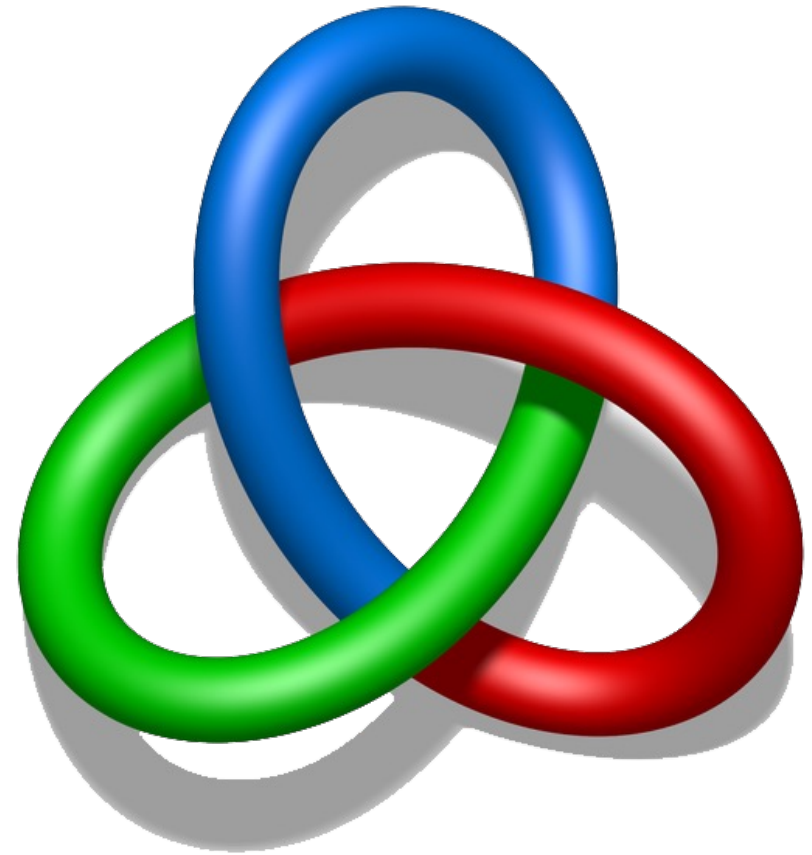


Longevity 17

Climate change and longevity risk

Nick Spencer

12th September 2022



Gordian Advice
Cutting to sustainable solutions

Agenda

- Physical and economic impacts of climate change
Nick Spencer (Gordian Advice)
- Impacts of new zoonotic and vector-borne diseases
Nicola Oliver (Medical Intelligence)
- Why do heat and air matter for longevity?
Melissa Leitner (Swiss Re)



Climate Change Health & Longevity

How does Climate impact health and longevity risks?

