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# Climate change, financial risk and uncertainty

Civil Service Climate and Environment  
Conference 2023

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21 February 2023



# Introduction to GAD

- Government consultancy working with UK government departments and public bodies
- Supporting policymakers to take account of risk and uncertainty
- Our mission:

*to improve the stewardship of public sector finances by supporting effective decision-making and robust financial reporting through actuarial analysis, modelling and advice.*



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# GAD broad work areas

Pensions

Insurance

Social  
Security

Other risk  
management

# Why climate change?

- Climate change is a significant source of uncertainty and risk
- Risk management can help government to make sense of this uncertainty and plan for future risks
- As actuaries we can help with the challenge of embedding climate change in government decision making



# What are we doing?

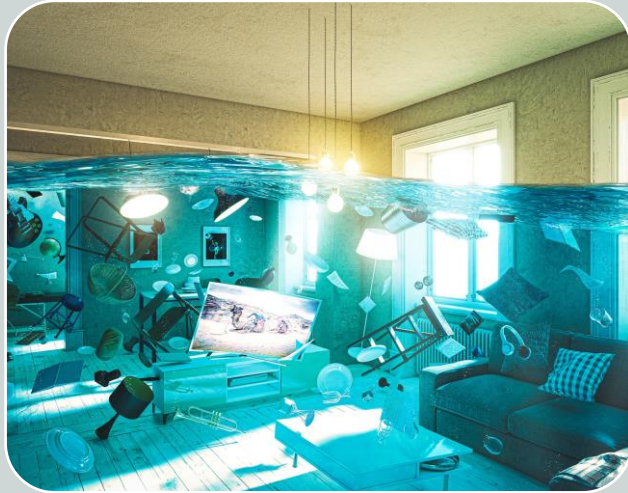
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# Supporting government workstreams



# Measuring, managing, and mitigating climate risk and uncertainty - examples



TCFD and  
Flood risk



Decarbonisation



Financing  
disaster risks



# TCFD and flood risk

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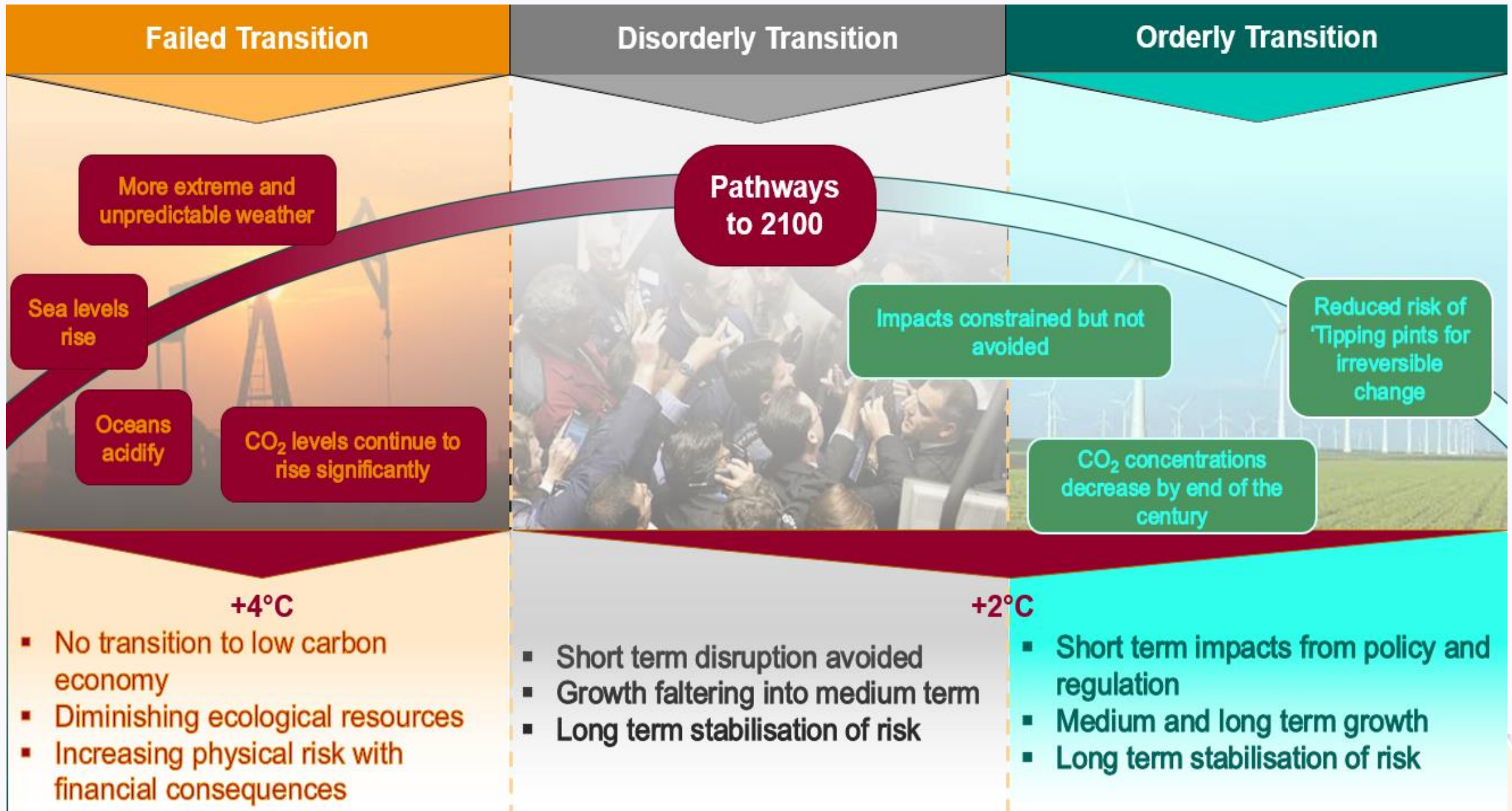


