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UNEP

Climate change and its implications for the transport sector

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IPCC

**Climate change
is unequivocal**

Observed changes (1)

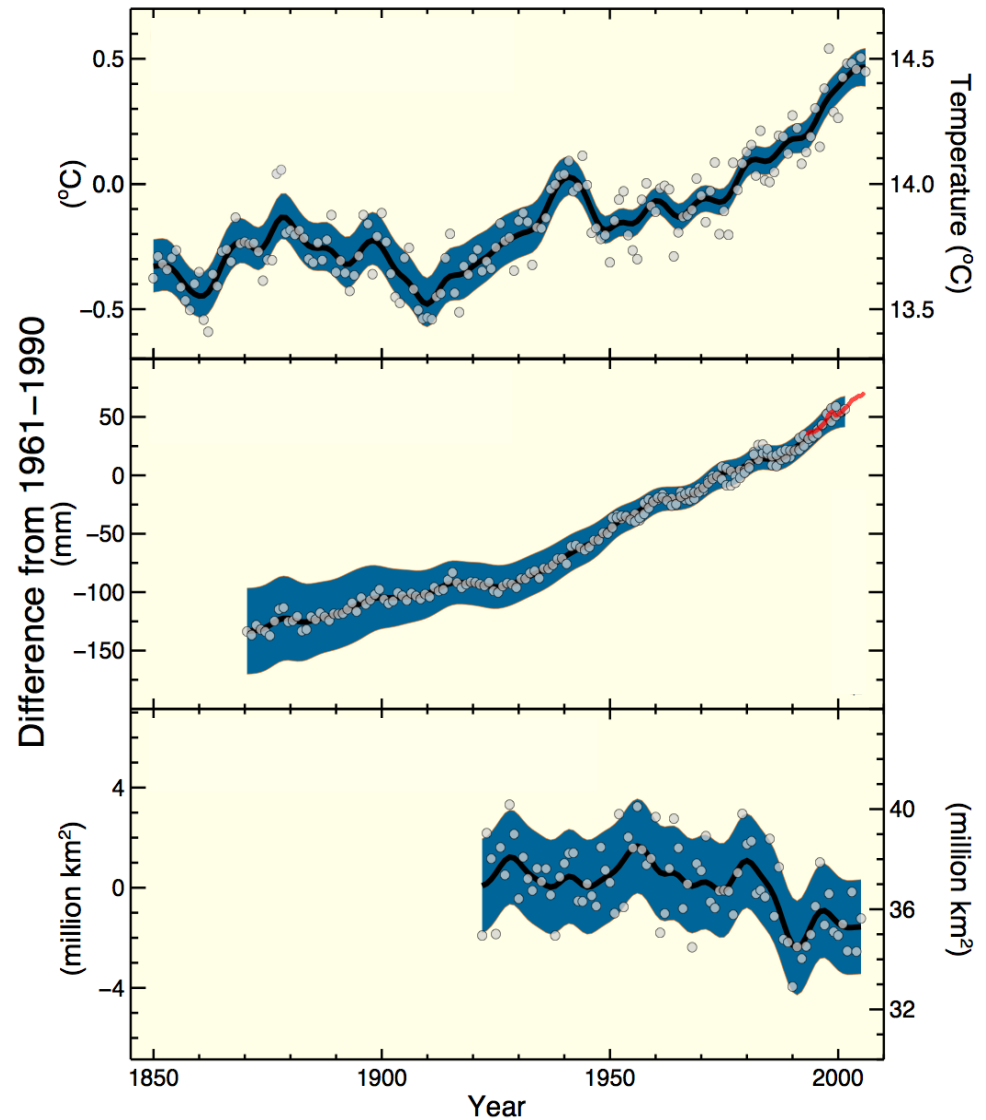
Global average temperature



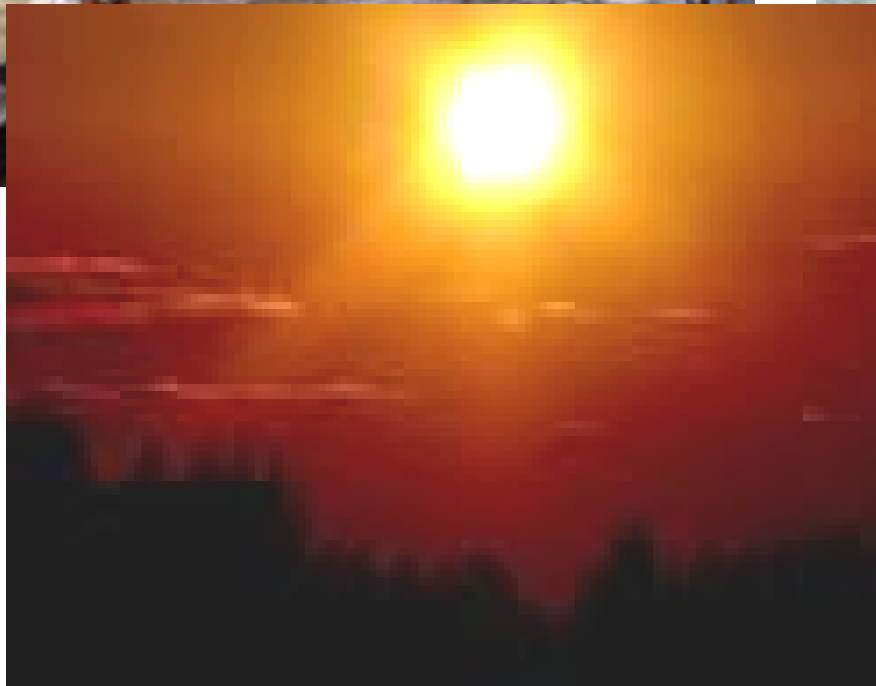
Global average sea level



Northern hemisphere snow cover



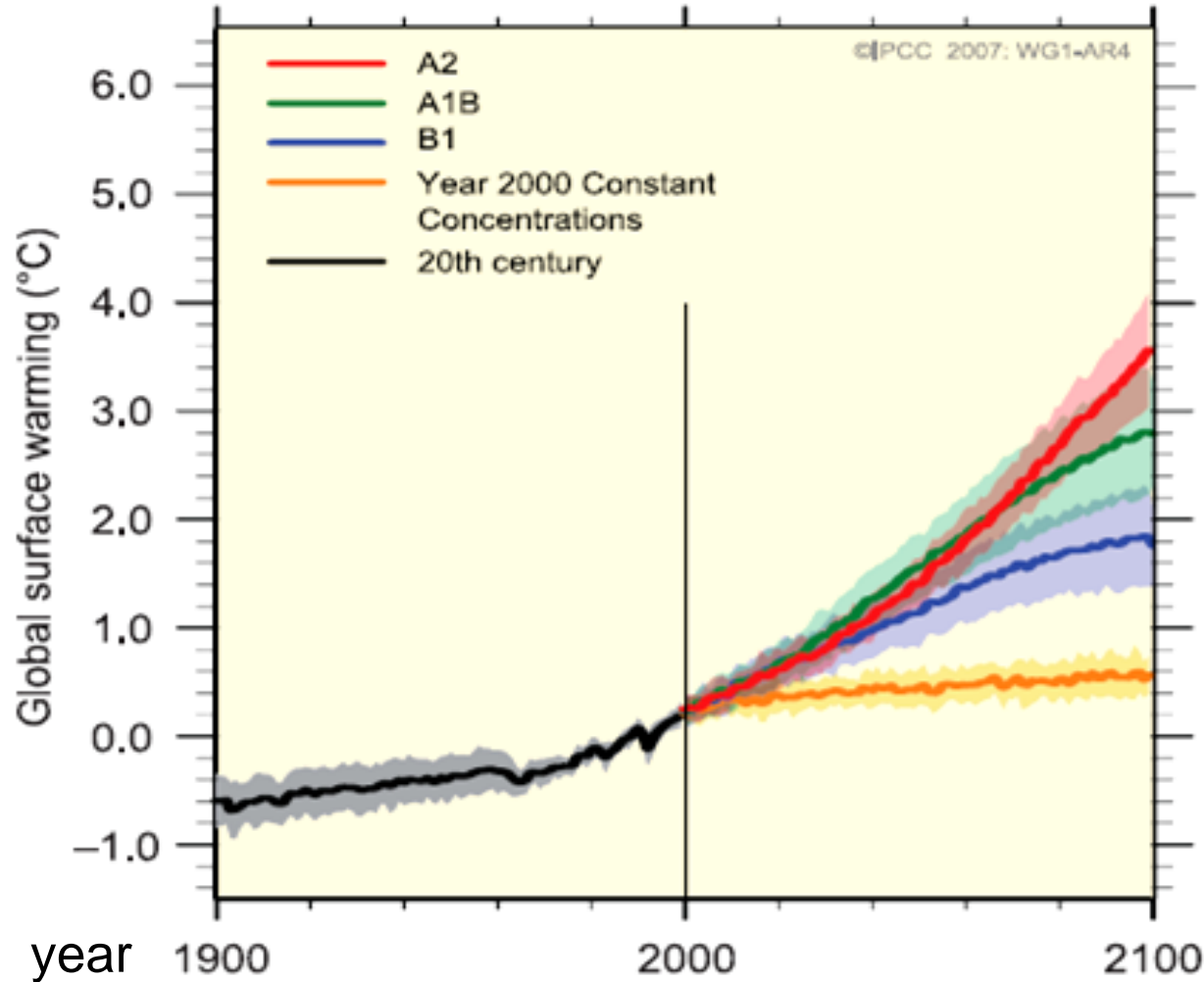
Observed changes (2)



Continued GHG emissions

at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century

Ranges for predicted surface warming



Continued emissions would lead to further warming of 1.8°C to 4°C over the 21st century

