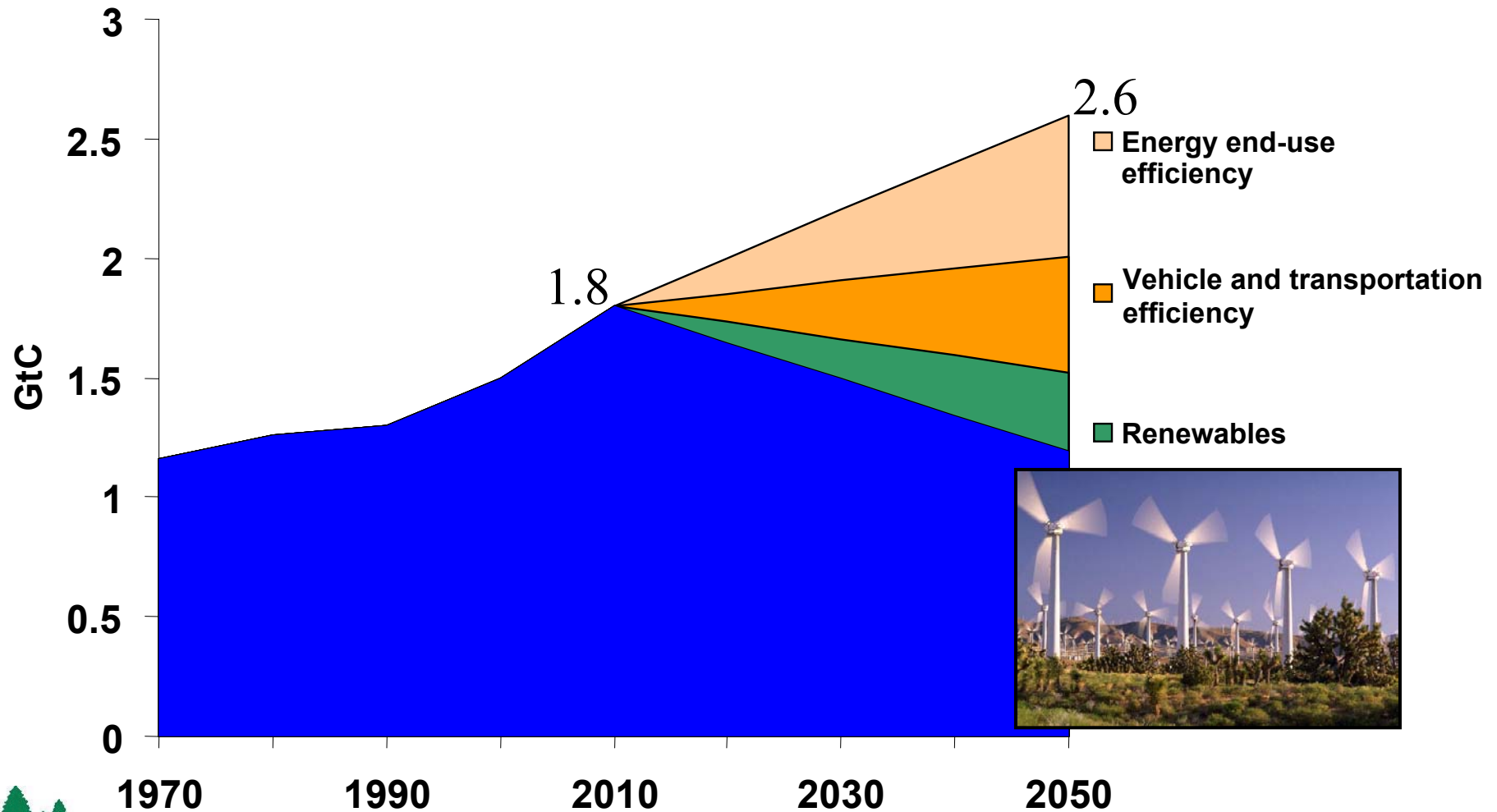
Cutting U.S. emissions in half

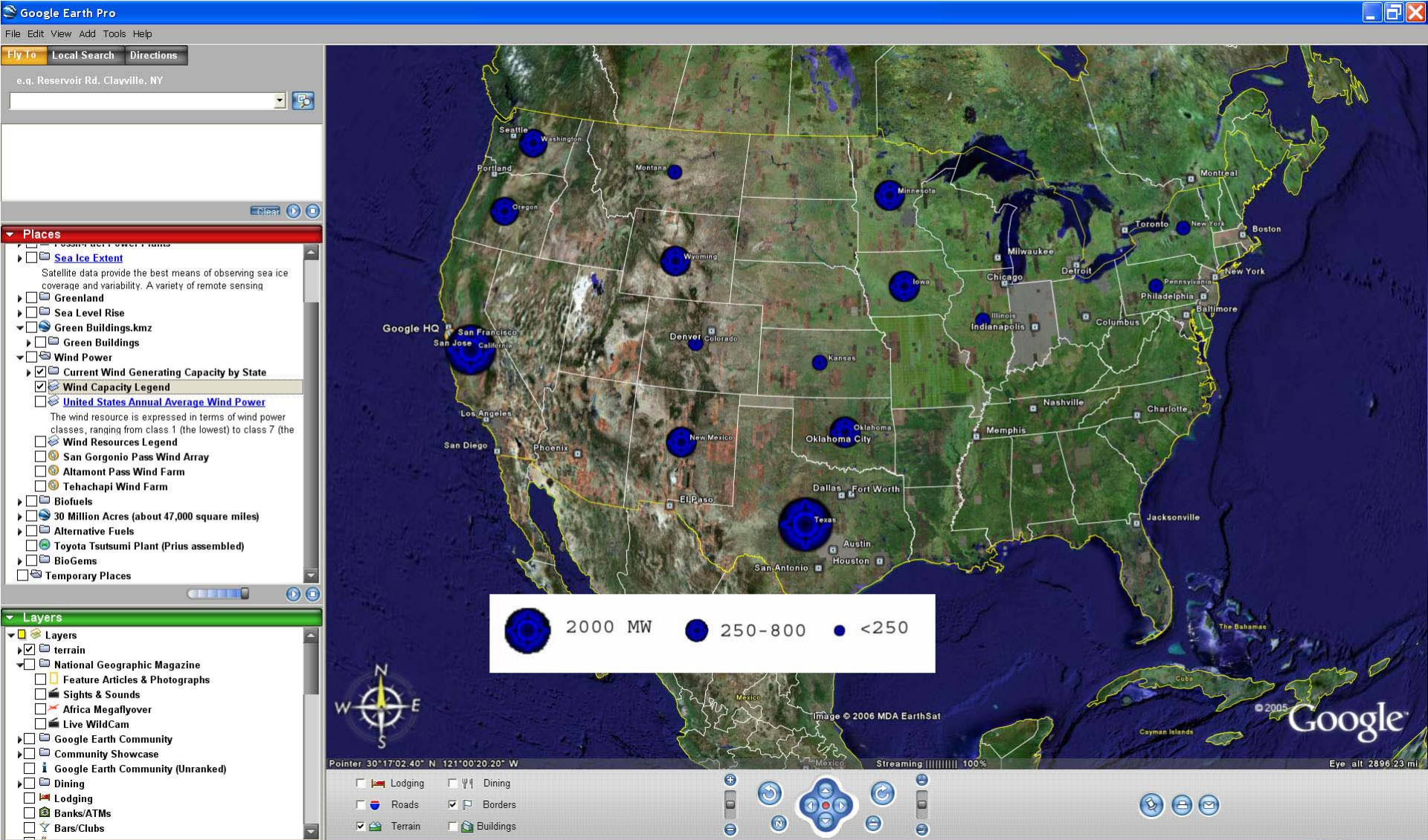


Cutting U.S. emissions in half

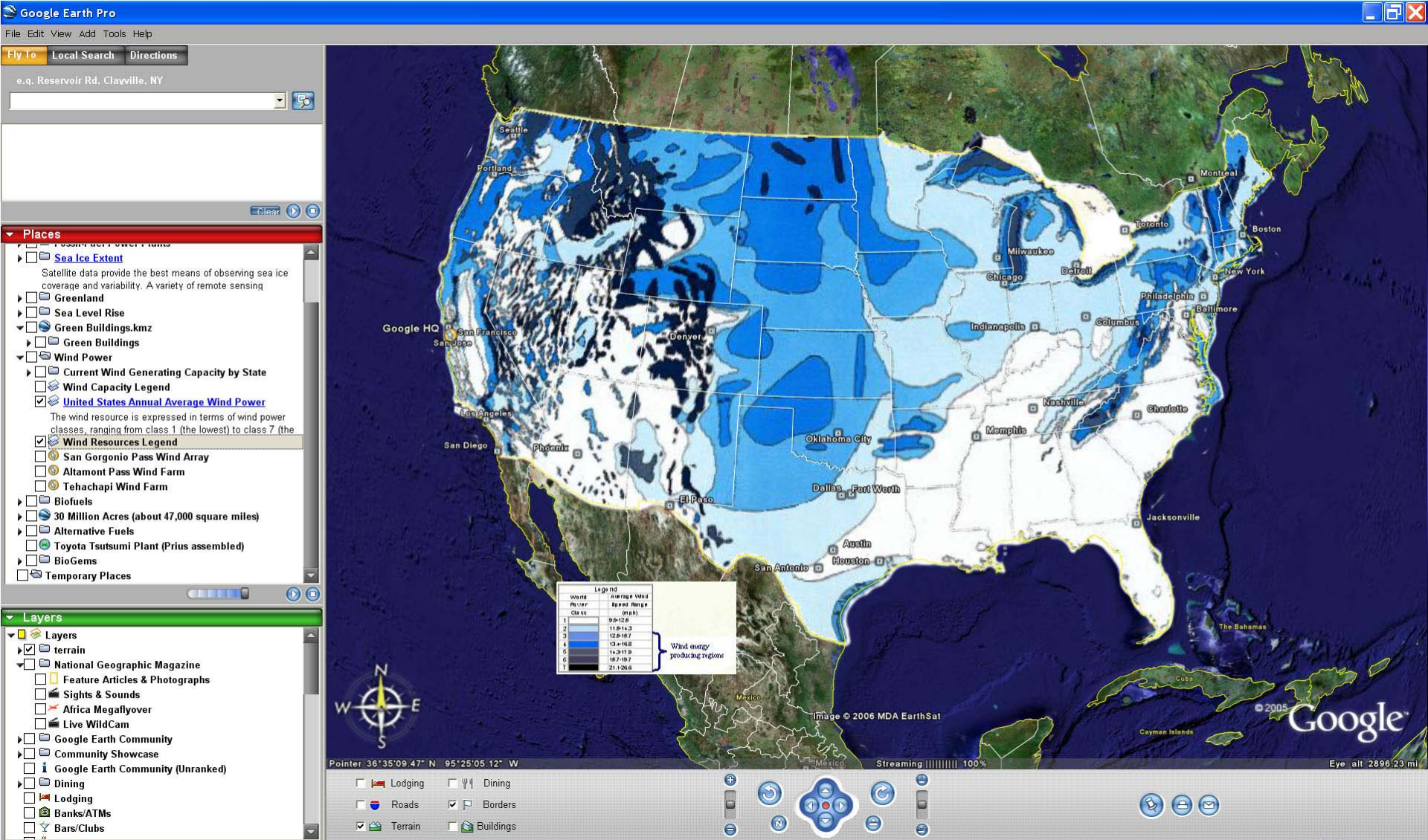


Cutting U.S. emissions in half



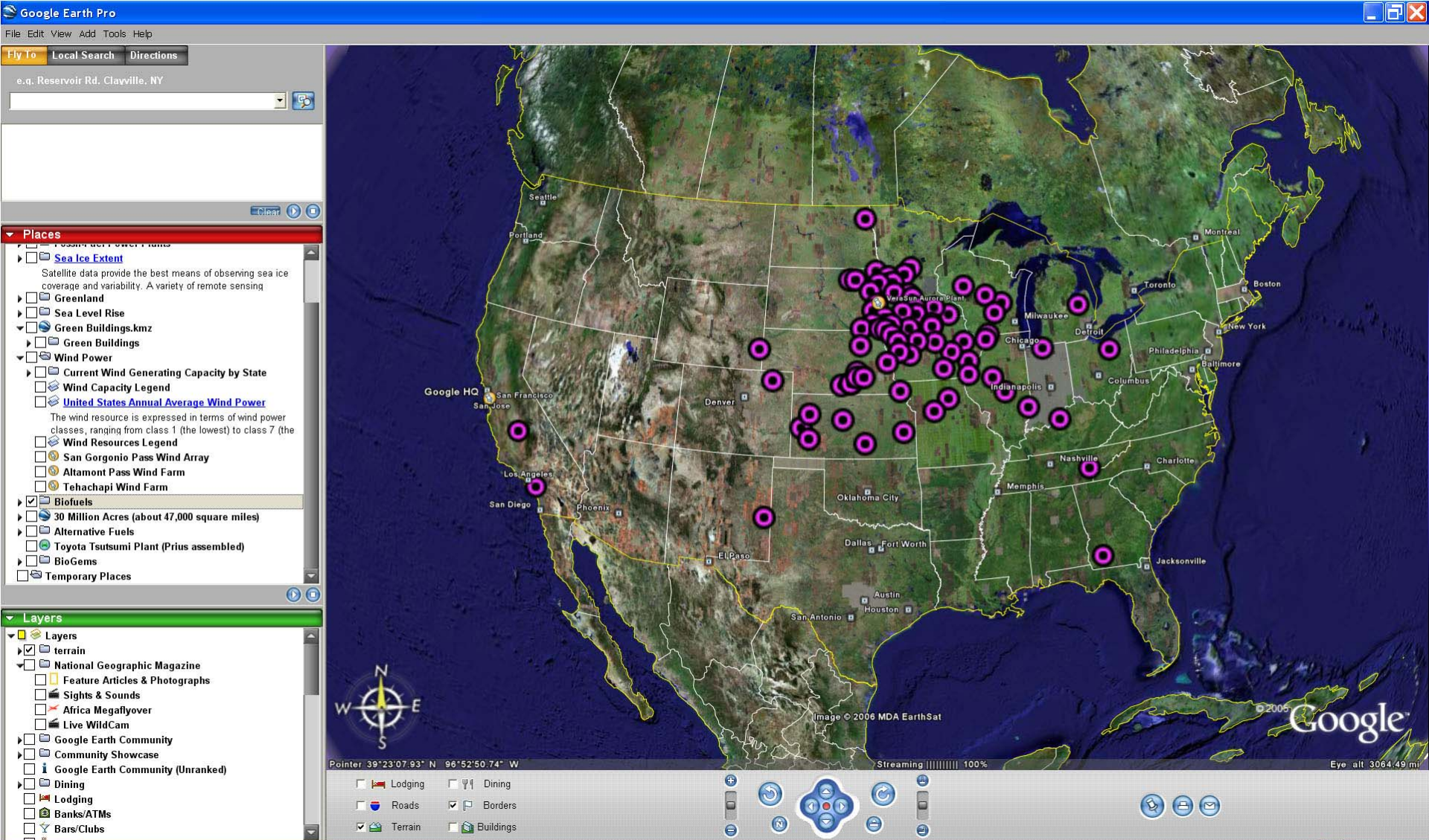


Installed wind capacity
