

Climate change milestones

■ **1824:** French physicist **Joseph Fourier** uses greenhouse analogy to describe importance of atmosphere in trapping heat and influencing Earth's temperature

■ **1859:** Irish physicist **John Tyndall** identifies water vapour and carbon dioxide as heat-trapping gases

■ **1896:** Swedish chemist **Svante Arrhenius** concludes that CO₂ emissions from industrial-age coal burning will enhance greenhouse effect – first suggestion that human activity produces greenhouse gases

■ **1938:** British engineer **Guy Callendar** first suggests that fossil fuel burning is responsible for observed warming of world's climate

■ **1958:** American scientist **Charles Keeling** makes first direct measurement of atmospheric CO₂ at Mauna Loa, Hawaii

CO₂ concentration (parts per million)

“Keeling Curve” becomes crucial tracker of CO₂ rise

■ **1965:** U.S. advisory panel warns that greenhouse effect is a matter of “real concern”

■ **1975:** U.S. scientist **Wallace Broecker** introduces term “global warming” into public domain in title of scientific paper

■ **1979: First World Climate Conference** urges governments “to foresee and prevent potential man-made changes in climate”

■ **1987: Montreal Protocol** signed, restricting chemicals that deplete ozone layer. Although not established with climate change in mind, it has major impact on greenhouse gas emissions

■ **1988:** UN sets up **Intergovernmental Panel on Climate Change** to collate and analyse evidence on global warming

■ **1990:** First IPCC report states that human activities are significantly adding to concentrations of greenhouse gases and documents global 0.5-degree Celsius increase in temperature over past 100 years

■ **1991:** Debris from eruption of **Mount Pinatubo** volcano in Philippines shields Earth from solar energy, causing global temperature to fall for two years before rising again

■ **1992: UN Earth Summit** in Rio de Janeiro creates **Framework Convention on Climate Change** – developed countries agree to cut emissions to 1990 levels

■ **1997: Kyoto Protocol** sets binding targets for industrialised nations to reduce emissions by 5% against 1990 levels over period 2008-2012

■ **1998:** Strong **El Niño** conditions combine with global warming to produce warmest year on record

■ **2001:** President **George W. Bush** removes U.S. from Kyoto process

■ **2002: Larsen B Ice Shelf** – over 3,000 sq. km in size – breaks off Antarctic peninsula

■ **2003:** Europe's worst heatwave in 500 years kills an estimated 30,000, accelerating divergence between European and U.S. public opinion

■ **2005:** Kyoto Protocol comes into force

■ **2006:** China overtakes U.S. as world's biggest CO₂ emitter, but U.S. remains well ahead on per-capita basis

■ **2007:** IPCC states that “warming of climate is unequivocal” and places blame firmly on human activity

■ **Oct:** IPCC and former U.S. vice-president **Al Gore** share Nobel Peace Prize for efforts to spread awareness of climate change

2007: Arctic sea ice shrinks to lowest extent on record

Arctic summers predicted to be ice-free within decades

■ **2008, May:** U.S. lists polar bear as endangered species due to rapid melting of its Arctic sea-ice habitat

■ **Nov:** U.S. president-elect **Barack Obama** vows to “engage vigorously” in talks on climate change

■ **2009:** New evidence shows Antarctica is warming rapidly, leaving **Wilkins Ice Shelf** – largest of its kind – on brink of breaking away

■ **Oct: International Energy Agency** says global economic crisis has led to fall of carbon emissions by 3% in 2009, giving world leaders unexpected opportunity to take decisive action on global warming

■ **Dec 7:** 192 governments convene for UN summit in Copenhagen to negotiate new climate change treaty