
Wildlife
Conservation
Society

KSWS REDD+

Science Talk

Carbon and Climate Change

05 January 2023

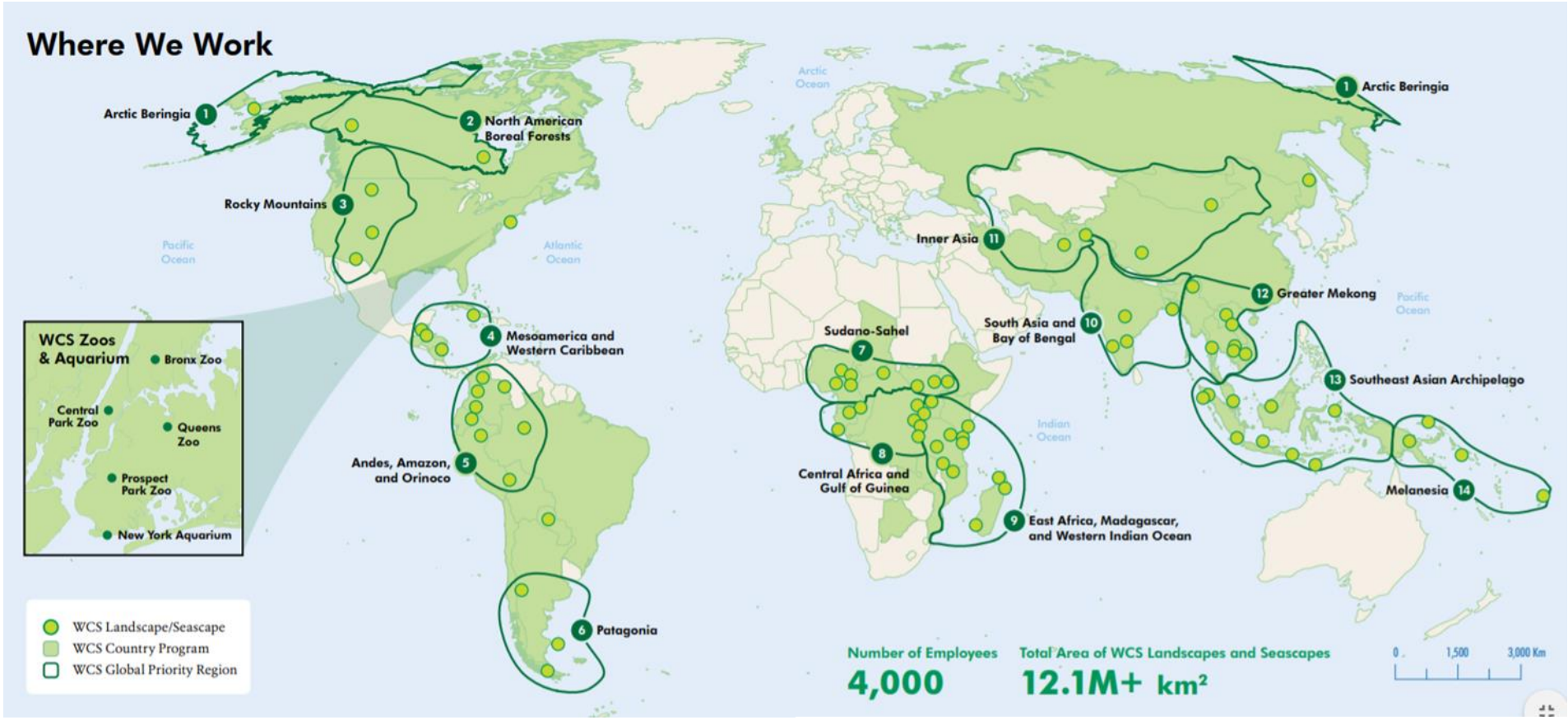
WHO WE ARE

Wildlife Conservation Society (WCS)

- *"WCS's goal is to conserve the world's largest wild places in 14 priority regions, home to more than 50% of the world's biodiversity."*

- Trusted organization

- Responsibility to ensure our projects do not cause harm to local people



1 Arctic Beringia
Arctic tundra and productive seas of Alaska, western Canada, and northeastern Russia

2 North American Boreal Forests
Boreal forests, mountains, and peatlands in Canada and Alaska

3 Rocky Mountains
Forests, grasslands, and riparian systems from southern Canada to the US-Mexico borderlands

4 Mesoamerica and Western Caribbean
Forests, coasts, and coral reefs in Belize, Cuba, Guatemala, Nicaragua, and Honduras

5 Andes, Amazon, and Orinoco
Forests, grasslands, and wetlands of Bolivia, Brazil, Colombia, Ecuador, Peru, and Venezuela

6 Patagonia
Landscapes, coasts, and seascapes of southern Chile and Argentina

7 Sudano-Sahel
Savannas, woodlands, forests, and wetlands of Nigeria, Cameroon, Chad, Central African Republic, South Sudan, and Ethiopia

8 Central Africa and Gulf of Guinea
Forests and coasts, including Equatorial Guinea, Gabon, Republic of Congo, and Democratic Republic of Congo

9 East Africa, Madagascar, and Western Indian Ocean
Savannas, forests, and coastal habitats of Uganda, Kenya, Rwanda, Tanzania, Mozambique, and Madagascar

10 South Asia and Bay of Bengal
Forests, mountains, and coasts, including Pakistan, India, and Bangladesh

11 Inner Asia
Forests, grasslands, and mountains of Afghanistan, Mongolia, the Tibetan Plateau of China, and the countries of Central Asia

12 Greater Mekong
Forests, grasslands, wetlands, and coasts of Cambodia, Laos, Myanmar, Thailand, Vietnam, and southern China