# Climate financial disclosures

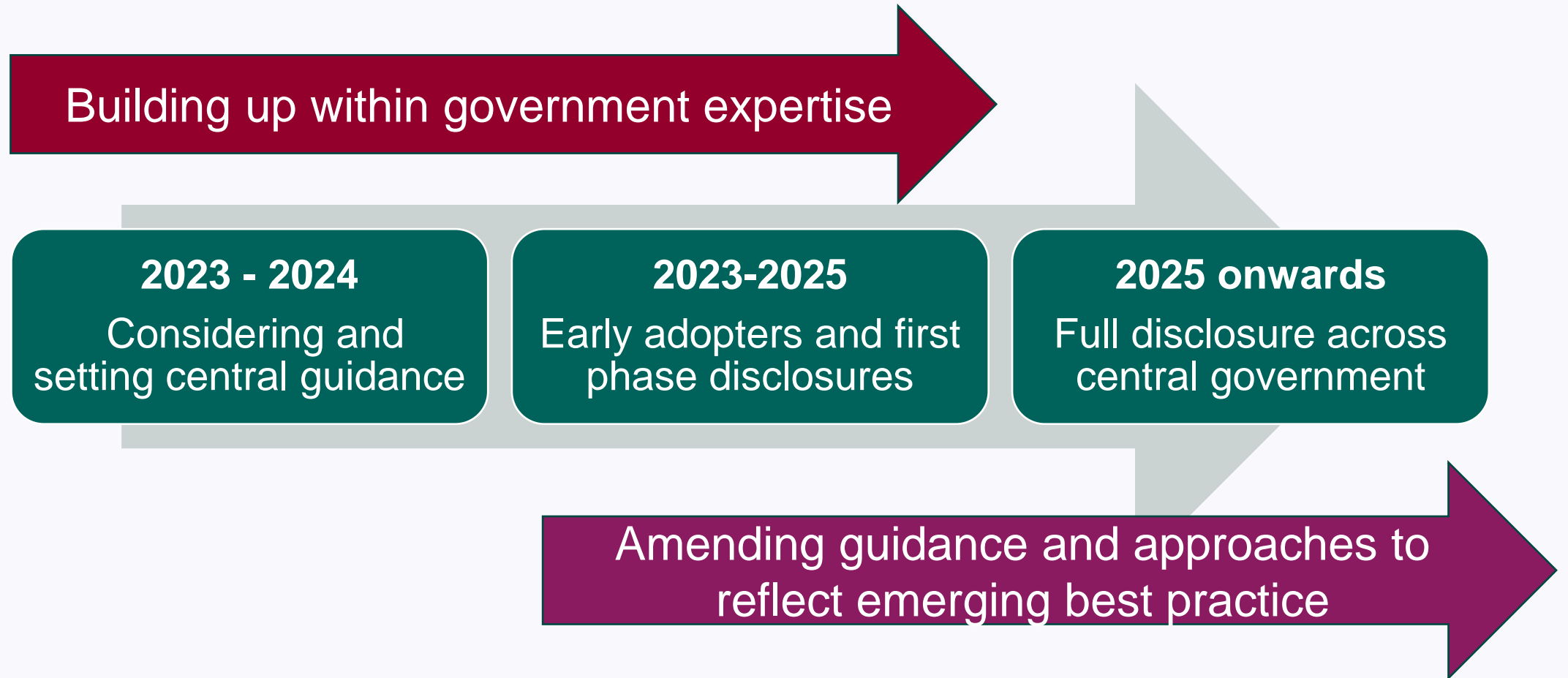
- Now commonly adopted across the UK economy
- TCFD considered the 'gold standard' approach
- Requires an assessment of climate related risk and opportunities
- Helps embed climate considerations into decision making and promote transparency



