

Global Warming Primer

Published May 31, 2013

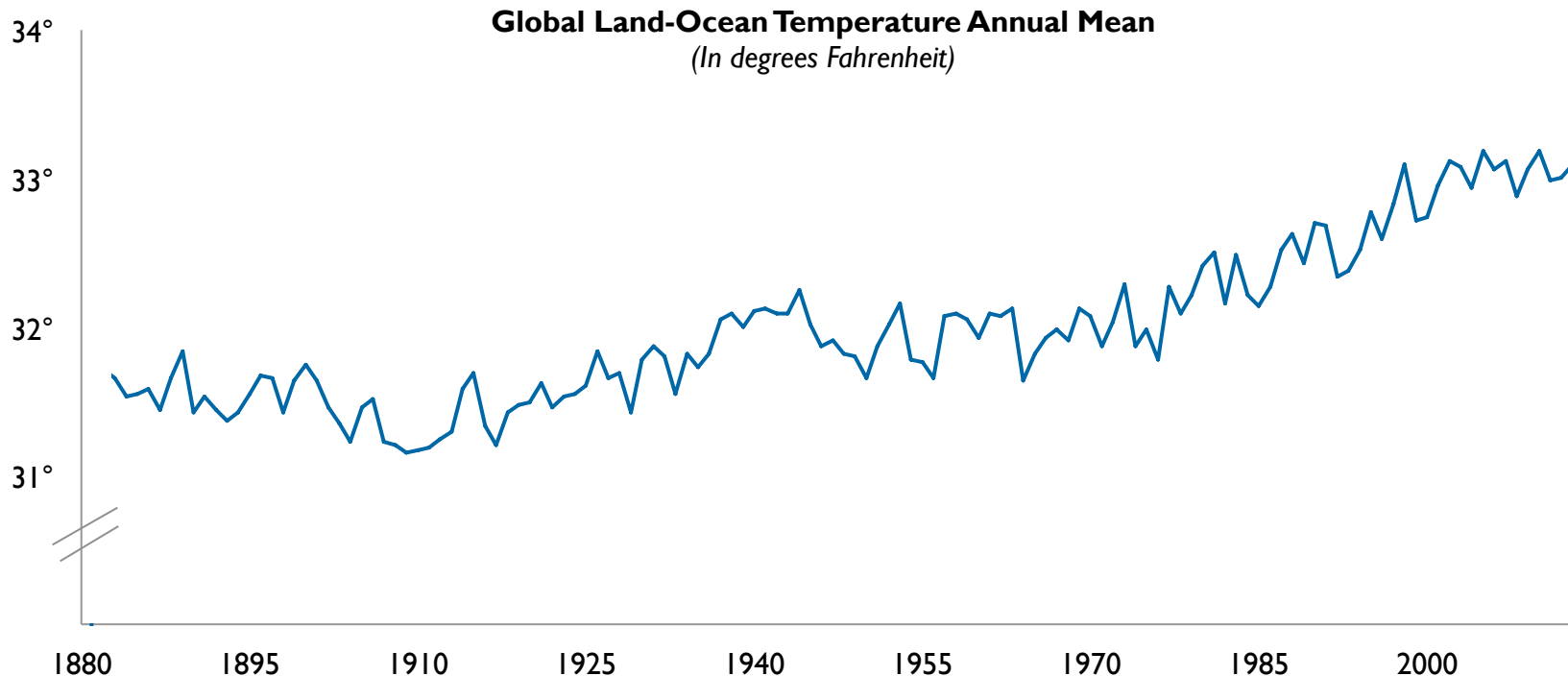
Updated: Sept. 22, 2014

National Journal Presentation Credits

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Global Warming Posited as Result of Increased Greenhouse Gas Emissions

