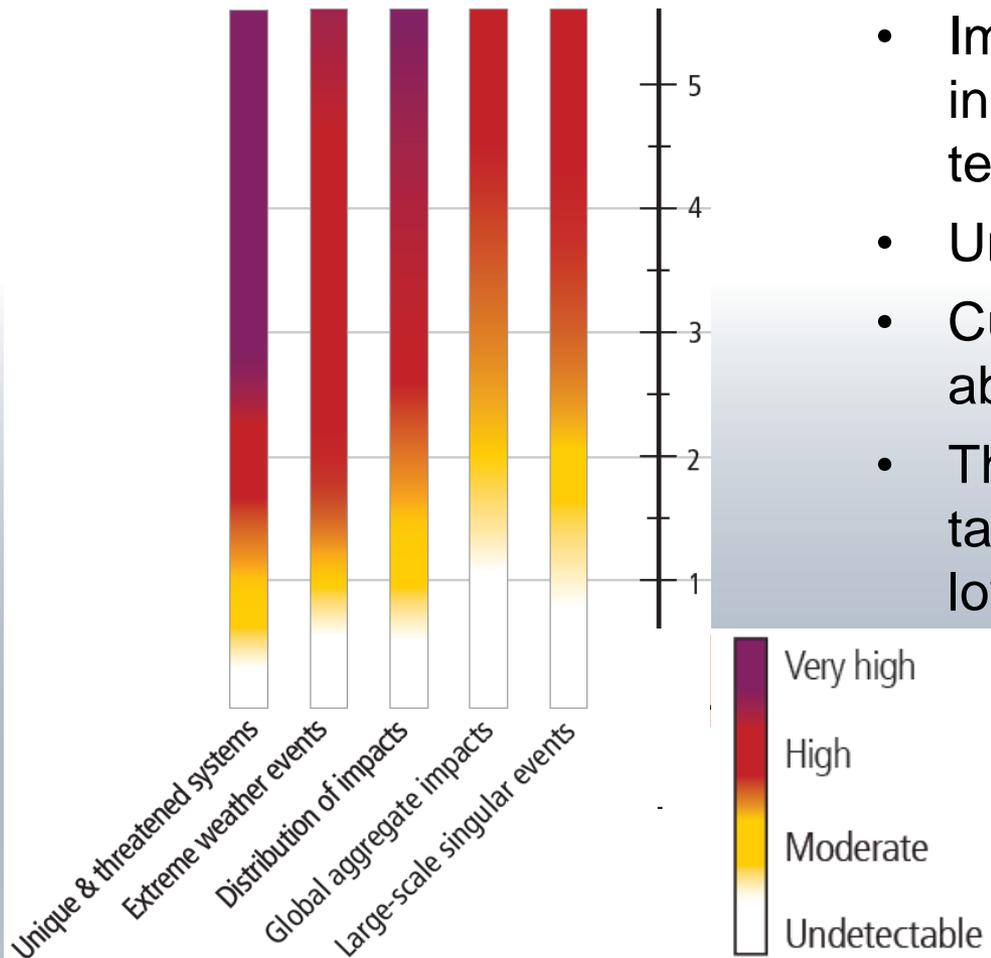




The Climate Challenge

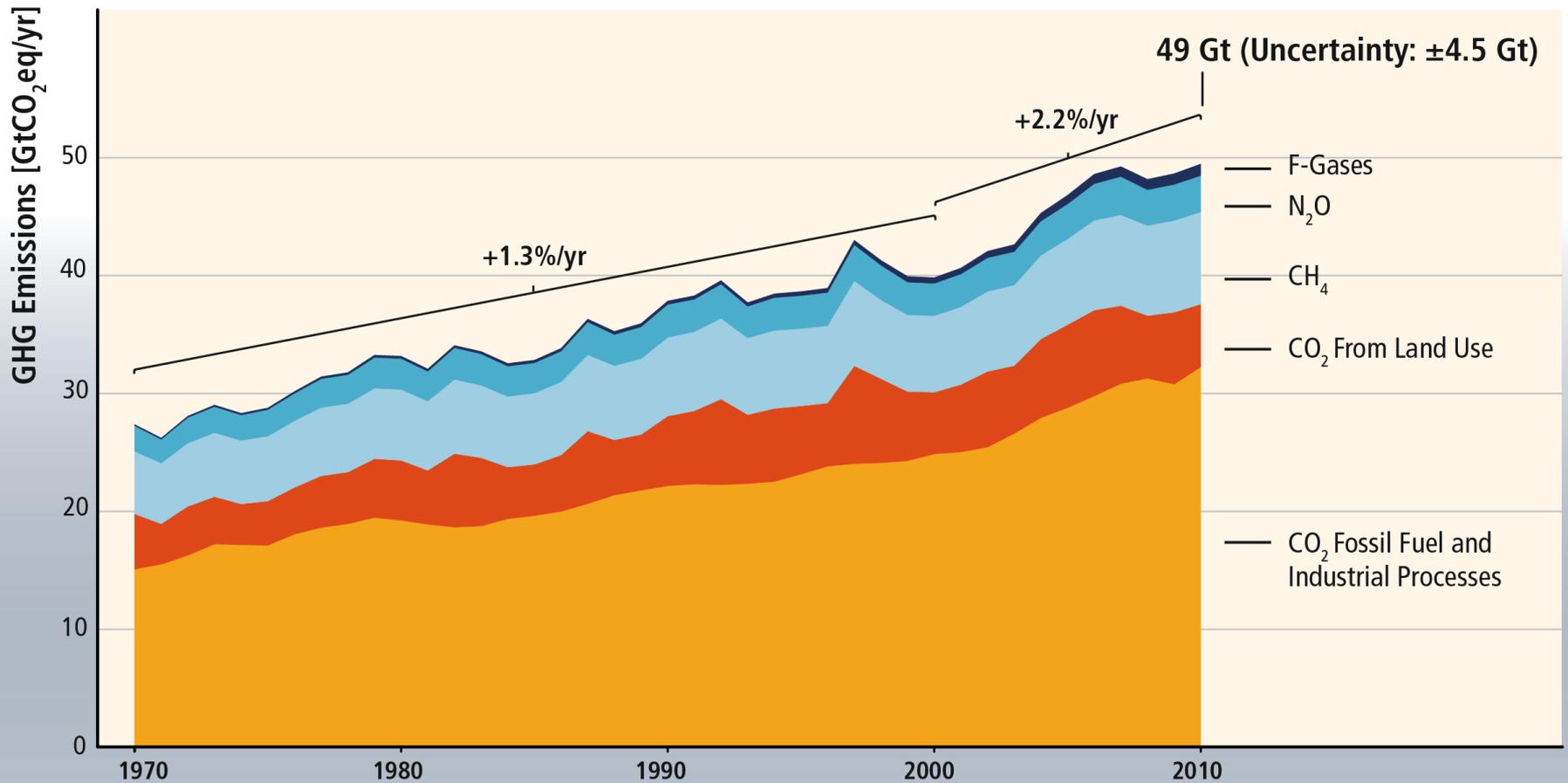


Key impacts of climate change



- Impacts of climate change increase as global average temperature rises
- Uncertainties remain significant
- Current temperature is 1C above pre-industrial levels
- There is no obviously ‘correct’ target for temperature rise – lower is better.

