

Thoughts

- Trends in sustainability

Responses risks

- Consumer shifts – purchasing patterns
- Transparency of information
- Significant shifts in policy & investment

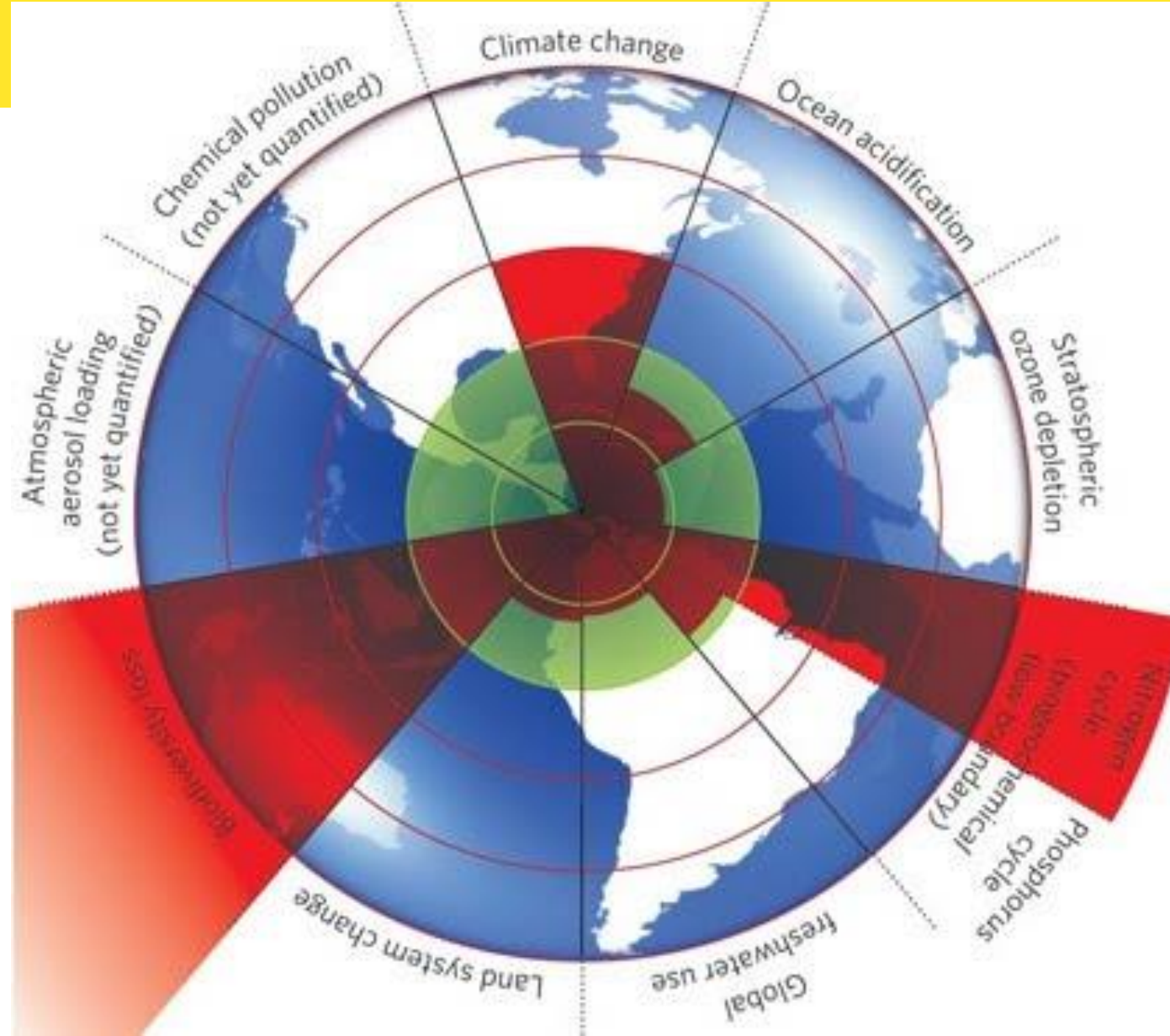


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Trends in sustainability

Peak Earth??

