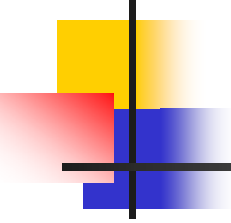




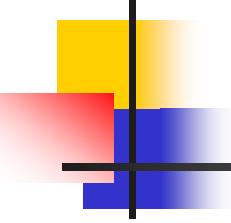
Climate Change

David Van Winkle
Delegate to UNCCC Dec 2005
Dallas Sierra Club



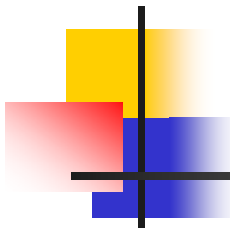
The Earth is getting hotter

- “2005 was the warmest year on record.”
- “Earth’s average temperature has risen nearly 1 degree F. over the past 30 years.”
 - James E. Hansen, Director of NASA’s Goddard Institute of Space Studies.



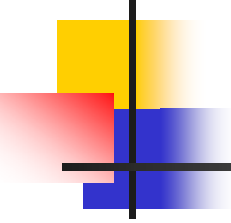
United Nations Conference

- The UN Conference on Climate Change (UNCCC) was started in 1994 and has met 11 times in annual meetings.
- The Kyoto Protocol was defined in the 1997 conference. This called for reduction of GHGs by 7% from 1990 to 2012.
- The Kyoto Protocol went into effect in February 2005, when over 50% of the nations ratified it.



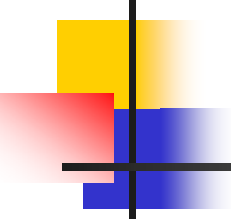
UNCCC – 2005 Conference

- The 2005 UNCCC was held in Montreal in early December. There are 189 countries participating.
- Attendance was >8000 people.
- The major objective of this conference was to agree upon a plan for the post-2012 time period.
- This objective was accomplished.



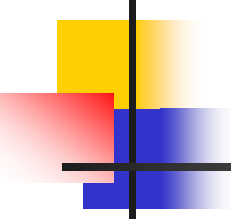
UNCCC – US government view

- The USA government has not ratified the Kyoto Protocol, claiming that:
 - Not all major countries (China) are included.
 - The protocol would harm the US economy.
- The current administration says that voluntary actions can better meet the intent of the protocol.