1 Physical Impacts

2 Transition Impacts

3 Interaction impacts e.g. inequalities, biodiversity, food systems and one-health



Climate risks are coming

Two choices: change or catastrophe

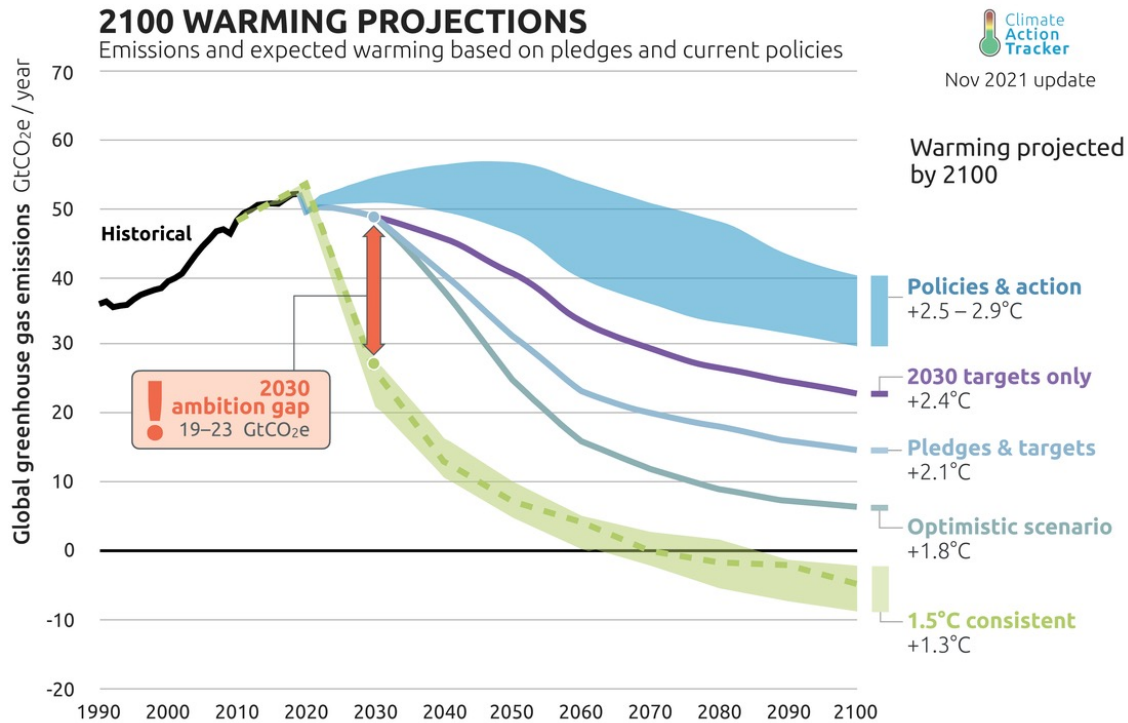


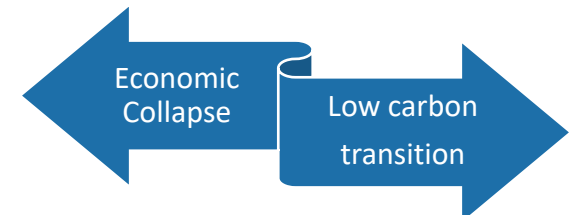
Chart Source: Climate Action Tracker, <https://climateactiontracker.org/global/temperatures/>
 1. Throughout this presentation use of "Carbon" or "CO₂" are used as a proxy for greenhouse gas emissions and their CO₂ equivalent impact on climate warming.
 2. Eg Schroder Climate Progress dashboard, 3.3°C of warming (August 2022)
<https://www.schroders.com/en/uk/pensions/insights/climate-progress-dashboard/>

- CO₂ concentrations¹ are at record levels and still rising
- Different estimators offer a range of temperature projections but 3 – 4°C by 2100 and rising often quoted based on current efforts²
- A 4°C rise is almost certainly inconsistent with our modern global economy

"In any case, we have no choice: a 2°C world might be insurable, a 4°C world certainly would not be."

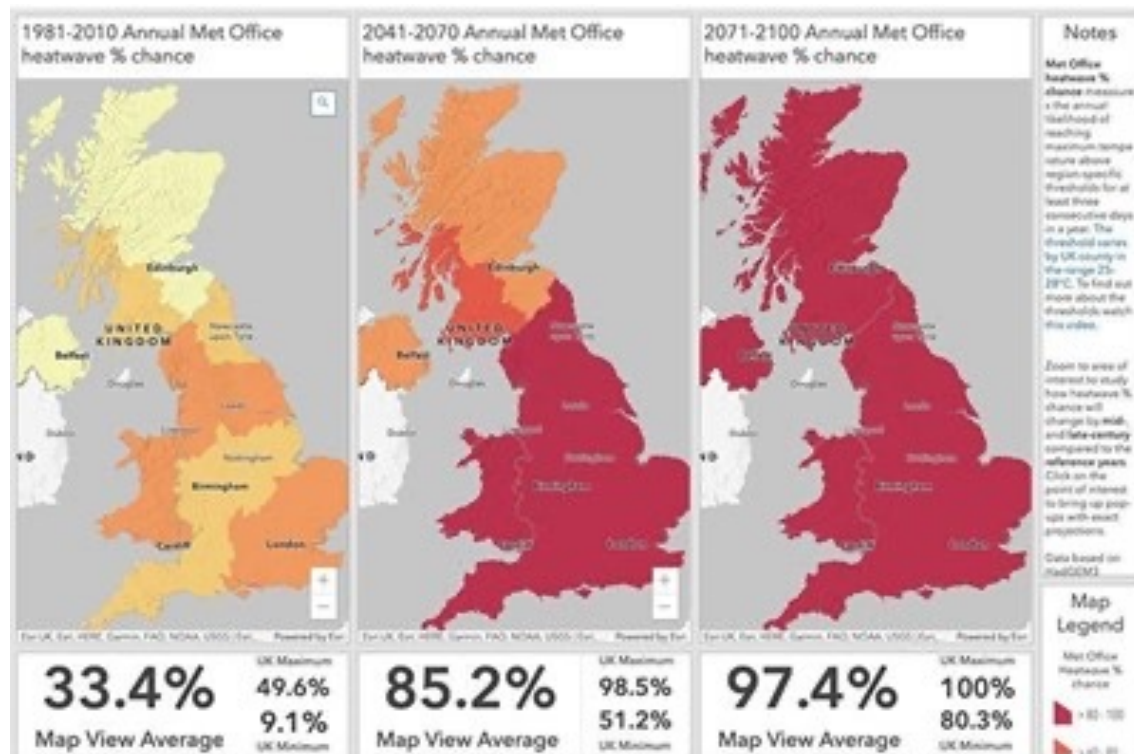
Henri de Castries, CEO AXA 2015

The Paris Agreement exists as there are only two outcomes



Physical Impacts: the heat is on

- Land temperature rising faster.
- Health impacts from prolonged and extreme exposures.
- Dramatic impacts expected on heatwaves (graphs show UK probability of heatwave (25°-28°, 3+ days))
- Climate models not yet at local scale and current impacts are significantly ahead of predictions