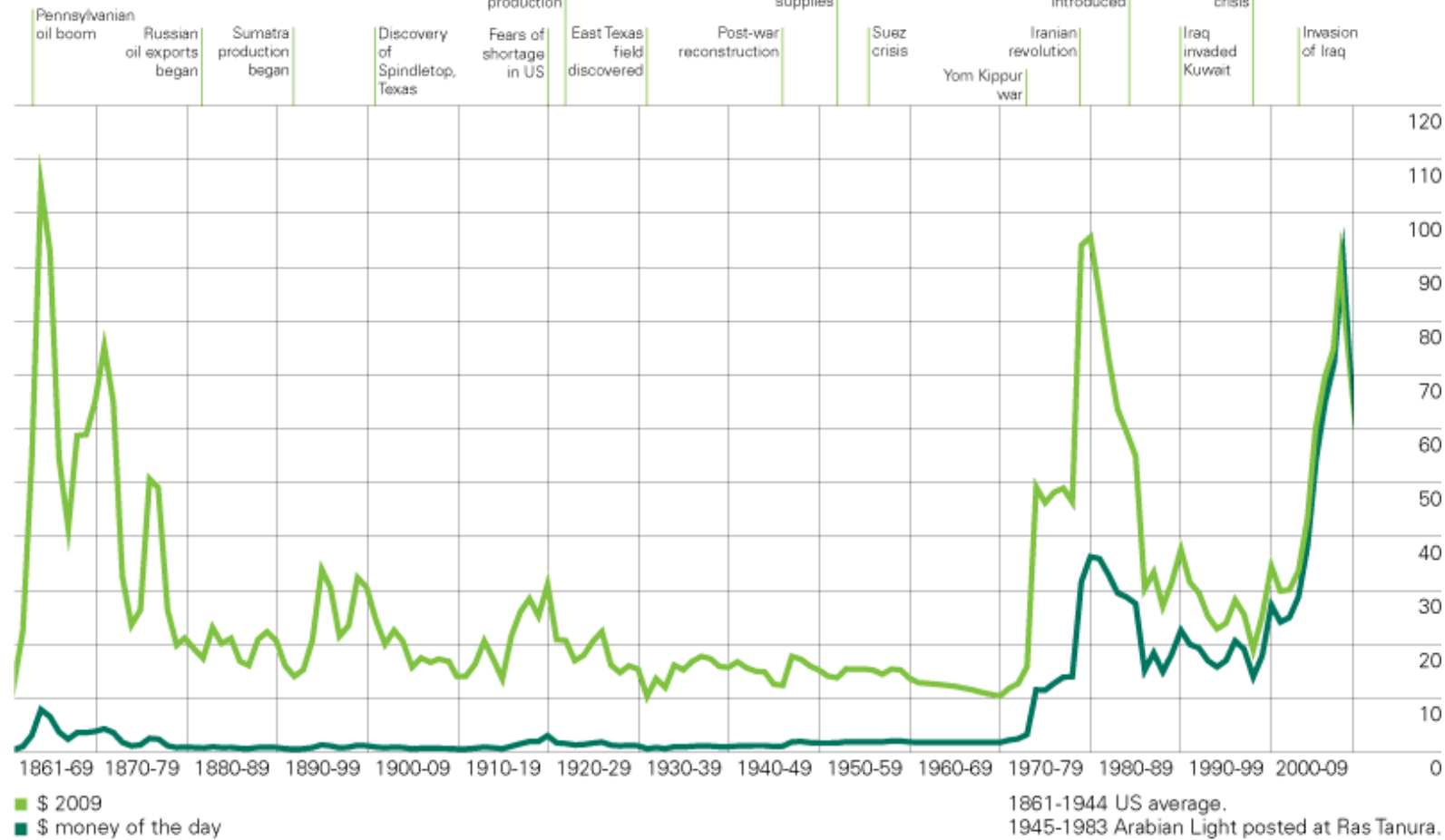


Crude oil prices since 1861

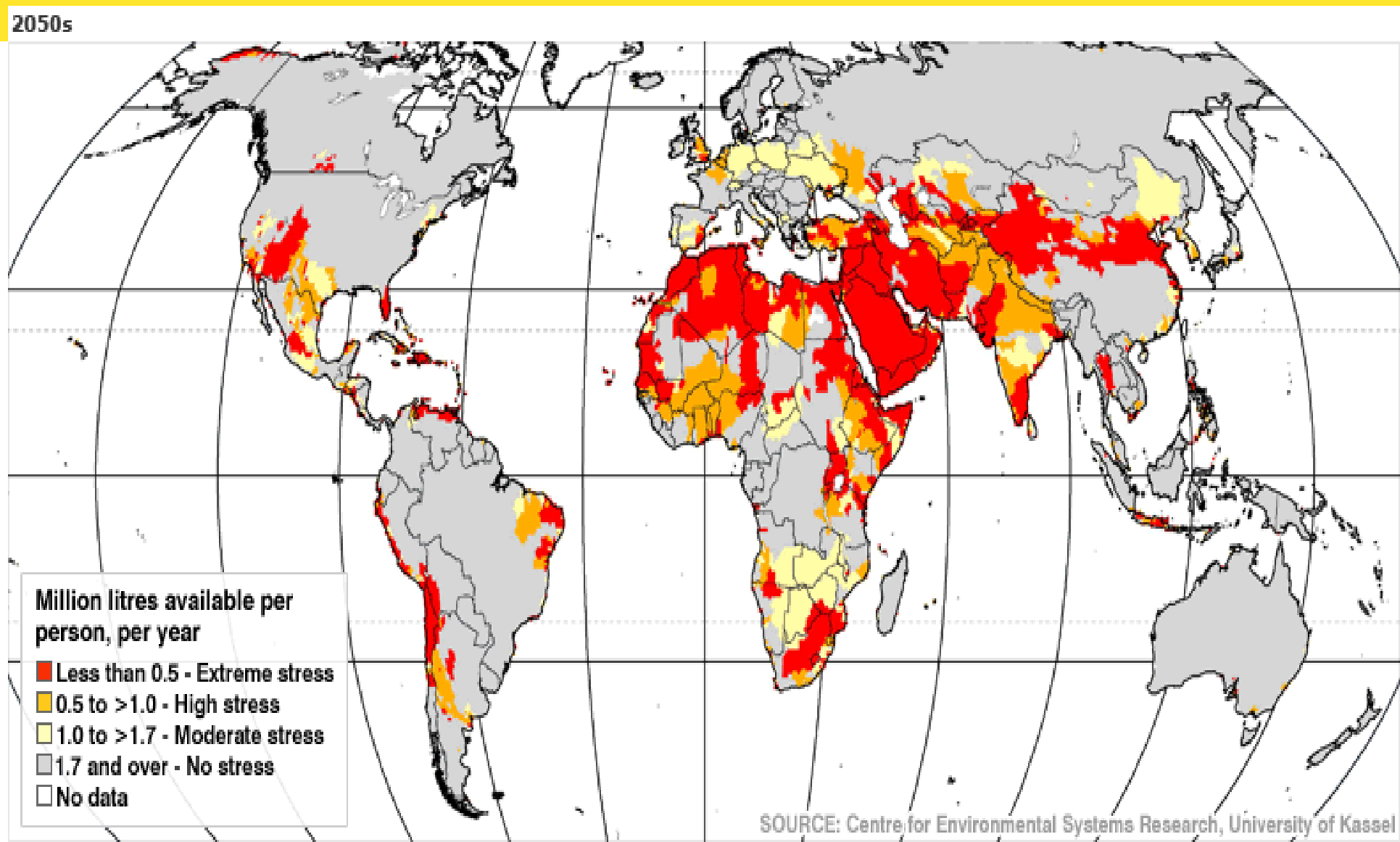
Crude oil prices 1861-2009

US dollars per barrel

World events

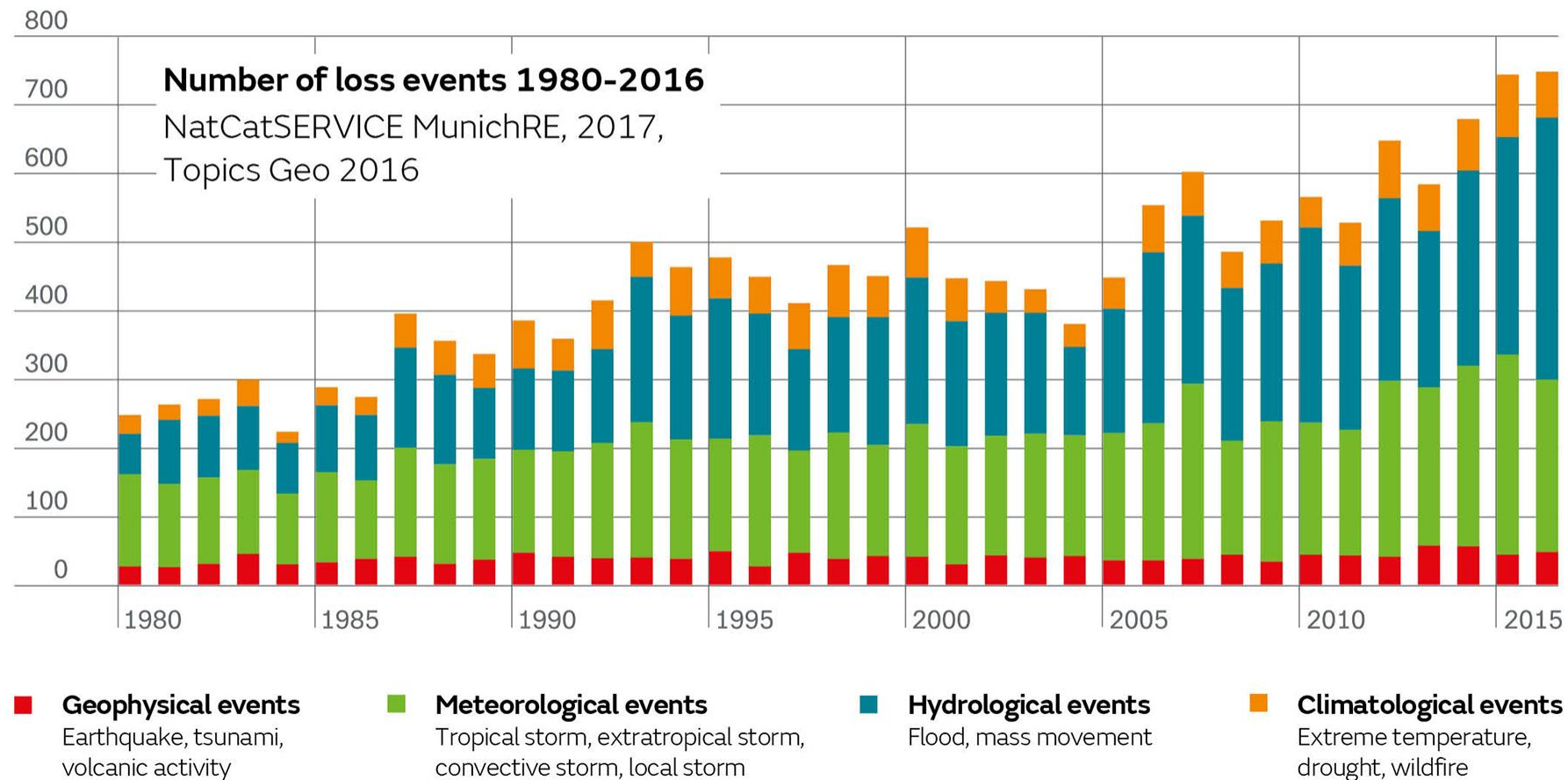


Worsening per capita water availability



Extreme weather impacts

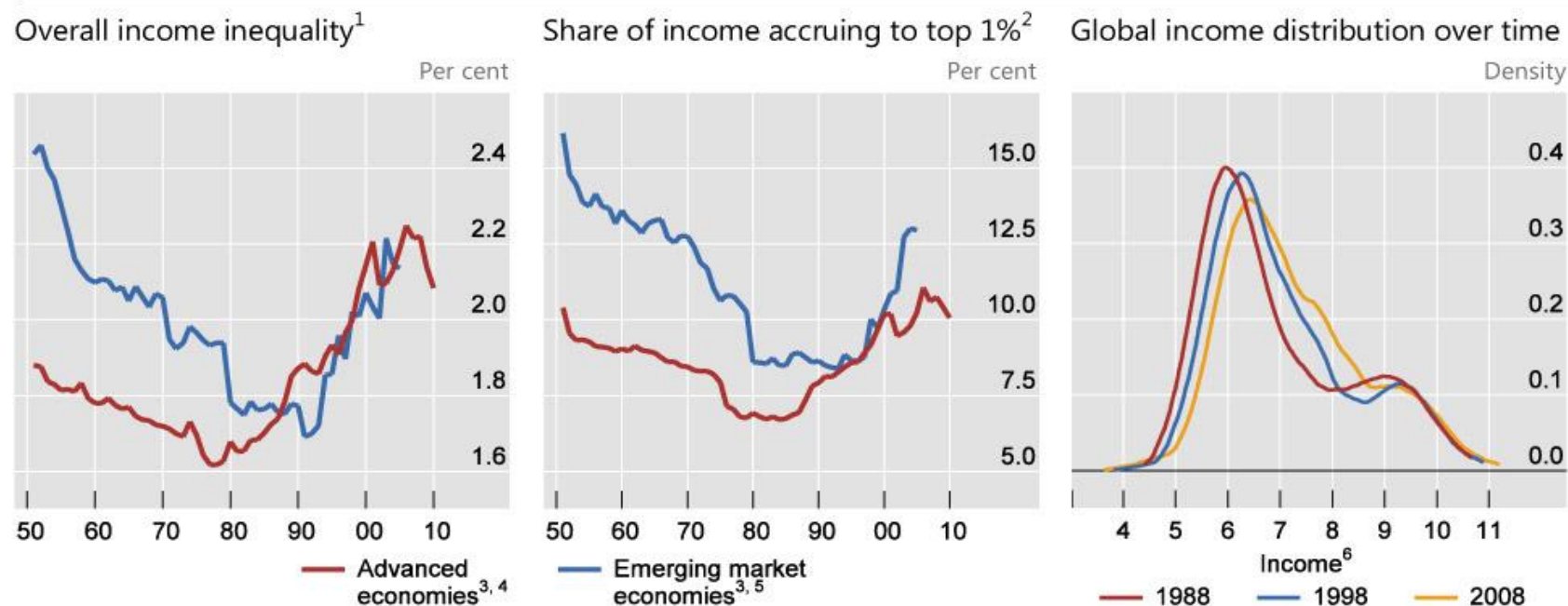
Are extremes becoming more frequent?



Social sustainability (?)

Income inequality has been increasing within countries but decreasing across countries

Graph A



¹ Pareto coefficients; a higher coefficient means higher inequality. ² Excluding capital gains. ³ Simple average of the economies listed. ⁴ Australia, Canada, France, Germany, Ireland, Italy, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States. ⁵ Argentina, India, Korea, Malaysia, Singapore and South Africa. ⁶ Annual income, in PPP-adjusted 2005 US dollars and in natural logarithms.

Sources: Alvaredo et al (2015); Lakner and Milanovic (2013).

Impacts on society

- Increasing difficulty to access resources which are fundamental for human life (water, food, energy, land, and minerals) has **several consequences**:
 - Increased uncertainty with regard to future economic growth which potentially lowers the ability of governments to invest in infrastructure;
 - The spread of systemic risks in highly indebted (and highly resource-intensive, i.e., countries consuming a lot of biophysical resources per capita and year) countries, such as the USA;
 - High volatility of commodity prices (FAO index);
 - Increasing inequality (OECD, 2008; UNDP, 2011);
 - Worsening living conditions and food security in vulnerable regions (WB, 2012);
 - Sustainability challenges linked to the need massively increase industrial productivity (McKinsey, 2011, Tonelli et al., 2013).
 - International political instability (e.g., the Arab Spring, see Lagi et al., 2011; Nomura Bank, 2012).