13 Southeast Asian Archipelago
Forests, coasts, and coral reefs of Indonesia, Malaysia, and the Philippines

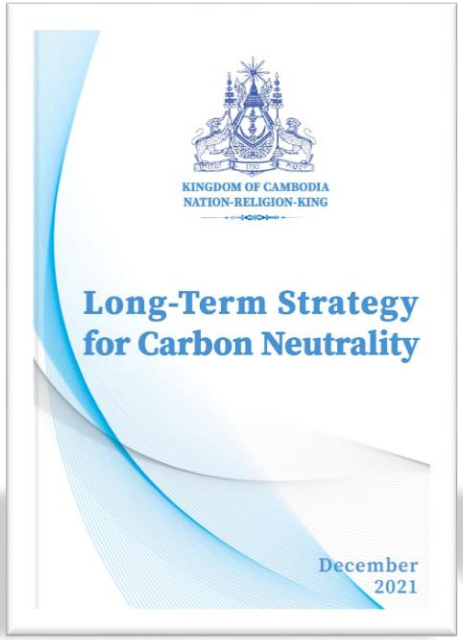
14 Melanesia
Highlands and islands of Fiji, Papua New Guinea, and Solomon Islands

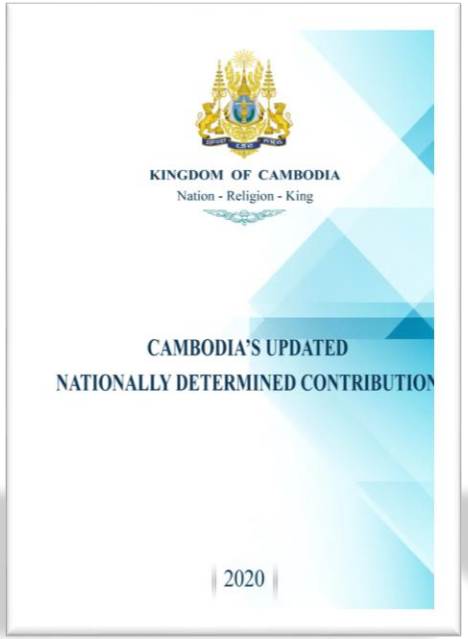
WCS IN CAMBODIA

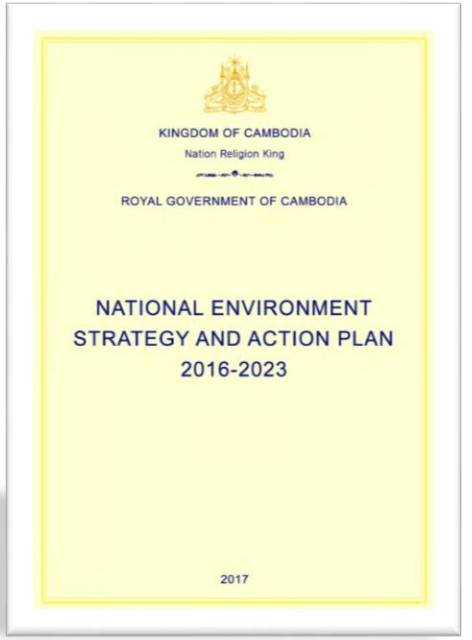
WCS supports the Royal Government of Cambodia to implement..

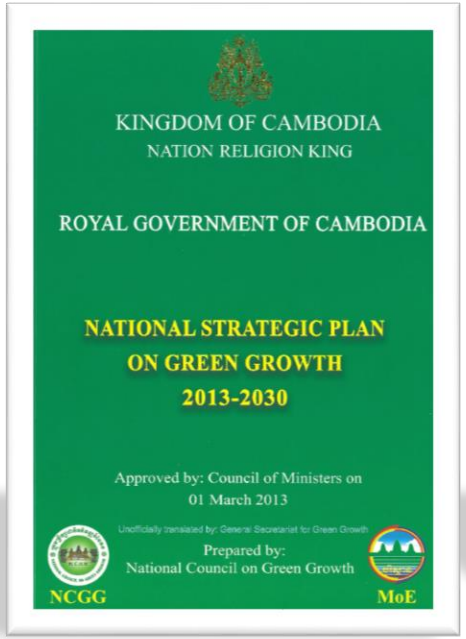
- *National laws*
- *Strategies*
- *Action plans*

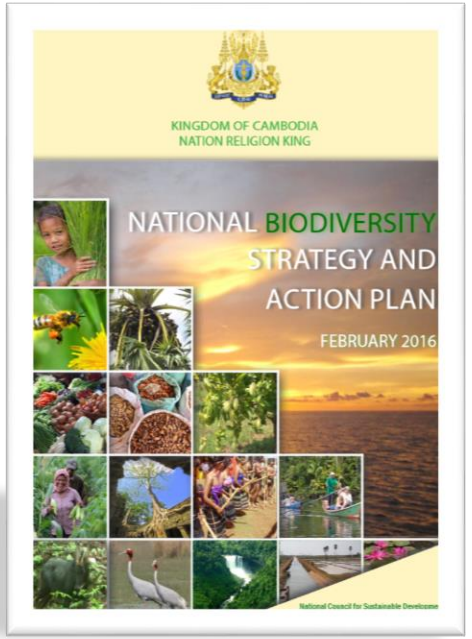
… related to protected areas, biodiversity, climate change, carbon emissions, and rural community development