UNCCC – Other US viewpoints

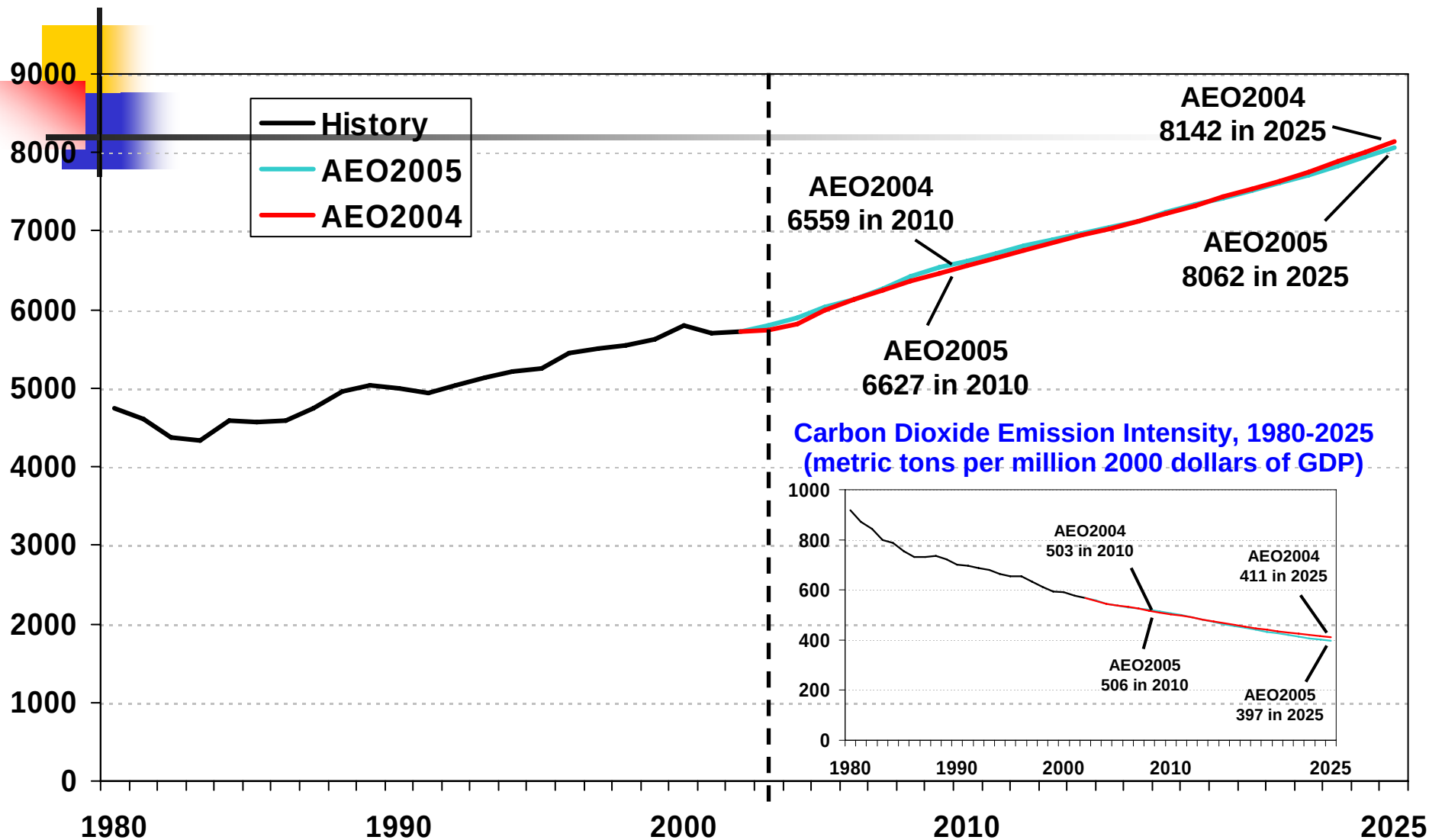
- American presence at the conference indicated that all Americans do not share the governments' viewpoint.
 - 195 US cities have joined the Cool Cities program, which commits those cities to meeting the Kyoto Protocol goals in 2012.
 - 13 states have renewable energy mandates.
 - 28 states have developed plans to reduce GHG.
 - 11 states – California, Oregon, Washington, NE states have implemented laws that require improving GHG output beginning in 2009, ramping to an improvement of 30% by 2016.
 - Dozens of companies have implemented GHG reduction programs.
 - U.S. Senate passed a resolution that recognizes global warming and its impact on the U.S.

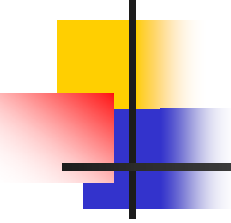


Green House Gases (GHG)

