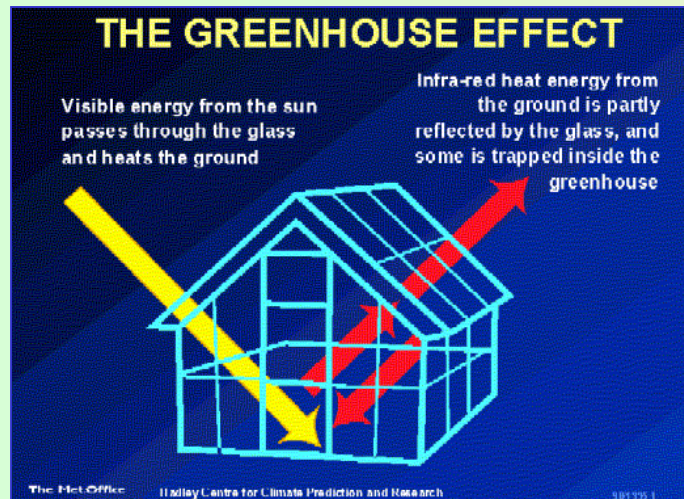


# Greenhouse Effect



<http://ircamera.as.arizona.edu/NatSci102/NatSci102/images/gheffect.gif>



## Definition

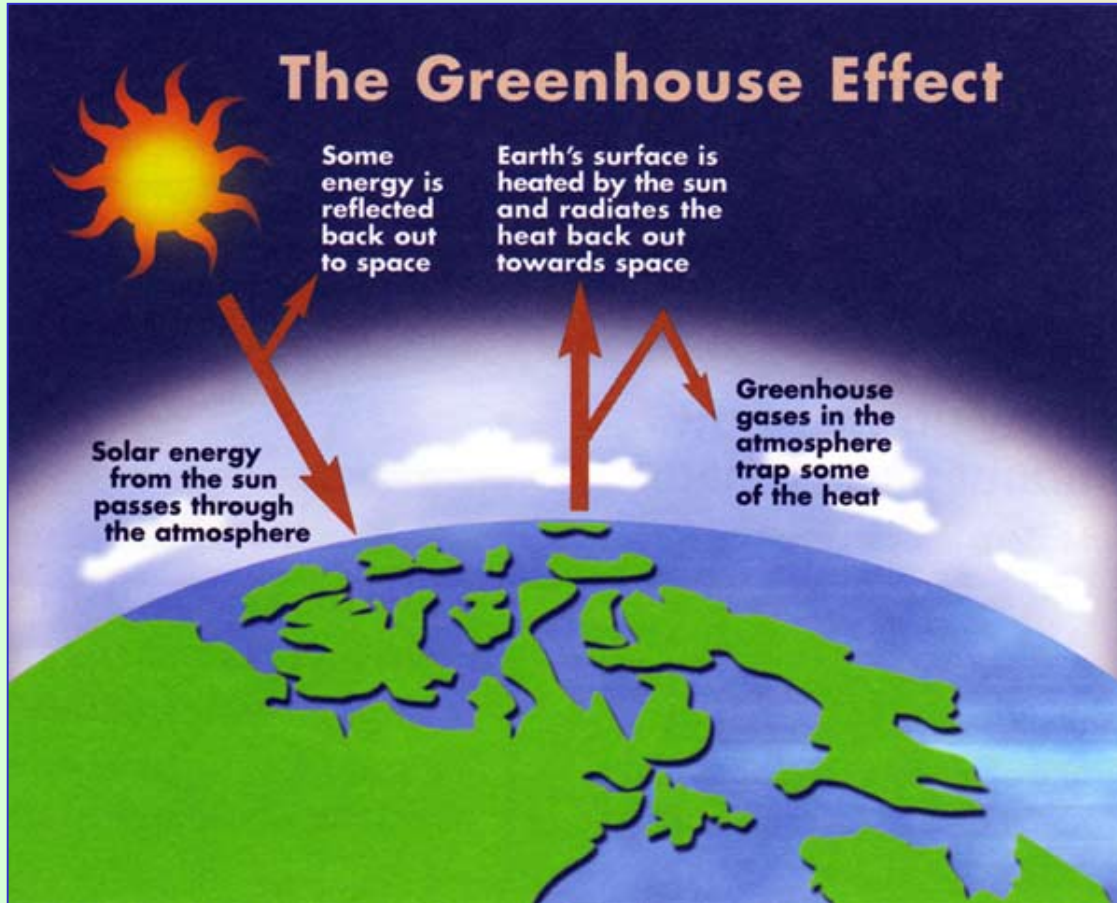
The greenhouse effect is the rise in temperature that the Earth experiences because certain gases in the atmosphere (water vapor, carbon dioxide, nitrous oxide, and methane, for example) trap energy from the sun.