# Scenario analysis – a key challenge



# Government's plans for TCFD implementation



# GAD's role



Source of risk management expertise within government:

- Analytical and advisory
- Supporting individual departments
- Developing risk management guidance
- Supporting central initiatives and expertise building



HM Treasury



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# About the Risk Protection Arrangement

- Offers value for money alternative to commercial insurance for schools
- Schools are protected against a wide range of risks including flood, fire, and business interruption
- GAD supported DFE in setting up the RPA and provides significant ongoing support



# Climate and RPA claims - Flood risk example

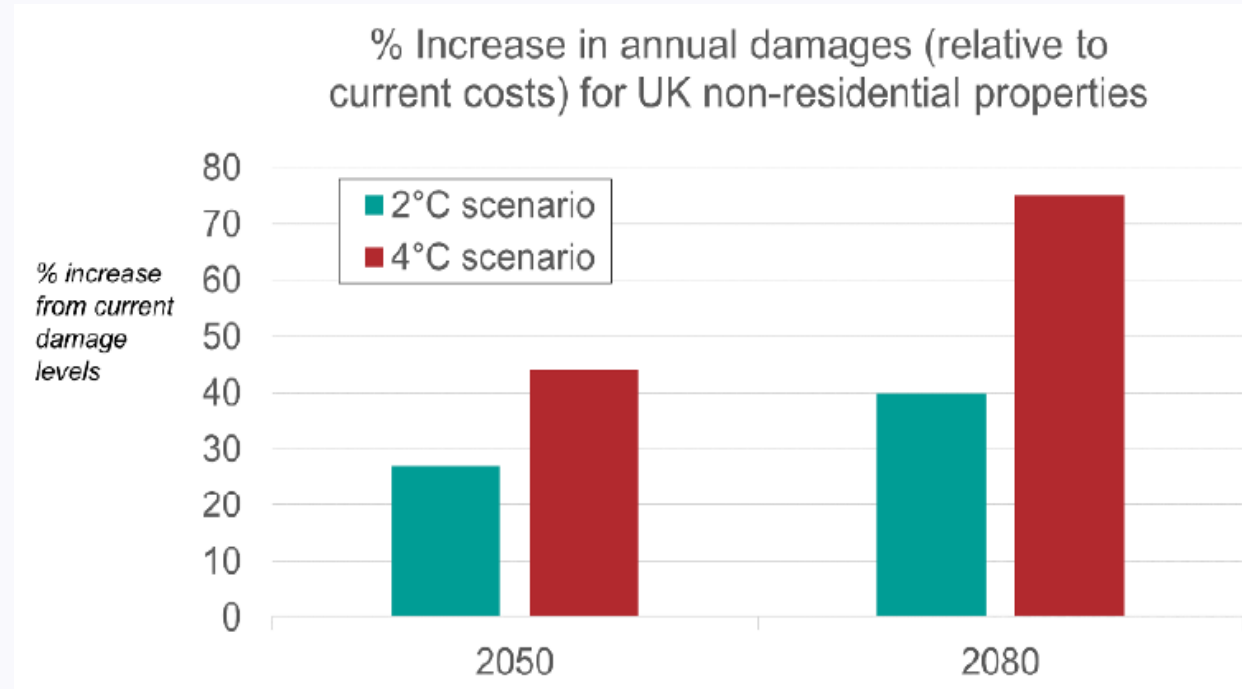
Current flood claims cost around **£1.70 per pupil year**