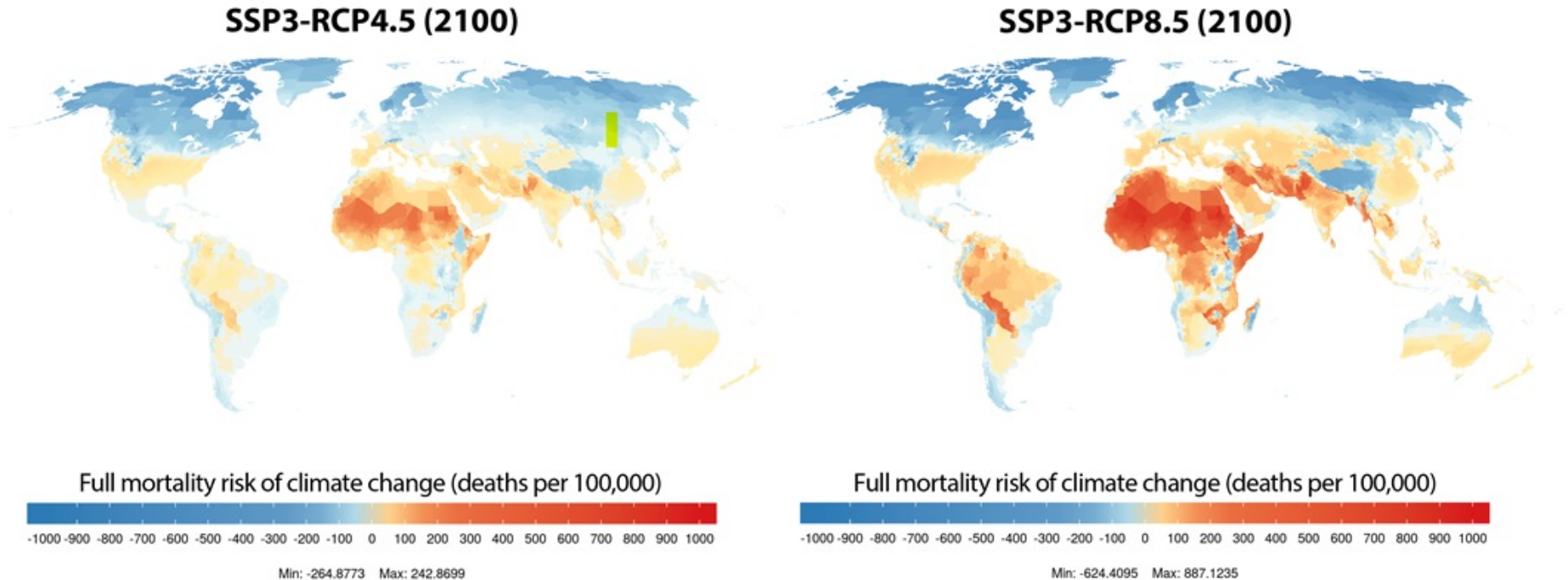
Source: <https://www.sec-ed.co.uk/resources-products/cop26-climate-change-resources-met-office-esri-uk-geography-1/>

Very significant impacts on mis-aligned housing and infrastructure – adaptation required with spending likely to fall short for the more vulnerable.



Mortality risk changes from temperature shifts

Moderate and higher climate forcing scenarios



Under high emissions, temperature impacts on projected global death rates increase by 73 per 100,000 on par with today's leading causes of death...before other impacts



Physical Impacts: not just hotter

Coastal zones and regional seas

- Sea level rise
- Increase in sea surface temperatures
- Increase in ocean acidity
- Northward migration of marine species
- Risks and some opportunities for fisheries
- Changes in phytoplankton communities
- Increasing number of marine dead zones
- Increasing risk of water-borne disease

Mediterranean Region

- Large increase in heat extremes
- Decrease in precipitation and river flow
- Increasing risk of forest fires
- Increased competition between different water users
- Increase in mortality from heatwaves
- High vulnerability to spillover effects of climate change from outside Europe

Atlantic Region

- Increase in heavy precipitation events
- Increase in river flow
- Increasing risk of river and coastal flooding
- Increasing damage risk from winter storms
- Decrease in energy demand for heating
- Increase in multiple climatic hazards

Continental region

- Increase in heat extremes
- Decrease in summer precipitation
- Increasing risk of river floods
- Increasing risk of forest fires
- Decrease in economic value of forests
- Increase in energy demand for cooling



Boreal Region

- Increase in heavy precipitation events
- Decrease in snow, lake, and river ice cover
- Increase in precipitation and river flows
- Increasing potential for forest growth and increasing risk of forest pests
- Increasing damage risk from winter storms
- Increase in crop yields
- Decrease in energy demand for heating
- Increase in hydropower potential
- Increase in summer tourism

Mountain region

- Temperature rise larger than European average
- Decrease in glacier extent and volume
- Upward shift of plant and animal species
- High risk of species extinctions
- Increasing risk of forest pests
- Increasing risk from rock falls and landslides
- Changes in hydropower potential
- Decrease in ski tourism

Not just hotter – but more floods, wildfires, hurricanes, cold/freezing weather and sea level rises/storm surges.