by state



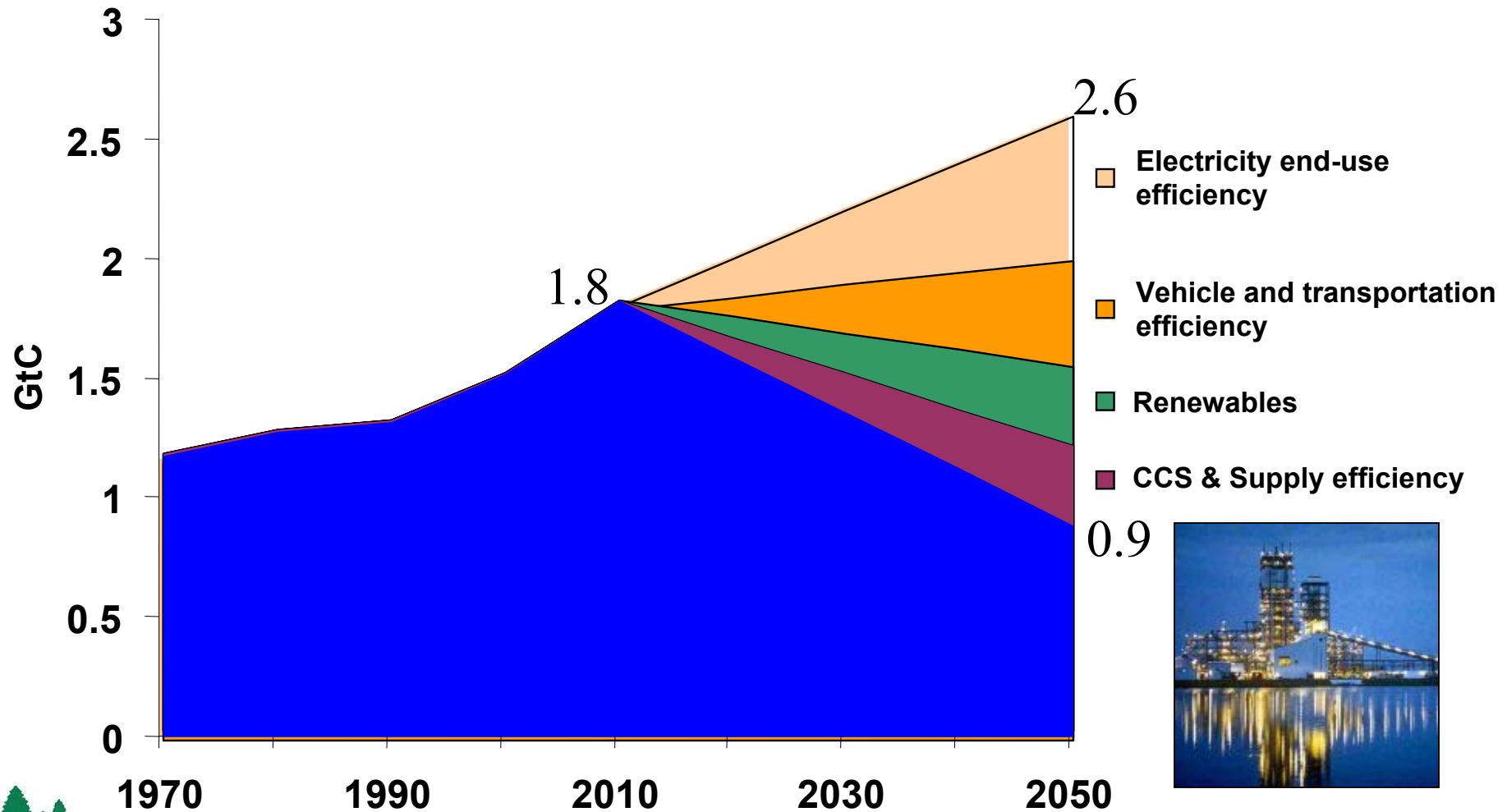
Wind potential

Battelle Wind Energy Resource Atlas:
<http://redc.nrel.gov/wind/pubs/atlas/>



Current Biofuels

Cutting U.S. emissions in half



After Pacala and Socolow, 2004; ARI CarBen3 Spreadsheet

Energy efficiency: cuts 600 MtC

