



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

Applied geoscience for our
changing Earth



Living with our changing Earth

John Ludden

Executive Director,
British Geological Survey
President, EuroGeosurveys



**NATURAL
ENVIRONMENT
RESEARCH COUNCIL**

Drivers of change

Population growth

Globalisation
rise of China
and India

Technological
change

Global challenges

Poverty
alleviation

Food, water
and energy
security

Disease
reduction



Climate
change

Graphic source: www.mondolithic.com /Slide A. Thorpe, NERC

Increase in Demand by 2030

Water
+30%

Food
+50%

Climate
+1°C by 2030

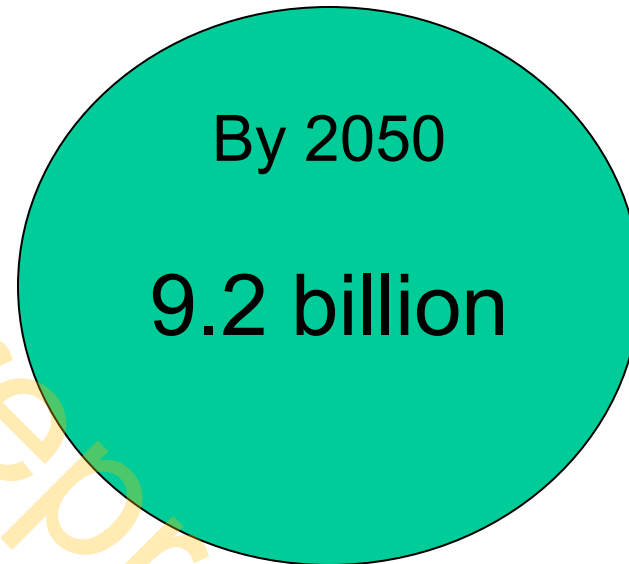
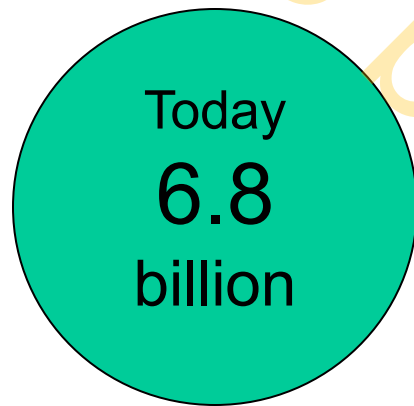
Energy
+50%

Specific
diseases
+50%



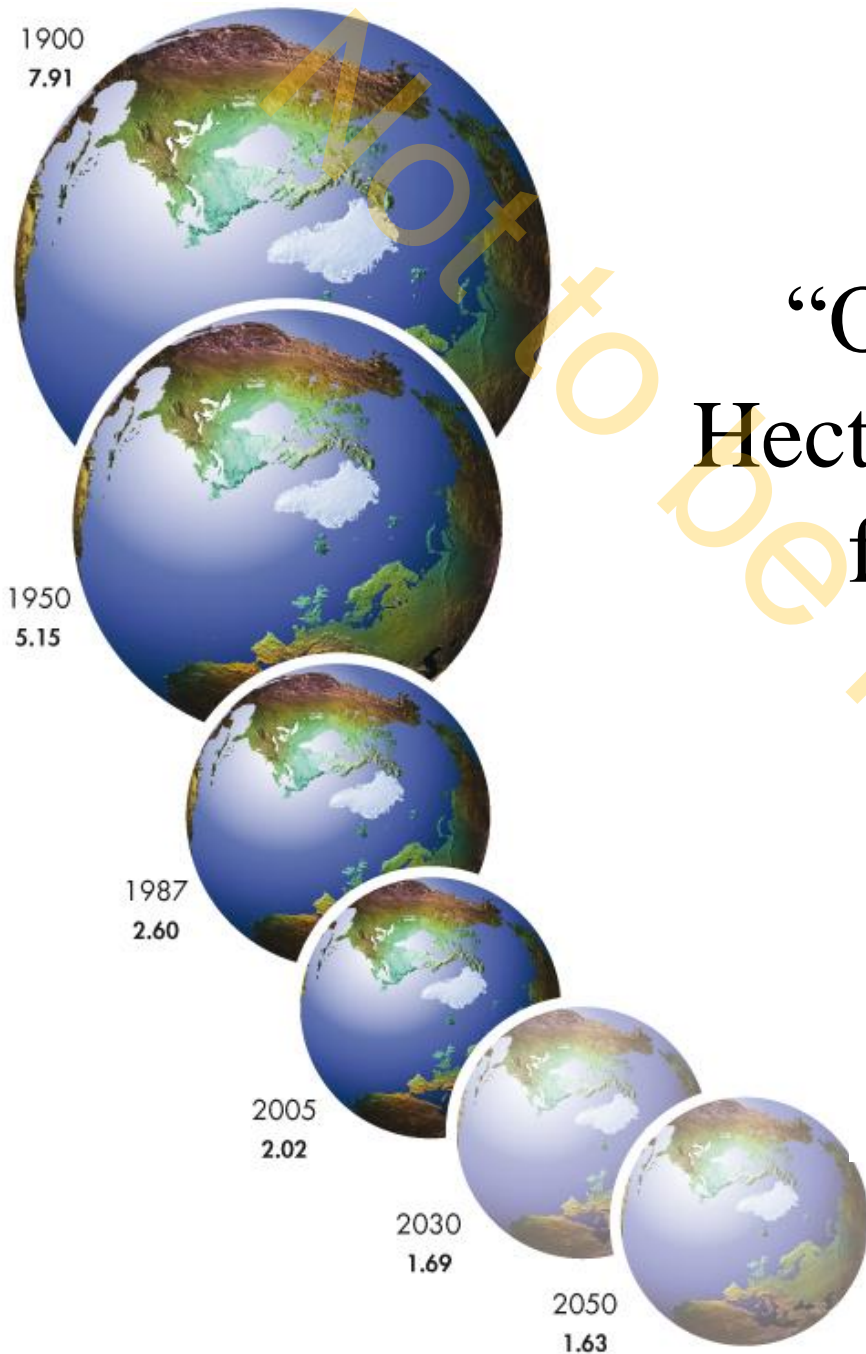
Graphic source: www.mondolithic.com /Slide A. Thorpe, NERC