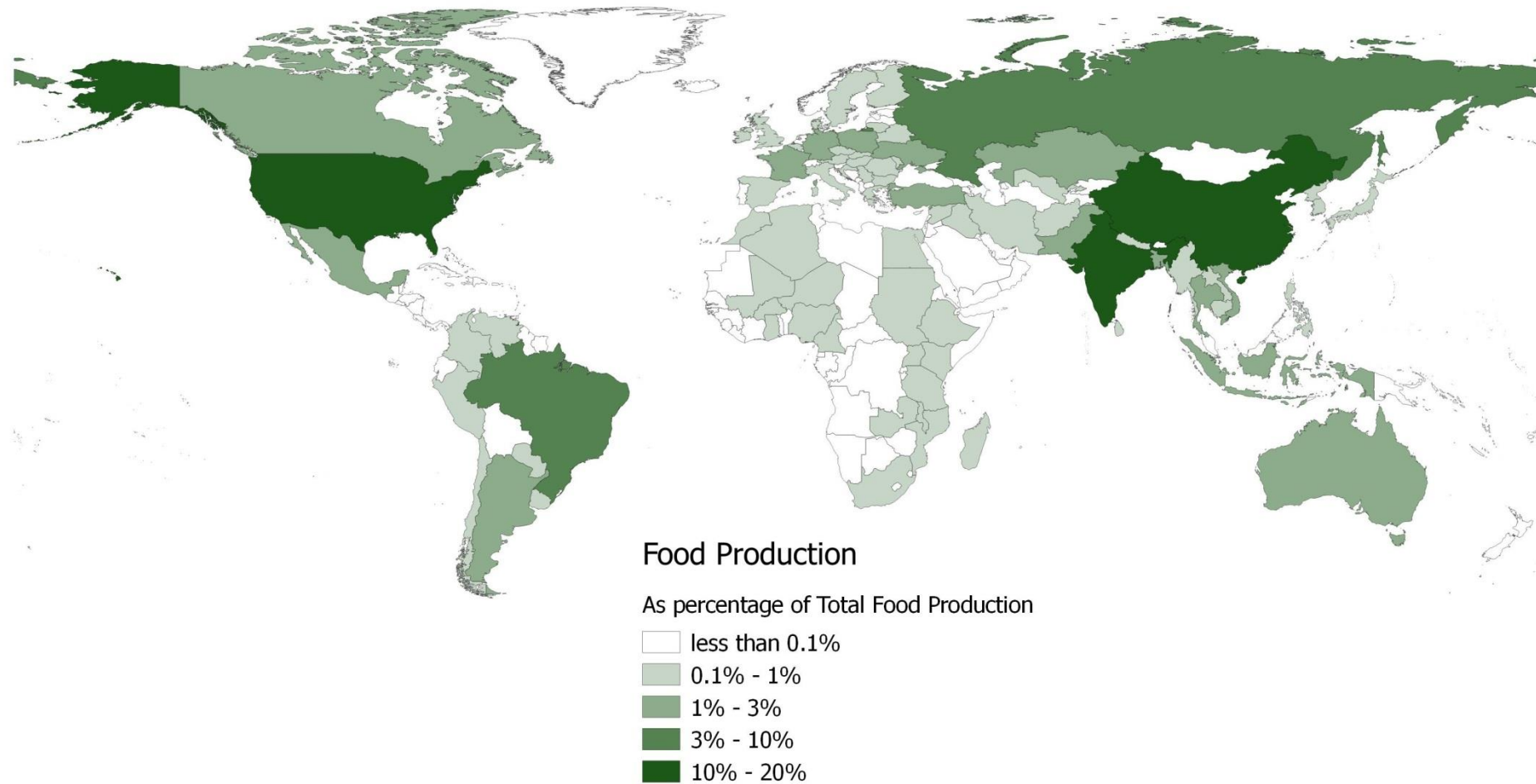


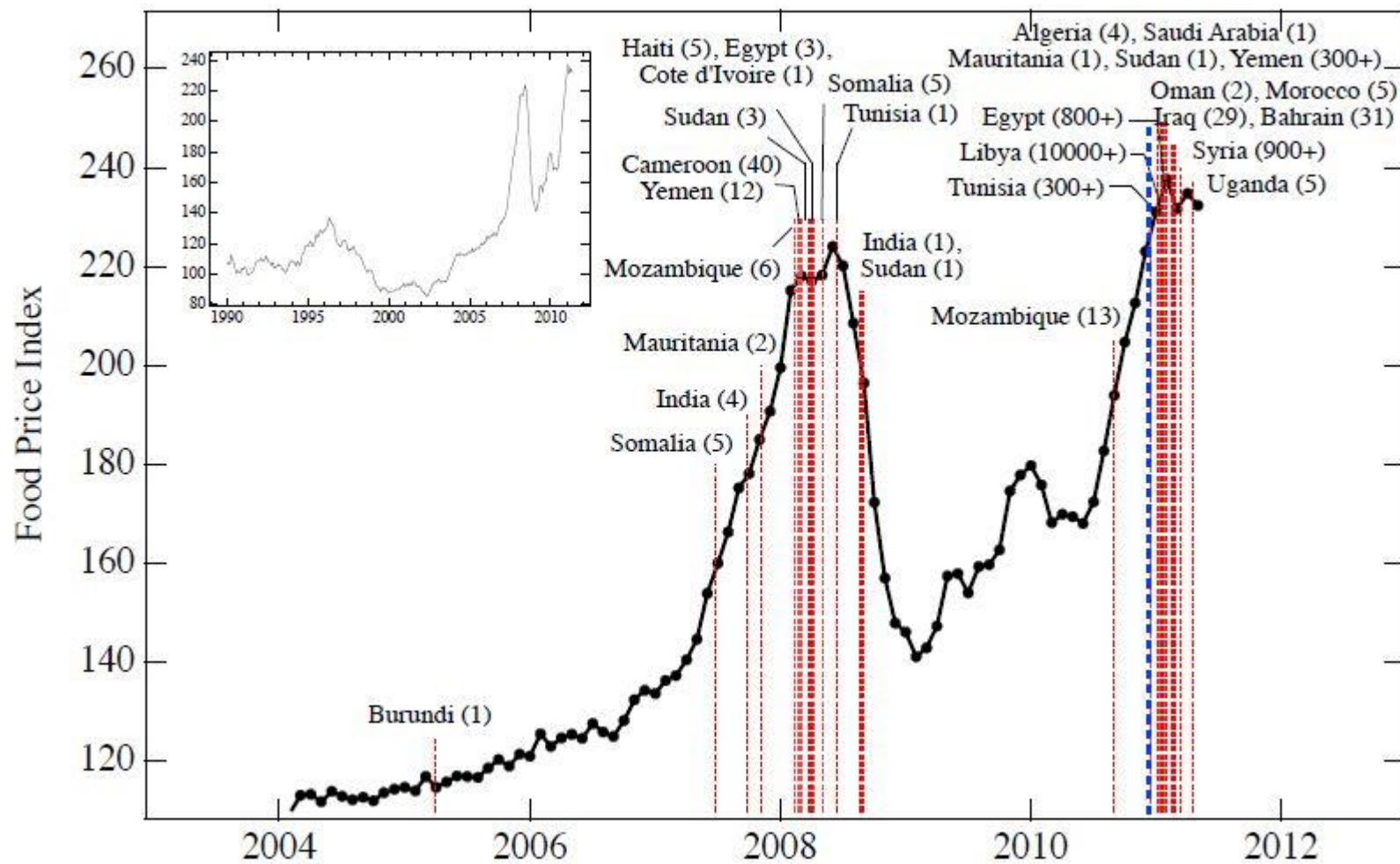
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Lloyd's scenario

Food production globally





Lloyd's scenario

- *Food production shock (developed by Molly Jahn, University of Wisconsin)*
 - *Maize: 10% production shock*
 - *Soy: 11% production shock*
 - *Wheat: 7% production shock*
 - *Rice: 7% production shock*