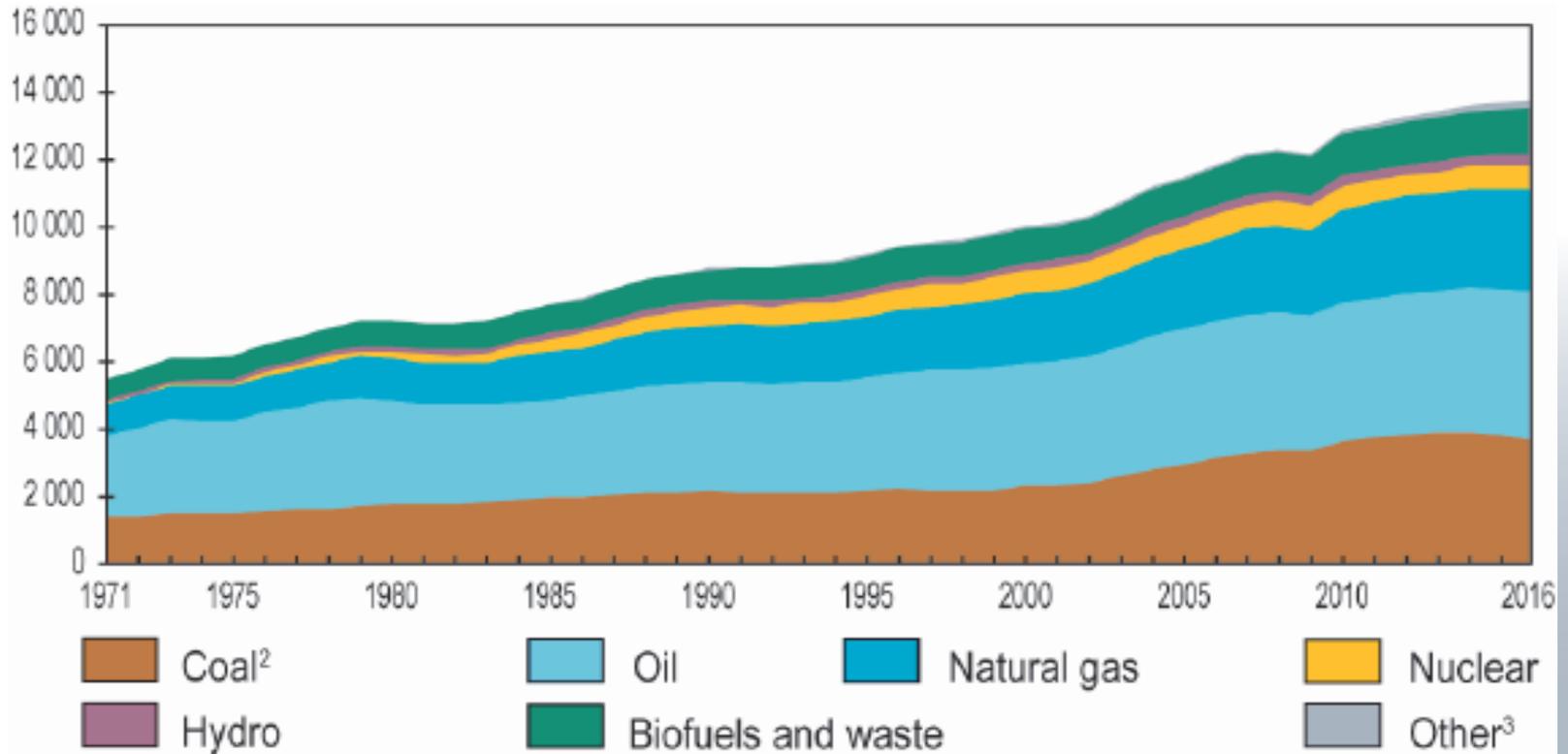
GHG emissions have risen over many decades



Based on Figure 1.3

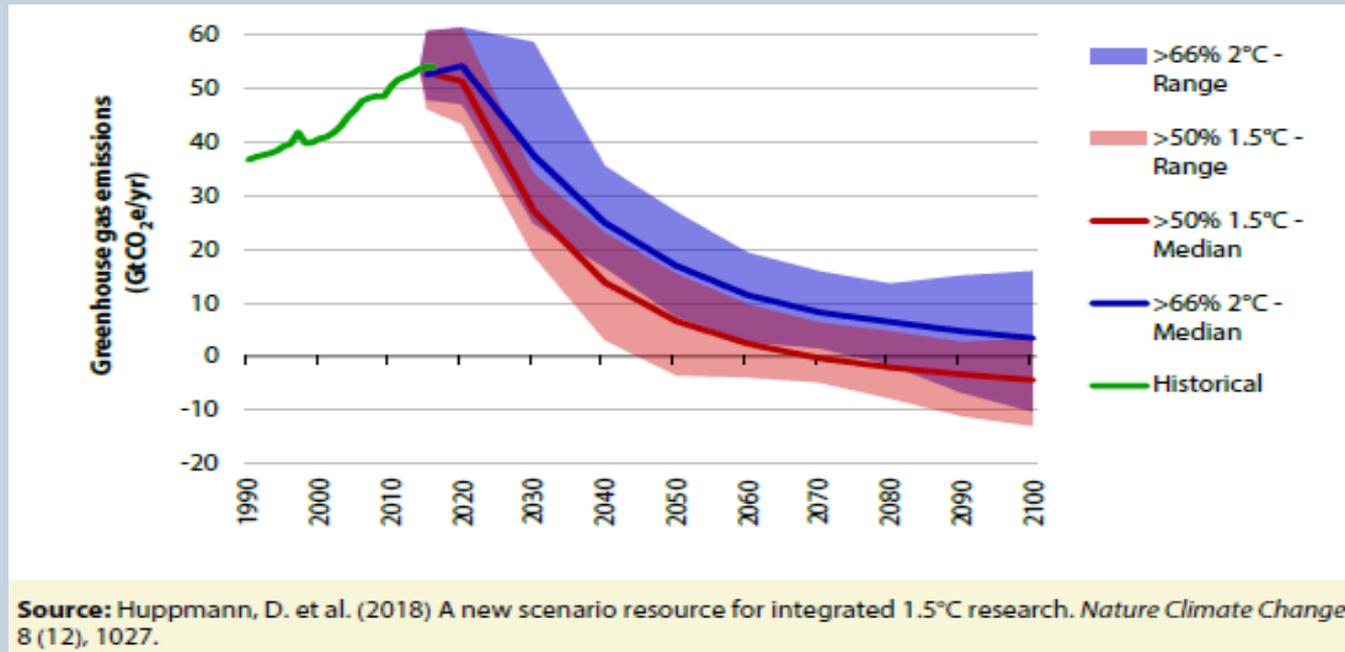
The global energy system is dominated by fossil fuels