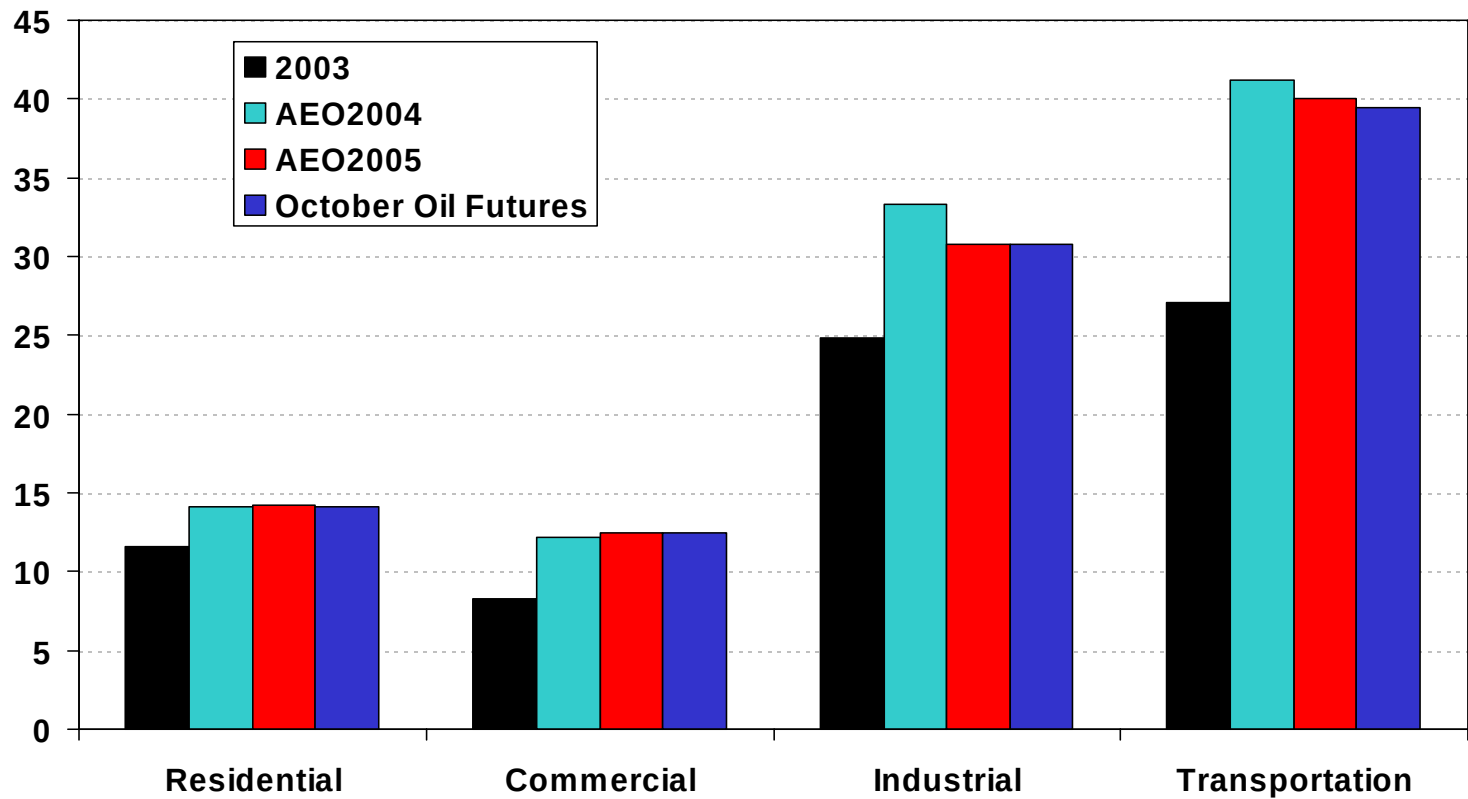
- The USA is the largest producer of GHG, with 21% of the total.
- The GHGs produced by the USA are primarily from CO₂ from fossil fuels – 81%.

Total Carbon Dioxide Emissions, 1980-2025 (million metric tons)