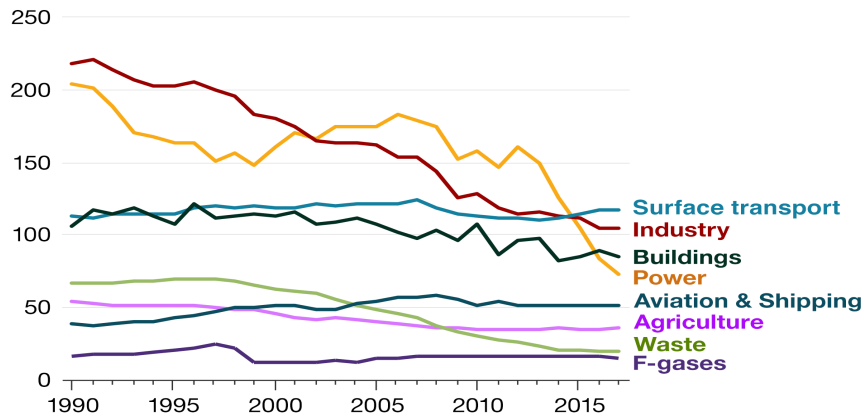


Transition Risks: climate changes everything

What needs to happen: 2021 UK Climate Change Committee report

Progress reducing emissions in the UK has been imbalanced

Annual emissions, million tonnes of CO2 equivalent



Source: Climate Change Committee/BEIS (2019)



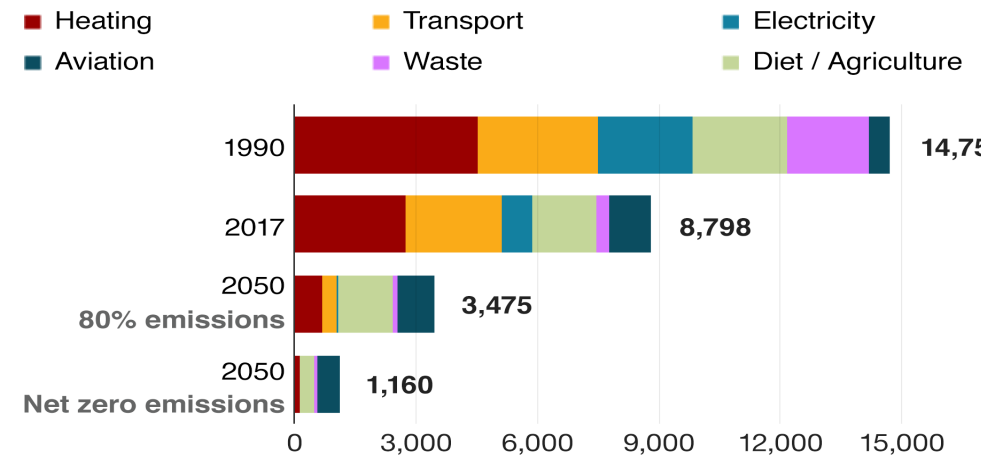
Existing changes focused in “easier” sectors

Next phases harder:

- Housing (10 million homes < Eff. Band C)
- Low carbon heating (c 30% but little progress)
- Farming (c 15% and future path unclear)
- Industry (harder conversions remain)
- Aviation & shipping (hard)

Household emissions in 1990, 2017 and 2050

Annual emissions, kilogrammes of CO2



Source: Climate Change Committee/BEIS (2019)