Negative impacts on Europe



Inland and coastal flooding



Health risks due to heat-waves



Reduction of water availability and crop productivity in South Europe



Species losses and reduced snow cover in mountains

Impacts on poor regions

People exposed to increased water stress by 2020:



- 120 million to 1.2 billion in Asia
- 12 to 81 million in Latin America
- 75 to 250 million in Africa

Possible yield reduction in agriculture:



- 30% by 2050 in Central and South Asia
- 30% by 2080 in Latin America
- 50% by 2020 in some African countries

Crop revenues could fall by 90% by 2100 in Africa

Adaptation and mitigation

Adaptation is necessary to address impacts resulting from the warming which is already unavoidable due to past emissions

But **adaptation alone cannot cope** with all the projected impacts of climate change

➡ **Need for a mix of strategies including adaptation and mitigation of GHG emissions**

Stabilisation scenarios

Global mean temp. increase (°C)	Stabilization level (ppm CO ₂ -eq)	Year CO ₂ needs to peak
2.0 – 2.4	445 – 490	2000 – 2015
2.4 – 2.8	490 – 535	2000 – 2020
2.8 – 3.2	535 – 590	2010 – 2030
3.2 – 4.0	590 – 710	2020 – 2060

Costs of mitigation in 2030

Stabilisation levels (ppm CO₂-eq)	Range of GDP reduction (%)	Reduction of average annual GDP growth rates (percentage pts)
445 - 535	< 3	< 0.12
535 - 590	0.2 – 2.5	< 0.1
590 - 710	-0.6 – 1.2	< 0.06

