

HOW CAN THE THREAT OF CLIMATE CHANGE BE REDUCED WITHOUT DAMAGING THE GLOBAL ECONOMY?

WHAT IS REALLY AT STAKE?

WHAT CAUSES CLIMATE CHANGE?

- Natural variations in the earth's orbit about the sun
- Human activities that release greenhouse gases to the atmosphere. eg industrialization, use of fossil fuels
- Current levels of carbon dioxide in the atmosphere (which exceed levels experienced at any time over the last two million years)



0.8°C (1.4°F)

Circa-2014 increase in the earth's average surface temperature relative to its pre-industrial value

2,000 Gt The circa-2014 cumulative emissions of carbon dioxide in billion tonnes since industrialization

HOW DOES IT AFFECT HUMANS AND THE PLANET?

- Extreme weather is occurring with greater frequency and intensity
- Torrential rains and prolonged drought in many regions are reducing food production, causing fires and creating climate refugees
- Potential political instability and conflict in nations most affected and least able to deal with the effects



WHAT IS THE EVIDENCE?

- Since the Industrial Revolution warming has occurred ten times faster than at any other time since the last ice age
- Glaciers, Arctic Sea Ice and the ice sheets of Greenland and the Antarctic are losing mass due to melting
- The earth's average sea level is rising



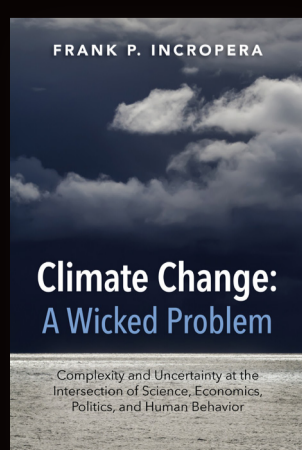
2.0°C (3.6°F) The increase in temperature beyond which the consequences of climate change are potentially unmanageable

400 ppm The circa-2014 atmospheric concentration of carbon dioxide expressed in parts per million

2040 At current emission rates, the year in which 450 ppm, 2,900 Gt and the 2.0 C threshold are reached

HOW DO WE COMBAT CLIMATE CHANGE?

- Attack its root cause and reduce greenhouse gas emissions
 - Reduce the demand for fossil fuels by increasing the efficiency of energy production and consumption
 - Decarbonize the world's primary energy supply
 - Reduce the use of coal by substituting natural gas or nuclear energy
 - Increase the use of renewable energy (solar, wind and hydro)
- Replace the use of petroleum for transportation by electrifying or using biofuels
- Foster a global sea change in cultural norms with conservation becoming a deeply engrained social value throughout the world
- Accept the inevitability of adverse effects and implement measures for adapting to climate change



Climate Change: A Wicked Problem

by Frank P. Incropera

Paperback, £19.99 / \$29.99

www.cambridge.org/incropera



CAMBRIDGE
UNIVERSITY PRESS