Population



Food prices rose by 50% in the past 2 years

Increased demand for natural resources
Increasing degradation of ecosystem services



GEO-4 2007

“Our Shrinking Earth”

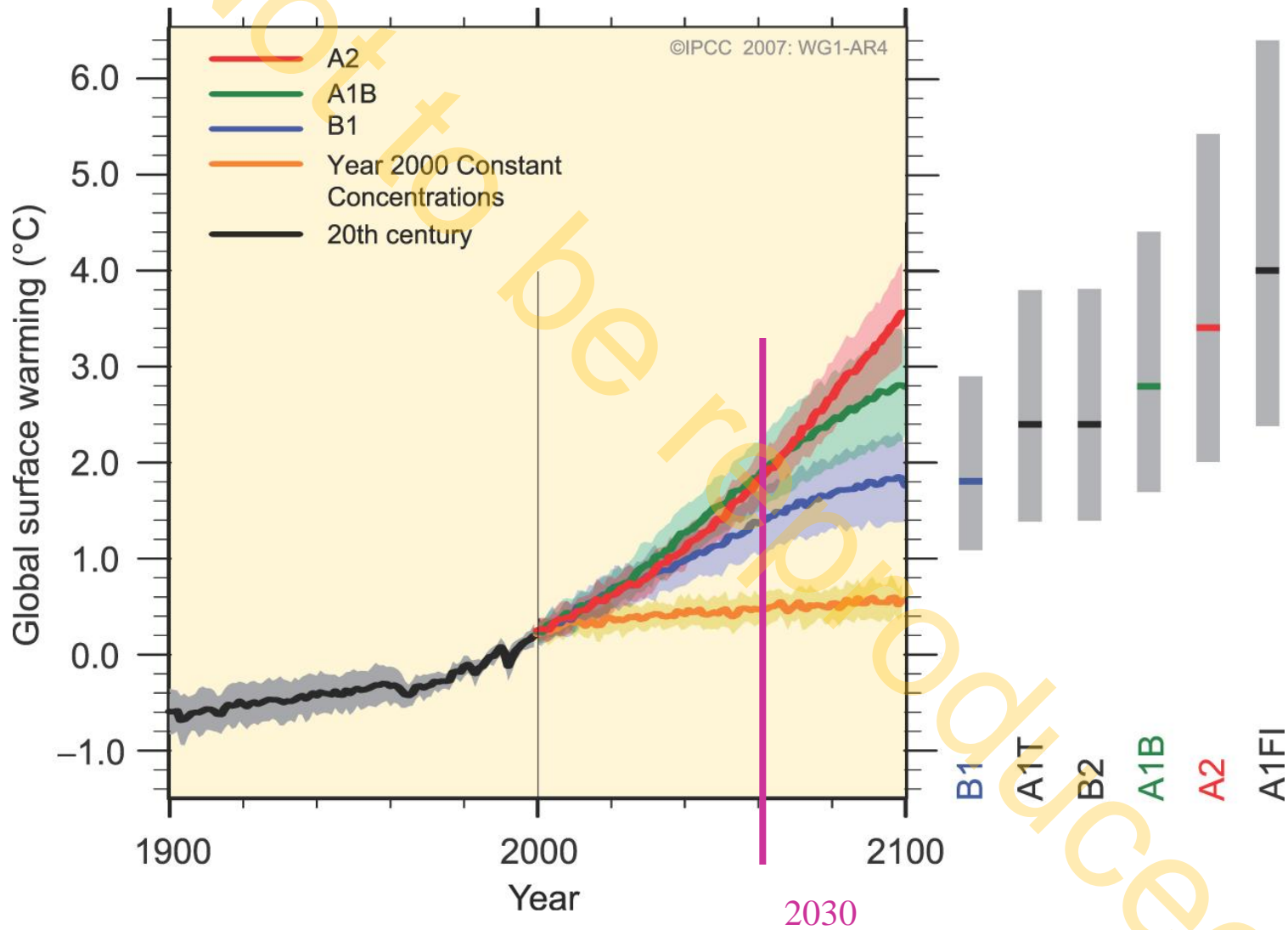
Hectares of land per person
from 1900 to 2050:

7.9 to 1.6*

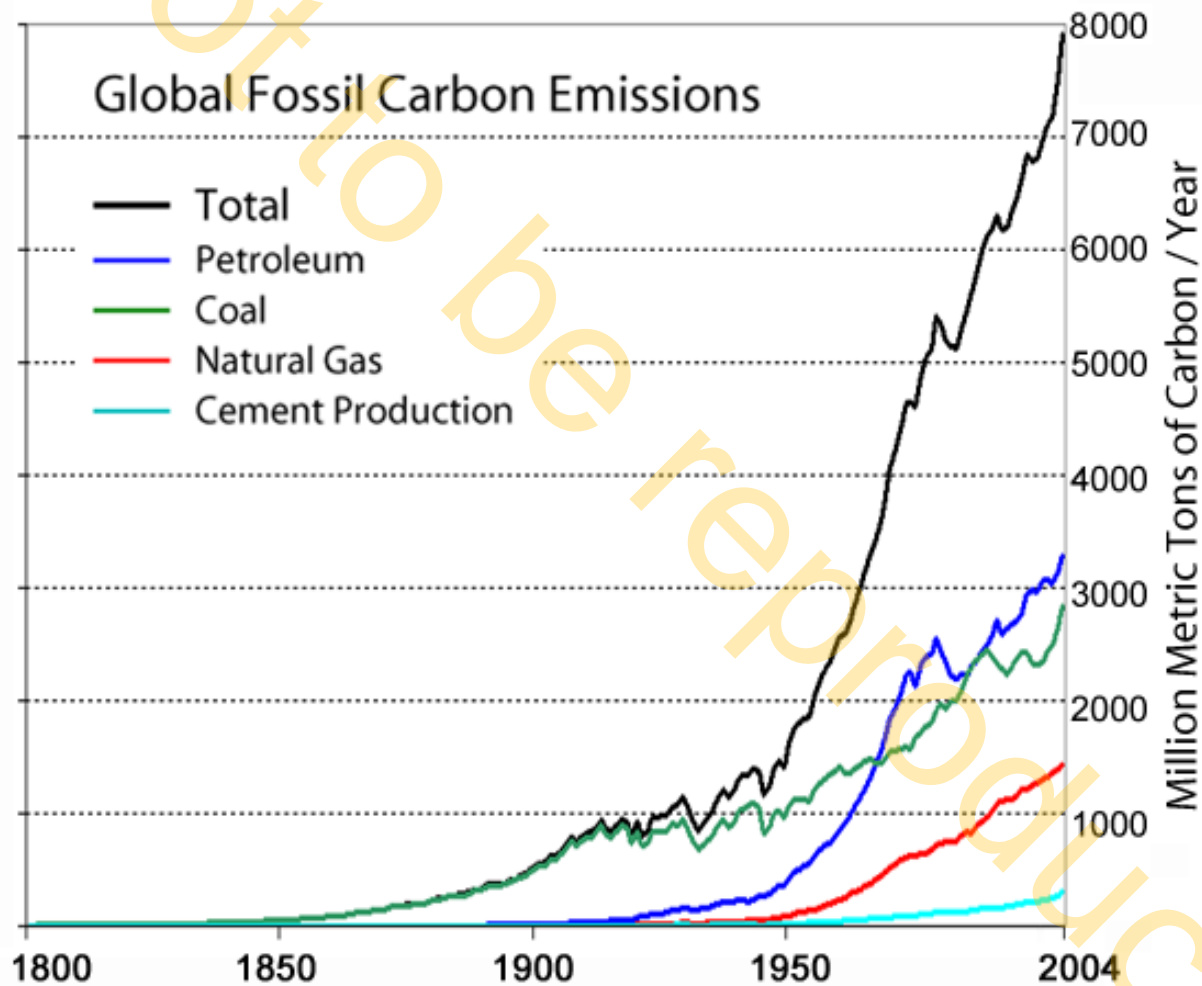
* = 128m x 128m = 4 acres

/Slide A. Thorpe, NERC

Projections of global warming

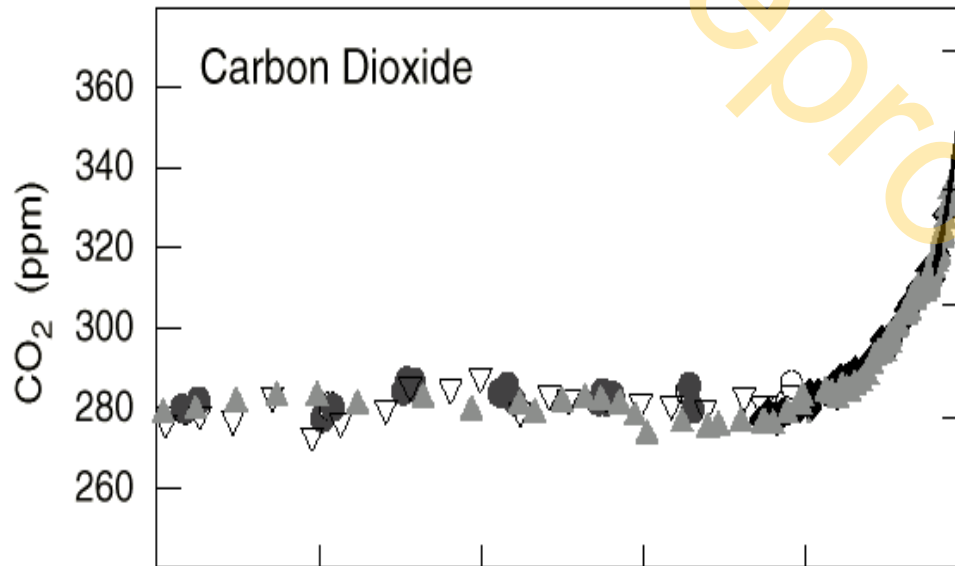
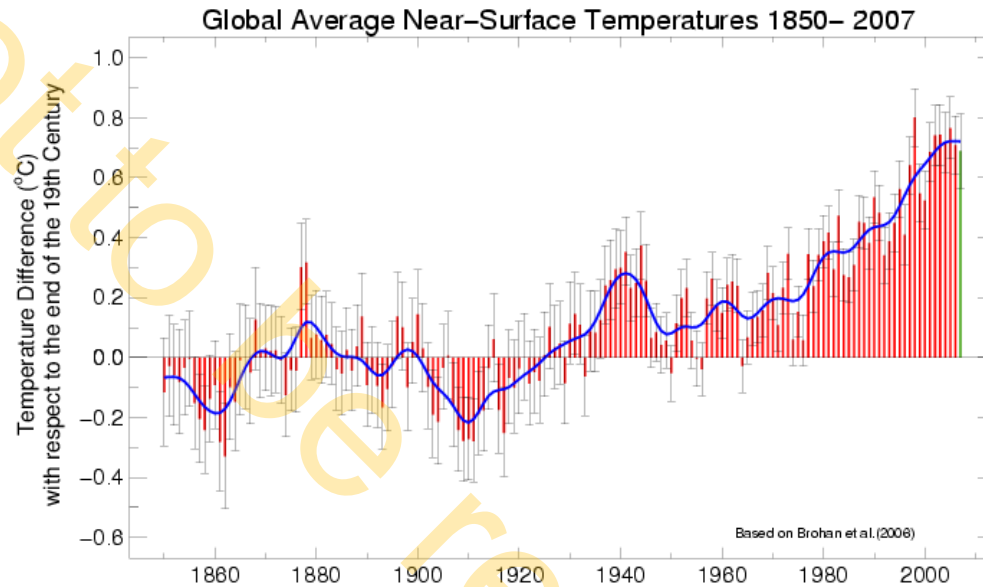


Global fossil carbon emissions



(US Department of Energy)