**Mitigation measures would induce 0.6% gain
to 3% decrease of GDP in 2030**

Implications for the transport sector

Current status



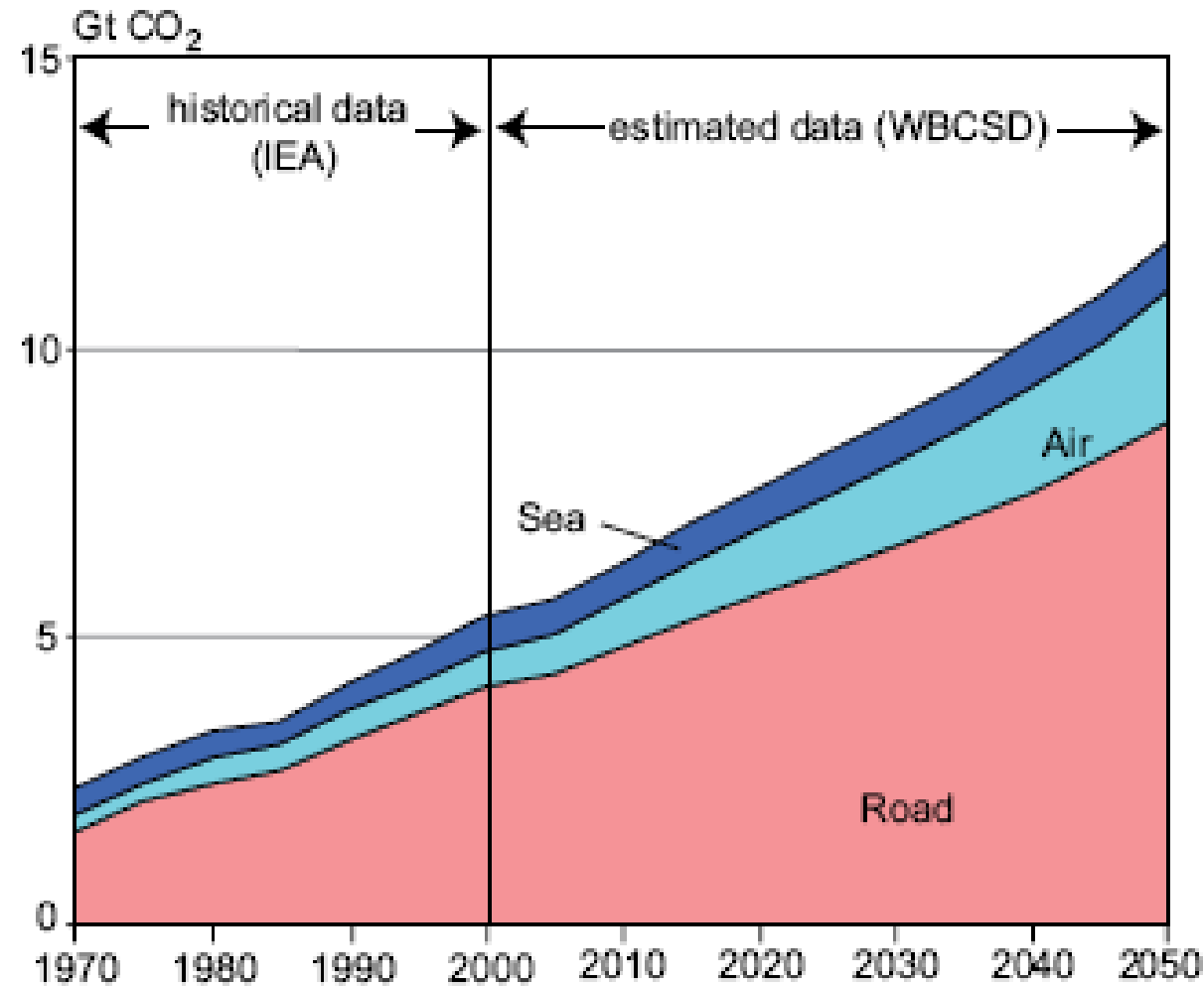
Transport sector is responsible for **23%** of world energy-related GHG emissions, **74%** coming from road