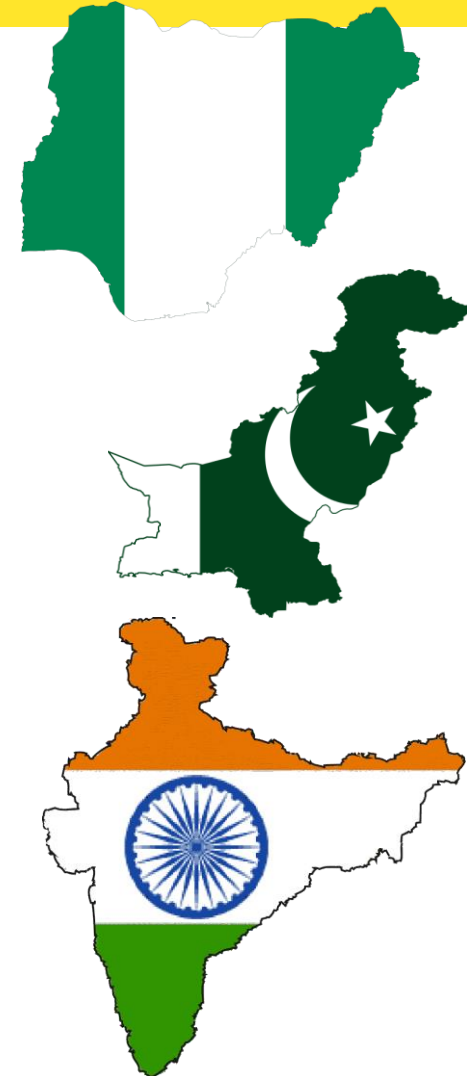


From left to right: Sophie Abraham (Willis), Lucy Stanbrough (Lloyd's), Dr John Alarcon (Willis), Oliver Bettis (Munich Re), Nigel Ralph (Lloyd's), Tom Hoad (Tokio Marine Kiln), Trevor Maynard (Lloyd's), Mike Maran (Catlin), Will Steeds (Catlin), Kenneth Donaldson (Munich Re), Dr Aled Jones (Anglia Ruskin University), Prof Molly Jahn (University of Wisconsin-Madison)

Attendees not pictured: Nick Beecroft (Lloyd's), Andrew Hitchcox (Tokio Marine Kiln), Falk Niehörster (RMS)

Possible responses: Nigeria civil war and terrorism in India

- Food riots break out in urban areas across the Middle East, North Africa and Latin America.
- Nigeria civil war following major offensive by Boko Haram. Onshore and shallow offshore oil rigs attacked.
- Pakistan terrorist group targets major cricket tournament. India cricket cancellations.
- Europe has an increasingly militarized border with Russia as political tensions continue.
- The Euro weakens and the main European stock markets lose 10%; US stock markets follow and lose 5% of their value.
- Public agriculture commodity stocks increase 100% in share value, agriculture chemical stocks rise 500% and agriculture engineering supply chain rise 150%



Insurance impacts

- Political risk insurance
 - Contract frustration (e.g. China-Brazil)
 - Cargo/marine hull (e.g. Liberia)
 - Trade credit
- Political violence and terrorism
 - Strikes, riots & civil commotion (e.g. Egypt)
 - Contingent business interruption
 - Terrorism
 - War on land
- Crop insurance
- Liability insurance (directors & officers, errors & omissions)



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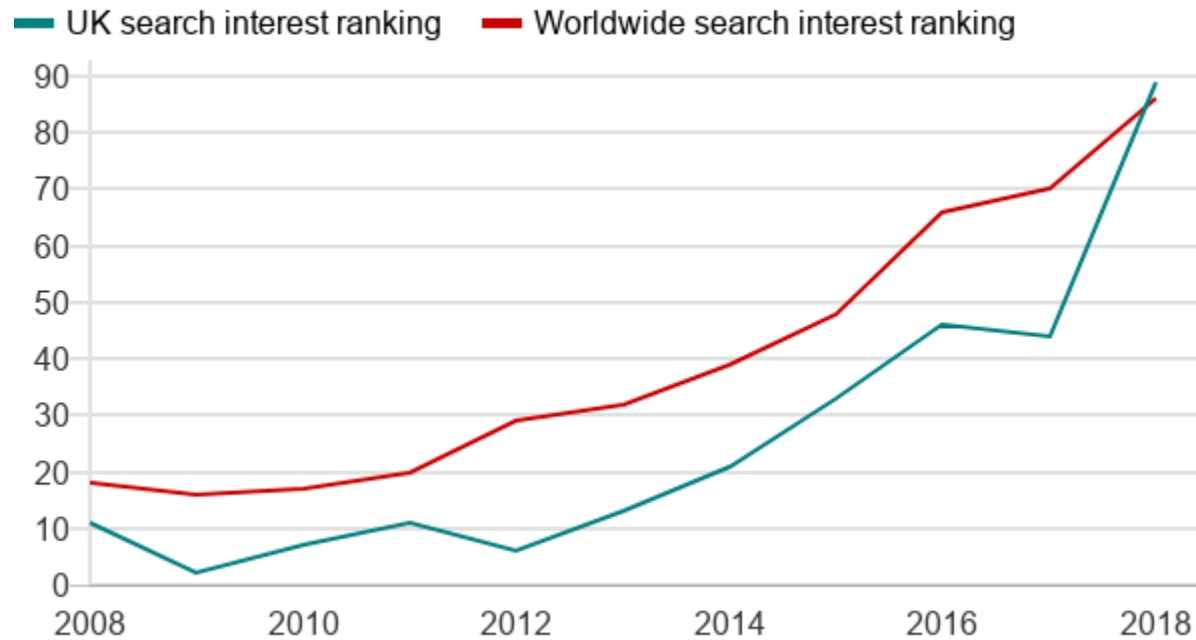
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Consumer trends