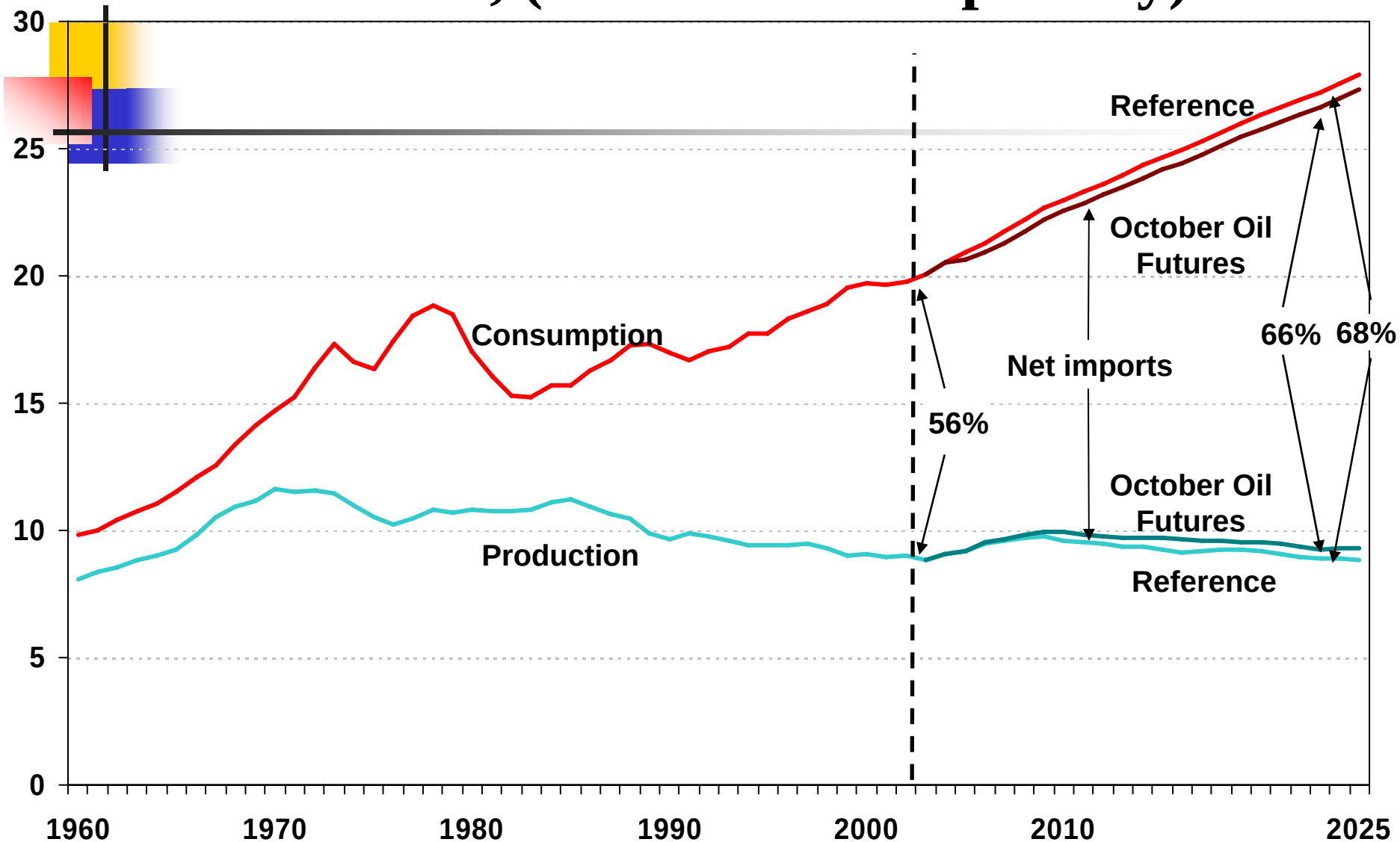


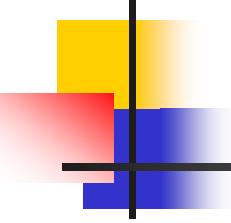


Energy Consumption by Sector



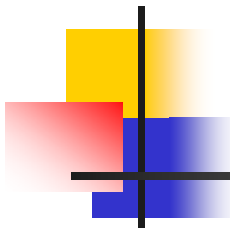
Petroleum Supply, Consumption, and Imports, 1970-2025, (million barrels per day)