Without these gases, heat would escape back into space and Earth's average temperature would be about 35°C colder.

Because of how they warm our world, these gases are referred to as greenhouse gases.

<http://www.defra.gov.uk/environment/climatechange/images/01.gif>

# Greenhouse Effect



<http://www.geocities.com/sjcenglishfvp/greenhouse-effect.jpg>

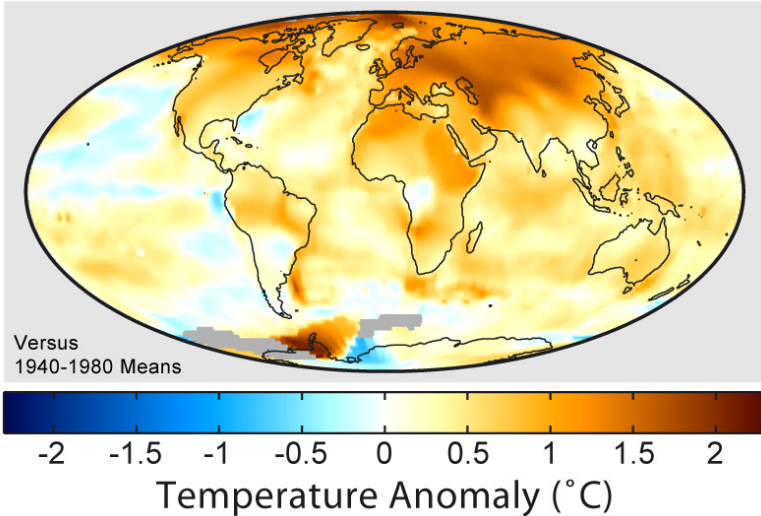
## The process

Once absorbed, this energy is sent back into the atmosphere.

Some of the energy passes back into space, but **much of it remains trapped in the atmosphere by the greenhouse gases, causing our world to heat up.**

# Greenhouse Effect

## 1999-2008 Mean Temperatures



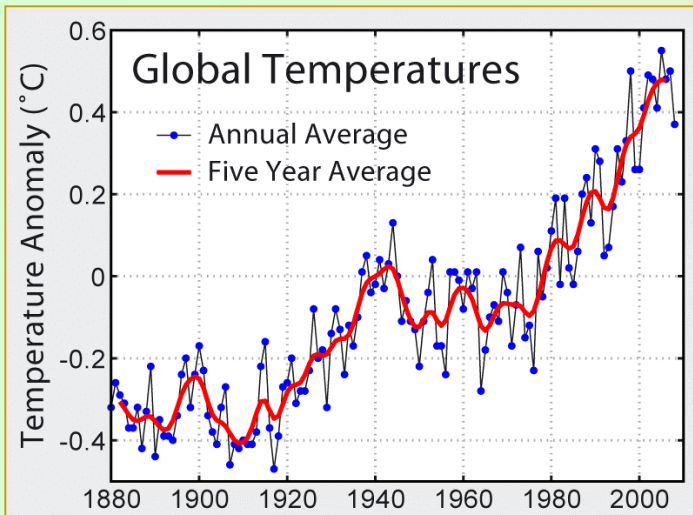
## Global Warming

Global warming is the increase in the average temperature of the Earth since the mid-twentieth century and its projected continuation.

Global temperature increased  $0.7^{\circ}\text{C}$  during the 100 years ending in 2005

The Intergovernmental Panel on Climate Change (IPCC) concludes that anthropogenic greenhouse gases are responsible for most of the observed temperature increase since the middle of the twentieth century.