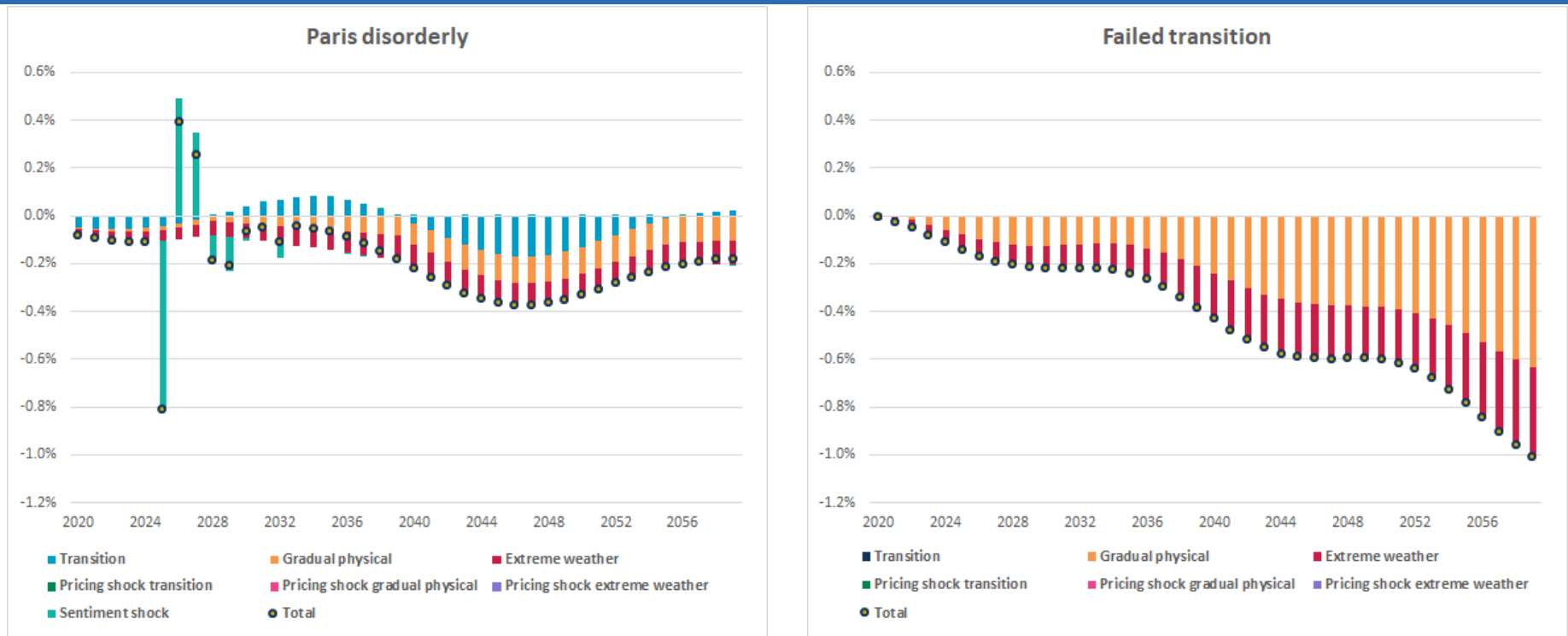
Transformational changes in just 30 years...

- 4x amount of electricity
- Significant retro-fitting to buildings
- Gas networks to hydrogen
- Limits on aviation demand, only electric cars from 2030s
- Less meat consumption
- Less waste, more recycling



Climate GDP impacts are material

Material for “Paris Aligned”, starts overwhelming productivity in failed transition



Percentage difference in the level of annual UK GDP explained by the various climate risk drivers (difference to climate-uninformed baseline pathway)

Source: “Climate change considerations for actuarial financial assumptions and the role of scenario analysis”, June 2020 (Ortec Finance)

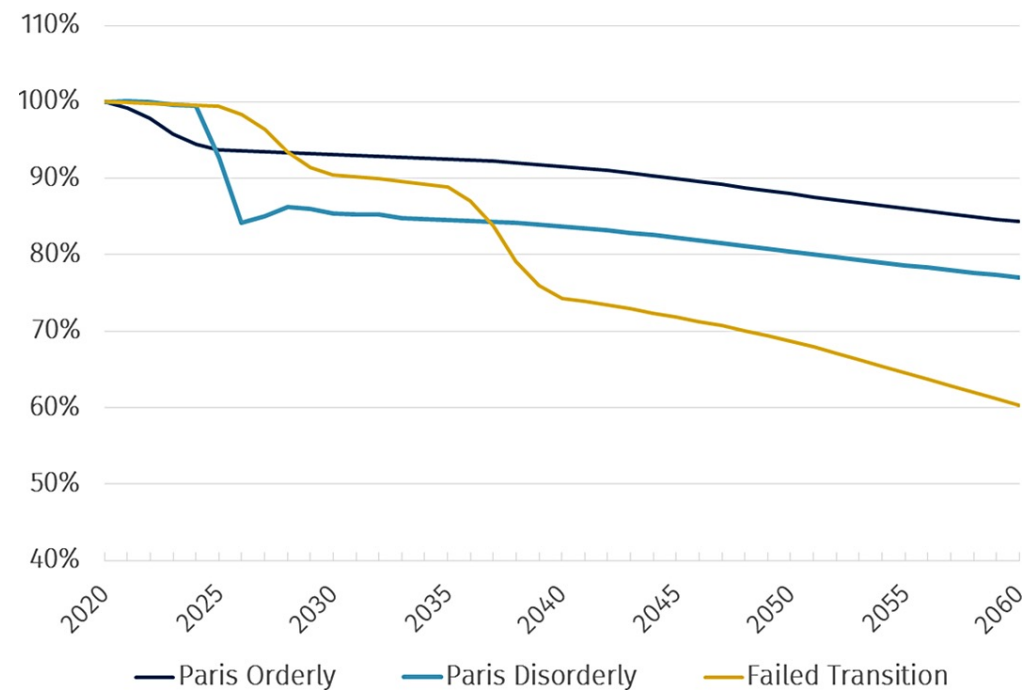


Intersectionalities: Markets and Wealth

Reflects on broader healthcare and adaption challenges

- Underperformance by 60% or more for some asset classes by 2060 (Global Equities over 70%)
- Market impact a reflection of GDP and wealth impacts
- GDP & wealth will impact healthcare spending as well as healthcare R&D and financing physical adaptations

Figure 17. Climate-adjusted UK equity returns (ratio of cumulative medians to the cumulative median of climate-uninformed baseline pathway).