Climate trends and CO2 concentrations

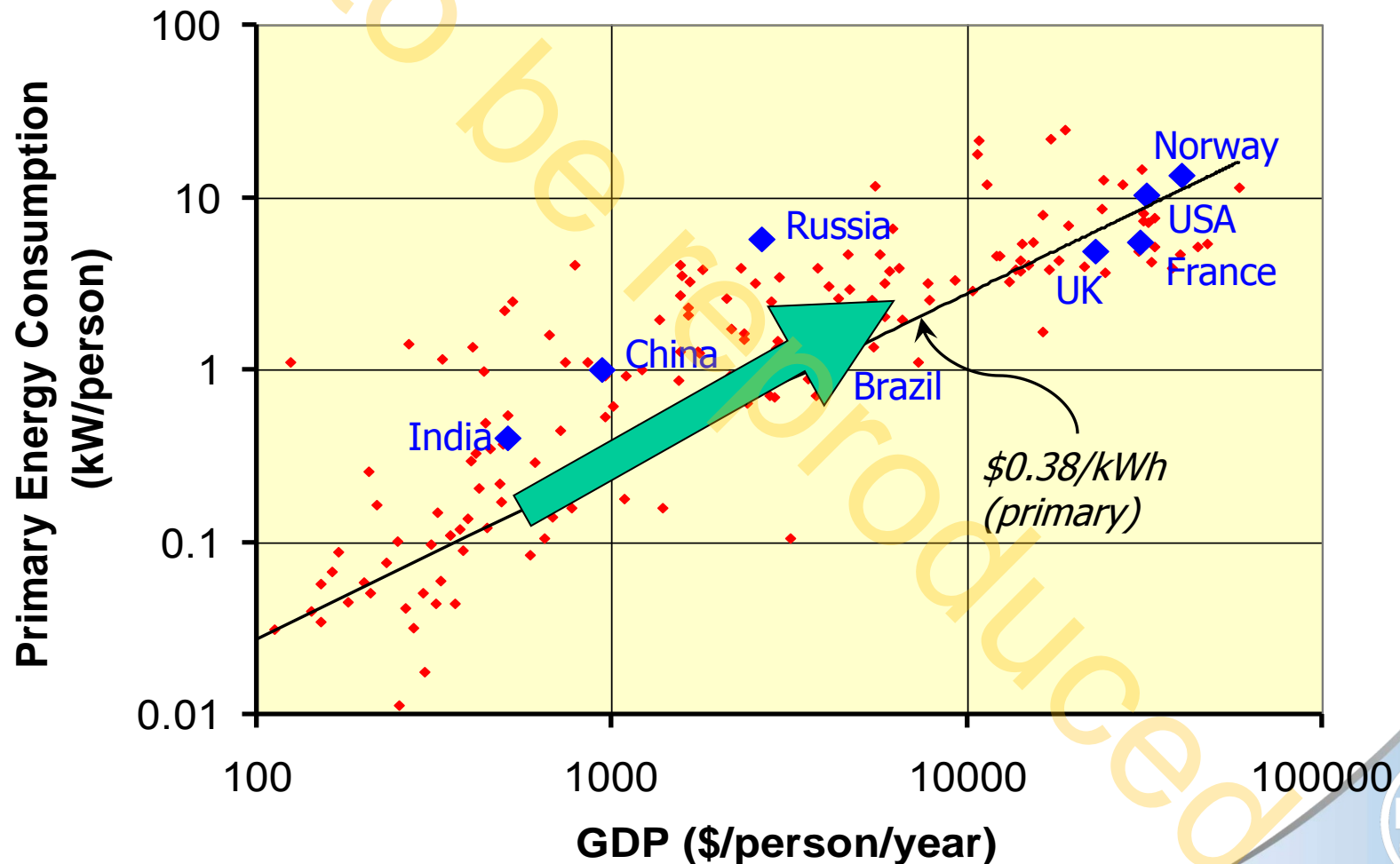


Energy

~60% of CO₂ comes from energy production

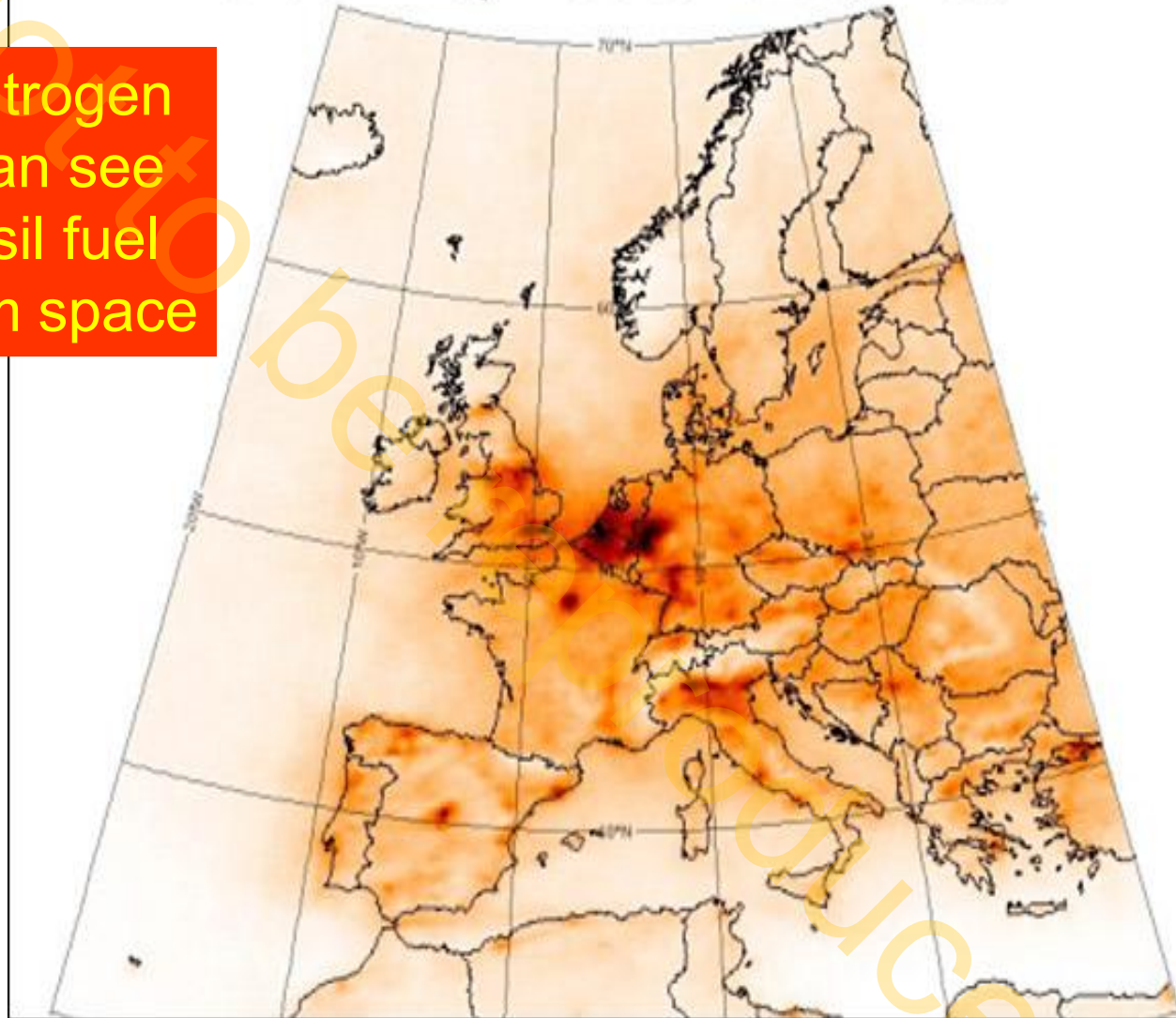
- World energy demand >50% increase by 2030
- China and India will account for half the increase
- The Mix will remain coal and gas, nuclear and renewables
 - One quarter of humanity has no access to electricity
- One third rely on traditional biomass for cooking and heating