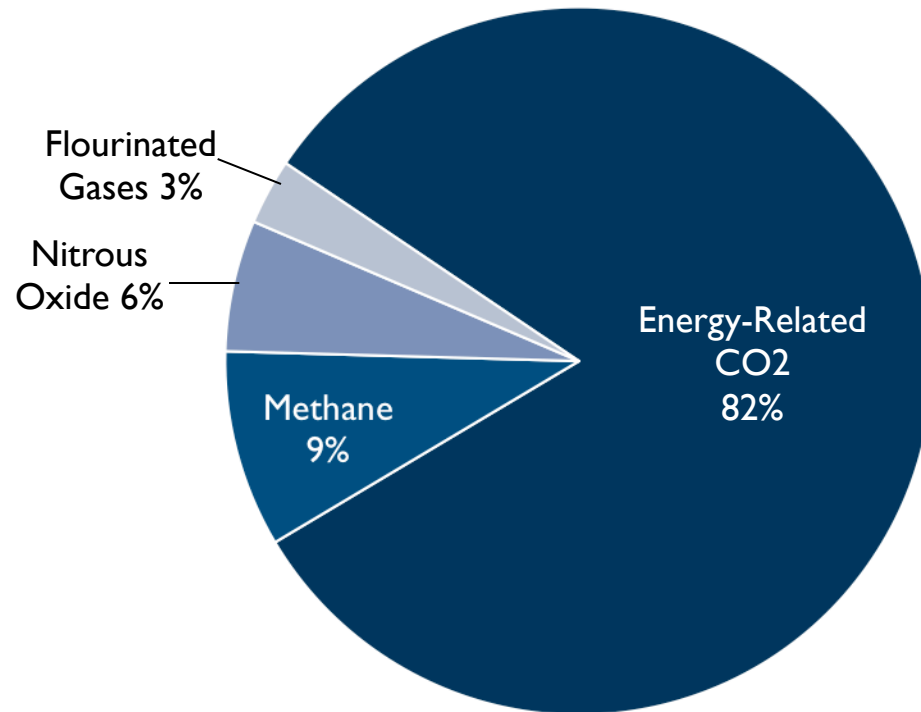


Analysis

- Global warming refers to the rise in temperature of the Earth's atmosphere and oceans (the average temperature has increased 1.4 degrees Fahrenheit within the 20th century)
- Most scientists believe rising temperatures have been caused by increasing greenhouse gas emissions
- Greenhouse gases trap heat from the sun and warm the Earth's surface; a certain amount of greenhouse gases are beneficial, but some scientists say increasing concentrations due to human activity could warm the Earth to a dangerous degree

Energy-Related CO₂ Emissions Make Up Most Greenhouse Gas Emissions

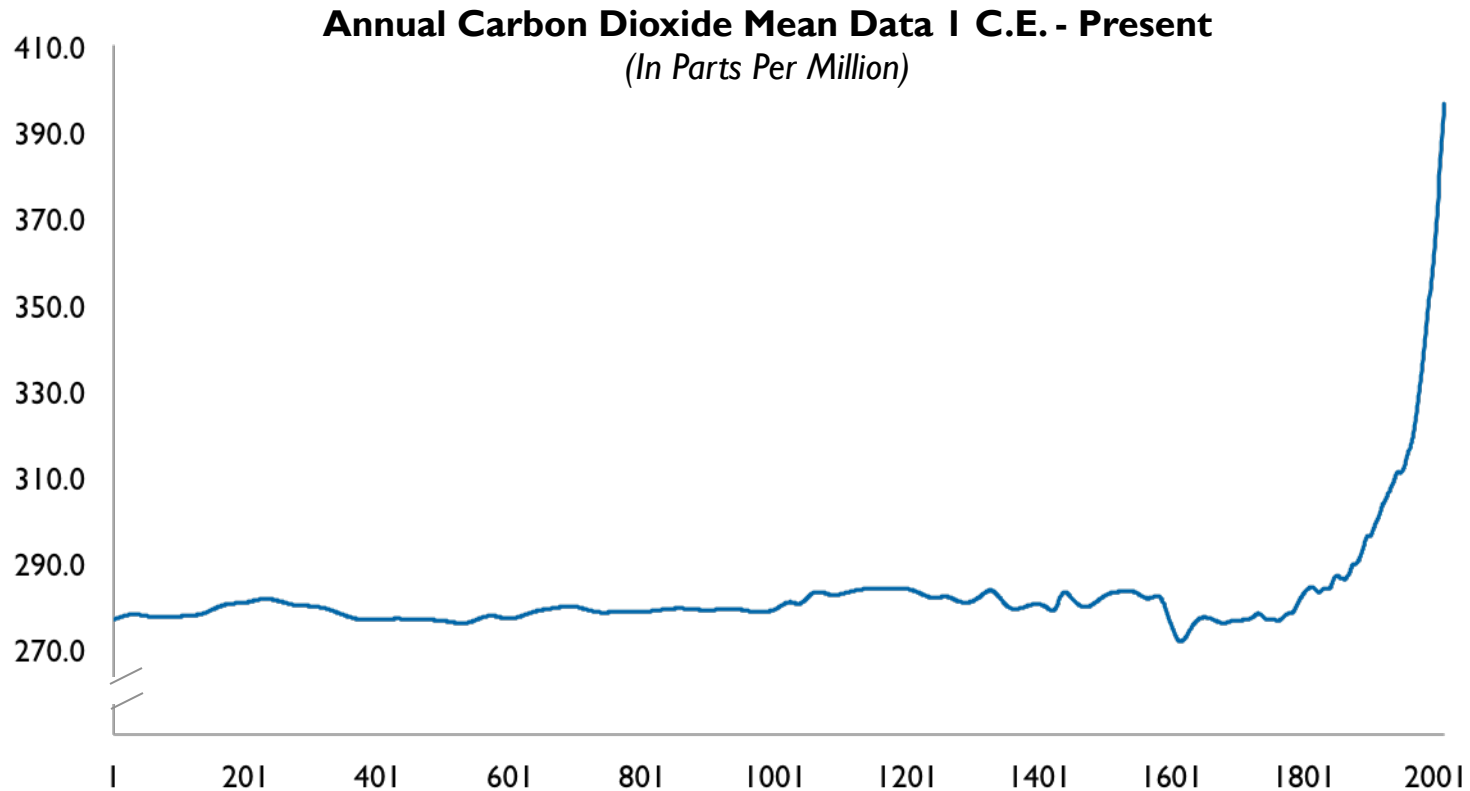
National Greenhouse Gas Emissions by Gas, 2012