Source: [“Climate change considerations for actuarial financial assumptions and the role of scenario analysis”](#), June 2020 (Ortec Finance)



Intersectionalities: air pollution

Increased Ozone and PM 2.5 Concentrations could create similar annual excess deaths to those of COVID19 (3-4 million pa)

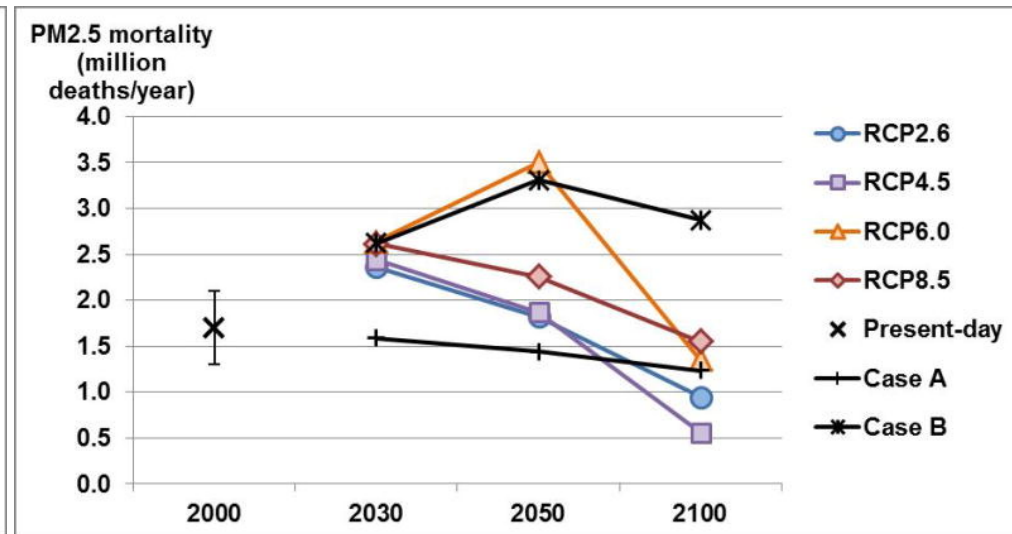
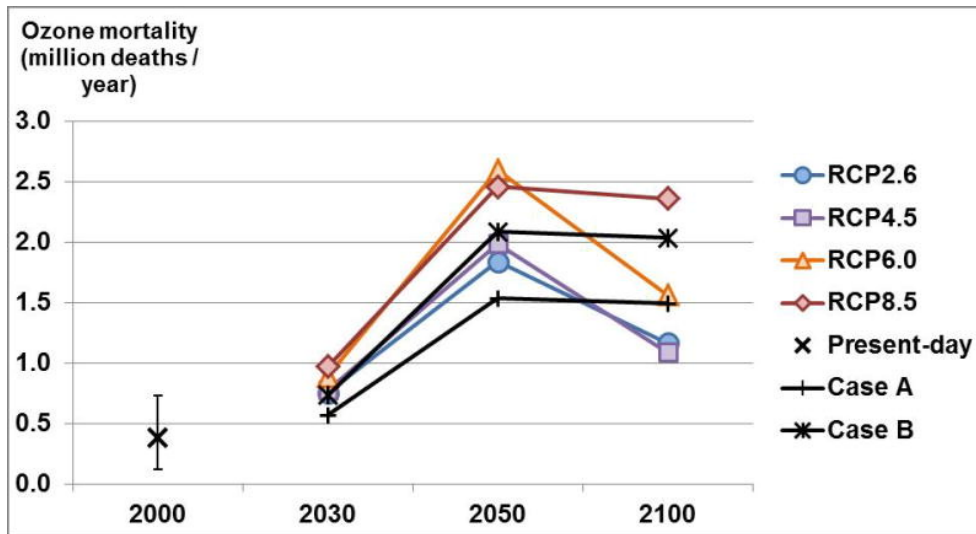