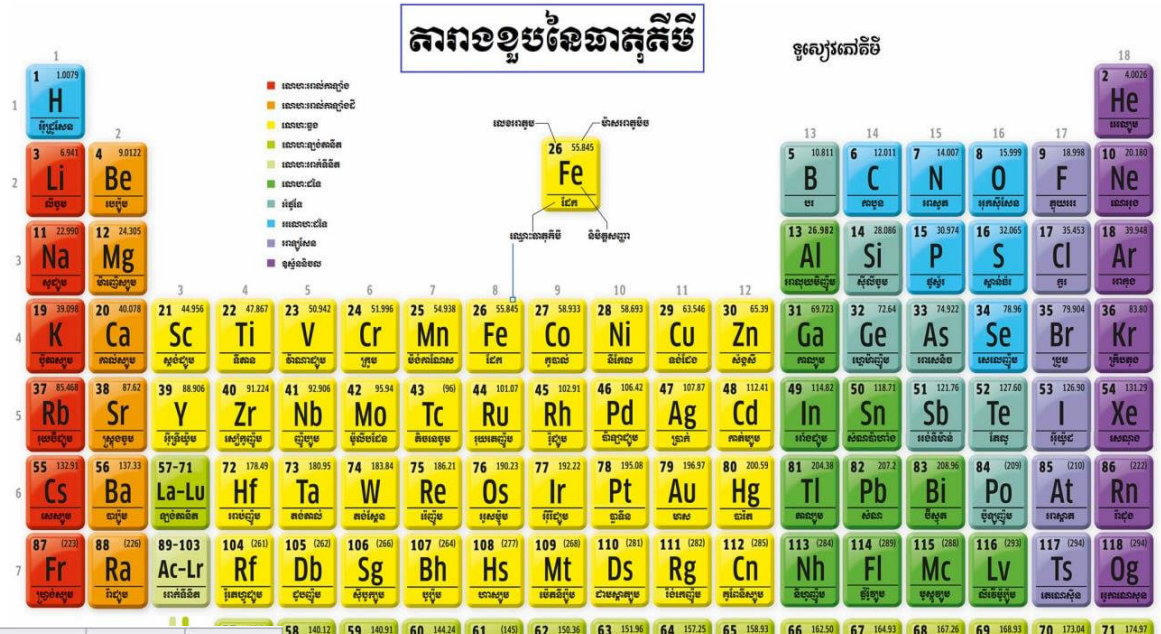


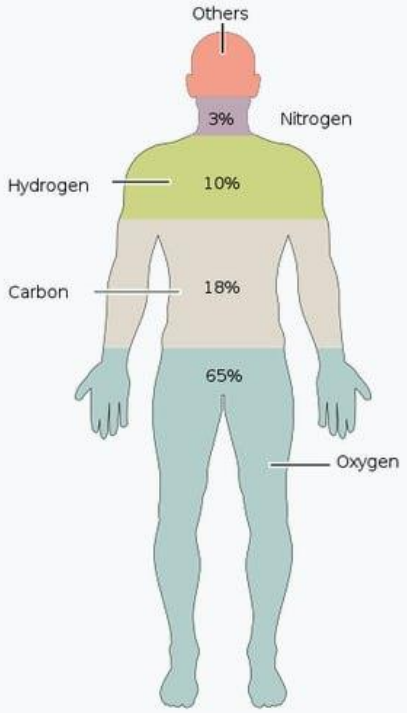




WHAT IS CARBON?

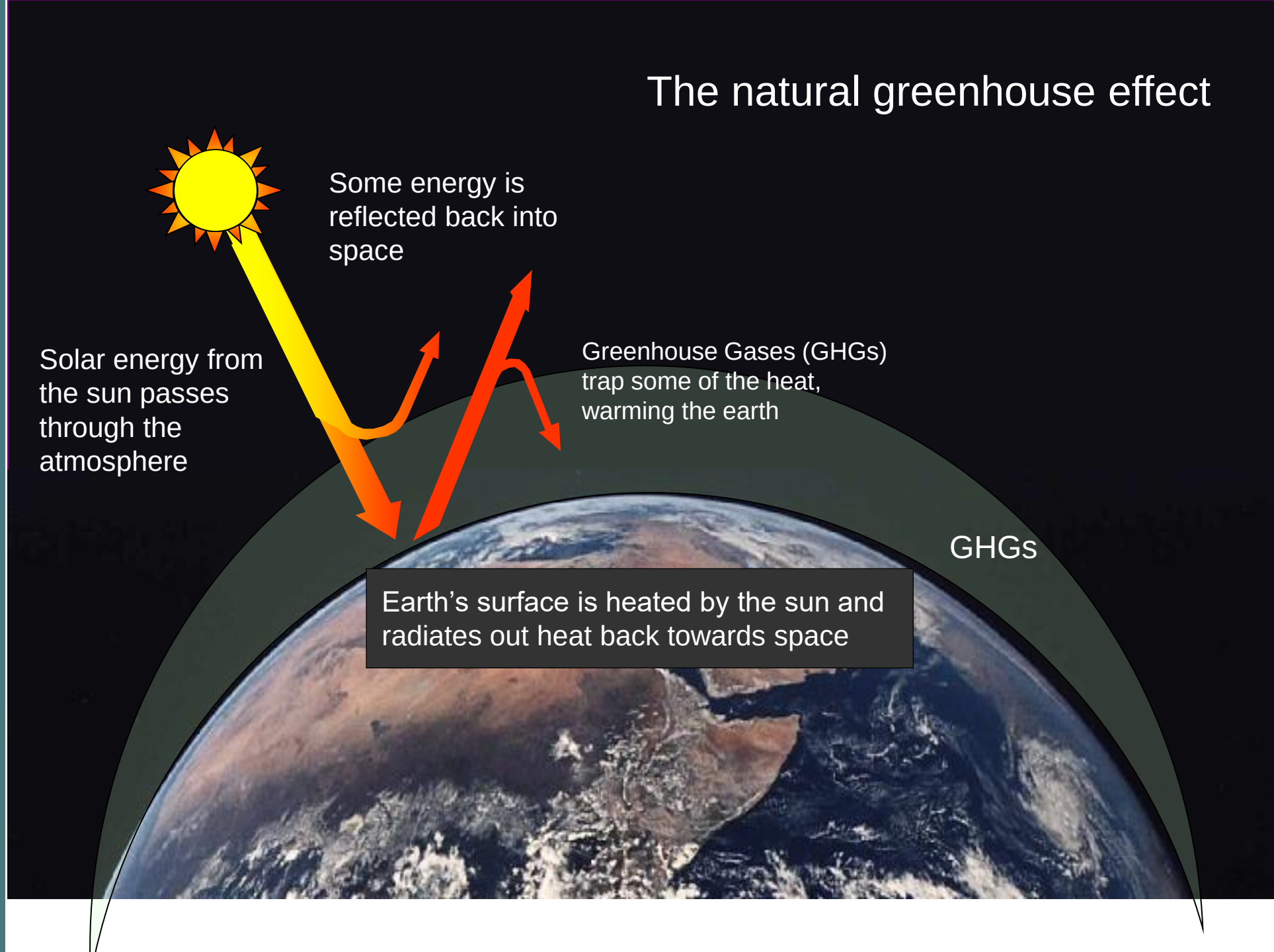
- Chemical element
- Role in life
- It is important



