



Changes in Earth's Energy Balance

1. What are three ways to change the Earth's radiation balance?
 - a. *by changing the incoming solar radiation*
 - b. *by changing the fraction of solar radiation that is reflected (albedo)*
 - c. *by altering the long-wave radiation from Earth back towards space (e.g., by changing greenhouse gas concentrations)*

2. What are three ways that naturally change the climate forcings?
 - a. *Changes in the Sun's brightness*
 - b. *Small variations in the shape of Earth's orbit and its axis of rotation that occur over thousands of years*
 - c. *Large volcanic eruptions that inject light-reflecting particles as high as the stratosphere*

3. What are three types of manmade radiative forcings?
 - a. *Particle pollution (aerosols)*
 - b. *Deforestation*
 - c. *Rising concentration of atmospheric carbon dioxide and other greenhouse gases*

4. Which type of manmade radiative forcing has the greatest effect?

Carbon dioxide emissions

5. What economic changes could happen to change the amount of atmospheric CO₂?

Possible answers: The economy could grow, or decline, resulting in more or less fossil fuel use

6. What political changes could happen to change the amount of CO₂ in the atmosphere?

Possible answers: Taxes on carbon emissions or carbon cap programs could reduce CO₂ emissions

7. What technological changes could have an impact on CO₂ emissions?

Possible answers: Higher mileage cars, energy saving lights, nuclear, wind or solar energy generation