The rise of the plant

Google searches for veganism

Popularity for search term "veganism", dated June of each year



Source: Google Trends

BBC

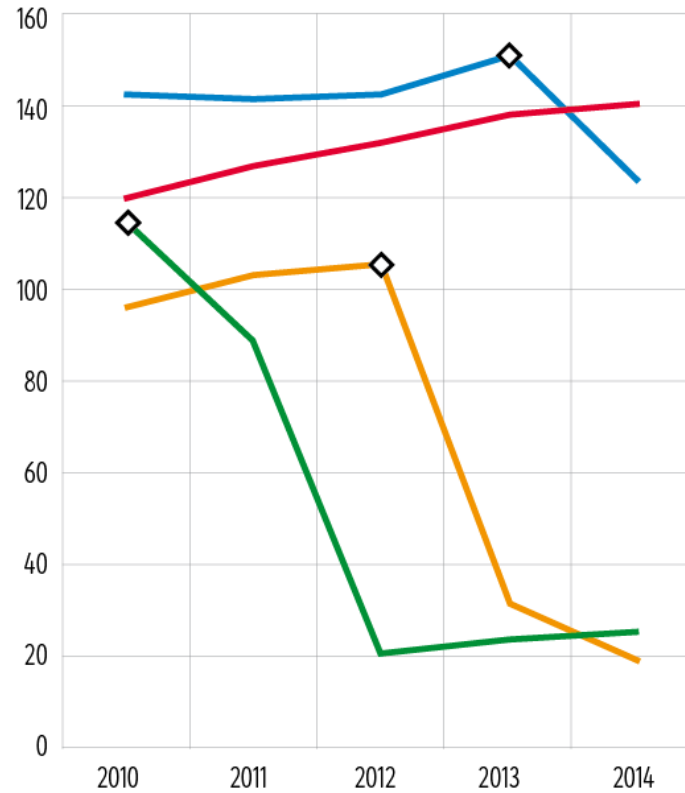
The fall of plastic

OUT OF THE BAG

ANNUAL PLASTIC BAG USAGE PER PERSON IN UK COUNTRIES

● ENGLAND ● SCOTLAND ● WALES ● NORTHERN IRELAND

◇ INTRODUCTION OF LEVY



SOURCES: WRAP, NEF





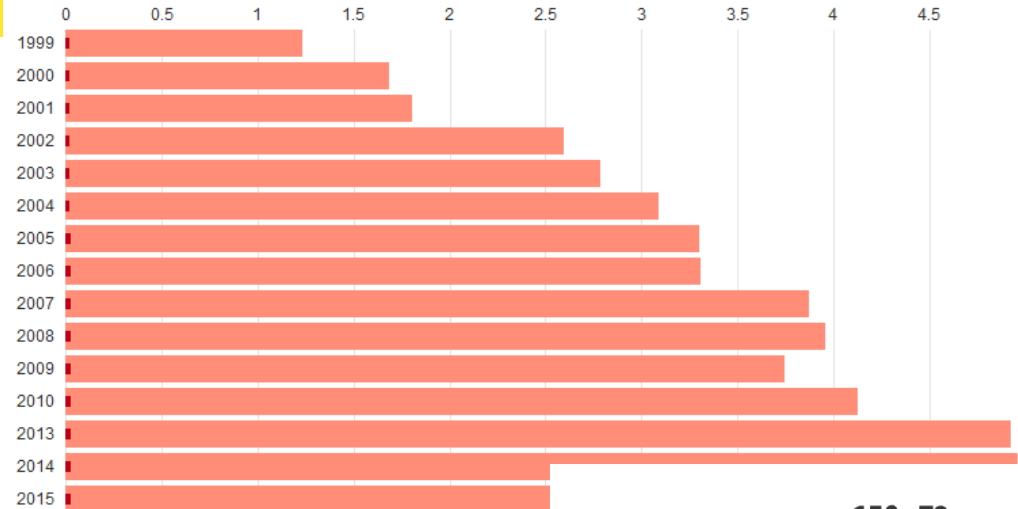
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Transparency of information

Information access

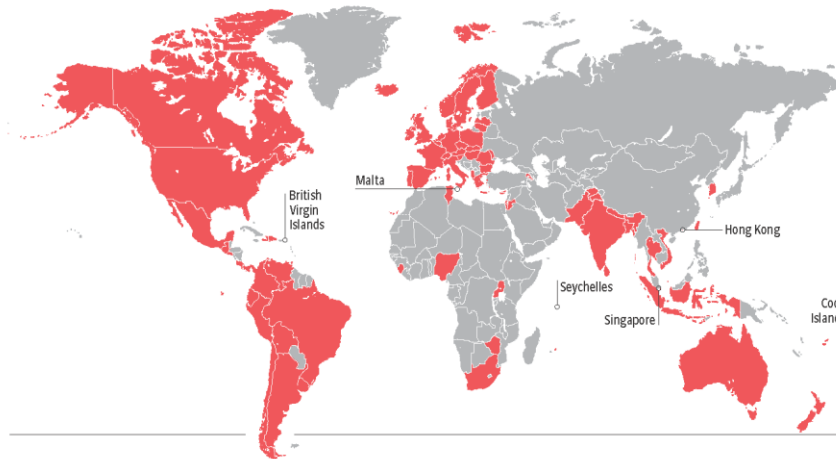
CEO vs average pay (£'s, millions)



Source: [High Pay Centre](#) [Get the data](#)

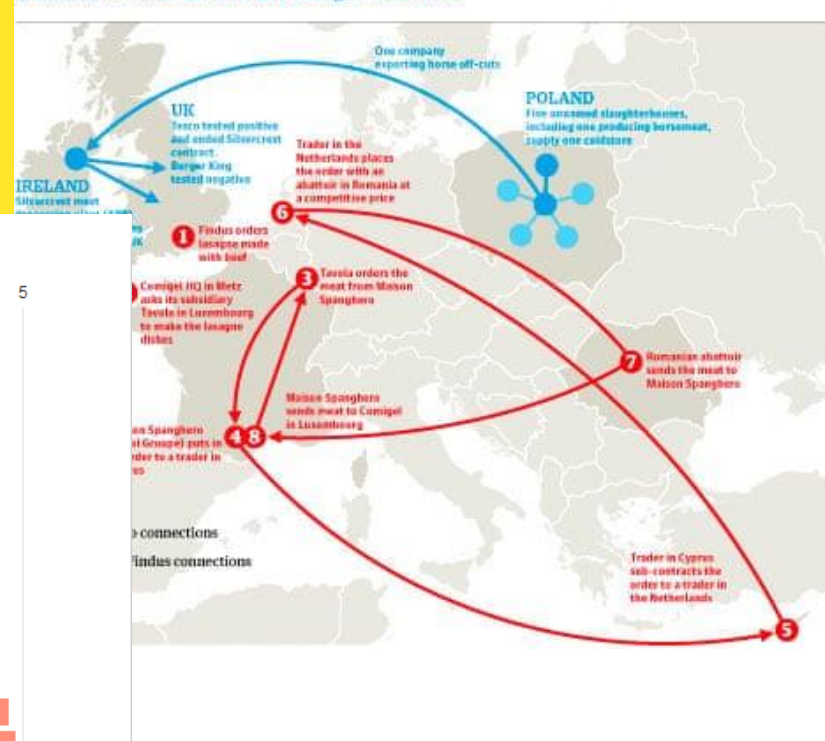
Number of announced responses: at least **150** in **79** countries and territories*

This number includes inquiries, audits or investigations by police, customs, financial crime and mafia prosecutors, judges and courts, tax authorities, parliaments and corporations



*These numbers from our Panama Papers investigation continue to grow.

Britain's horsemeat The ABP and Comigel connections

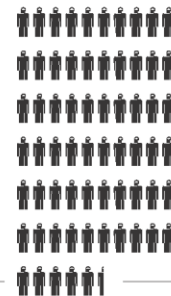


Number of people and companies investigated

Authorities are probing potential tax evasion, financial crimes and other wrongdoing revealed in the Panama Papers

1 icon = 100 people and companies

6,520*



Source: ICIJ

NewsMatch
Quality journalism matters.