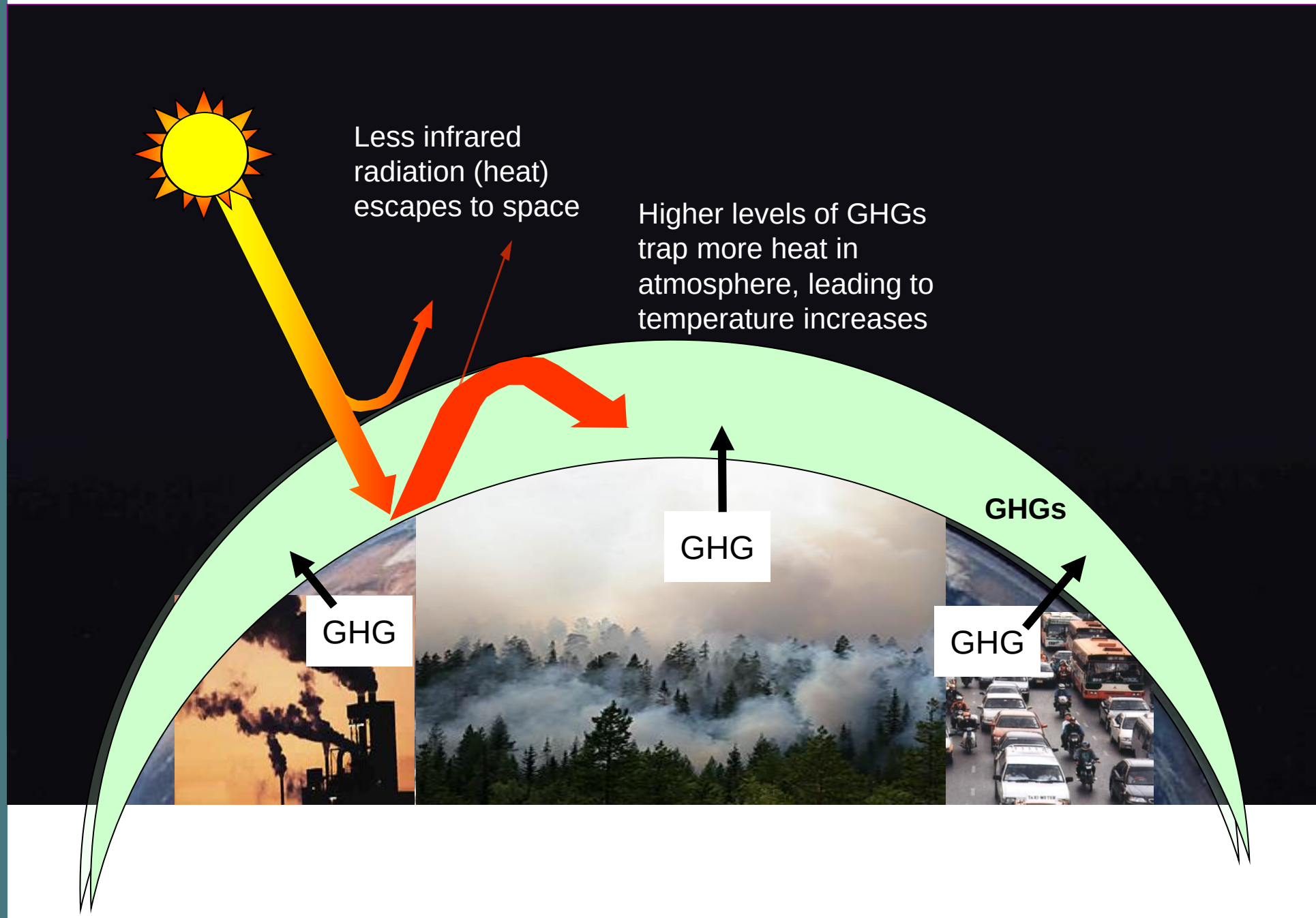


Element	Symbol	percent mass	percent atoms
Oxygen	O	65.0	24.0
Carbon	C	18.5	12.0
Hydrogen	H	10	62.0
Nitrogen	N	3.2	1.1
Calcium	Ca	1.5	0.22
Phosphorus	P	1.0	0.22
Potassium	K	0.4	0.03
Sulfur	S	0.3	0.038
Sodium	Na	0.2	0.037
Chlorine	Cl	0.2	0.024
Magnesium	Mg	0.1	0.015
All others		< 0.1	< 0.3

What is Causing Climate Chang?