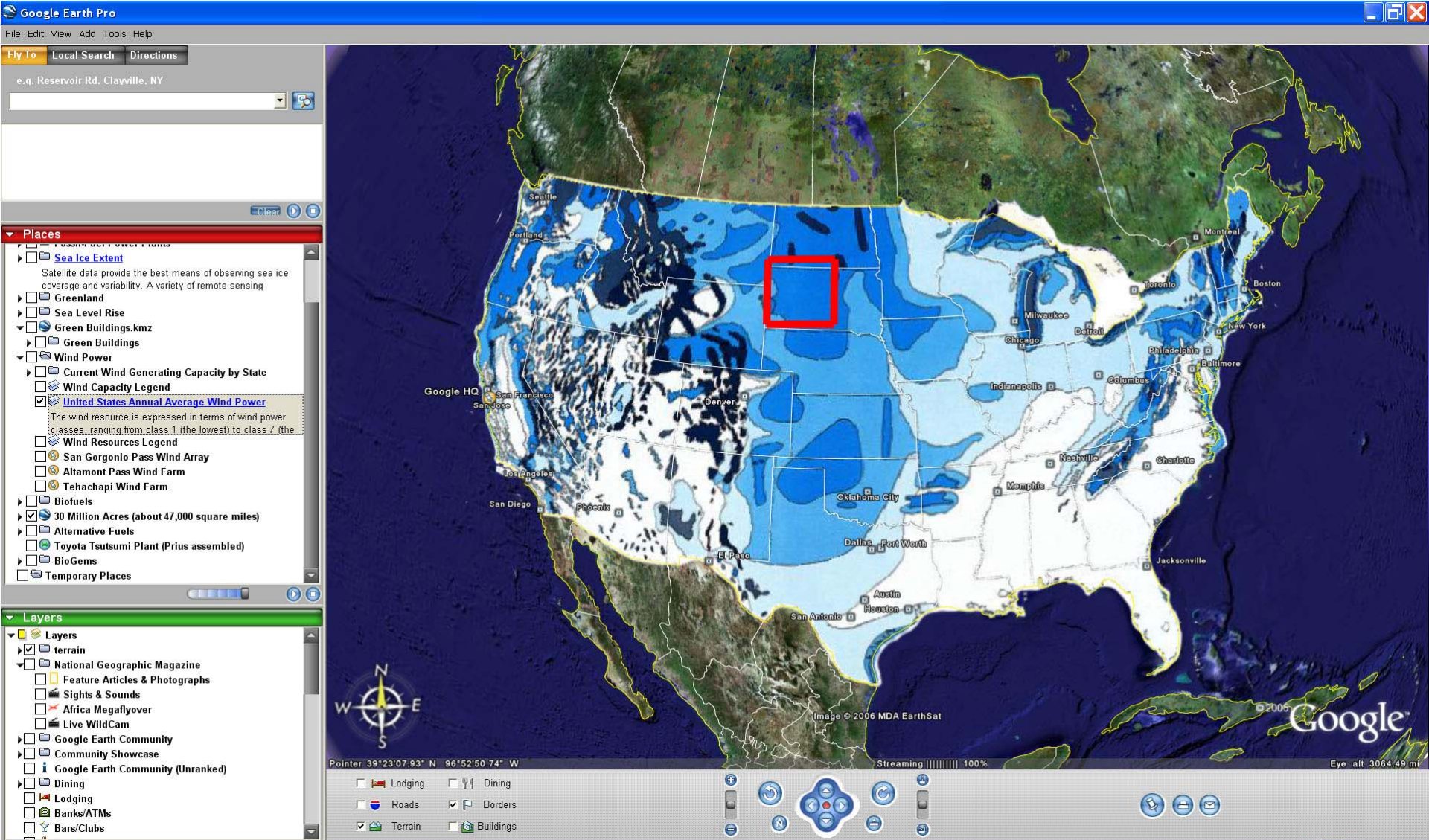
- Reduce 2050 electricity demand by 25%
 - Motors and controls
 - Lighting
 - Refrigeration
- Reduce building & industry direct fuel use by 40% in 2050
 - Green building design
 - Industrial processes
 - Combined heat and power