Analysis

- Energy-related emissions include emissions from electric power generation, transportation and residential, commercial and industrial use
- Most methane, the second largest greenhouse gas emission, comes from leaks in natural gas and petroleum facilities and coal mines

CO2 Levels Recently Hit Highest Point in Human History

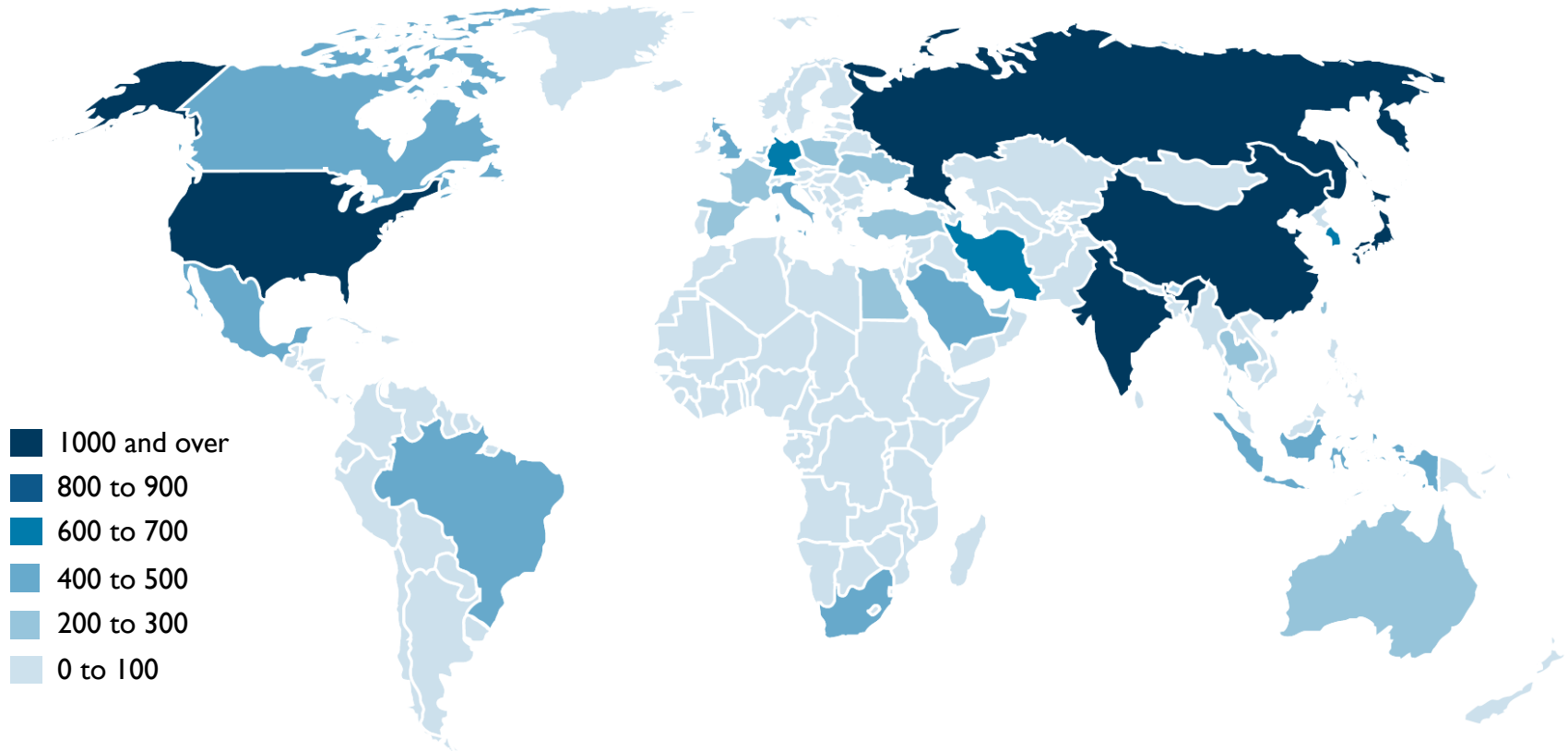


Analysis

- Atmospheric carbon dioxide levels are cyclical and hit 400 ppm in May 2013 during their seasonal Northern Hemisphere peak. It may take a few more years to maintain year-round CO2 levels over 400 ppm
- The Scripps Institution of Oceanography estimates that the Earth's atmospheric CO2 concentration last exceeded 400 ppm about 3 to 5 million years ago

U.S. a Major Contributor to Global CO2 Emissions

Total CO2 Emissions from the Consumption of Energy by Country in 2011
(In millions of metric tons)