The enhanced greenhouse effect

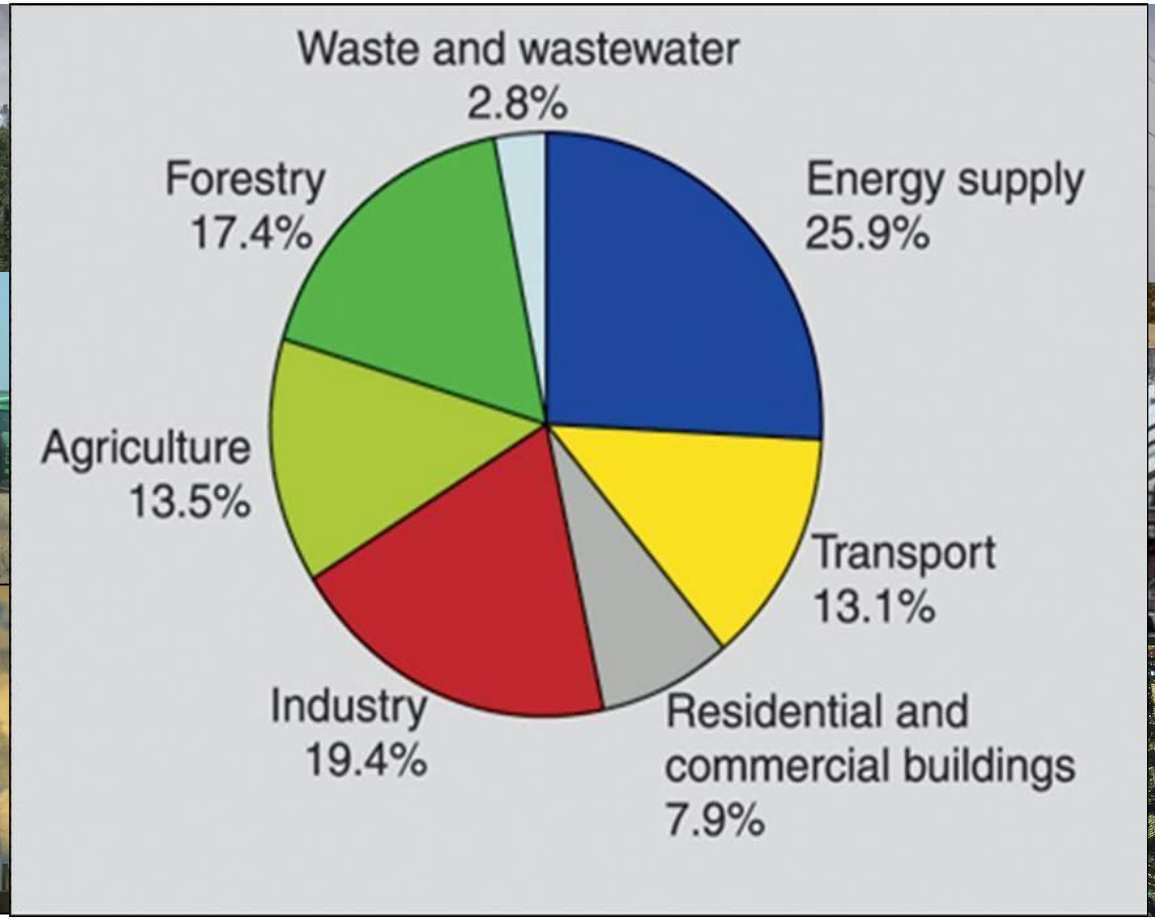


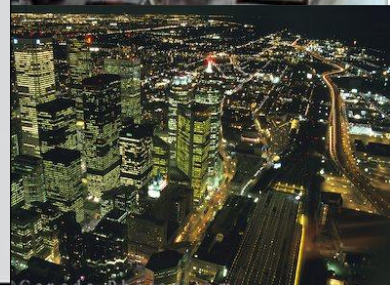
What human activities generate GHGs?

- *Carbon emissions from tropical deforestation and forest degradation ~20% of total emissions*

Greenhouse Gas	Industrial Sources	Land Use Sources
Carbon dioxide (CO_2)	fossil fuel combustion and cement manufacturing	Deforestation and burning of forests
Methane (CH_4)	Landfills, coal mining, natural gas production	Conversion of wetlands Rice paddies Livestock production
Nitrous oxide (N_2O)	Fossil fuel combustion Nitric acid production	Fertilizer use Burning of biomass
Hydrofluorocarbons (HFCs)	Industrial processes Manufacturing	---
Perfluorocarbons (PFCs)	Industrial processes Manufacturing	---
Sulphur hexafluoride (SF_6)	Electrical transmission and distribution systems	----