**Under low warming projections, costs per pupil could increase:**

- to £2.16 by 2050 (**c27% increase**),
- to £2.38 by 2080 (**c40% increase**)

**Under high warming projections, costs per pupil could increase:**

- to £2.45 by 2050 (**c45% increase**),
- to £2.98 by 2080 (**c75% increase**)



# Flood risk example – next steps

- Bespoke scenario analysis based on latest Environment Agency data
- GAD use above analysis to quantify potential costs to RPA
- Explore value for money of adaptation measures
- Ongoing monitoring of risk and experience over time



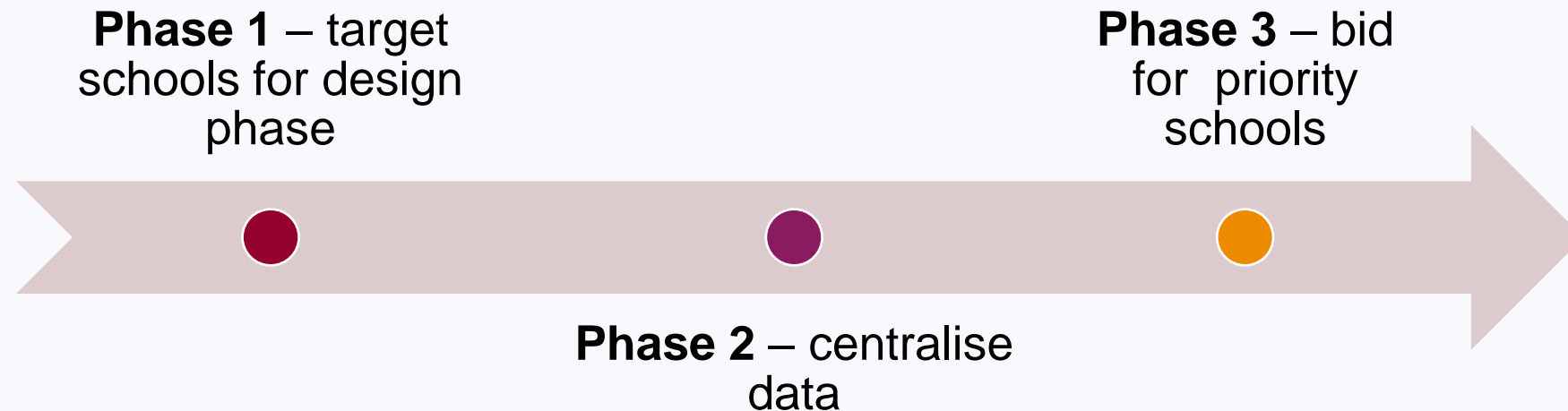


# Decarbonisation



# Decarbonisation of schools

- Project: Bid for Public Sector Decarbonisation Scheme funding



# Phase 1: Targeting schools

- Identify RPA schools with oldest, worst condition boilers

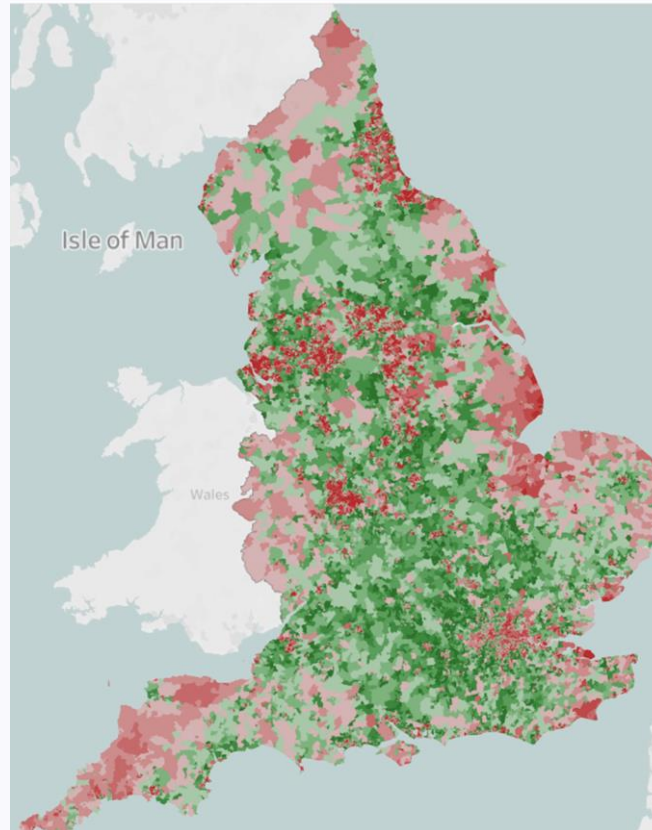
Condition	Count	>5 years	3-5 years	1-2 years	0 years
Good (A)	5,603	42%	-	-	-
Satisfactory (B)	5,560	1%	40%	1%	-
Bx	456	-	3	<1%	-
Poor (C)	776	-	<1%	6%	<1%
Cx	482	-	-	1%	3%
Bad (D)	274	-	-	-	2%