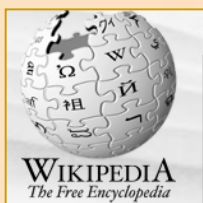
[http://upload.wikimedia.org/wikipedia/en/8/8c/Global\\_Warming\\_Map.jpg](http://upload.wikimedia.org/wikipedia/en/8/8c/Global_Warming_Map.jpg)



[http://upload.wikimedia.org/wikipedia/commons/f/f4/Instrumental\\_Temperature\\_Record.png](http://upload.wikimedia.org/wikipedia/commons/f/f4/Instrumental_Temperature_Record.png)



# Greenhouse Effect



## The causes of global warming

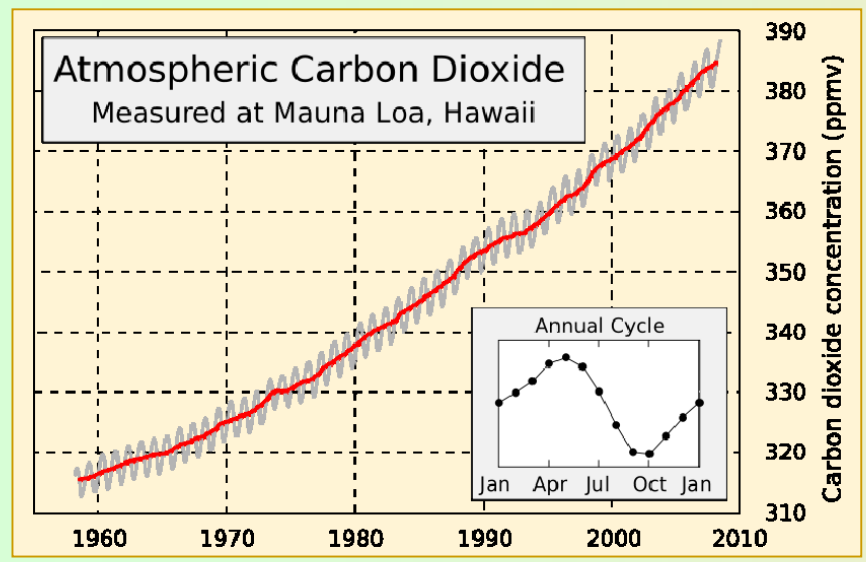
On Earth the major greenhouse gases are

- water vapor, which causes about 36-70 percent of the greenhouse effect;

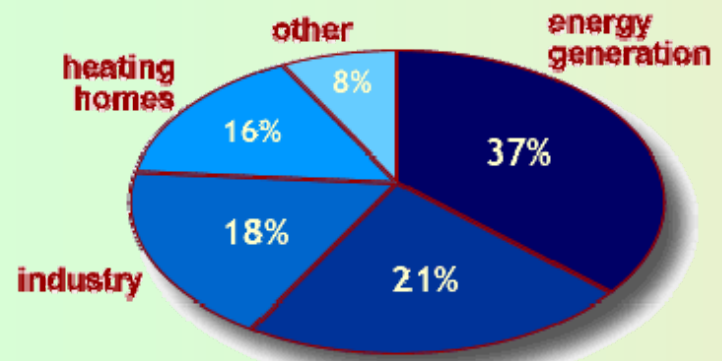
- carbon dioxide (CO<sub>2</sub>), which causes 9-26 percent;

- methane (CH<sub>4</sub>), which causes 4-9 percent;

- and ozone, which causes 3-7 percent



[http://upload.wikimedia.org/wikipedia/commons/thumb/5/51/Mauna\\_Loa\\_Carbon\\_Dioxide-en.svg/800px-Mauna\\_Loa\\_Carbon\\_Dioxide-en.svg.png](http://upload.wikimedia.org/wikipedia/commons/thumb/5/51/Mauna_Loa_Carbon_Dioxide-en.svg/800px-Mauna_Loa_Carbon_Dioxide-en.svg.png)