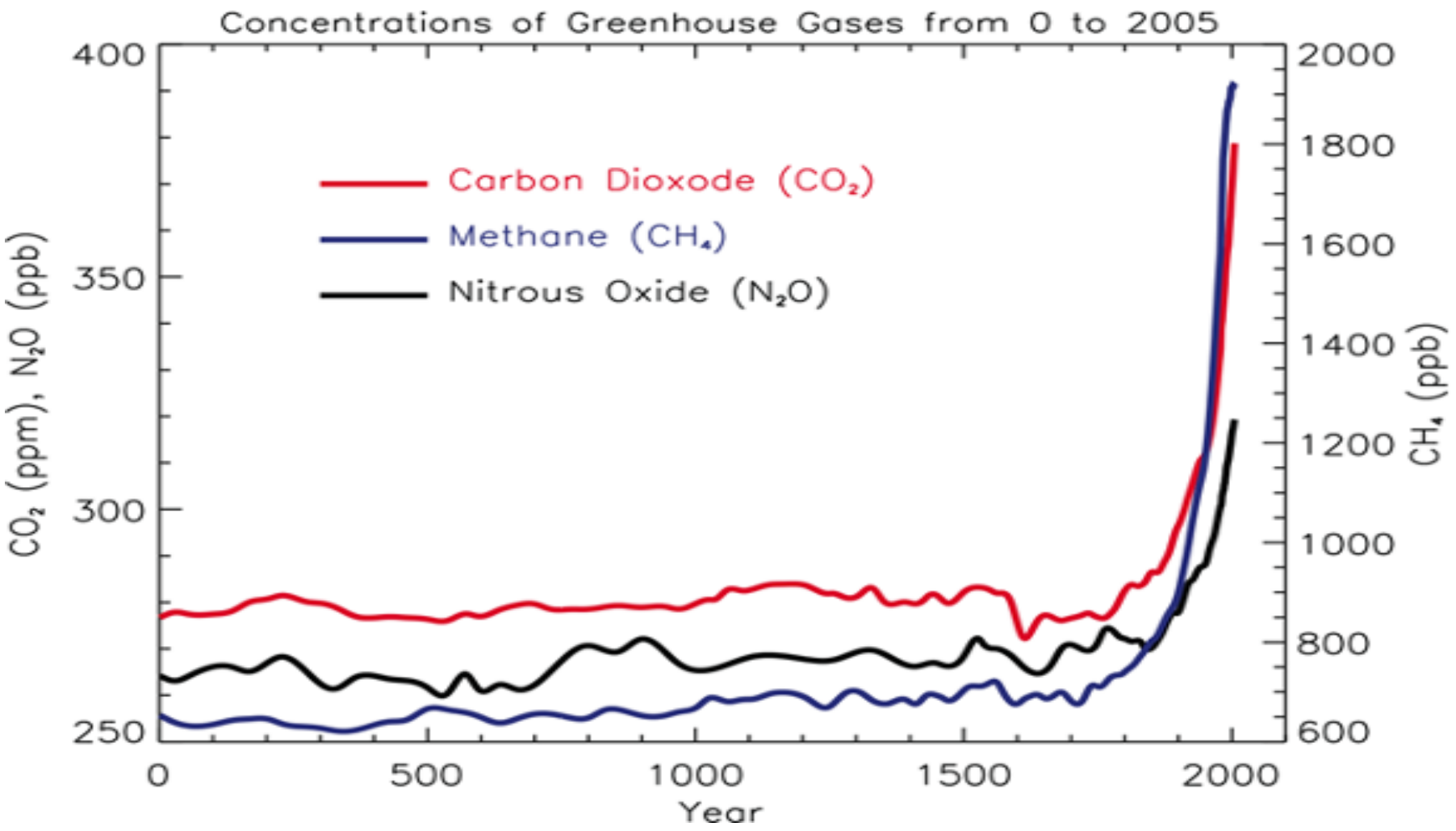
Which sectors produce greenhouse gases?





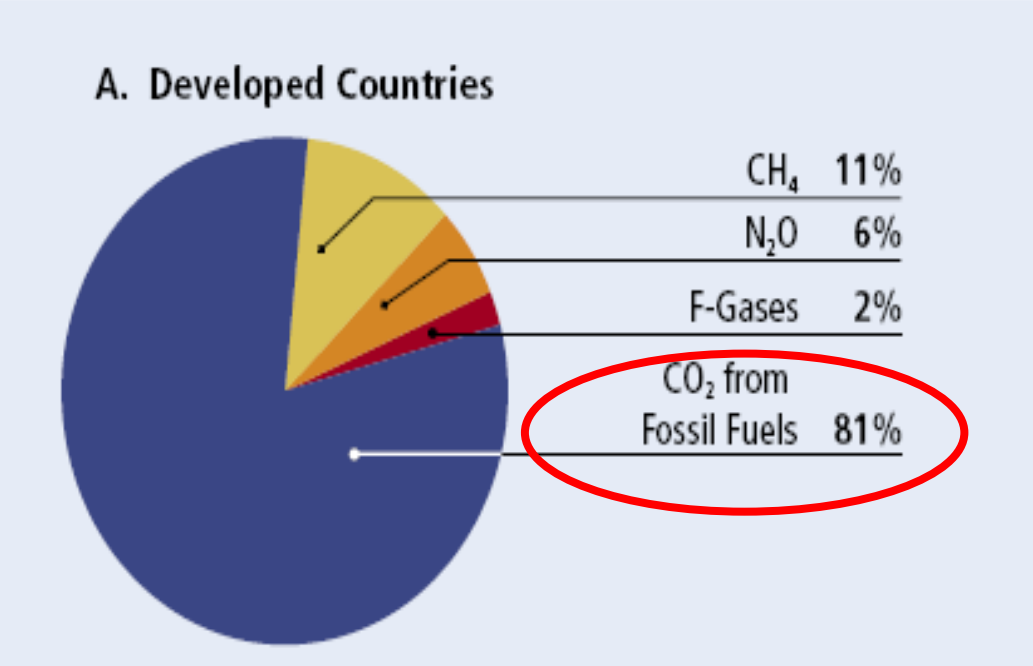
How rapidly are GHG concentrations rising?