Transport efficiency: cuts 475 MtC

- Passenger vehicles
 - 2050 fleet averages 54 mpg, not 24 mpg
 - Hybrids
 - Fuel cells
 - Conventional vehicle improvements
- Other transport efficiency
 - Trucks average 13 mpg, not 7 mpg
 - Aircraft average 105 smpg, not 80 smpg
 - Smart growth reduces travel by 10%

Renewable energy: cuts 325 MtC

- Wind
 - 30% of electricity generation
 - Requires 300,000 2 MW turbines
 - Land area of 25 million acres, multiple use
- Biofuels
 - 40 billion gallons
 - 30 million acres growing 12 tons biomass/acre
 - Area equal to Conservation Reserve set aside

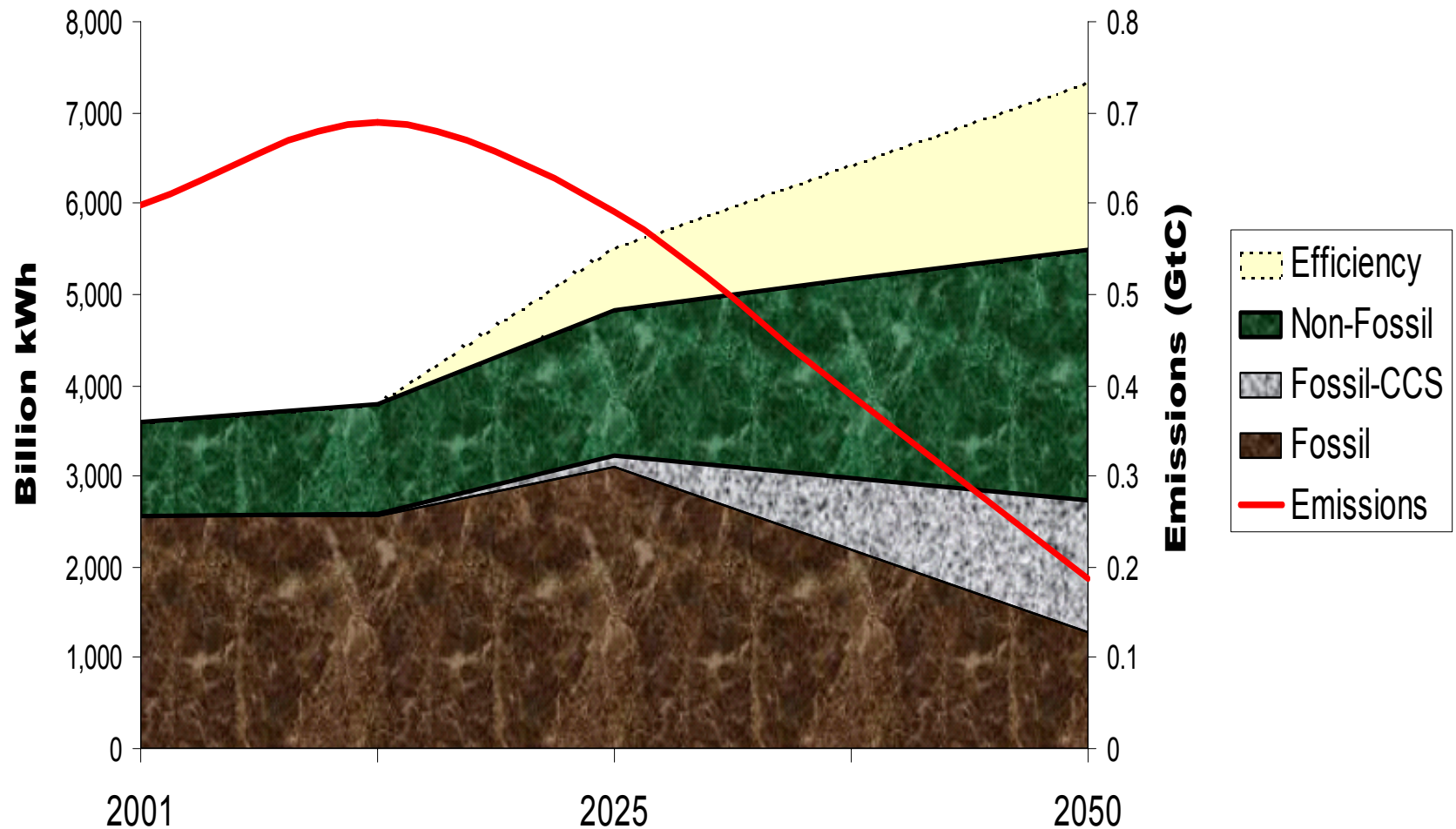


30 million acres

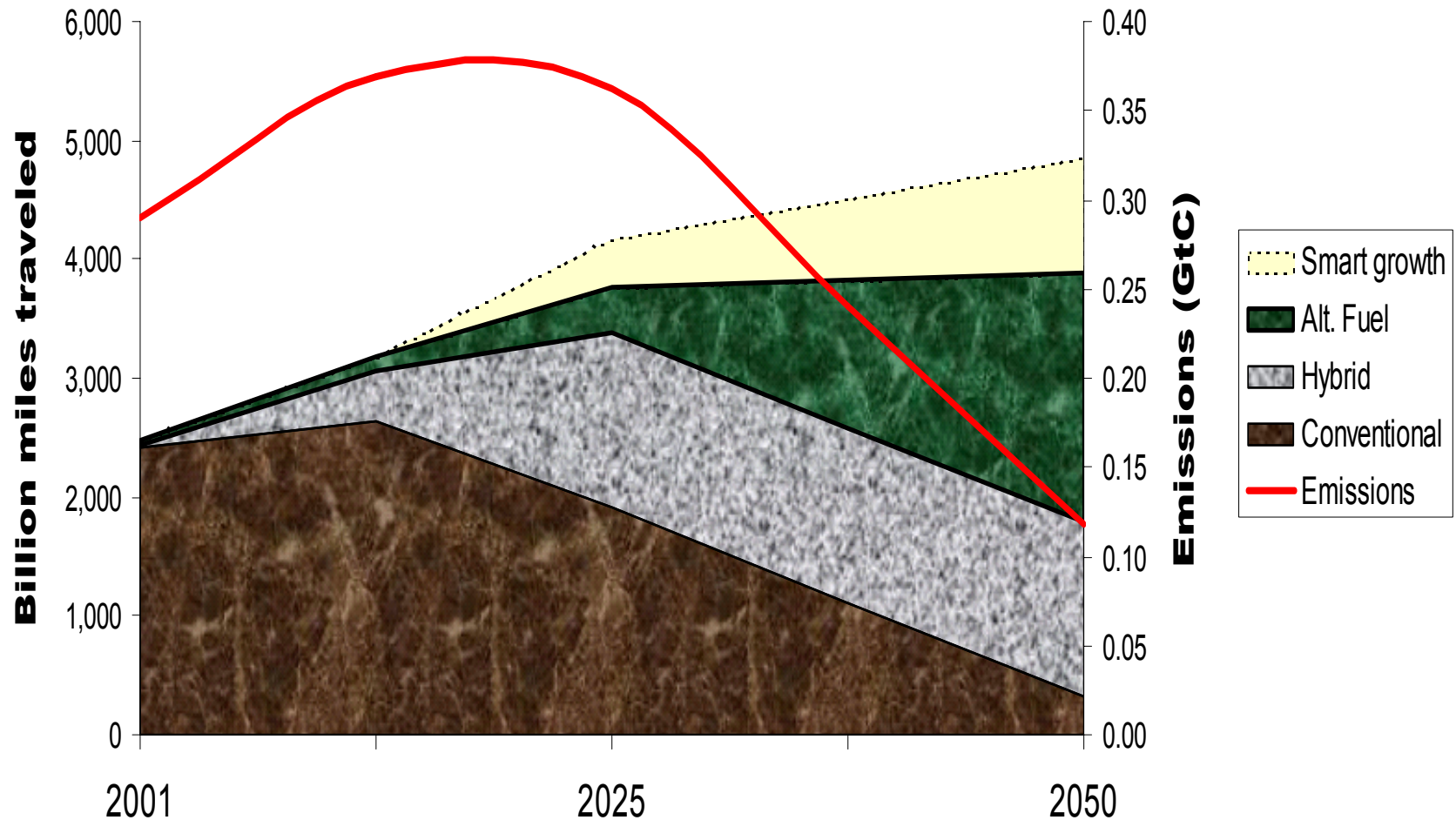
CO₂ capture and storage: cuts 325 MtC

- Equip 180 GW of coal with CCS
 - 25 x current CO₂ use for EOR
 - 4 x current natural gas buffer storage flows
- Additional CCS at other stationary sources
 - Large industrial facilities
 - Natural gas production