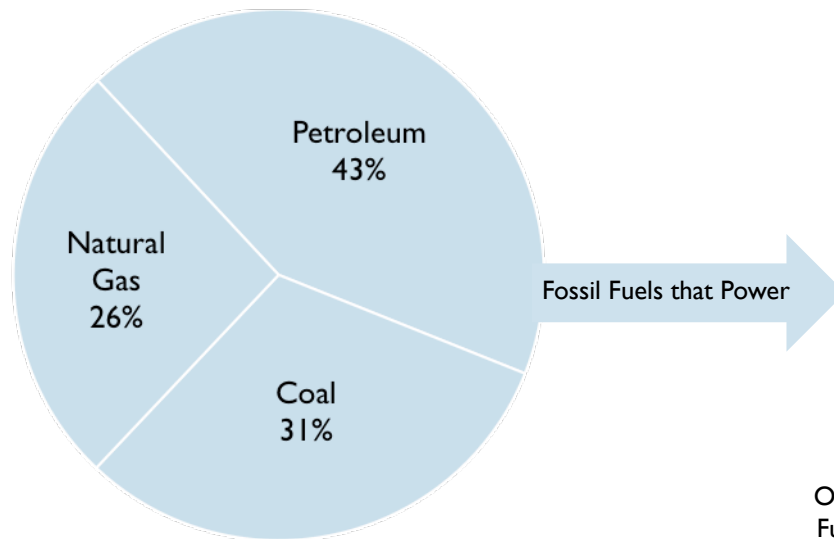


Analysis

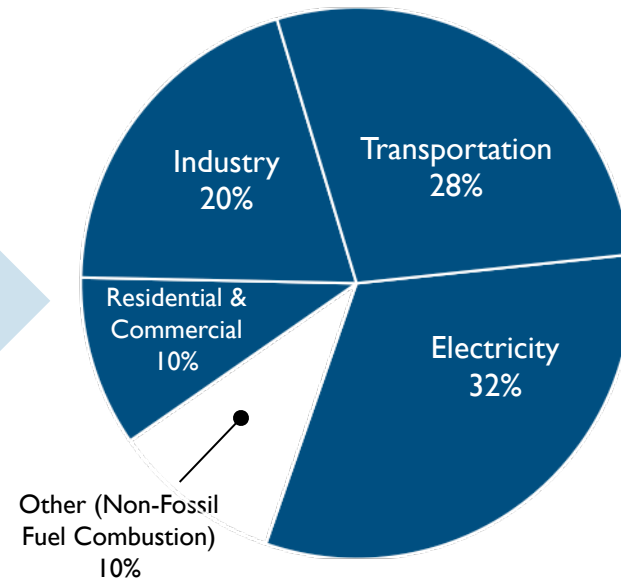
China, Russia, Japan, the U.S. and European countries had the highest levels of greenhouse gas emissions in 2011

U.S. CO₂ Production Comes Primarily from Fossil Fuels, Fossil Fuels Contribute Nearly Equally to CO₂ Emissions