- In the last 50 yrs, CO_2 levels have grown more rapidly than ever before
- CO_2 levels are increasing 1.5- 2 ppm/yr

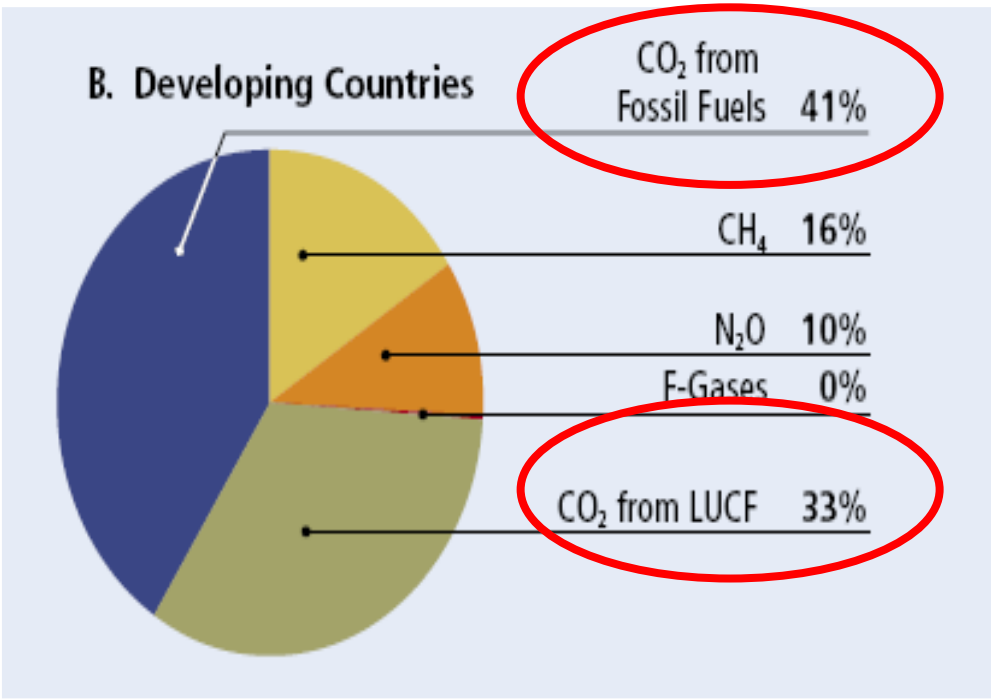


How can we reduce CO2 Emissions?

- Reduce fossil usage, industrial emissions, reduce car use, more efficient electricity, renewable energy, reduce deforestation



Greatest source of GHG = fossil fuels

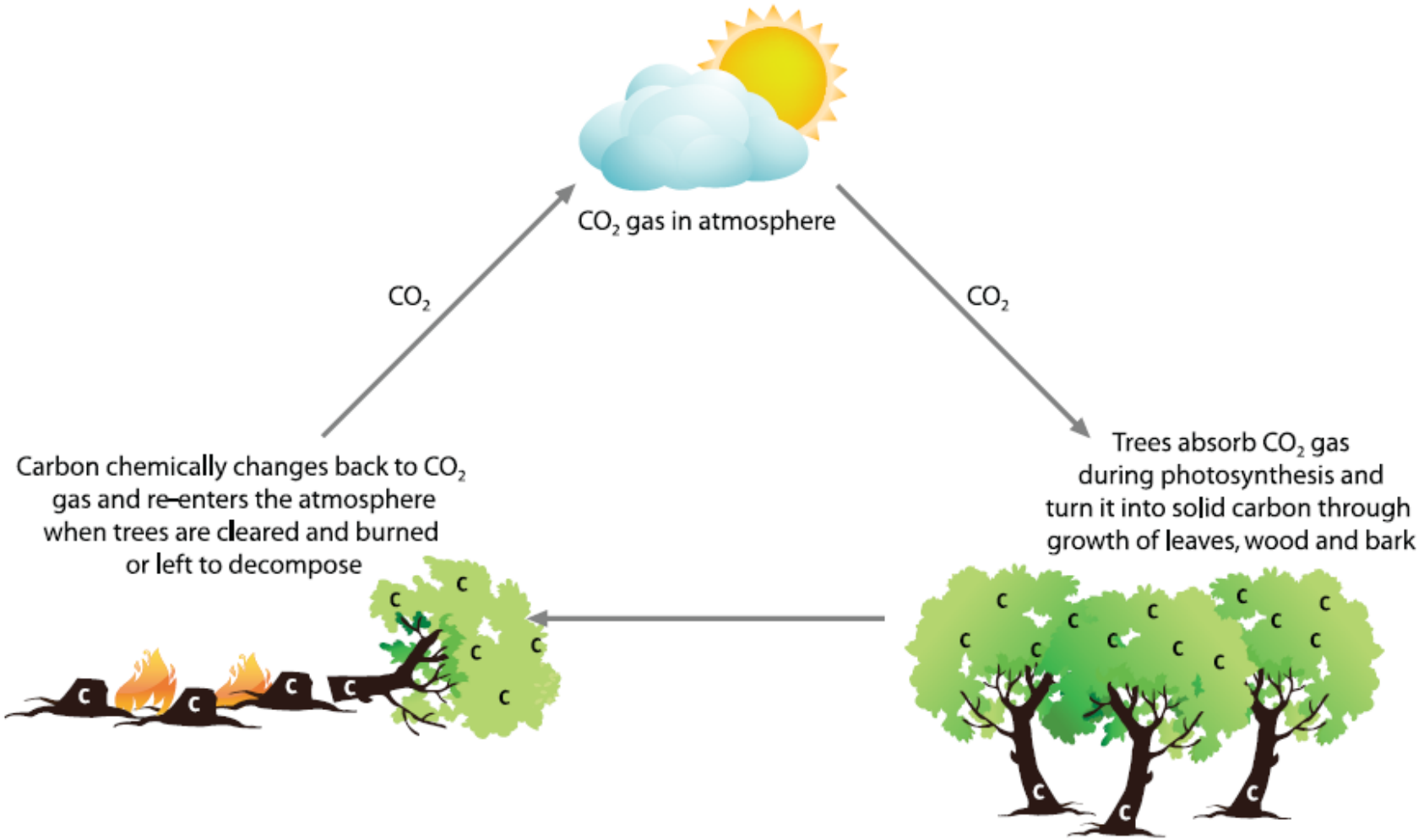


Land use change (deforestation) is a major source (second only to fossil fuels)