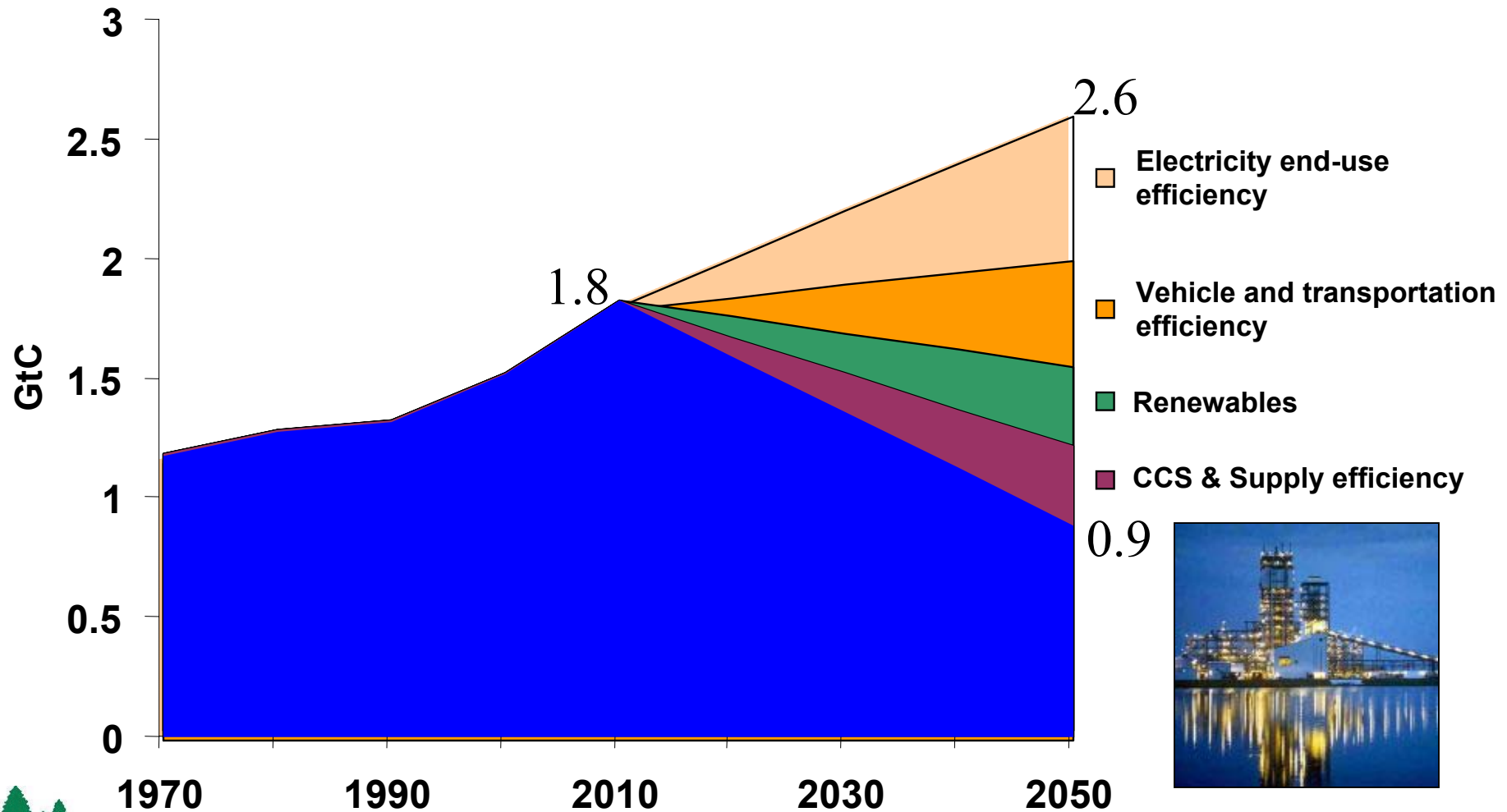
Cleaning up electricity



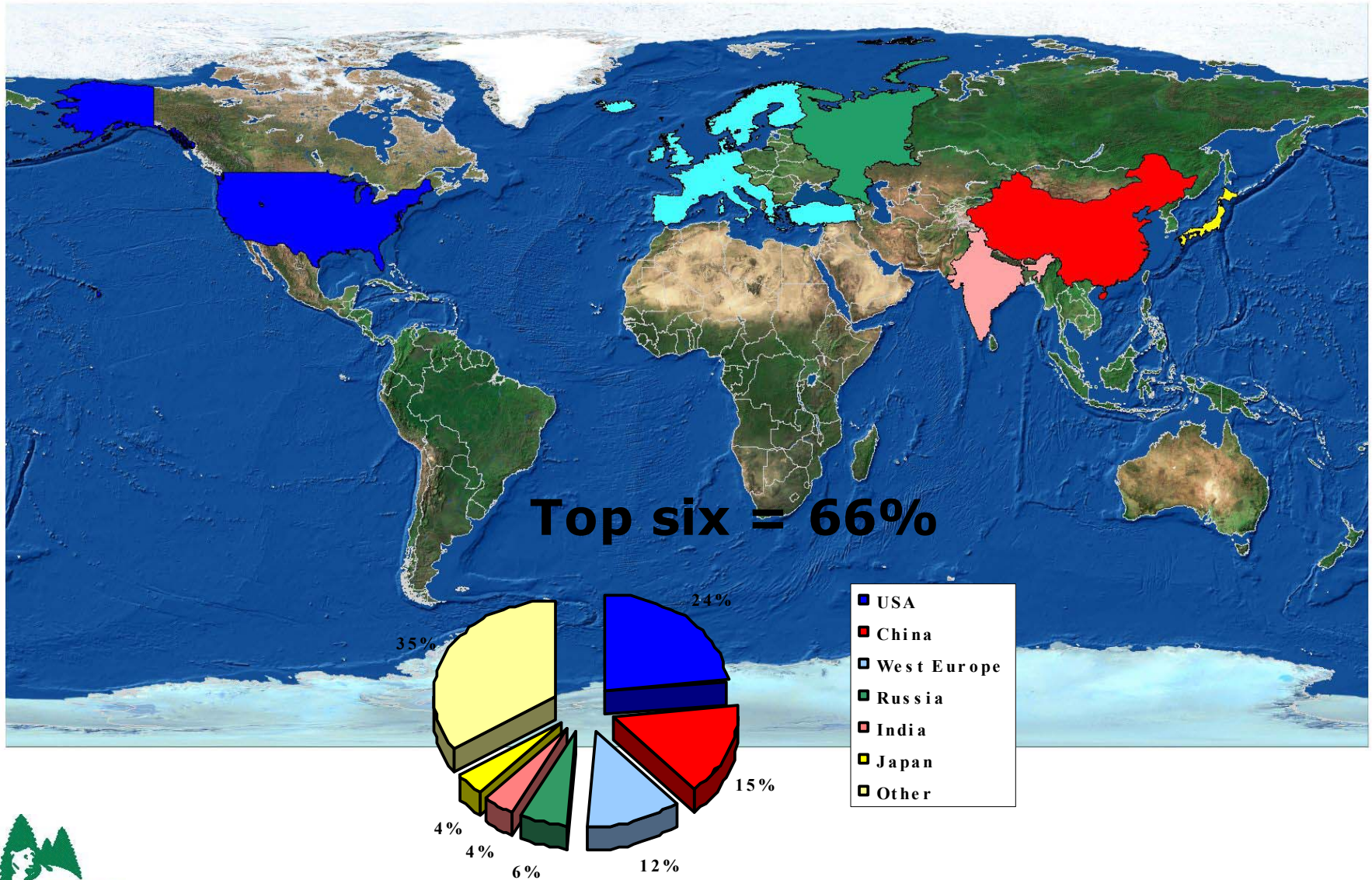
Cleaning up vehicles



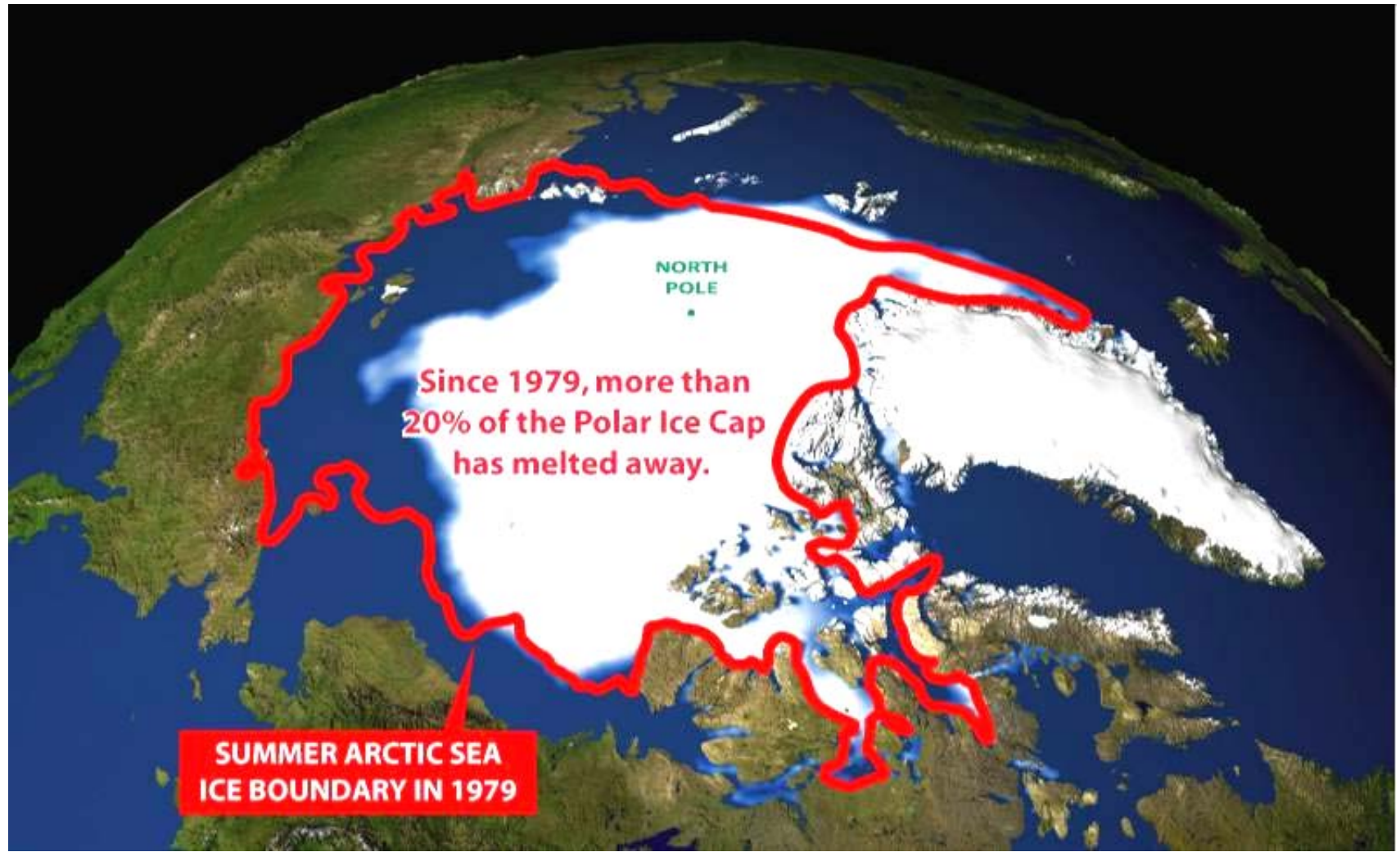
Cutting U.S. emissions in half



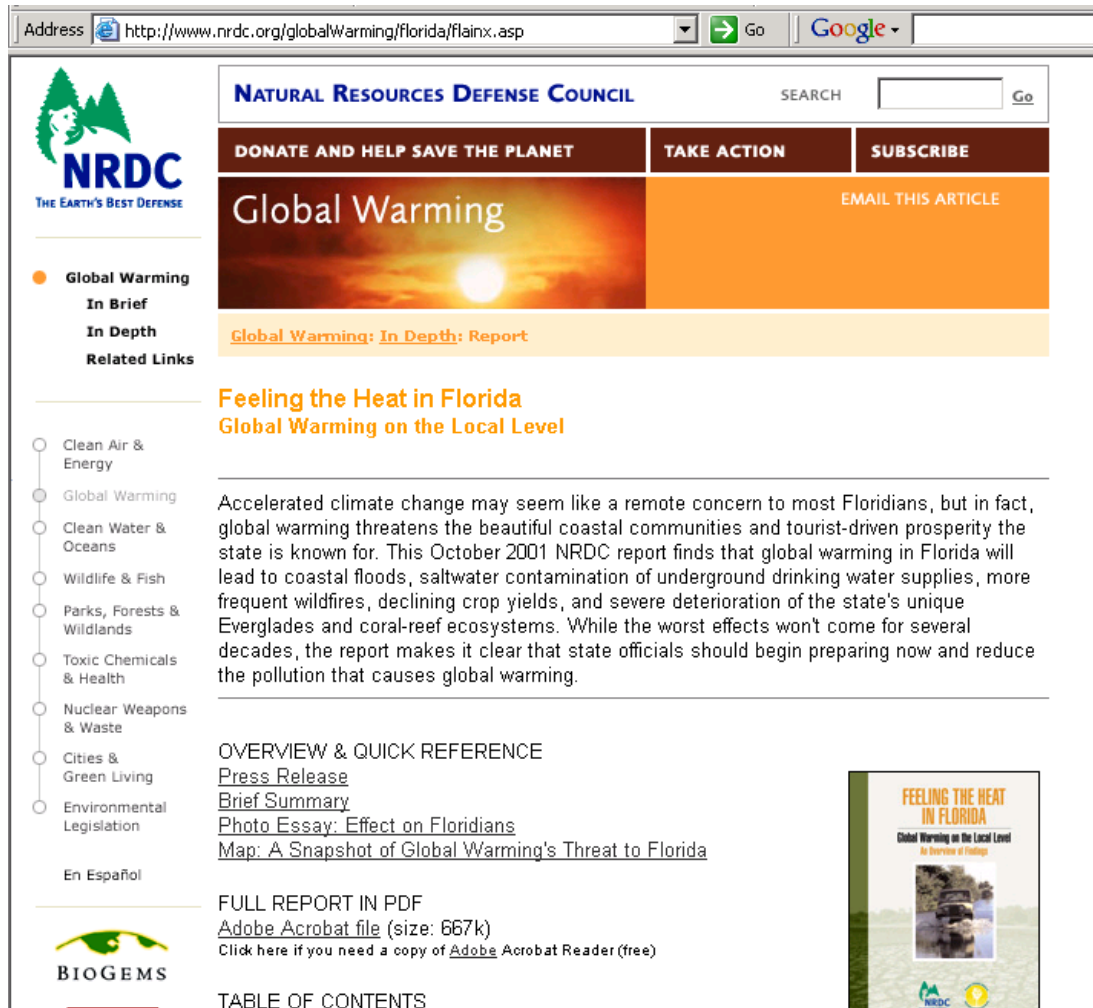
Biggest CO₂ emitters 2000-2025



Warming won't wait. Will we?



More information: www.nrdc.org



The screenshot shows a web browser window with the address bar displaying <http://www.nrdc.org/globalWarming/florida/flainx.asp>. The NRDC logo is in the top left corner. The main content area features a large orange banner with the text "Global Warming" and a sun image. Below the banner is a link to "Global Warming: In Depth: Report". To the right of the banner is a button labeled "EMAIL THIS ARTICLE". Below the banner is a section titled "Feeling the Heat in Florida" with the subtitle "Global Warming on the Local Level". The text describes the threats of global warming to Florida's coastal communities and ecosystems. Below