

24 November 2009

## Climate change: Copenhagen in graphics



The energy supply is the biggest source of emissions globally

### **Where do greenhouse gas emissions come from?**

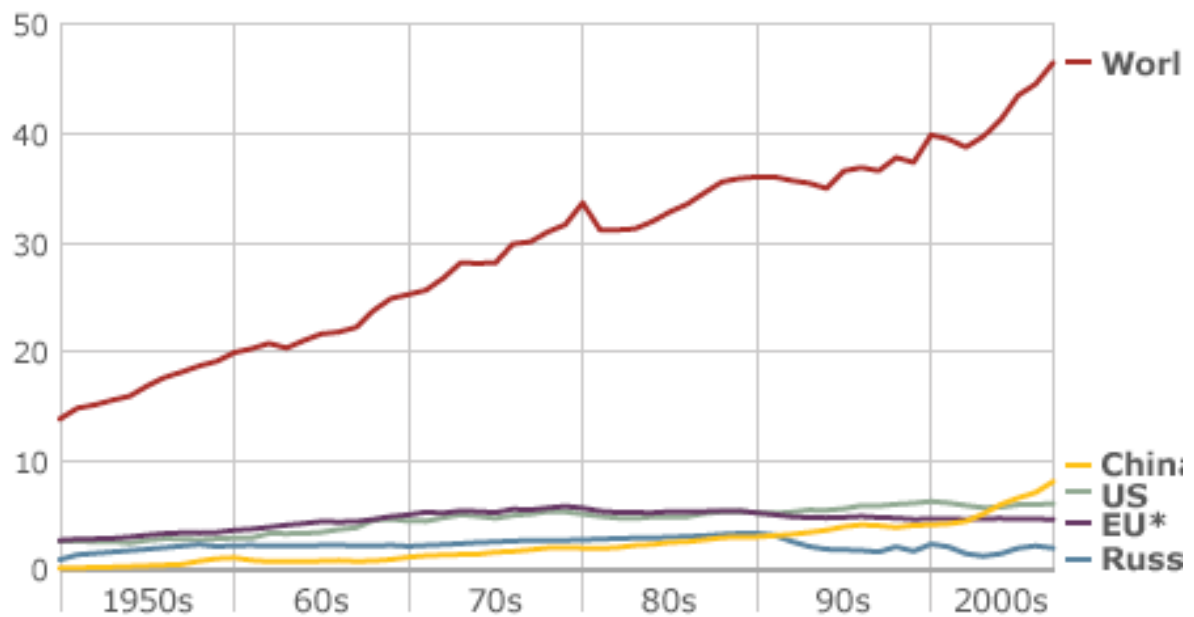
Which countries are most responsible for causing human-induced climate change?

And have governments pledged tough enough cuts so far to keep the global average temperature rise within "safe limits"?

As the UN summit in Copenhagen approaches, we look at the past, present and possible futures of climate change.

## The world's rising emissions

Greenhouse gas emissions, 1950-2007  
Gigatonnes (Gt) of carbon dioxide equivalent



\*includes all 27 member states

Source: PRIM

Growing populations and rising living standards helped drive emissions ever upwards during the second half of the 20th century. In the first years of the new century, China's emissions overtook those of the US.

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Global emissions have risen steadily in recent decades.

### CLIMATE CHANGE GLOSSARY

Select a term from the dropdown:

Glossary  
Adaptation  
Annex I countries  
Annex II countries  
Anthropogenic climate change  
Atmospheric aerosols  
Bali action plan  
Bali roadmap  
Baseline for cuts  
Black carbon  
Boxer-Kerry bill  
Business as usual  
Cap and trade  
Carbon capture and storage (CCS)  
Carbon dioxide (CO<sub>2</sub>)  
Carbon dioxide (CO<sub>2</sub>) equivalent  
Carbon intensity  
Carbon leakage  
Carbon neutral  
Carbon offsetting  
Carbon sequestration  
Certified Emission Reduction (CER)  
Clean Coal Technology  
Clean Development Mechanism (CDM)  
Climate change  
CFCCO<sub>2</sub>  
COP15  
Dangerous climate change  
Deforestation  
Emission Trading Scheme (ETS)  
EU Burden-sharing agreement  
Fossil\_fuels  
Geological sequestration  
Global average temperature  
Global energy budget  
Global dimming  
Global warming  
Greenhouse gases (GHGs)  
Greenhouse effect  
Hockey stick  
IPCC  
Joint implementation  
Kyoto Protocol  
Major Economies Forum on Energy and Climate  
Methane  
Mitigation  
Natural greenhouse effect  
Non-annex I countries  
Per-capita emissions  
Pre-industrial levels of carbon dioxide  
REDD  
Stern review  
Technology transfer  
UNFCCC  
Waxman-Markey energy bill  
Weather