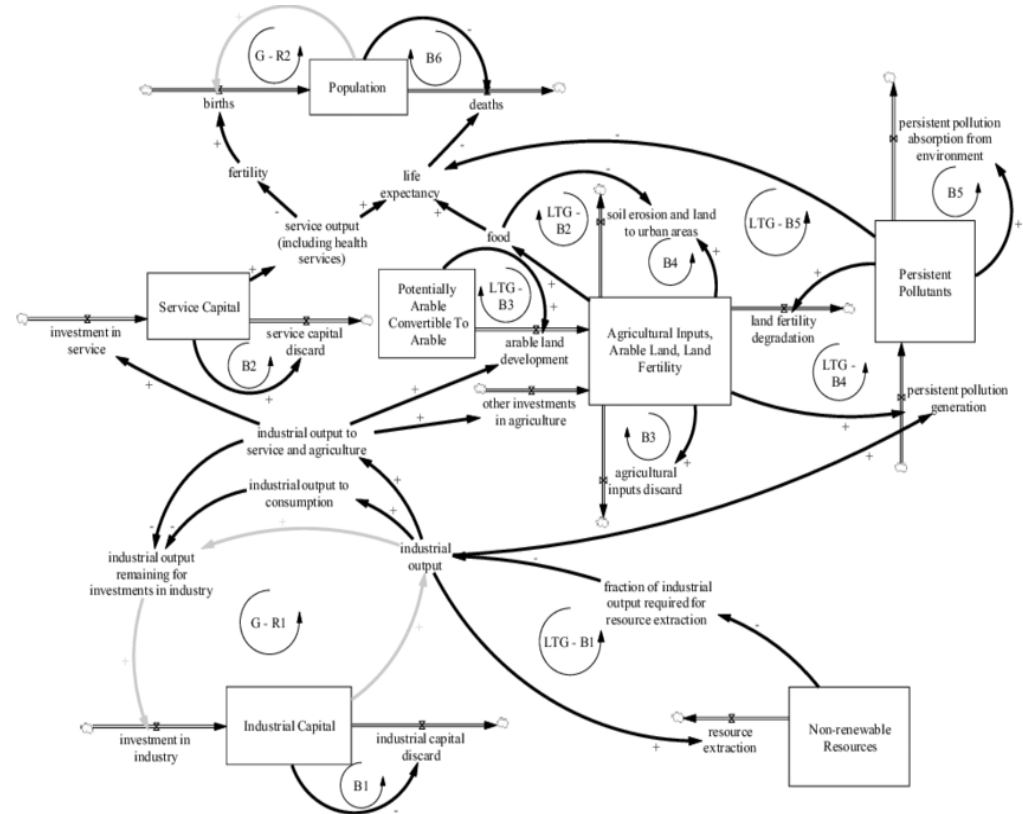
Image Source: [The effect of future ambient air pollution on human premature mortality to 2100 using output from the ACCMIP model ensemble - PubMed \(nih.gov\), 2016](#)



Intersectionalities: Food system

Access to, and equality of, nutrition

- Food systems... it's complicated
- Shift in climate likely to have significant impact especially on price and the variability of supply
- Supply insecurity and price volatility quite likely to lead to food nationalism and thus a significant geopolitical issue
- Access to, and equality of, nutrition will be reduced