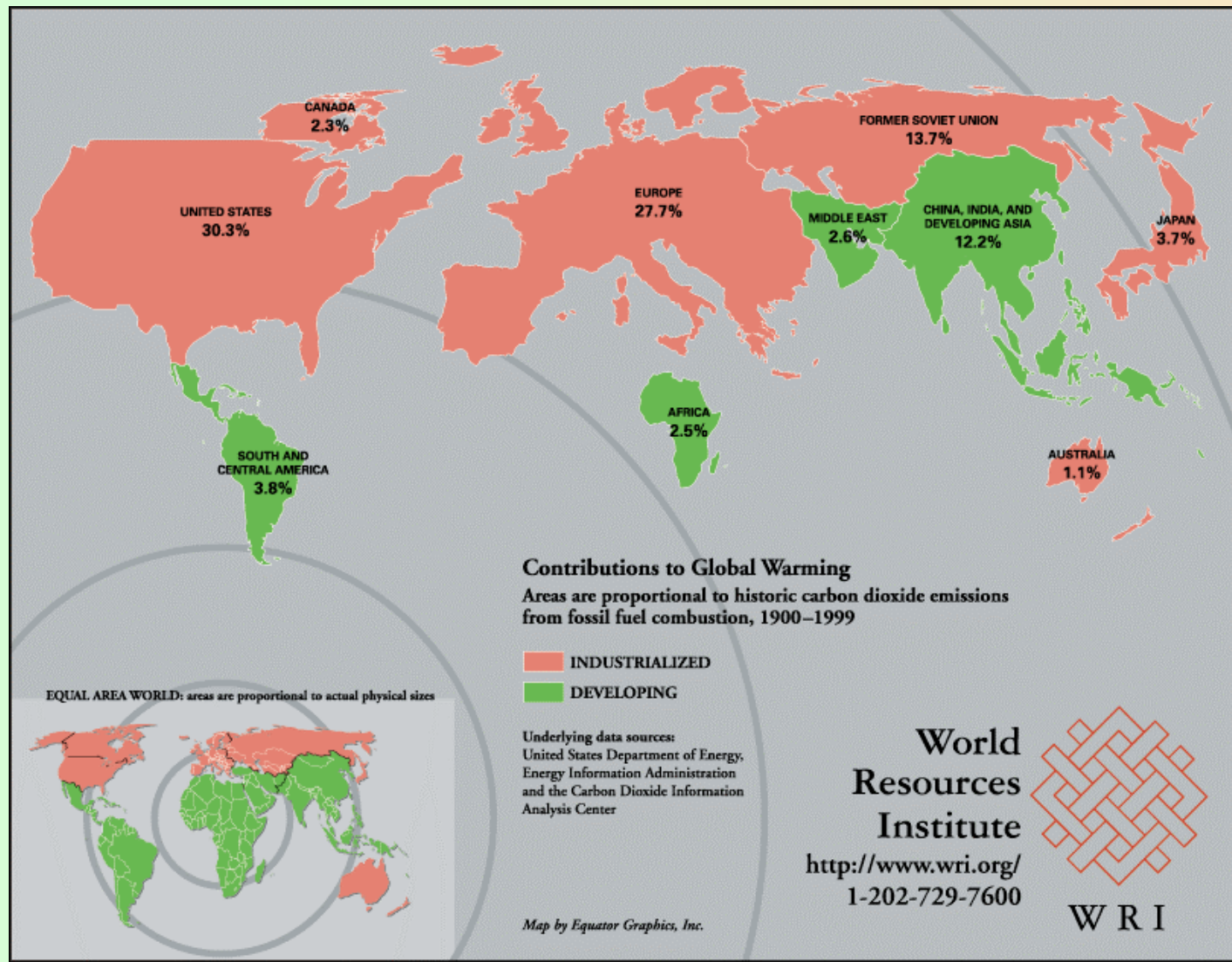
UK Carbon Dioxide Emissions (2004)

<http://www.climatechoices.org.uk/images/UKCO2.gif>

# Greenhouse Effect

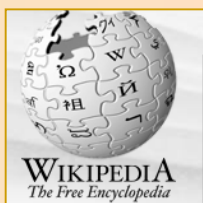
## Contributions to global warming map

This map redefines the relative area of countries and regions of the world using historical carbon dioxide emissions from fossil fuel consumption.

