



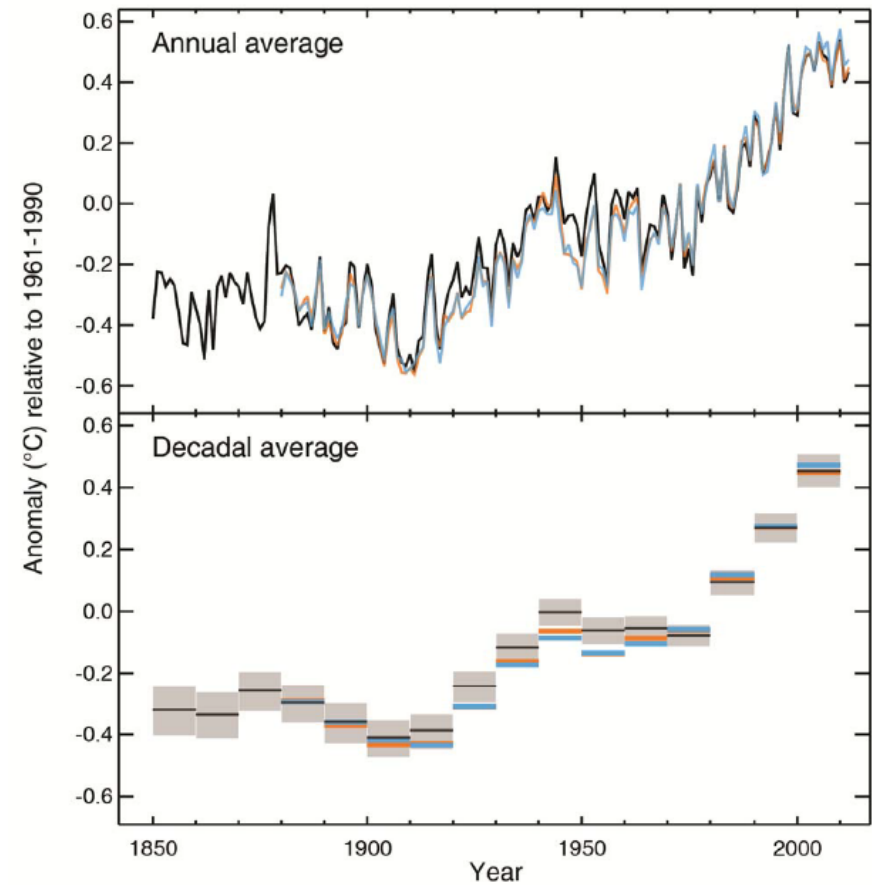
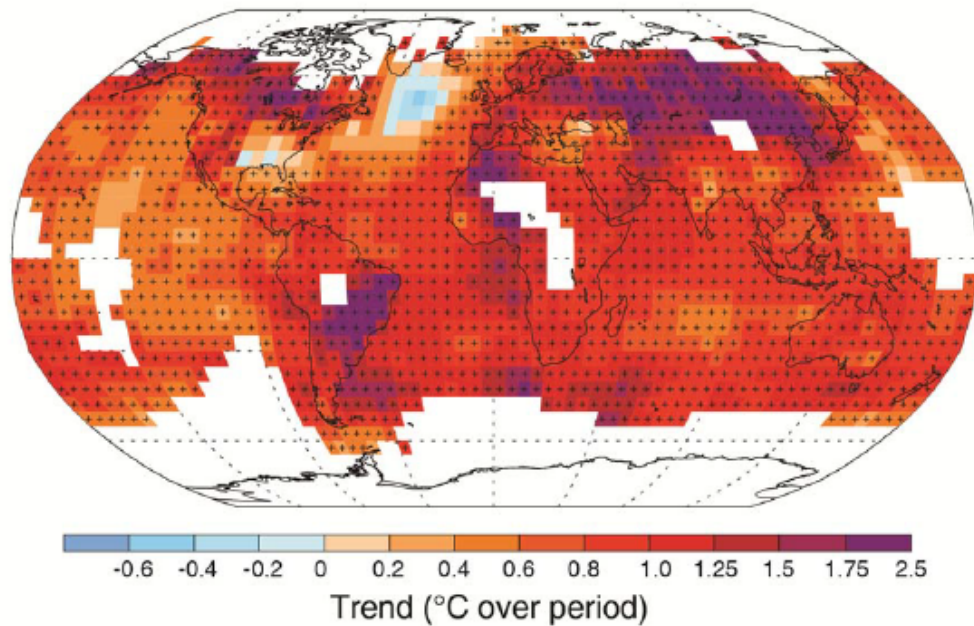
The findings of the Inter-Governmental Panel on Climate Change (IPCC)

- implications for science and technology in support of
.. climate change and energy policy