Energy, Wealth, Economic Growth





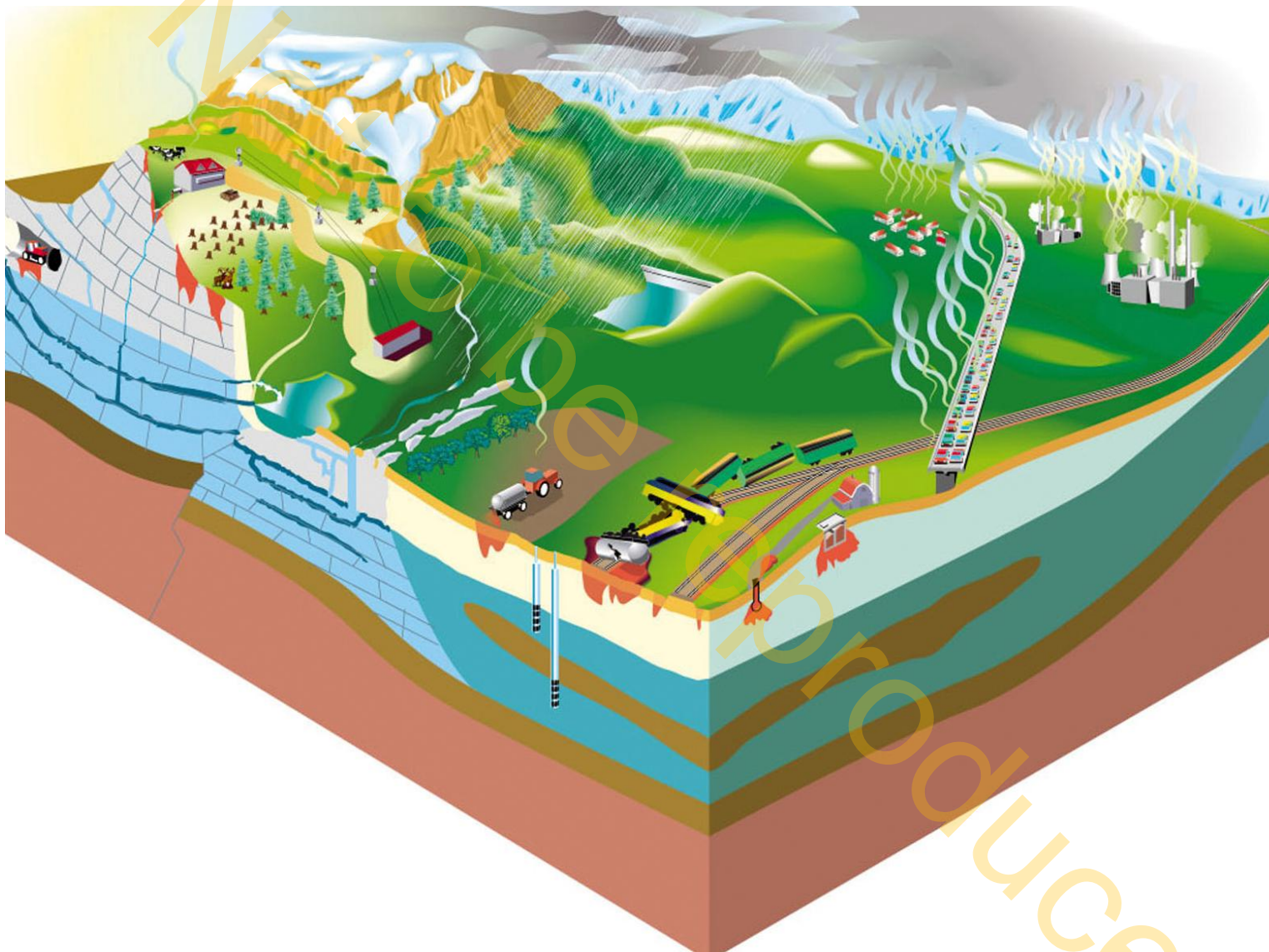