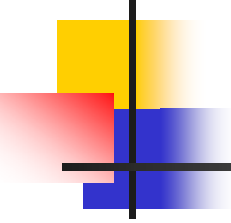
Sources of Carbon Dioxide

- Transportation – 32%
- Electricity – 38%
- Other 30%



Transportation

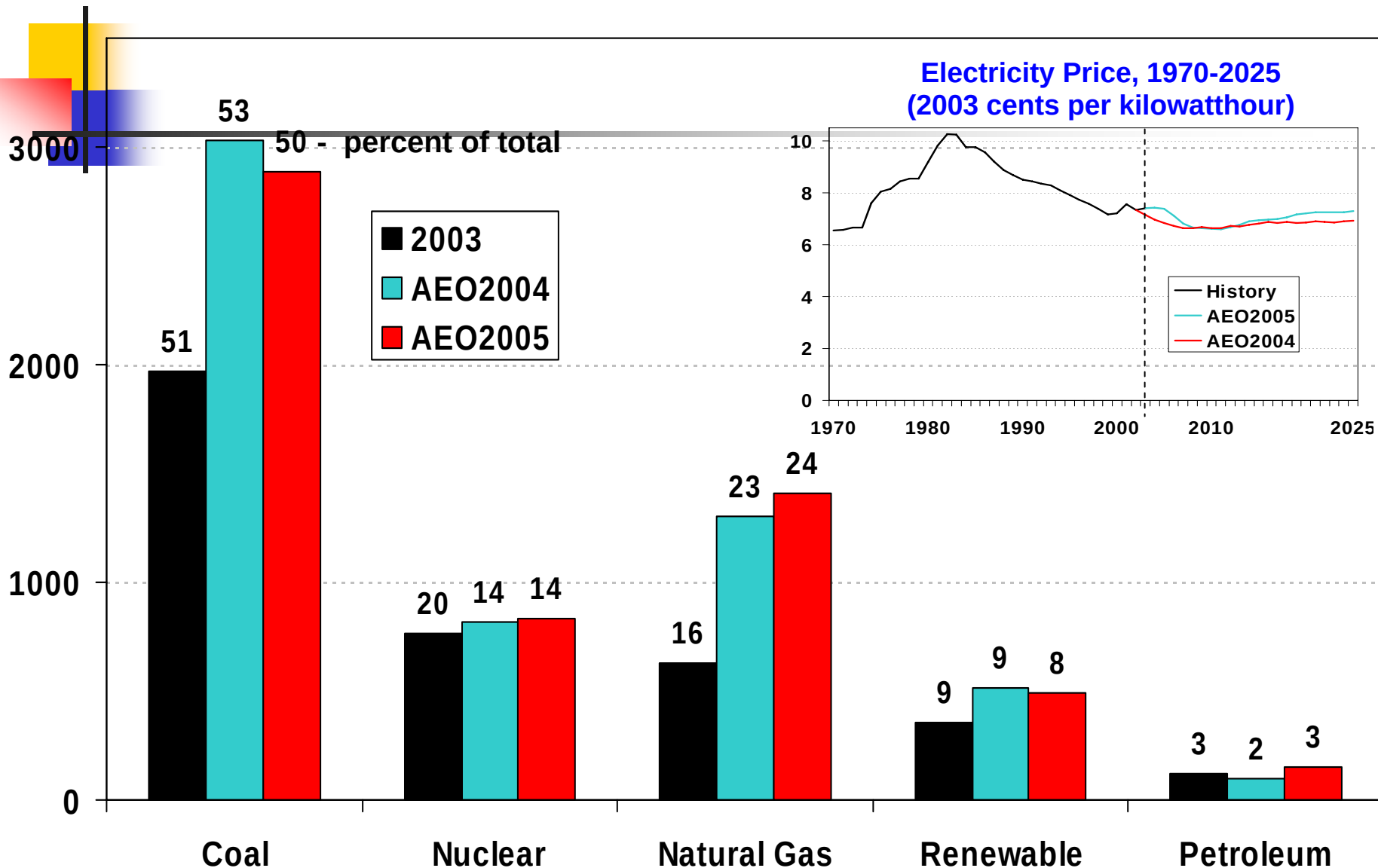
- Vehicle fuel efficiency increased significantly from 1970 to 1985 due to implementation of CAFÉ standards created because of the middle east oil price/instability situation.
- Overall vehicle fuel efficiency has NOT improved in the past 20 years. While individual vehicle MPG has improved, the mix of vehicles in use has offset these improvements.
- Eleven states – California, Oregon, Washington, NE states have implemented laws that require improving GHG output beginning in 2009, ramping to an improvement of 30% by 2016.