2012 U.S. Energy-Related CO₂ Emissions by Major Fuel



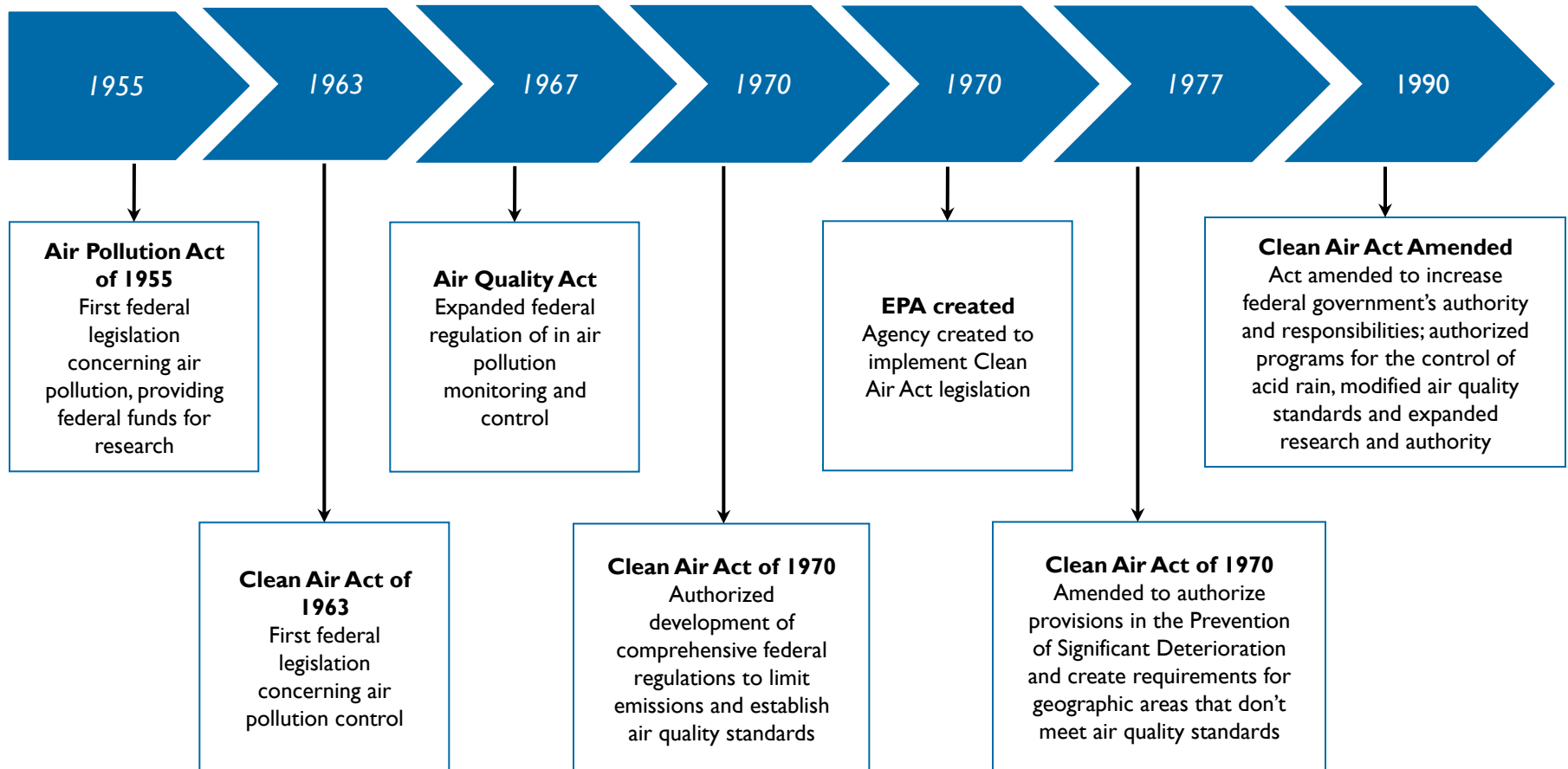
2012 U.S. CO₂ Emissions by Source



Analysis

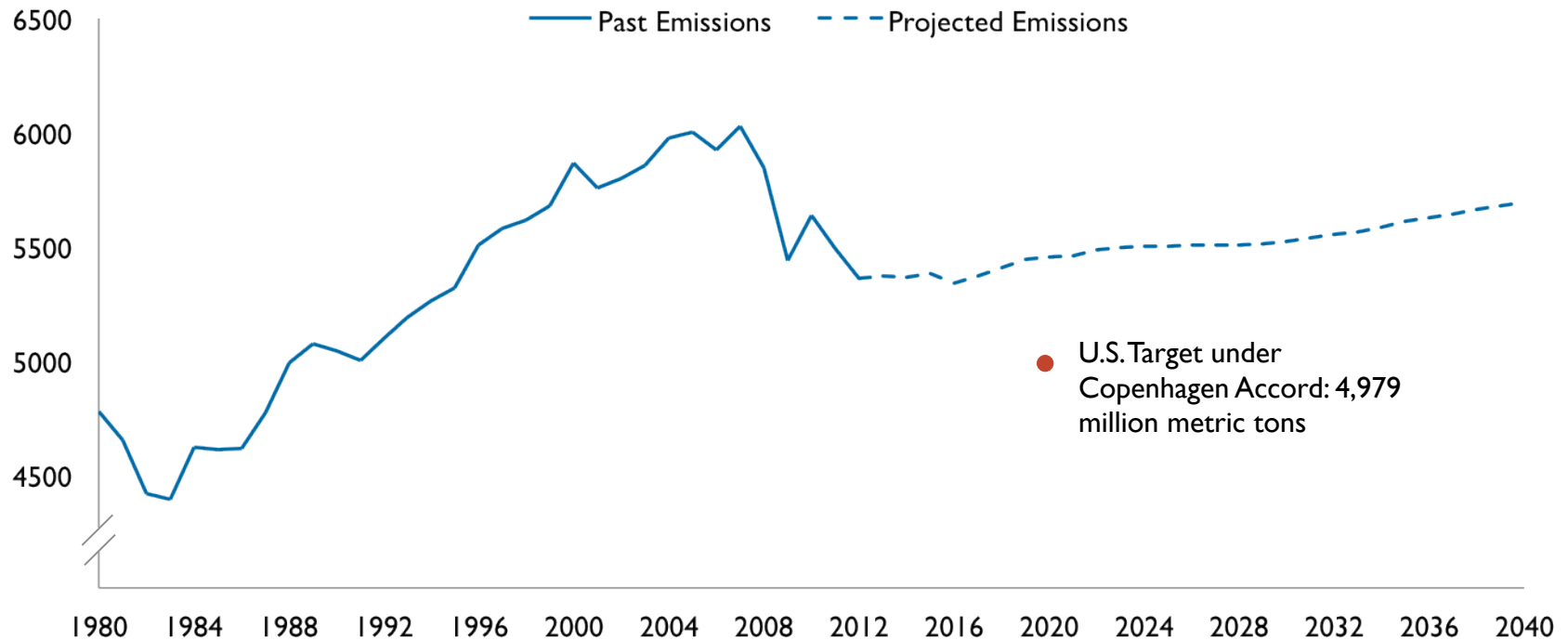
In 2011, 94% of energy-related emissions took the form of carbon dioxide from the use of fossil fuels

Clean Air Legislation Implemented to Reduce Greenhouse Gas Emissions, Ameliorate Global Warming