Period 1-May-2005 to 13-Sep-2005



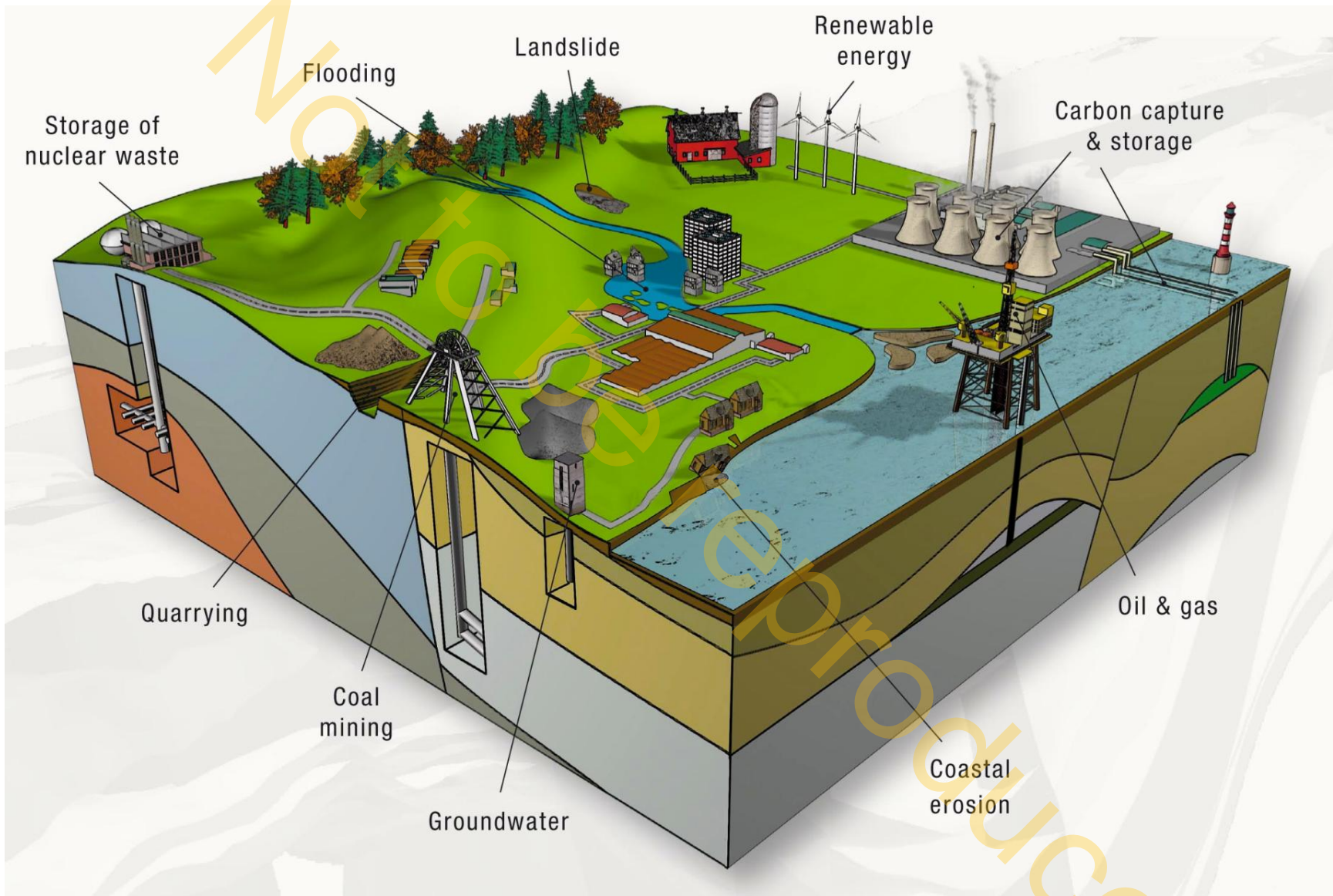
(NASA)