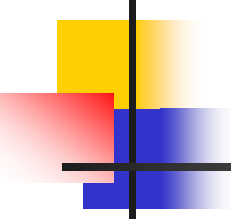


Transportation - continued

- Improving GHGs from transportation.
 - Hybrids
 - High efficient diesels
 - Better mix of vehicles
 - Improve design approach to reduce weight
 - Fewer miles
- Hydrogen fuel cells
 - NOT a source of energy, just a way to store it.
 - Not cost effective today.
 - Could be cost effective in 20 years.

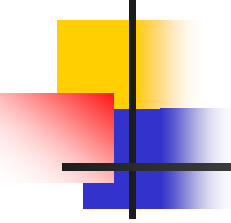
Electricity Generation by Fuel, 2003 and 2025 (billion kilowatthours)





Electricity - Sources

Fuel		% Electricity	GHG tons/GWh
■	Coal	51%	820
■	Nuclear	20%	0
■	Natural Gas	16%	520
■	Renewables	9%	0
■	Hydro	7%	
■	Other	2%	
■	Other	3%	
■	Note: GHG tons/GWh are best technology available today.		

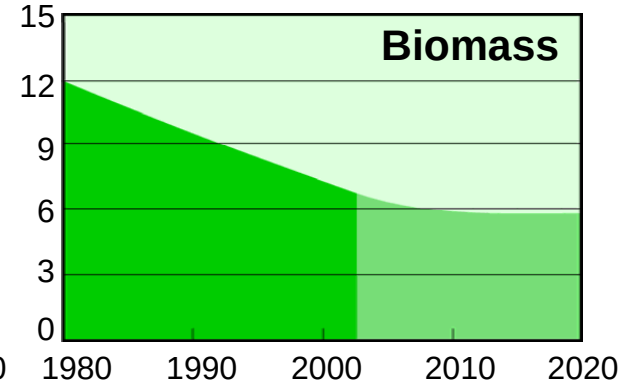
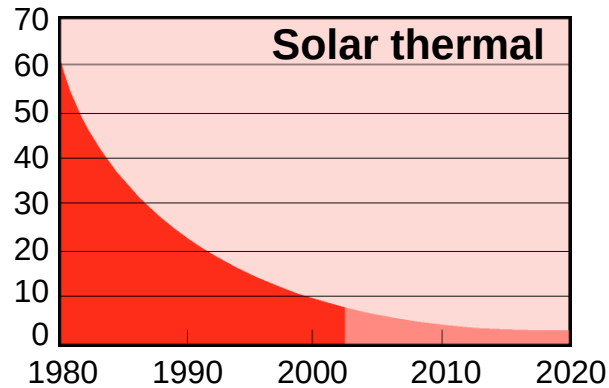
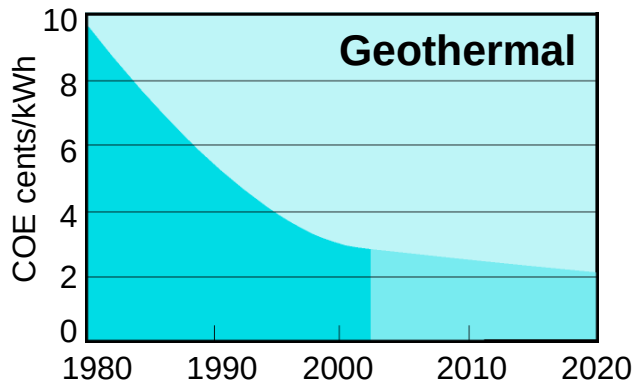
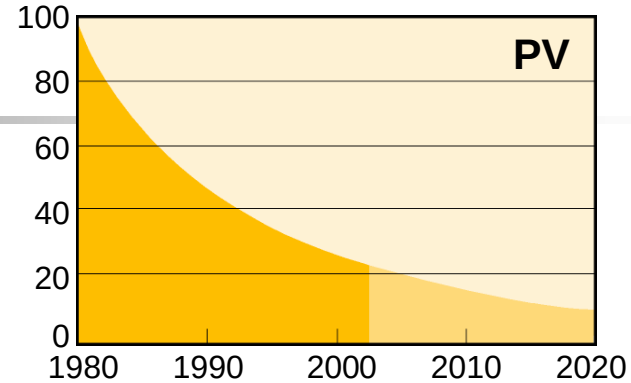
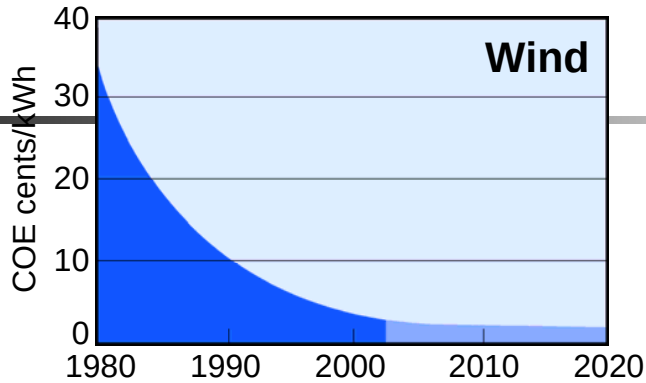