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Policy & investment shifts

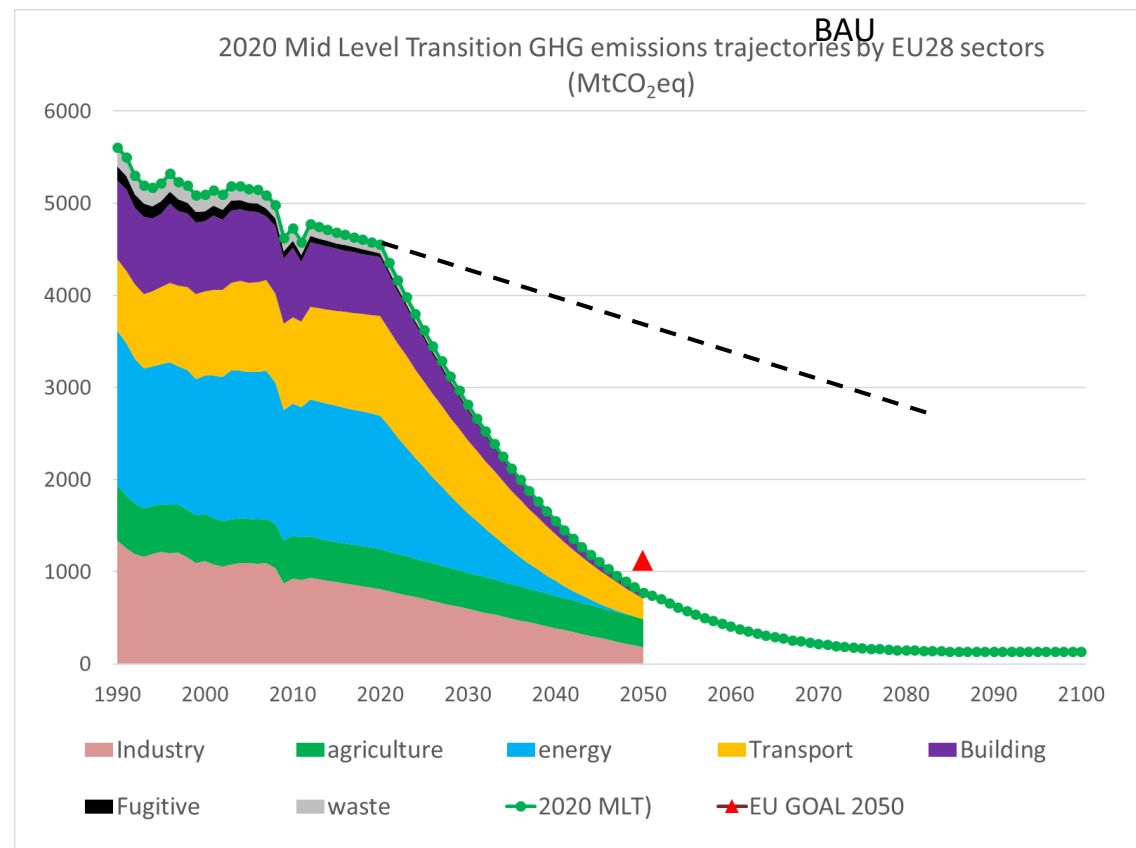
Energy Transition

- Decarbonisation of whole energy system
- Some carbon in transport, industry & agriculture
- Massive investment, behaviour & policy challenges remain