Between 1950 and 1997, auto fleet increased from about 50 million vehicles to **580 million** vehicles, five times faster than the growth in population

Freight transport, which consumes **35%** of all transport energy, has been growing more rapidly than passenger transport and is expected to continue to do so

Petroleum supplies **95%** of the total energy used by transport

CO₂ emission from transport



Transport energy use and carbon emissions are projected to be about **80%** higher than current levels by 2030

Mitigation technologies

Technologies currently available

- More fuel efficient hybrid vehicles
- Cleaner diesel vehicles
- Biofuels

Technologies projected to be commercialised before 2030

- Advanced electric and hybrid vehicles
- Second generation biofuels
- Higher efficiency aircraft



Beyond technology innovation

The needed reduction of GHG emissions in the transport sector requires the adoption of adequate **instruments, policies and practices**:

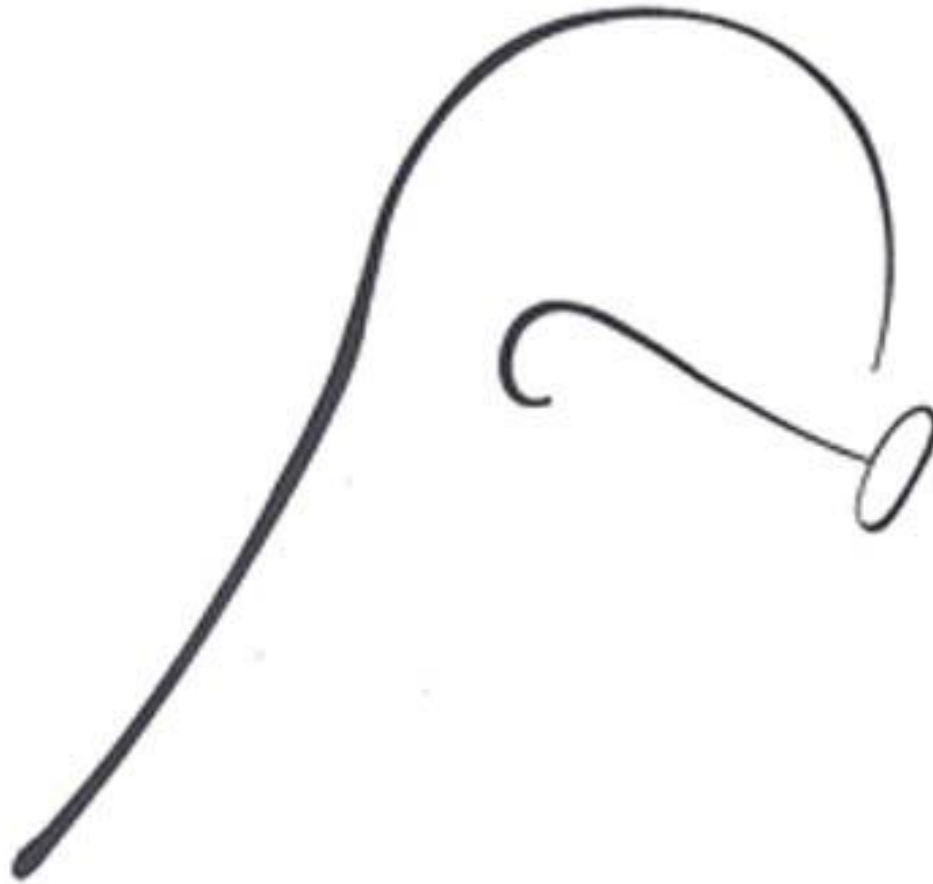
- Effective carbon-price signal
- Regulations, standards, taxes, charges
- Change in land use
- Change in lifestyles and consumption patterns
- Development of public transports





Credit: Press office, City of Münster, Germany

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