this is a section titled "OVERVIEW & QUICK REFERENCE" with links to "Press Release", "Brief Summary", "Photo Essay: Effect on Floridians", and "Map: A Snapshot of Global Warming's Threat to Florida". At the bottom, there is a section for the "FULL REPORT IN PDF" with a link to an "Adobe Acrobat file (size: 667k)" and a note to click here for a copy of the Adobe Acrobat Reader (free). A sidebar on the left lists various environmental topics, with "Global Warming" selected. The NRDC logo is also in the bottom left corner.

Address <http://www.nrdc.org/globalWarming/florida/flainx.asp> Go Google

NATURAL RESOURCES DEFENSE COUNCIL SEARCH Go

DONATE AND HELP SAVE THE PLANET **TAKE ACTION** **SUBSCRIBE**

Global Warming EMAIL THIS ARTICLE

[Global Warming: In Depth: Report](#)

Feeling the Heat in Florida
Global Warming on the Local Level

Accelerated climate change may seem like a remote concern to most Floridians, but in fact, global warming threatens the beautiful coastal communities and tourist-driven prosperity the state is known for. This October 2001 NRDC report finds that global warming in Florida will lead to coastal floods, saltwater contamination of underground drinking water supplies, more frequent wildfires, declining crop yields, and severe deterioration of the state's unique Everglades and coral-reef ecosystems. While the worst effects won't come for several decades, the report makes it clear that state officials should begin preparing now and reduce the pollution that causes global warming.

OVERVIEW & QUICK REFERENCE
[Press Release](#)
[Brief Summary](#)
[Photo Essay: Effect on Floridians](#)
[Map: A Snapshot of Global Warming's Threat to Florida](#)

FULL REPORT IN PDF
[Adobe Acrobat file \(size: 667k\)](#)
Click here if you need a copy of [Adobe Acrobat Reader](#) (free)

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- Nuclear Weapons & Waste
- Cities & Green Living
- Environmental Legislation