Graphic source, EuroGeosurveys

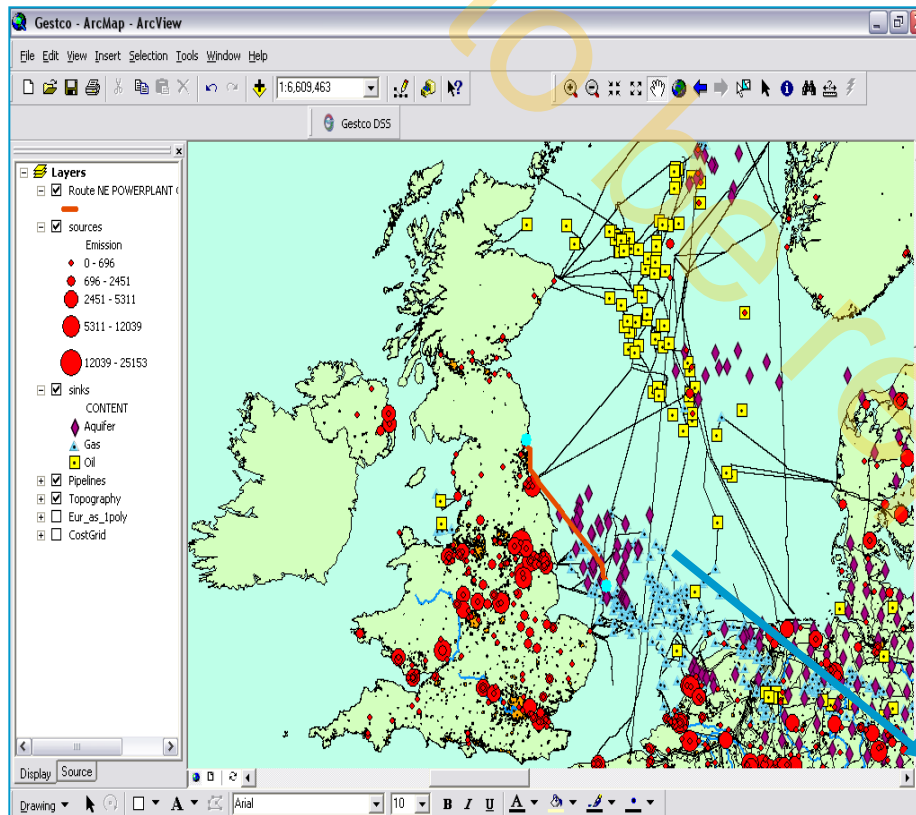


Graphic Source EuroGeosurveys



Geoscience for...

..... spatial planning and development



Geoscience for...

..... subsurface geological infrastructure



Building for the future
.....Megacities

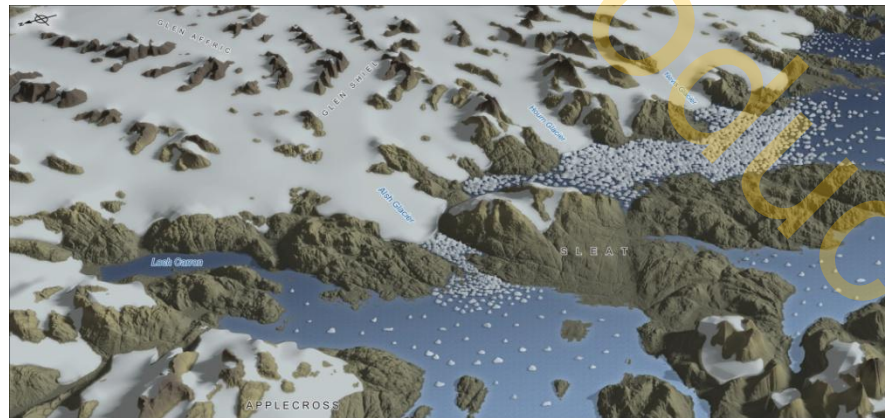
Geoscience for...

..... monitoring & mitigating hazards



Geoscience for...

.....monitoring environmental change impacts



Can we define a global science initiative in which we play a central role?

Food, water,
energy security

landscape
vulnerability



Subsurface
infrastructure

Erosion

Communication

Graphic source: www.mondolith.com, Slide Alan Thorpe NERC