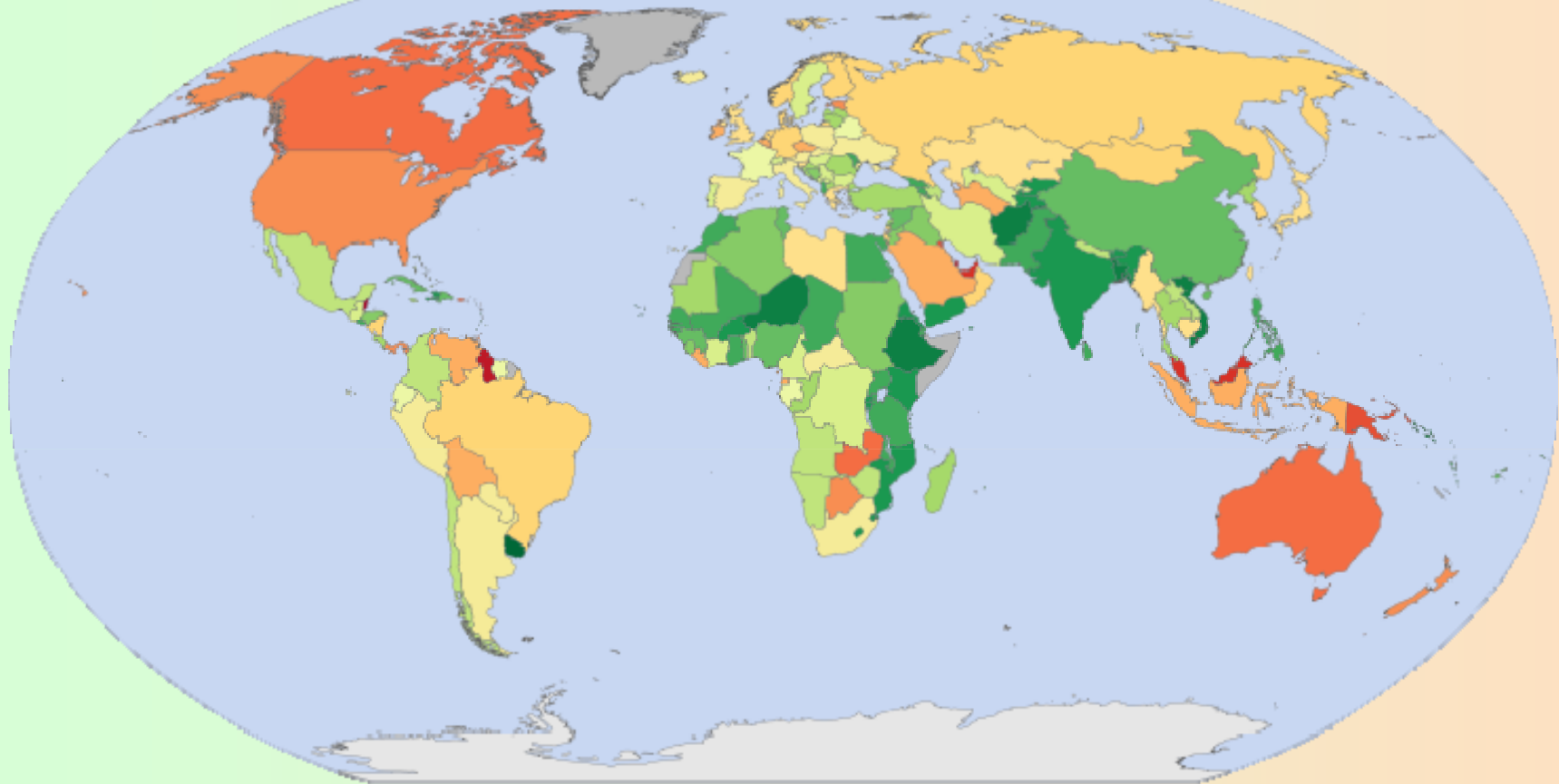


# Greenhouse Effect

## Contribution to global warming



Per capita greenhouse gas emissions by country in 2000 (including land-use change)