Sir Mark Walport, Chief Scientific Adviser to HM Government

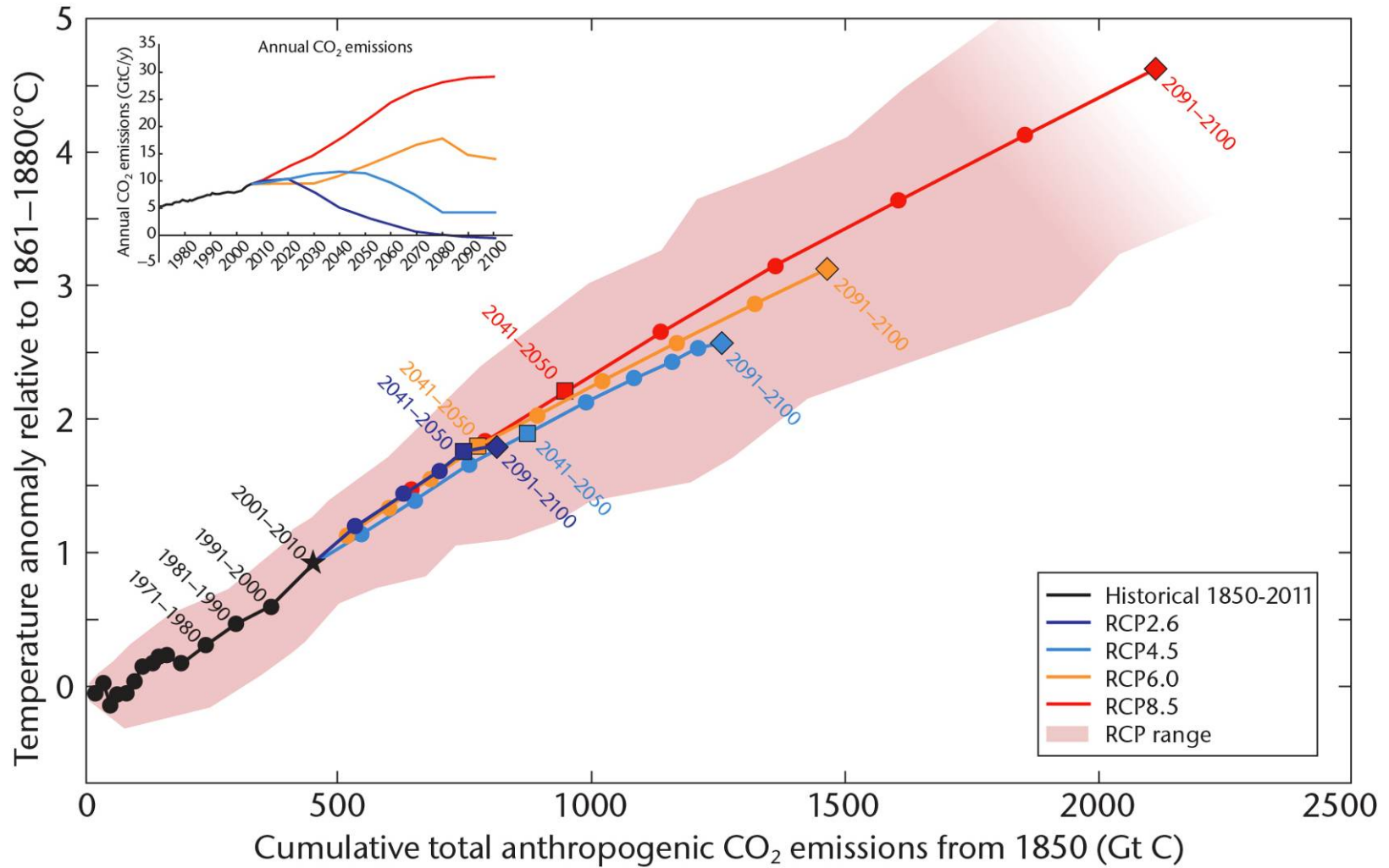


Warming of the climate system is unequivocal





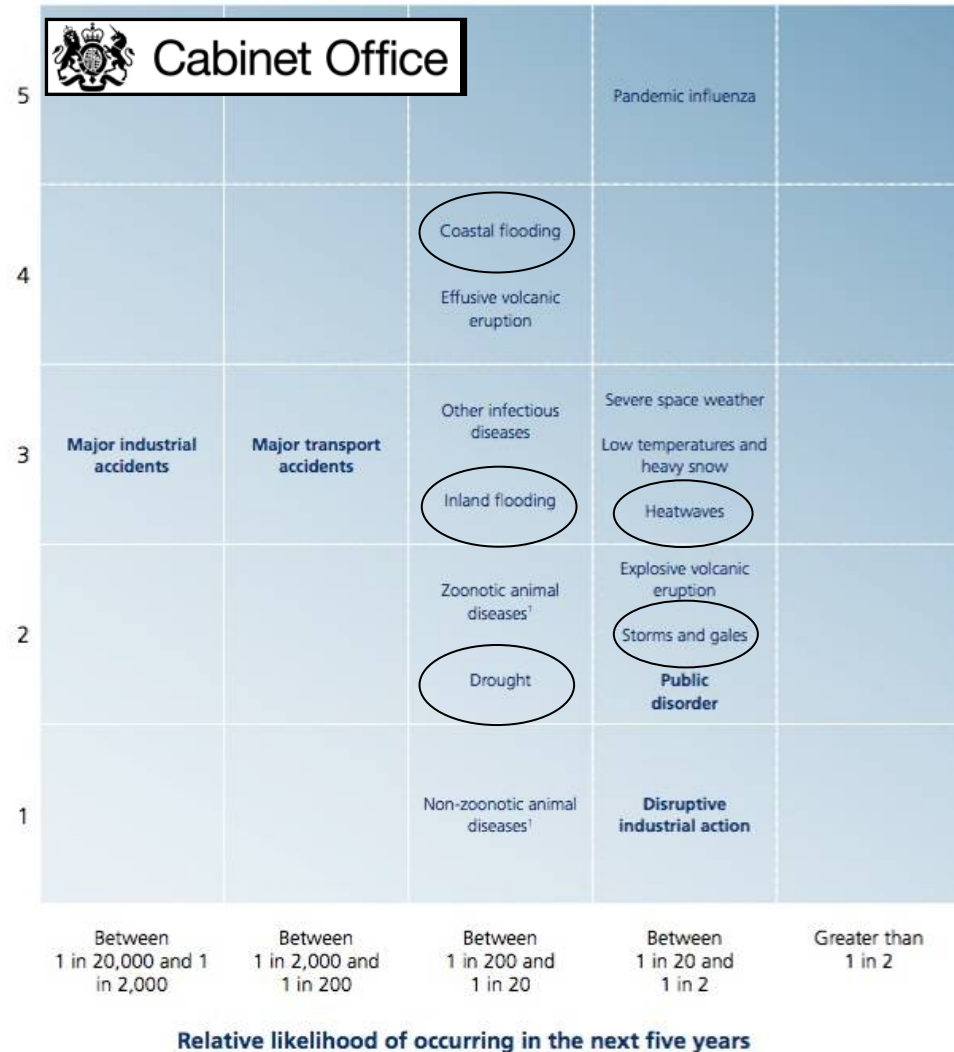
Future temperature rise depends on cumulative emissions




















Climate change is already affecting the UK. Further direct impacts are expected. A number of risks on the NRA can be expected to increase in likelihood and impact in the coming years and decades

- The UK Climate Change Risk Assessment identified increased risk of flooding, drought and heatwaves.
- The UK floods in autumn 2000 cost the UK insurance industry £1.3 billion. Research shows that human greenhouse gas emissions may have roughly doubled the chance of this event occurring.
- The 2003 European summer heat waves caused up to 35,000 excess deaths. Research has shown it is very likely that the risk of these events occurring has at least doubled over the last 100 years due to greenhouse gas emissions, and that they are very likely to become commonplace in as little as 40 years from now.





Three electricity sources are key to meeting the UK's legislated emissions reduction targets: renewables, nuclear power, and clean fossil fuels

	Cost optimised	Higher renewables; more efficient	Higher nuclear; less efficient	Higher CCS; more bioenergy
	Energy saving per capita 50% reduction	Electricity Demand 470 TWh	Energy saving per capita 54% reduction	Electricity Demand 530 TWh
	Energy saving per capita 31% reduction	Electricity Demand 610 TWh	Energy saving per capita 43% reduction	Electricity Demand 490 TWh