**Carbon dioxide (CO<sub>2</sub>) equivalent** - Six greenhouse gases are limited by the Kyoto Protocol. Each gas

has a different global warming potential.

The overall warming effect of this cocktail of gases is often expressed in terms of carbon dioxide equivalent - the amount of CO<sub>2</sub> that would create the same amount of warming.

CO<sub>2</sub> equivalent is often measured in kilotonnes (Kt) or thousands of tonnes, and gigatonnes (Gt) or billions of tonnes.

[Suggest additions](#)

[Glossary in full](#)

But when trying to assign "responsibility" for causing climate change, how should they be measured?

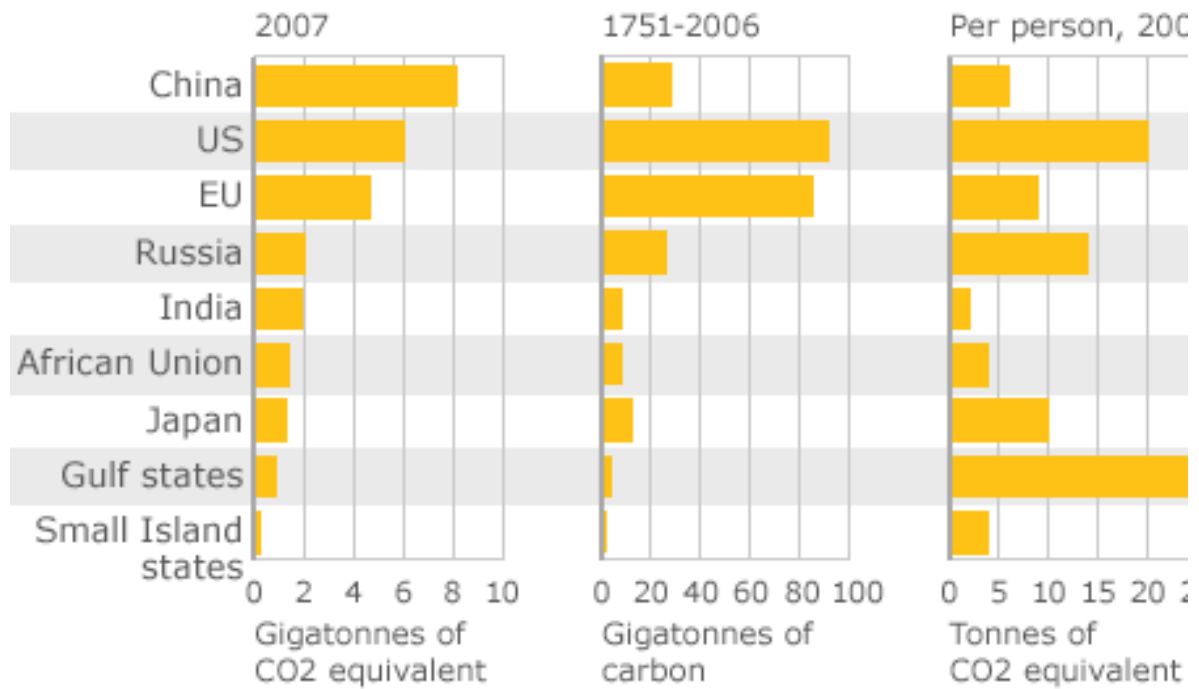
Populous developing countries such as China and India have relatively high overall emissions - comparable with many developed countries.

But each of their citizens produces a much smaller amount than counterparts in regions such as North America or Western Europe.