En Español

BIOGEMS

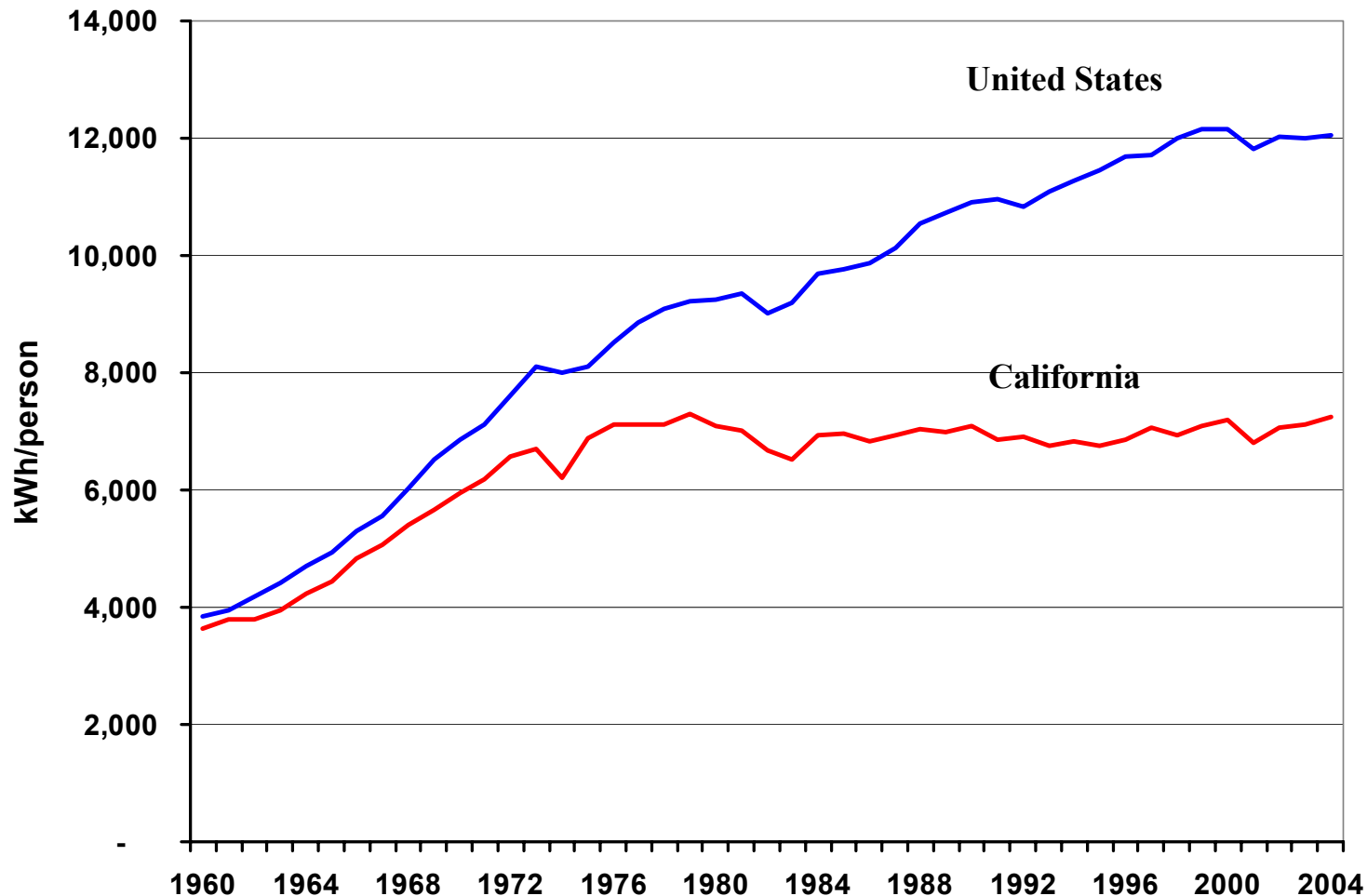
NRDC
THE EARTH'S BEST DEFENSE

FEELING THE HEAT IN FLORIDA
Global Warming on the Local Level
An Overview of Findings

NRDC

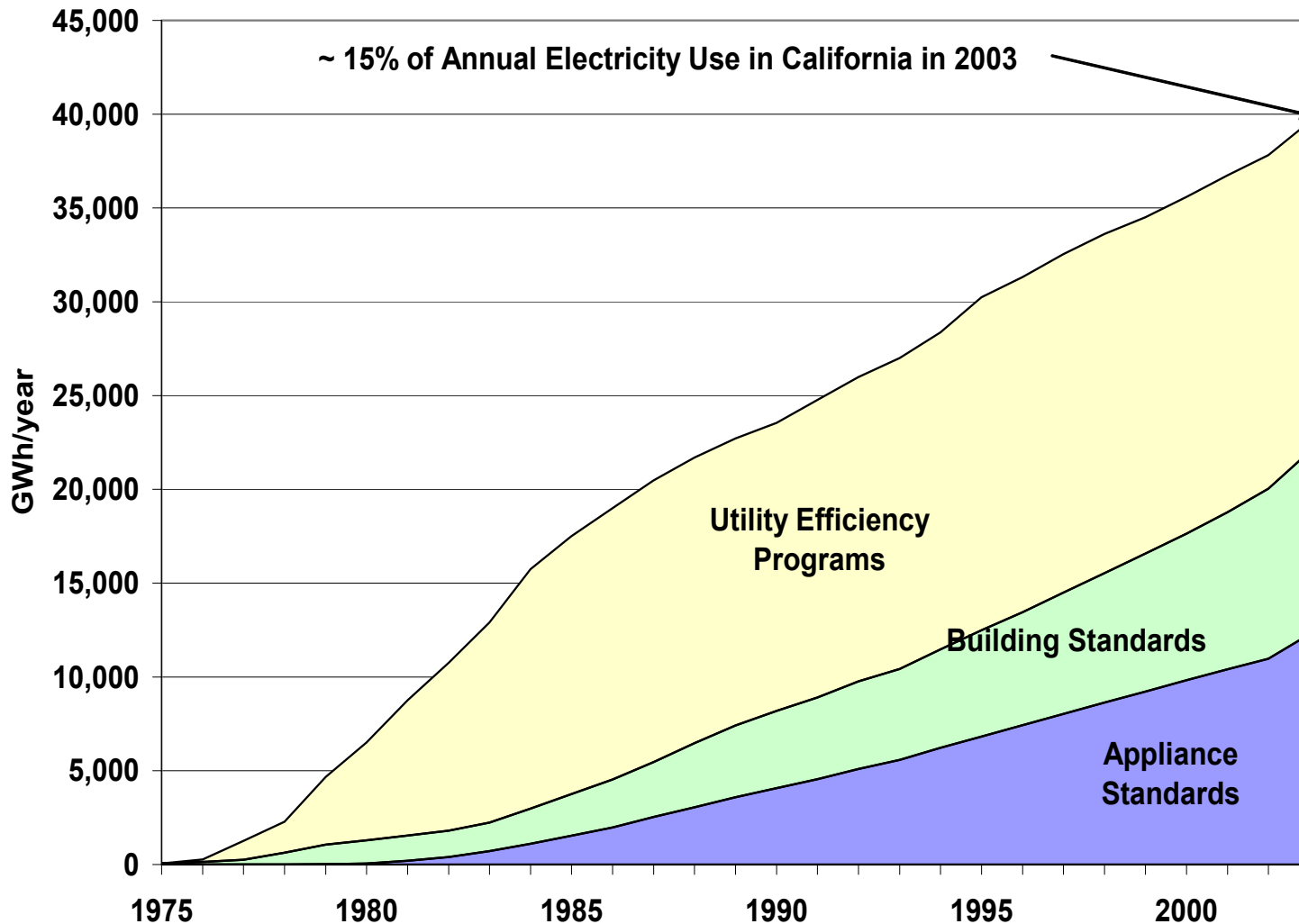
California leads the nation

Per Capita Electricity Consumption



Source: California Energy Commission, 2005

Efficiency: a critical resource



Source: California Energy Commission, 2005