# Phase 1: Targeting schools

- Combine with overall and education deprivation indices
- Obtain even spread of pilot schools across areas
- 205 schools in pilot
- Tailored Heat Decarbonisation Plan for each school

Deprivation index

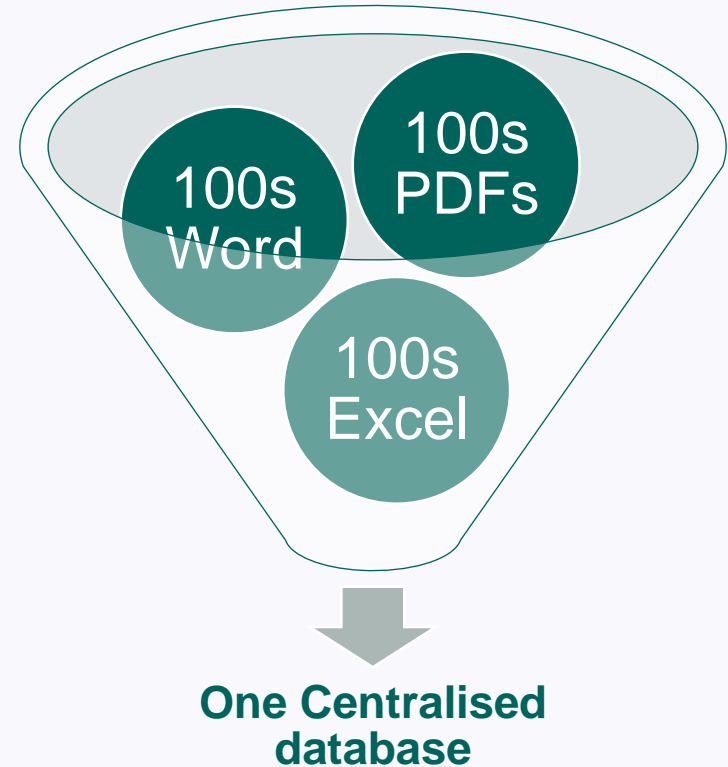


Pilot schools



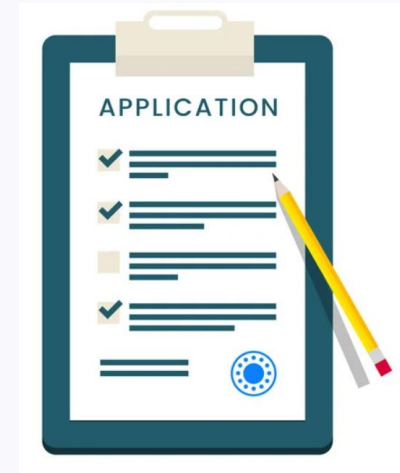
# Phase 2: Centralising data

- Collect data into centralised database
- Use data science techniques to clean and analyse data
- Assist prioritisation and completion of funding bid
- Lessons learnt for future projects



# Phase 3: Funding bid and beyond

- Public Sector Decarbonisation Scheme funding bid for 25 schools
- Project potential carbon savings from other schools
- Design future, larger Heat Decarbonisation Plans
- Link HDP assessments with RPA claim information