Despite Clean Air Legislation, U.S. Carbon Emissions Outpace Environmental Goals

Total Carbon Dioxide Emissions from the Consumption of Energy
(Million Metric Tons)

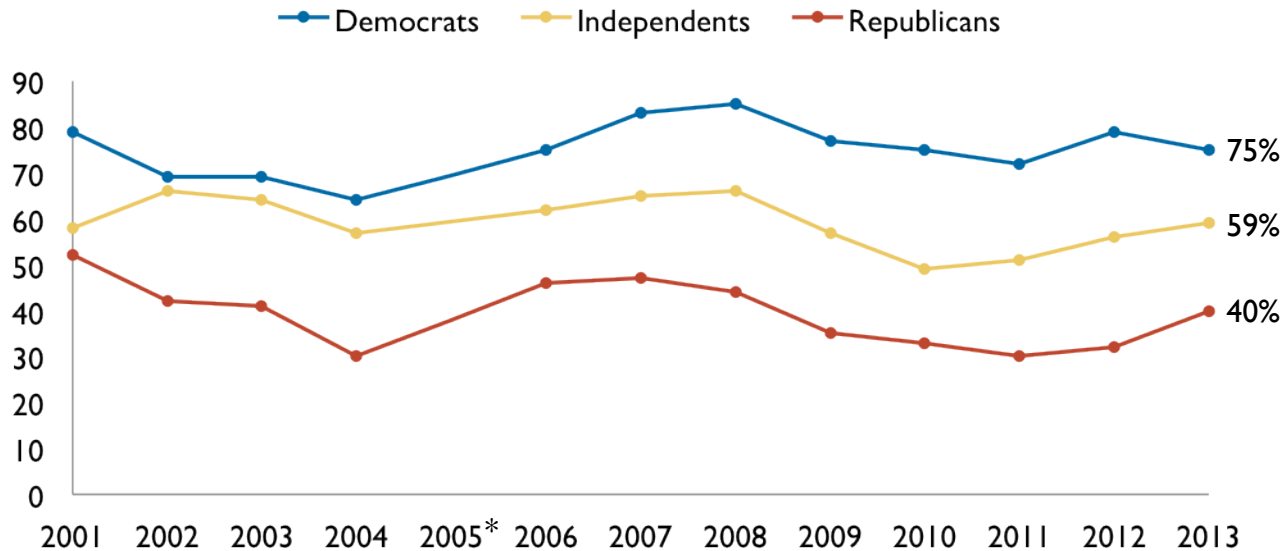


Analysis

- Emission reductions from 2005 to 2012 are a result of slower economic growth, switching to cleaner energy like natural gas and renewables, and accelerated energy efficiency
- Under the Copenhagen Accord, the U.S. pledged to reduce carbon emissions to 4,979 million metric tons, 83% of 2005 levels, by 2020; the long-term goal is to reduce emissions to 1,020 million metric tons, 17% of 2005 levels, by 2050

Global Warming Concerns High Among Dems, Rising Among Republicans

How Much Do You Personally Worry About Global Warming?
Percentage Responding to Survey Question: A Great Deal/A Fair Amount



Analysis

- A recent divide has emerged within the Republican Party between GOP members with ties to the fossil fuel industry who see climate change as a false threat and younger and more moderate voters who are concerned about climate change
- GOP strategists like Glen Bolger believe a position that supports the science of climate change would lose in a primary, but perhaps not the general election, as a Gallup Poll indicates 58% of all Americans are concerned about global warming

*No polling data for 2005

Source: Linda Saad, "Republican Skepticism About Global Warming Eases," Gallup, April 9, 2013; Coral Davenport, "The Coming GOP War Over Climate Change," National Journal, May 9, 2013.

Potential Hazards Due to Global Warming Loom Large

Global Climate Change: Future Trends

Phenomena	Likelihood of Trend
Contraction of snow cover areas, increased thaw in permafrost regions, decrease in sea ice extent	Virtually certain
Increased frequency of hot extremes, heat waves and heavy precipitation	Very likely to occur
Precipitation increases in high latitudes	Very likely to occur
Precipitation decreases in subtropical land	Very likely to occur
Increase in tropical cyclone activity	Likely to occur
Decreased water resources in many semi-arid areas, including western U.S. and Mediterranean basin	High Confidence