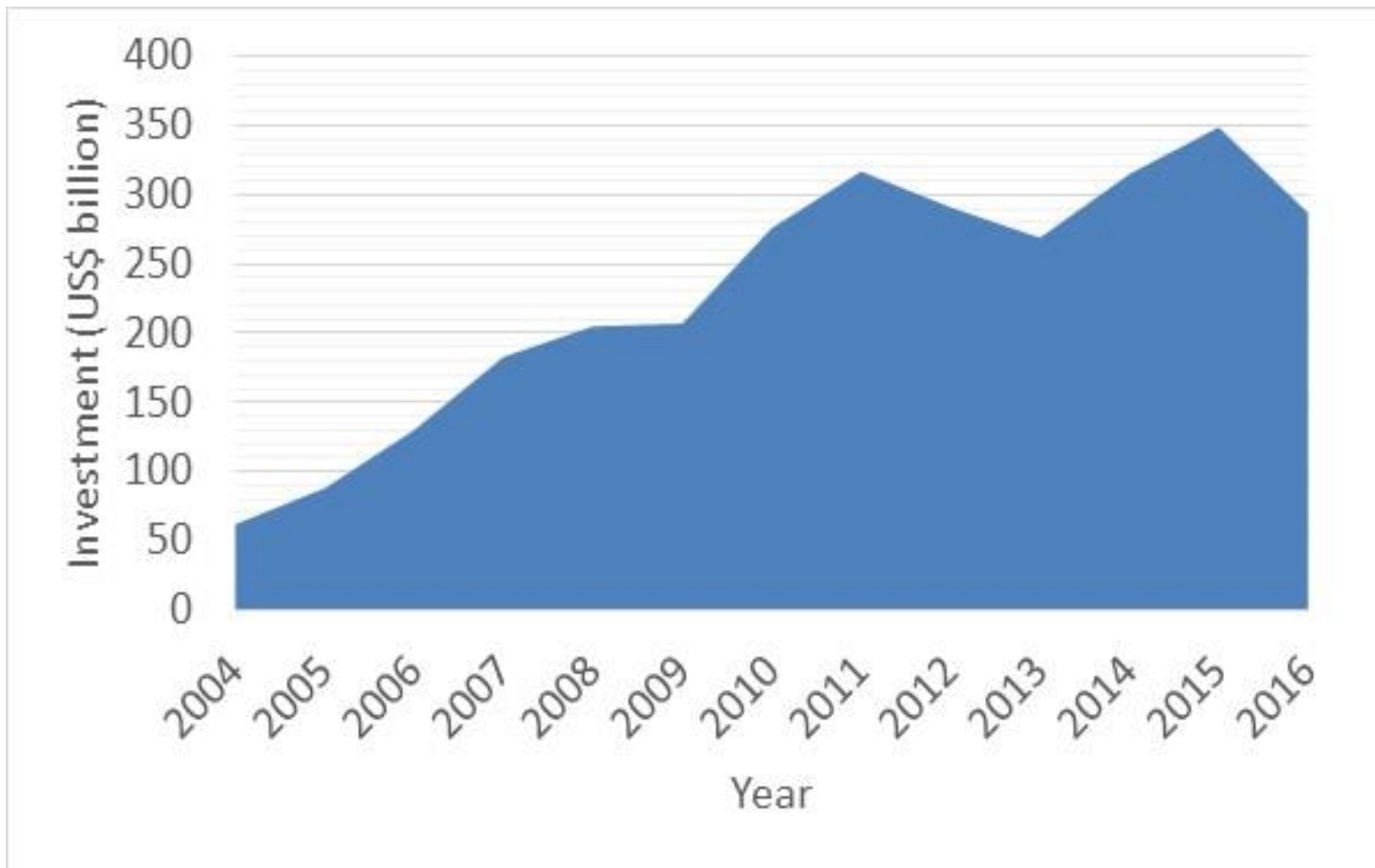
EU scenarios

OT 2020

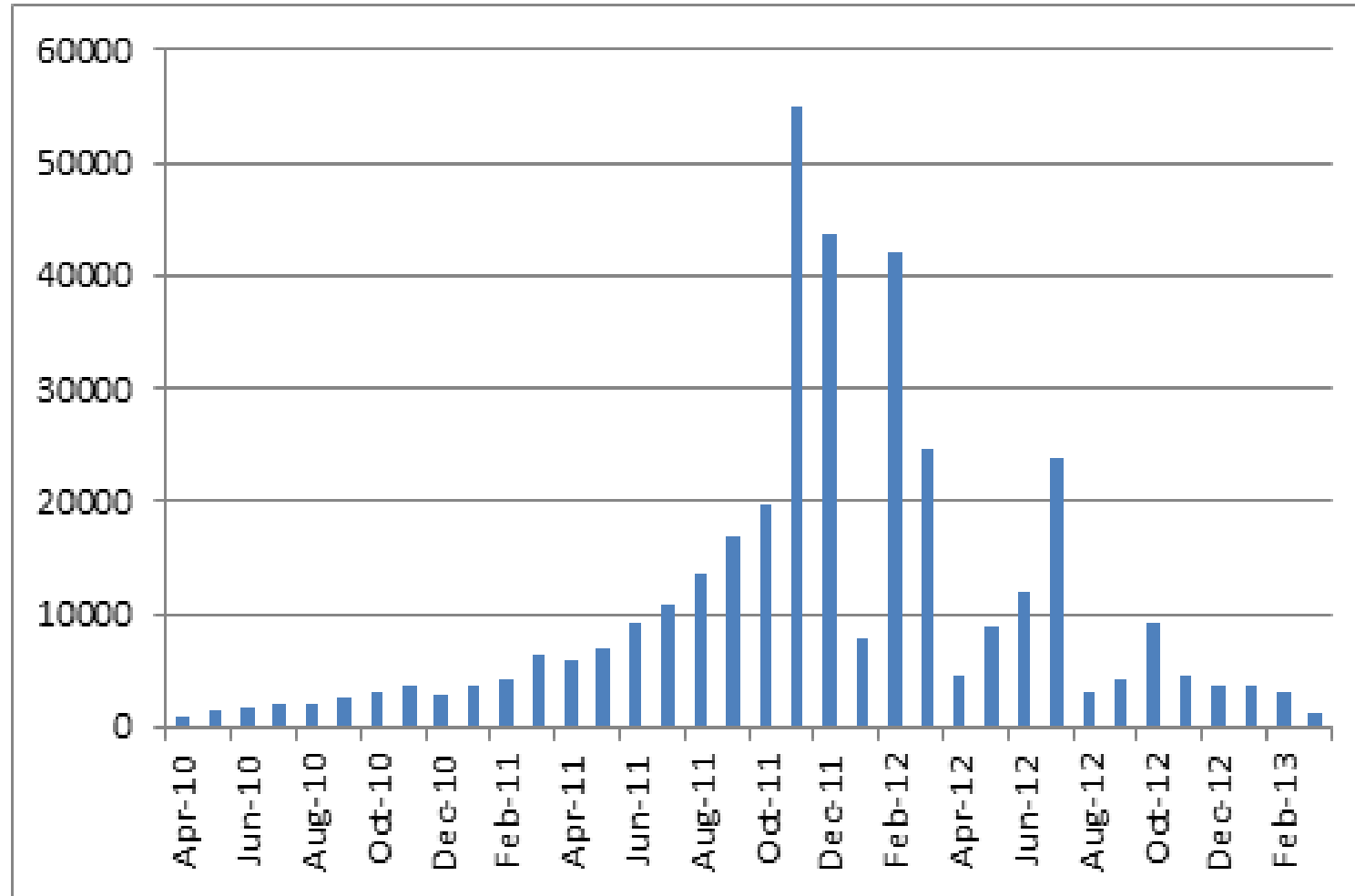
Goal: -80% GHG's 1990
in 2050



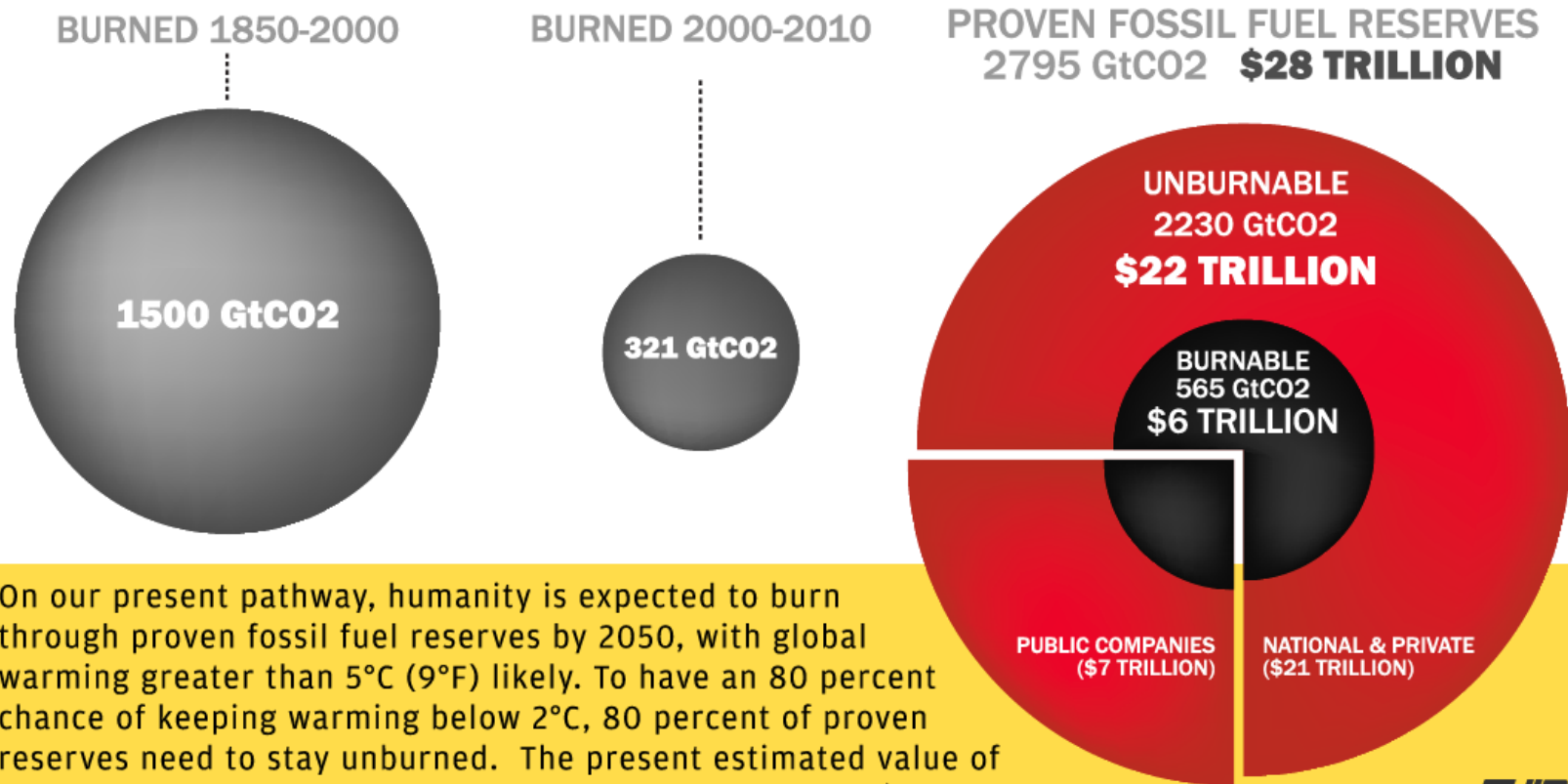
Clean Energy Investment (billions of \$)



The rise and fall of solar



THE **\$22 TRILLION** CARBON BUBBLE



On our present pathway, humanity is expected to burn through proven fossil fuel reserves by 2050, with global warming greater than 5°C (9°F) likely. To have an 80 percent chance of keeping warming below 2°C, 80 percent of proven reserves need to stay unburned. The present estimated value of these civilization-threatening reserves is approximately \$22 trillion.

**THINK
PROGRESS**

Sources: Meinshausen et al. 2009; Allen et al. 2009; Sokolov et al. 2009; Carbon Tracker Initiative 2011. Carbon reserves as of the start of 2011; since then approximately 50 gigatons of carbon dioxide have been burned. Total fossil reserves are projected to be four times larger than proven reserves, and exploration for new reserves continues.

Thanks!