Countries that industrialised early and grew rich early because of that industrialisation, such as the UK, Germany and the US, have a higher "historical footprint".

In some peoples' eyes, this gives them a higher responsibility for curbing the problem.

## Three different ways to look at carbon emissions



Sources: CDIAC, Potsdam Institute for Climate Impact Research

A number of academic teams have calculated how emissions are likely to rise in the next few decades, and what that is likely to mean in terms of rising temperatures.



**Copenhagen:**  
[Where they stand](#)  
[What's your Copenhagen solution?](#)

Their projections are not exact because there are many sources of uncertainty in the calculations, including the exact relationship between greenhouse gas levels and

temperature rise.

A number of developed countries and blocs have set targets for cutting their emissions, some of which depend on what other countries do.

The EU, for example, will cut emissions by 20% from 1990 levels - but if there is a global deal, that will rise to 30%.

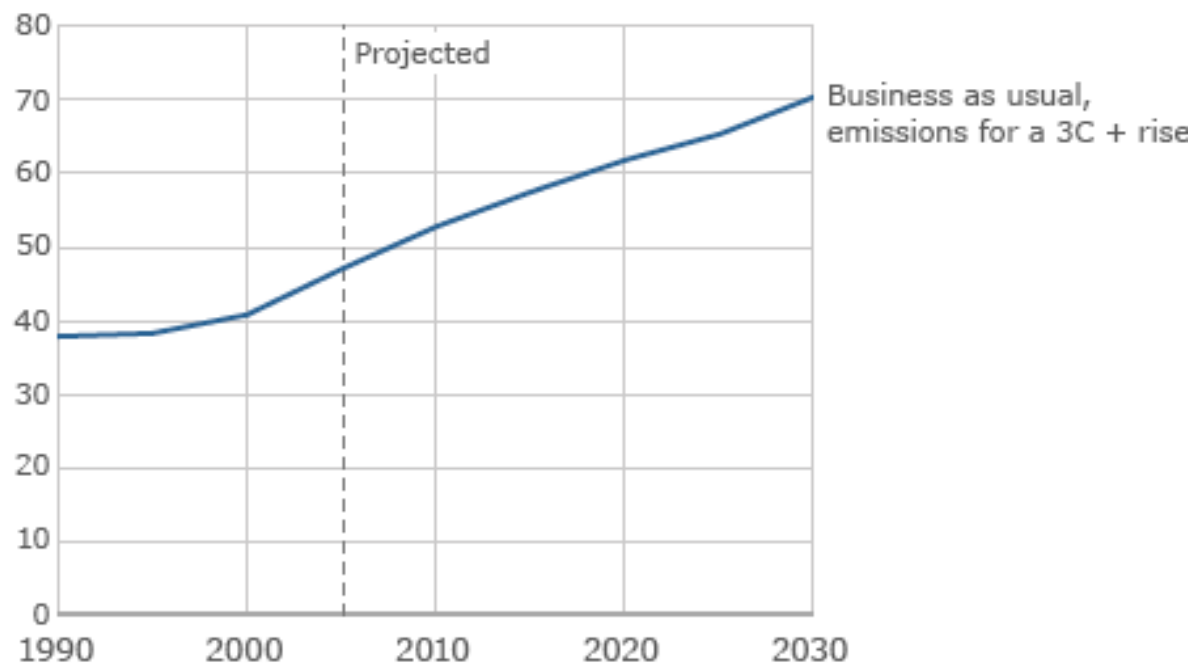
Some developing nations have also pledged to reduce the rate at which their emissions are growing.

If implemented, are these curbs enough to keep the global average temperature rise below 2C - the target adopted by G8, the EU and a number of major developing countries?

## Looking into the future of climate change

Business as usual: Rising emissions, rising temperatures

Gigatonnes of CO2 equivalent



Source: European Climate Foundati

Analysts project that if no further action is taken on emissions, man-made warming will go beyond the relative safety of 2C above pre-industrial levels.

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According to the European Climate Foundation analysis - and others - commitments made so far are probably not enough to meet the G8 target.

This shortfall is one of the issues likely to be highlighted during the Copenhagen conference.