Electricity - Wind

- Clean
- Cost effective
- Many good sites available in midwest.
- Variable – requires use with other fuel that can be modulated to meet demand.
- Requires new transmission lines between source and consumers.
- Could produce 20% of total.

Renewable Energy Cost Trends

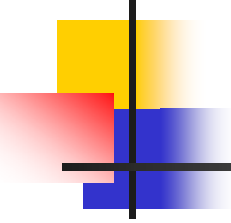
Levelized cents/kWh in constant \$2000¹



Source: NREL Energy Analysis Office (www.nrel.gov/analysis/docs/cost_curves_2002.ppt)

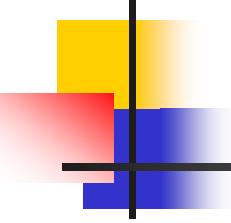
¹These graphs are reflections of historical cost trends NOT precise annual historical data.

Updated: October 2002



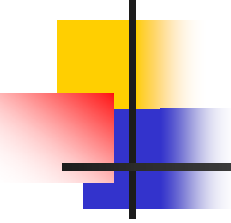
Electricity – Carbon Sequestration

- Carbon sequestration captures the CO₂ from the fossil fuel power plant and stores it underground.
- The technology is 15 years from production, according to the PEW institute.
- Existing coal-fired plants would lose 31% of their energy output (revenue) if implemented.
- New plants using the IGCC approach would use 16% of their energy for CS.



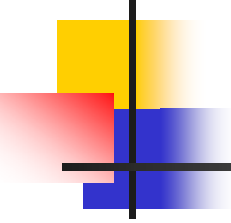
Energy use – Residential

- HVAC 53%
- Appliances/lighting 30%
- Water heating 17%



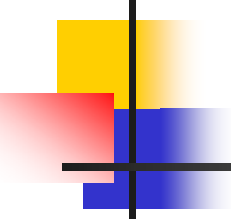
Electricity - Residential

- Proper home design – Energy star
 - Right design for climate
 - Not leaky
 - Most non-energy star homes are very leaky!
 - High efficient HVAC
 - Proper insulation
 - High efficient appliances
 - Compact florescent lights



Electricity - Residential

- Upgrading of existing homes:
 - Incentives
 - Federal
 - States
 - Utilities
 - Education and business opportunity
 - MOST home owners do NOT understand how to cost effectively reduce their energy consumption.



Existing Home Owners

- Prioritized actions
 - Assess home performance by professional.
 - Blower door test and duct blaster.
 - Correct leaks.
 - Consider more efficient HVAC & insulation.
 - Install compact florescent lights.
 - Consider more efficient appliances.