# Financing disaster risks

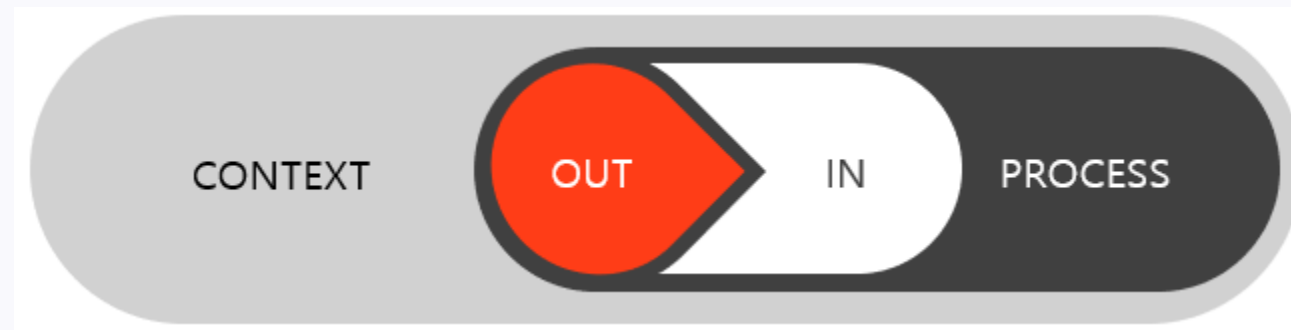




# Climate Disaster Risk Finance

**Context** – the underlying risk, need, and wider factors to consider when developing Disaster Risk financing (DRF)-based approaches.

**Money-in instruments** – the DRF instruments in place to supply the right amount of money at the right time.

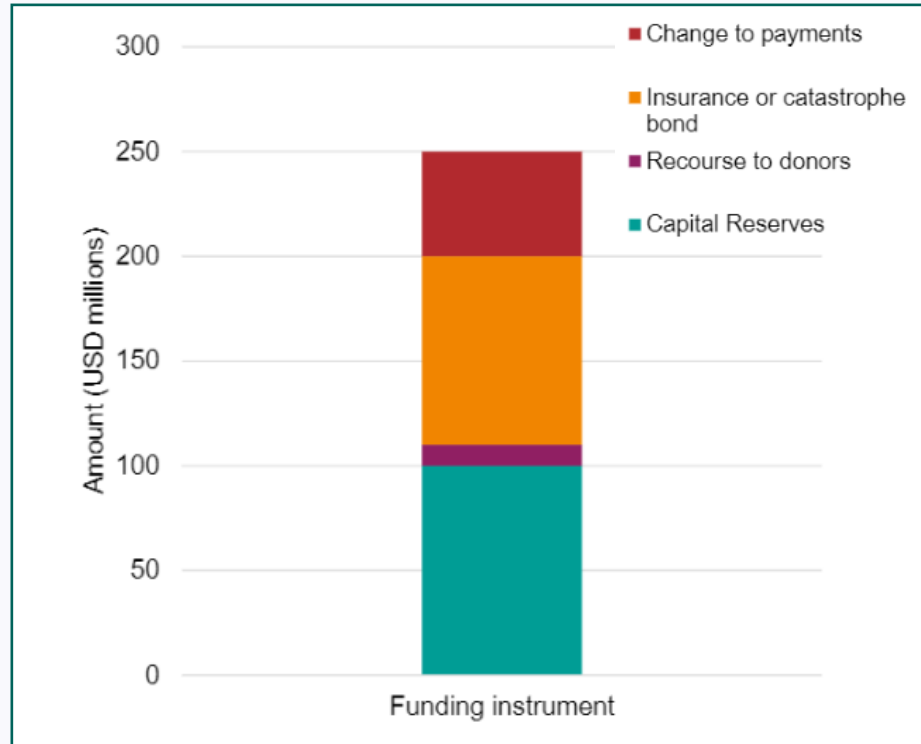


**Money-out systems** – the systems and plans in place that use money to reduce the impact of disasters on people.

**Project management processes** – practical considerations, including project implementation processes, costs, contingencies, and monitoring and evaluation.

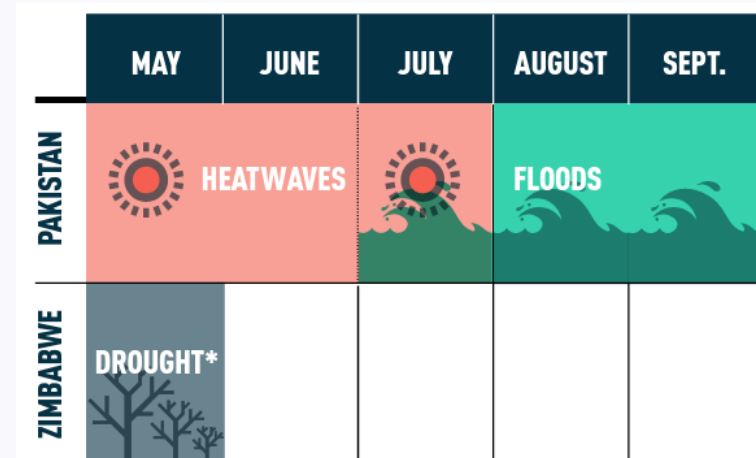
*Source: The Centre for Disaster Protection*