World¹ TPES from 1971 to 2016 by fuel (Mtoe)



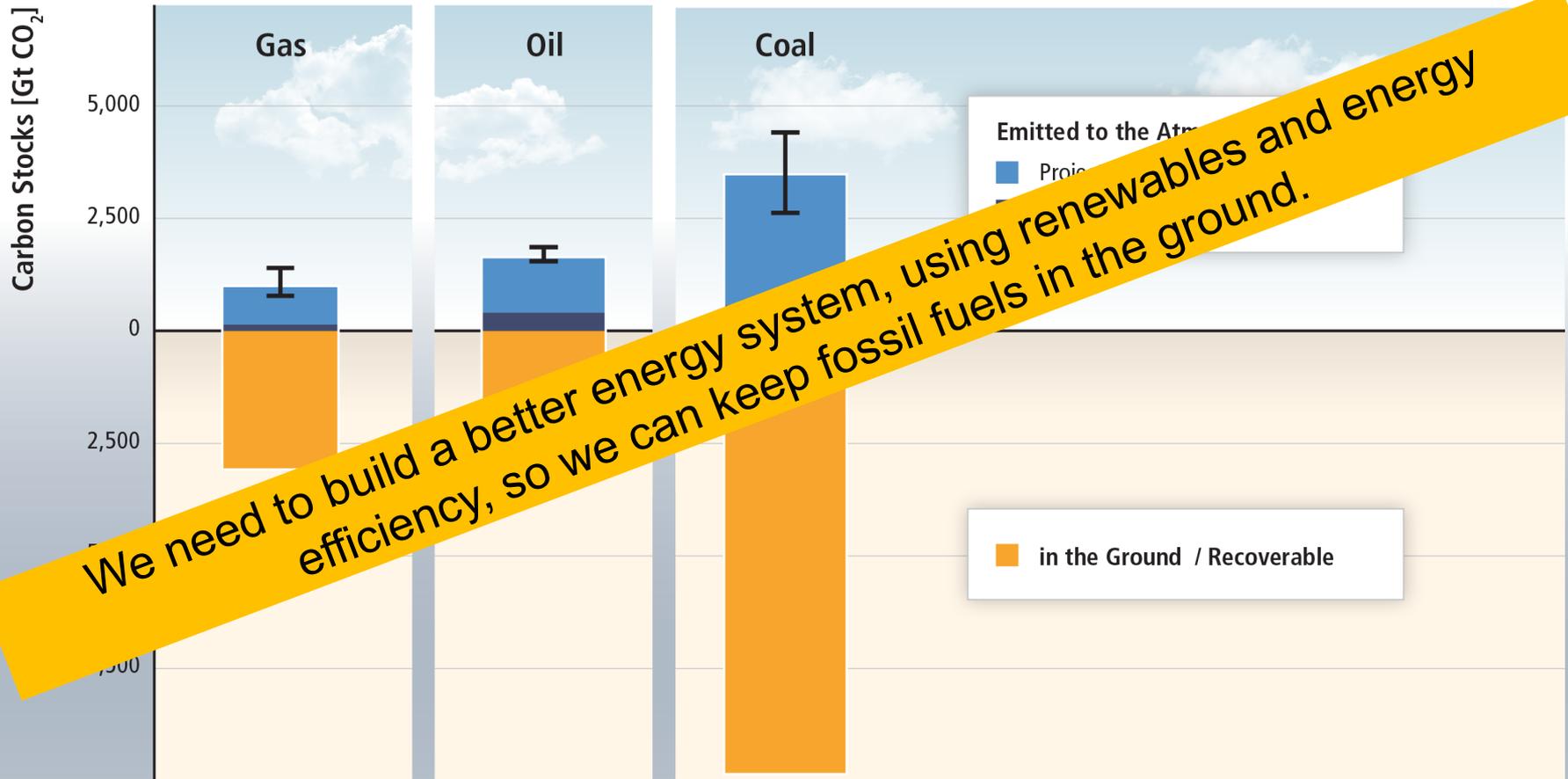
IEA World Energy Statistics, 2018

Implications of the Paris Agreement



- Emissions of carbon dioxide need to fall to ‘net zero’.
- “Limiting warming to 1.5°C is possible within the laws of chemistry and physics but doing so would require unprecedented changes”.
- 2°C looks more feasible but still very challenging
- It involves transforming the energy system of the world in a few decades

There is far more carbon under the ground than we can safely emit



Based on SRREN Figure 1.7

There are reasons to be cautious

- Rising emissions in many countries
- Huge unmet need for energy services in developing countries
- Many sectors of the economy are difficult sectors to decarbonise, notably aviation, shipping, agriculture, industrial processes, space heating
- Some controversial proposed solutions, especially “negative emissions technologies”.

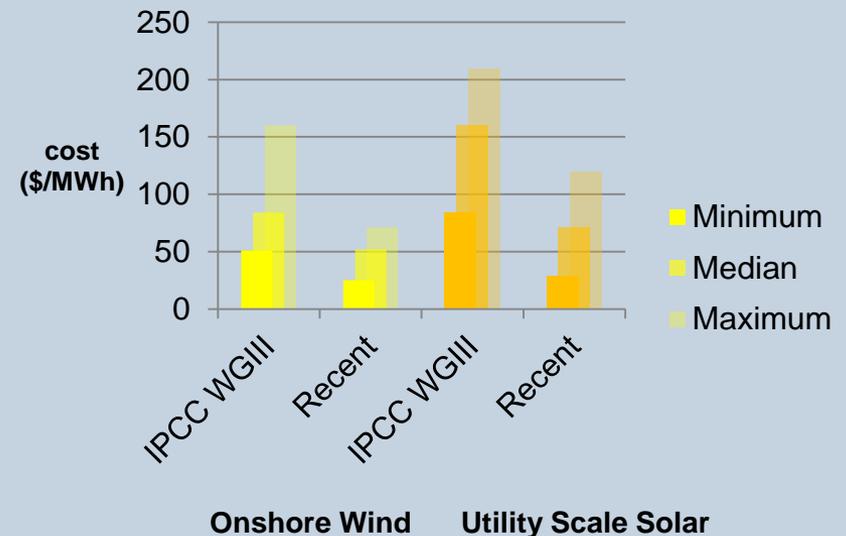
7 AFFORDABLE AND CLEAN ENERGY



...but reasons to be optimistic

- Falling energy use and emissions in some countries
- Huge opportunities for improved efficiency in energy use
- Signs of changing lifestyles in rich countries, e.g. car use, meat consumption
- Renewables now are the cheapest source of electricity in many places

Recent Cost Changes for Wind and Solar



What needs to be done in the UK?

- Commit to “net zero” greenhouse gas emissions by 2050, as recommended by the Committee on Climate Change.
- More importantly a policy framework and action plan to deliver:
 - Radical reductions in energy demand
 - Rapid decarbonisation of electricity
 - Early adoption of electric vehicles and sustainable transport modes
 - Elimination of fossil fuels in buildings and industry
- Some “carbon capture and storage”, but no major geo-engineering



What needs to be done now?

- Start with things that already make sense
 - Zero carbon new buildings
 - Insulate our buildings
 - Wind and solar production
 - Stop expanding fossil fuel production
- Action plans for more difficult problems
 - Support for more sustainable consumption – less aviation, change diet, reuse and recycle etc
 - Low carbon heating
 - Technology innovation for industrial processes, freight transport.
- Recognise the benefits for health and employment



What does this imply locally?

- Green economy needs to be central to local politics.
- Oxfordshire can lead.
 - A high density of engaged citizens and community projects
 - A centre for innovation, hosting major research and demonstration projects
 - Positive local politics.
- Our calculations for 2030 imply:
 - Electricity: 30-fold increase in renewable electricity generation – mainly solar
 - Zero carbon new buildings; 4000 deep renovations annually. Major programmes for renewable heat.
 - Transport – growth of mass transit and cycling. Most new vehicles low carbon