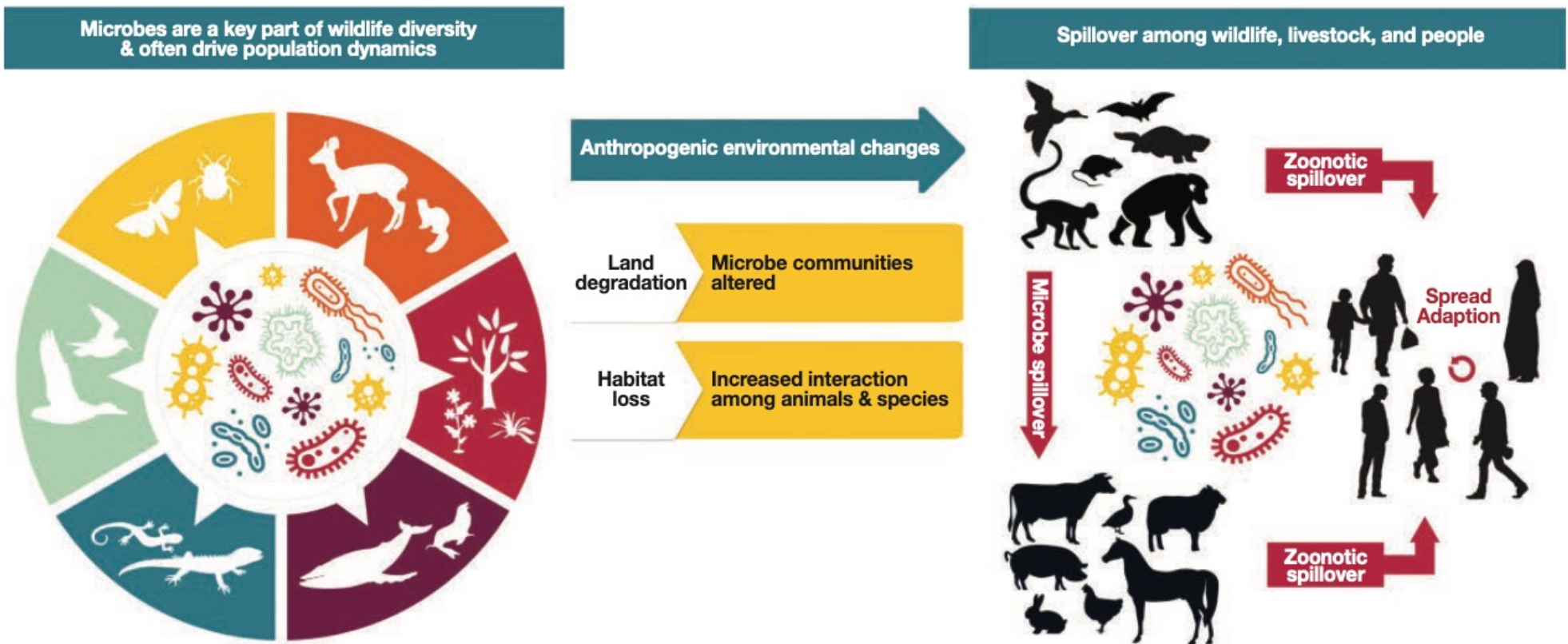


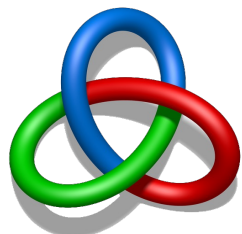
Major feedback loops and accumulation processes in the World3-03



Intersectionalities: biodiversity and “One health”

Origins and drivers of emerging zoonotic diseases and pandemics





Gordian Advice

Cutting to sustainable solutions

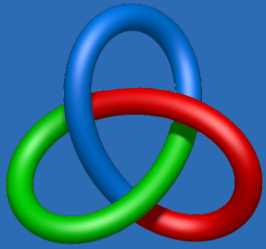
Any opinion expressed is that of Gordian Advice Limited, it is not a statement of fact, is subject to change and does not constitute investment advice as defined by MIFID II or UK Financial Conduct Authority. It is not an offer or invitation to invest in any investment product or service. Nothing in this presentation constitutes legal advice.

Unless otherwise specified, Gordian Advice Limited is the source of all data. Information contained in this material is current at the time of issue and, to the best of our knowledge, accurate. Past performance figures are not necessarily a guide to future performance. Any forecast, projection or target is indicative only and not guaranteed in any way.

It's important to remember that the value of any investments and the income from them can fall as well as rise, nothing is guaranteed and you may not get back the amount you originally invested.

All investors should seek authorised, professional investment advice before proceeding with any investment. All investors should seek the advice of a qualified lawyer before making decisions regarding legal and regulatory matters.





Gordian Advice

Gordian Advice has advised UK Pension Funds , mastertrusts & insurers with over £100 bn in assets, to integrate sustainable investment into their investment portfolios and investment strategy. It does so by helping them:

- Understand the Sustainability and Climate Change risks that are embedded in their investment portfolios and unlock potential opportunities
- **Develop beliefs, policies and practices** to manage and monitor these risks
- **Understand the potential impact of sustainability and climate change risks on their investment strategy and seek rewarding opportunities**
- **Understand the impact of their investment portfolios on climate change and broader sustainability goals**
- **Improve the Stewardship** of their assets and **consider their purpose, their agency and their impact**

Why Gordian Advice?

Gordian Advice currently works with a number of clients across insurers and pension funds who are responsible for over £100 bn in assets. Gordian Advice offers differentiated support:

- ✓ **Partner-level engagement:** cost effective due to low overheads
- ✓ **Action-oriented advice not a just consultation:** specific advice & recommendations based on applying experience & insights to your needs and not a consultation of your preference between pre-packaged options
- ✓ **Seek market savvy strategies:** focused on integrating current investment outlook & opportunities with long-term strategic objectives
- ✓ **Sustainability thought-leadership:** at the forefront of the UK actuarial profession's thinking, a co-authoring a prize-winning paper [Climate change considerations for actuarial financial assumptions & the role of scenario analysis](#)
- ✓ **Bespoke engagements:** targeted to your needs & to maximise the benefit from the available budget



Nick Spencer, Biography



nick@gordianadvice.com

- Nick is an influential Non-Executive Director and one of the leading voices in the UK investment advisory industry following 30 years' experience working as an advisor, an asset manager and trust director with Boards across the UK, Europe and the Middle East. Entrepreneurial with new business successes in every executive role, he recognised for a real passion for investing and, more importantly, a passion for his clients. He is one of the few who can explain the significance of sustainability so that it creates a penny drop moment. A visionary who sees the issues of tomorrow and looks to drive change today by developing capabilities to meet the challenges faced by institutional investors.
- Nick brings demonstrable evidence of his knowledge of the intricacies of pension schemes with a strong practical, and strategic, understanding of investment. He is an excellent communicator at all levels and a prize-winning thought leader. He is noted for the extent of thought given to every major intellectual investment challenge and the availability of such knowledge at his fingertips.
- In 2018, Nick founded his own sustainable advisory boutique, Gordian Advice. At Gordian Advice, he is a sustainable investment strategist focused on integrating long-term environment, societal and governance influences into investment strategies and portfolios.
- Nick is also a Council Member for the Institute and Faculty of Actuaries (IFoA), and a past chair of its Sustainability Board. He is a passionate believer on the importance of values & culture and an advocate for aligning the asset management industry with a broad societal purpose. He was Co-chair of Russell Investments' EMEA Diversity & Inclusion committee & is an Ambassador for the Diversity Project.