# Risk pooling

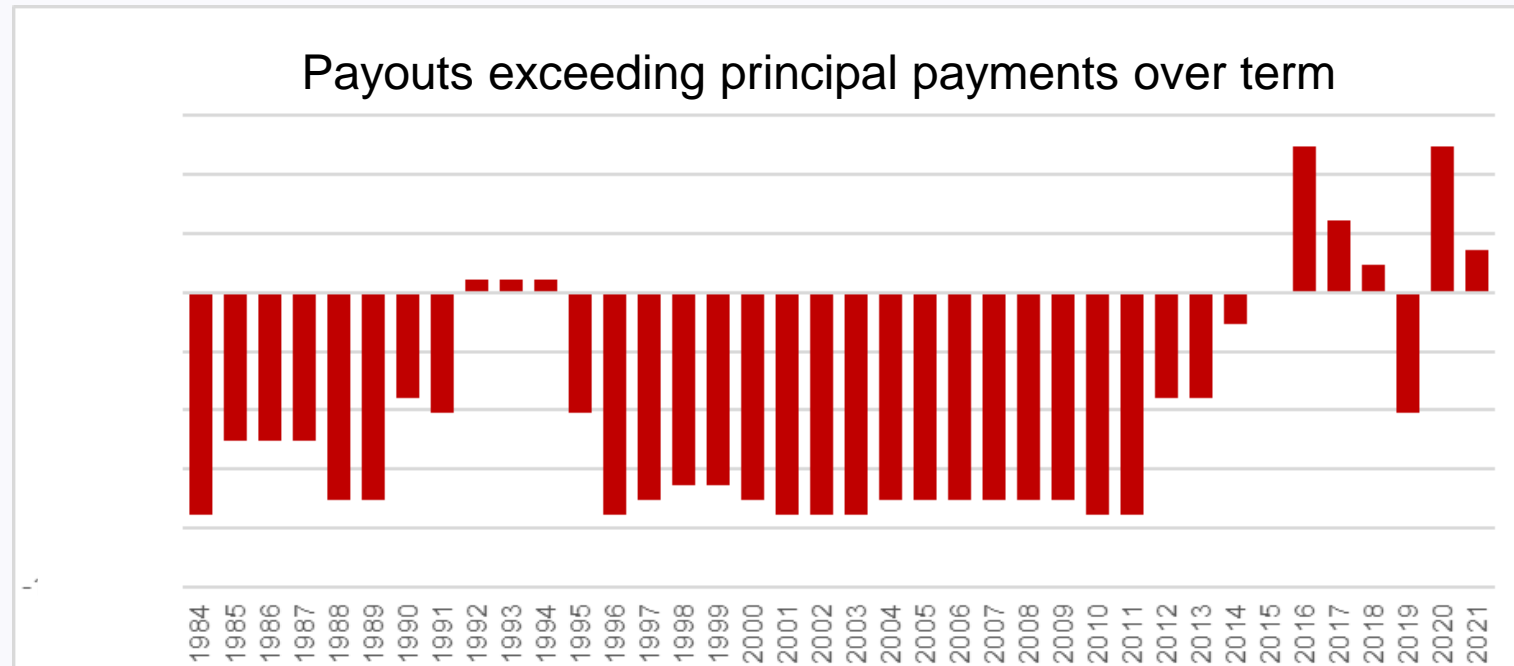


Summary of outcomes:

Total annual payment	Likelihood	Outcome
<\$100m	92%	Payouts are paid out from capital reserves. Donor tops up reserves at the end of the year so that capital position is restored (otherwise SFF's activities have to be reduced)
>\$100m	8%	As above but donor is also called upon to provide additional \$10m during the year to meet the high level of payouts
>\$110m	5%	As above but insurer/bond holders start to experience losses
>\$200m	Negligible (<0.1%)	As above but SFF scales back or stops payments to recipients



# Parametric insurance



# Q&A / Discussion

What financial risks from climate change affect your work?

How are those risks understood / managed?

How do you address the uncertainties of climate change?



# GAD Contacts



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