

20 Most Important Things to Know About Global Warming

1. The average global temperature over the last 140 years has risen about 0.6 degrees Celsius (1.1 degree Fahrenheit).
2. At present, the ocean is rising at the rate of about 1cm (10mm) every 5 years; over the past 100 years the Earth's average ocean level has risen 10 to 20cm.
3. The five main global warming gases are: Carbon Dioxide, Methane, Nitrous Oxide, Chlorofluorocarbons (CFC's), and Water Vapor.
4. The Earth's average global temperatures have fluctuated widely over the past several hundred thousand years.
5. The Intergovernmental Panel on Climate Change (IPCC) – was established in 1988 by the United Nations to analyze and project possible future climate change on the planet Earth.
6. There are four reasons why greenhouse gases have increased dramatically in the past several decades
 - a. the widespread use of fossil fuels (carbon dioxide)
 - b. deforestation and clearing of grasslands (fewer trees to sequester carbon)
 - c. increased number of cattle and livestock (methane)
 - d. rice paddies/inorganic fertilizers (nitrous oxide and methane)
7. The 16 warmest years on record have occurred since 1980 and the 10 warmest have occurred since 1990.
8. The 20th century was the hottest century in the past 1,000 years.
9. Glaciers and sea ice are melting and shrinking in many parts of the world; the Arctic is shrinking and large pieces of the Antarctic are breaking off and going into the ocean.
10. What are some of the negative impacts that global warming might cause?
 - a. flooding from ocean rise and storm surges
 - b. unpredictable and severe weather patterns
 - c. displacement of species from their normal ranges
 - d. extinction of species unable to migrate or adapt to climate change
 - e. disruption of world-wide agricultural production
 - f. dislocation of people living near the ocean
 - g. increased spread of diseases such as malaria
11. What are some of the positive impacts that global warming might cause?
 - a. expanded and increased agricultural production due to warmer weather in some locales and increases in CO₂ concentrations
 - b. reduced heating costs during the winter months
 - c. increased electrical production from wind farms due to an increase in winds from a warmer atmosphere
 - d. increased rainfall due to increased evaporation from the oceans due to warmer atmospheric temperatures
 - e. increased habitable land mass in what are now cold climes
12. Kyoto Protocol: In 1997 delegates from 161 countries met in an effort to reduce carbon dioxide emissions from the world's most polluting countries. The Protocol became operational in 2004 by which time more than 120 countries has ratified it. The United States has refused to sign the agreement feeling that the Protocol will not be effective in reducing global warming and that it will hurt the U.S. economy.
13. The world needs to cut the entire mix of global warming gases that are being produced by 50% by 2018 just to stabilize the present concentrations of these gases in the air.

14. What are some of the things that can be done to reduce global warming?
 - a. make all machines that use fossil fuels more efficient
 - b. reduce the use of fossil fuels
 - c. tax the use of fossil fuels
 - d. continue to phase out CFC's
 - e. sequester carbon dioxide deep underground or in the bottom of the ocean
 - f. plant more trees
 - g. reduce human population growth and consumption
 - h. reduce the number of cattle because of their methane production
 - i. switch from oil and coal to natural gas which produces less carbon dioxide
15. Ocean Current (thermohaline) Shutdown – The giant conveyor belt-like current that brings warm water from the equatorial region to the North Atlantic could be disrupted or stopped. This could happen as more fresh water enters the ocean due to increased rainfall and the melting of glaciers and icecaps and, in turn, would dilute the cold, salty water in the North Atlantic. The diluted water would not sink in order to complete the loop back to the equator and the current would stop. Northern latitudes would become much colder, and ironically, this could trigger another ice age.
16. Carbon dioxide levels in the atmosphere have risen from about 280 ppm during the nineteenth century to 375 ppm by 2004. (34% increase)
17. Contributions of global warming gases: North America 28% (U.S. 25%); Europe and Russia 28%; Asia/Pacific 31%; rest of the world 13%
18. The **Milankovitch Cycles** have contributed to natural climate change for millions of years (wobble - 22,000 year cycle; tilt change - 41,000 year cycle; orbit change - 100,000 year cycle)
19. Case Study: The Maldives – The Maldives is an island nation whose average elevation above sea level is 1 meter. With an expected sea level rise of 9 to 88 cm (20-35 in.) by the year 2100, this nation is concerned about its future. Storm surges caused by hurricanes, or tsunamis, could devastate the islands that make up this small country.
20. Possible natural counterbalances to the greenhouse effect:
 - a. increased CO₂ concentrations will increase plant growth which will absorb excess CO₂
 - b. increased evaporation of water will increase cloud cover and snow cover which, in turn, will reflect sunlight
 - c. the Earth's ocean serves as a massive heat sink preventing excessive heating of the planet