

## Global Warming: The Facts Are Clear

### WHAT IS GLOBAL WARMING?

Global warming refers to the rise in average global temperature due to human activities, namely, the emissions of greenhouse gas pollution produced by the burning of fossil fuels and land-use changes like deforestation. Scientists predict that higher temperatures will probably be accompanied by an increase in extreme weather events like flooding and drought, as well as a rise in the global sea level. Even though the first signs already are apparent, a sharp reduction of greenhouse gas pollution could significantly slow global warming.

### HOW DOES GLOBAL WARMING OCCUR?

Light from the sun passes through the Earth's atmosphere and heats its surface. The Earth's surface then gives off heat, some of which is trapped in its atmosphere by a blanket of greenhouse gases rather than escaping into space, keeping the Earth warmer than it otherwise would be. Most of this greenhouse effect is natural, maintaining the Earth's average temperature at about 60°F (15°C). Without the natural greenhouse effect, the Earth's average temperature would be closer to 0°F (-18°C). The atmospheric concentrations of several greenhouse gases are rising as a result of human activity. Carbon dioxide (CO<sub>2</sub>), the most important human-made greenhouse gas, is released primarily by the burning of fossil fuels like coal, oil, and natural gas, thereby raising the concentration of carbon dioxide by 30 percent since pre-industrial times.

Concentrations of other greenhouse gases also have climbed: methane levels have more than doubled, and nitrous oxide levels are increasing as well.

Climate scientists around the world agree that global average temperature has risen about 1°F (0.4°C to 0.8°C) in the past 140 years. Assessments by the U.S. National Academy of Sciences and the United Nations' Intergovernmental Panel on Climate Change (IPCC) find that most of the warming of the past 50 years is likely due to the man-made production of greenhouse gas pollution.

### WHAT IS THE LEVEL OF GLOBAL WARMING PREDICTED FOR THE FUTURE?

Scientists predict that in the 21st century, the Earth could warm more quickly than at any other time in the history of civilization. Such a rise in global temperature would have significant and dangerous impacts. Between modern times and the last ice age—when much of Canada and the northern U.S. was covered with a thick ice sheet—the difference in global average temperature was only about 9°F (5°C). A rise in temperature could have serious and potentially devastating effects on the planet's ecosystems.

### HOW ARE GOVERNMENTS ADDRESSING THE PROBLEM?

International agreements call for cuts in greenhouse gas pollution. While the pace and magnitude of



ENVIRONMENTAL DEFENSE  
finding the ways that work

For more information, please contact Environmental Defense, 257 Park Avenue South, New York, NY 10010, 212-505-2100  
Austin • Boston • Boulder • Los Angeles • New York • Oakland • Raleigh • Washington

future warming are still uncertain, the consensus among scientists and government officials on the key aspects of the problem led to negotiation and the signing of the UN Framework Convention on Climate Change at the 1992 Earth Summit and the 1997 Kyoto Protocol. The protocol calls for mandatory reductions of emissions by industrial countries (e.g., 7% below 1990 levels for the U.S. based on average emissions between 2008 and 2012). Even

though more than 100 countries, including the European Union, Canada, and Japan, have ratified the Kyoto Protocol, the U.S., the world's largest emitter of greenhouse gas pollution has refused to ratify the measure.



**ENVIRONMENTAL DEFENSE**

finding the ways that work

For more information, please contact Environmental Defense, 257 Park Avenue South, New York, NY 10010 , 212-505-2100  
Austin • Boston • Boulder • Los Angeles • New York • Oakland • Raleigh • Washington