

Mitigation Strategies - Reduction of Greenhouse Gas Emissions

CO₂ cap and trade

- set overall targets on CO₂ emissions per economic sector
- allow trading of CO₂ permits
- progressively lower the caps over time
- the marketplace should drive industry toward efficiency
- beware of loopholes

regulate short-lived atmospheric components

- quicker and cheaper for partial solution
- methane, tropospheric ozone, and black carbon have short atmospheric residence times; reducing these will have quick effect

improved coal combustion: to get more energy and less CO₂ per ton of coal
investment by government and industry is required to develop the technologies
conventional coal energy is very inefficient and polluting
but coal is cheap and very plentiful & will continue to be an important energy source

carbon capture and sequestration

- technology exists to capture CO₂ in smokestacks
- can be improved to decrease energy required from 25-30% to 15-20% of the overall heat generated by burning the fuel
- the apparatus is also very large and may not be applicable to retrofitting power plants with limited property
- CO₂ can be pumped into deep porous/permeable formations under land or oceans
- a pipeline network (like our natural gas pipelines) will be needed to deliver CO₂
- CO₂ can be used to help pump oil and natural gas out of deep reservoirs
- CO₂ may gradually leak out of some reservoirs but at the very least the method will help give us valuable time to change our energy economy

some ***pilot projects*** are already running, others are being built or planned
investment by government and industry is required to develop the technologies

alternative energy

non-fossil fuel energy sources could potentially supply all of our energy needs
problems: most are significantly more expensive than fossil fuel energy (but remember, we are not paying the full cost of our energy supply; we and our children will be paying for the effects for a long time)
many of these supply energy intermittently (solar, wind)

alternative heat sources:
nuclear, solar thermal, biofuels, hydrothermal

alternative turning power:
hydroelectric, wind, tidal, ocean currents

alternative electron source:
photovoltaic

very small government investment in research and development
prices (now high) come down with increased development