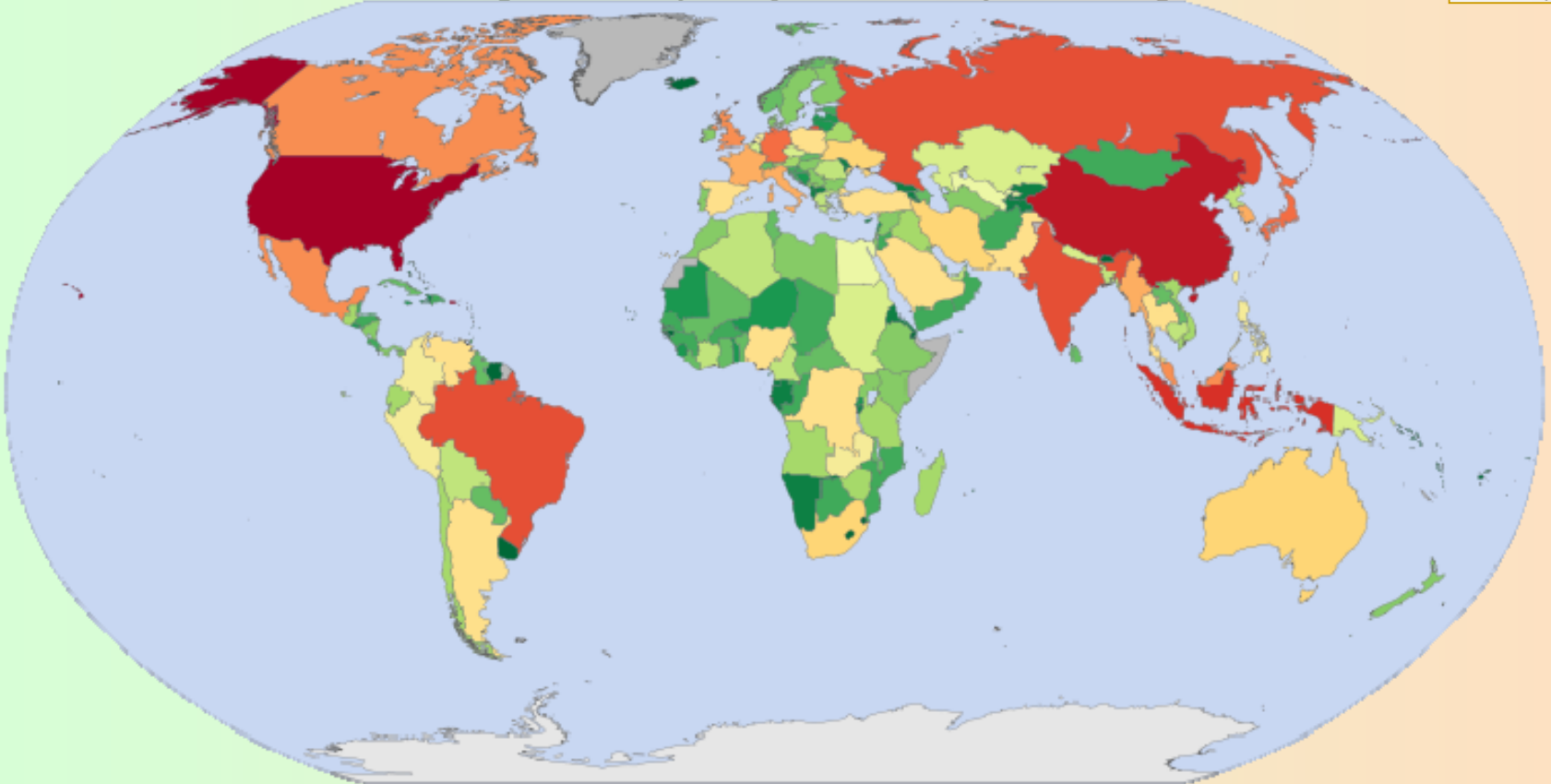
[http://upload.wikimedia.org/wikipedia/commons/thumb/e/ea/GHG\\_per\\_capita\\_2000.svg/800px-GHG\\_per\\_capita\\_2000.svg.png](http://upload.wikimedia.org/wikipedia/commons/thumb/e/ea/GHG_per_capita_2000.svg/800px-GHG_per_capita_2000.svg.png)

# Greenhouse Effect

## Contribution to global warming



Greenhouse gas emissions by country in 2000 (including land-use change)



[http://upload.wikimedia.org/wikipedia/commons/thumb/6/6b/GHG\\_by\\_country\\_2000.svg/800px-GHG\\_by\\_country\\_2000.svg.png](http://upload.wikimedia.org/wikipedia/commons/thumb/6/6b/GHG_by_country_2000.svg/800px-GHG_by_country_2000.svg.png)