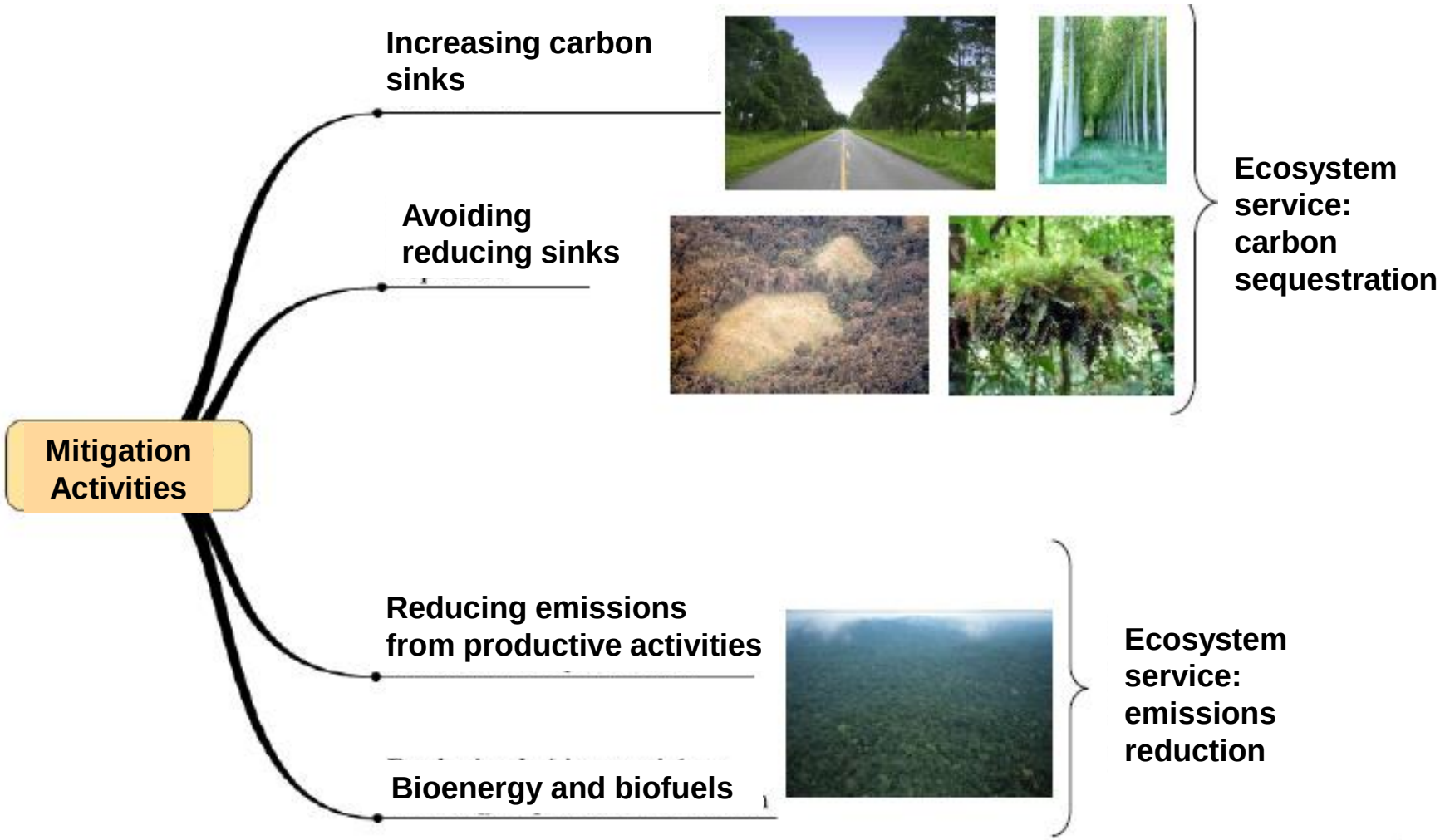
Source: World Resource Institute (Navigating the numbers)

How can we reduce CO2 Emissions?

- Forest stores and emit carbon
- Forests absorb 2.6 gigatons C (9.5 gT CO2) per year
- Emissions from tropical deforestation 1.5 gigatons C per year
- Forest regeneration and restoration can also seq uester carbon, up to ~33% of total emissions



Options for mitigating climate change



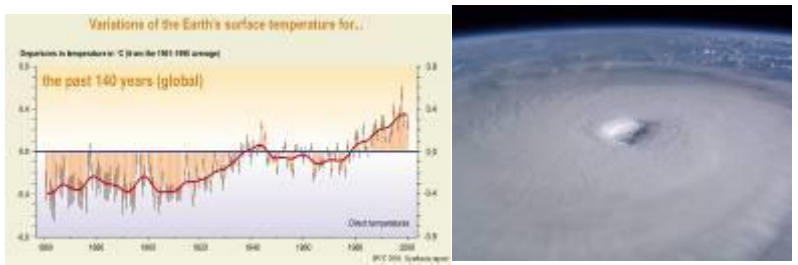
Forests and Climate Change: Mitigation & Adaptation

Remove carbon from the atmosphere, reduce green house gas emissions from deforestation

MITIGATION

Natural forest, forest plantation, agroforestry systems, agricultural systems, etc.

Climate change



ADAPTATION

Reduce climate change impacts and vulnerability

We Stand for Wildlife™