Electricity	33 GW nuclear 18 GW wind 28 GW CCS 27 GW other renew 33 GW gas	 16 GW nuclear 82 GW wind 13 GW CCS 14 GW solar 10 GW marine 24 GW back-up gas	 75 GW nuclear 20 GW wind 2 GW CCS 2 GW hydro 11 GW back-up gas	 20 GW nuclear 34 GW wind 40 GW CCS 2 GW hydro No back-up gas
Buildings	Heating mix of heat pumps, resistive heat, biomass pellets, district heat	 7.7m SWIs, 8.8m CWIs, 100% house-level heating systems	 5.6m SWIs, 6.9m CWIs, 90% house-level heating systems, 10% network-level	 5.6m SWIs, 6.9m CWIs, 50% house-level heating systems, 50% network-level
Transport	75% ULEVs, unclear on modal shift	 100% ULEVs, high modal shift	 80% ULEVs, 20% ICEs, low modal shift	 65% ULEVs, 35% ICEs, medium modal shift
Industry	Medium growth, over half of emissions captured by CCS	 Medium growth, 48% of emissions captured by CCS	 Medium growth, 0% of emissions captured by CCS	 Medium growth, 48% of emissions captured by CCS
Bio energy / land use	~350 TWh of bioenergy, low ambition on land mgmt	 181 TWh of bioenergy, low ambition on land mgmt	 461 TWh of bioenergy, high ambition on land mgmt	 471 TWh of bioenergy, medium ambition on land mgmt

CCS = Carbon Capture and Storage; ULEV = Ultra Low Emission Vehicles; ICE = Internal Combustion Engine; SWI = Solid Wall Insulation; CWI = Cavity Wall Insulation



The UK has recognised strengths in science and technology to address climate change

The UK has outstanding technological expertise. For example:

- Next-generation nuclear
- Next-generation solar
- Innovation in wind turbines, transport and wave and tidal technologies
- Carbon capture and storage

Climate services are embryonic but are a growth market. The UK is at the forefront of this building on our world leading climate science and forecasting capability

