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Risikodiversifikation als Anpassungsstrategie

Dr. David N. Bresch, Head Sustainability & Emerging Risk Management, Swiss Re

Climate change may increase risks, creating huge challenges

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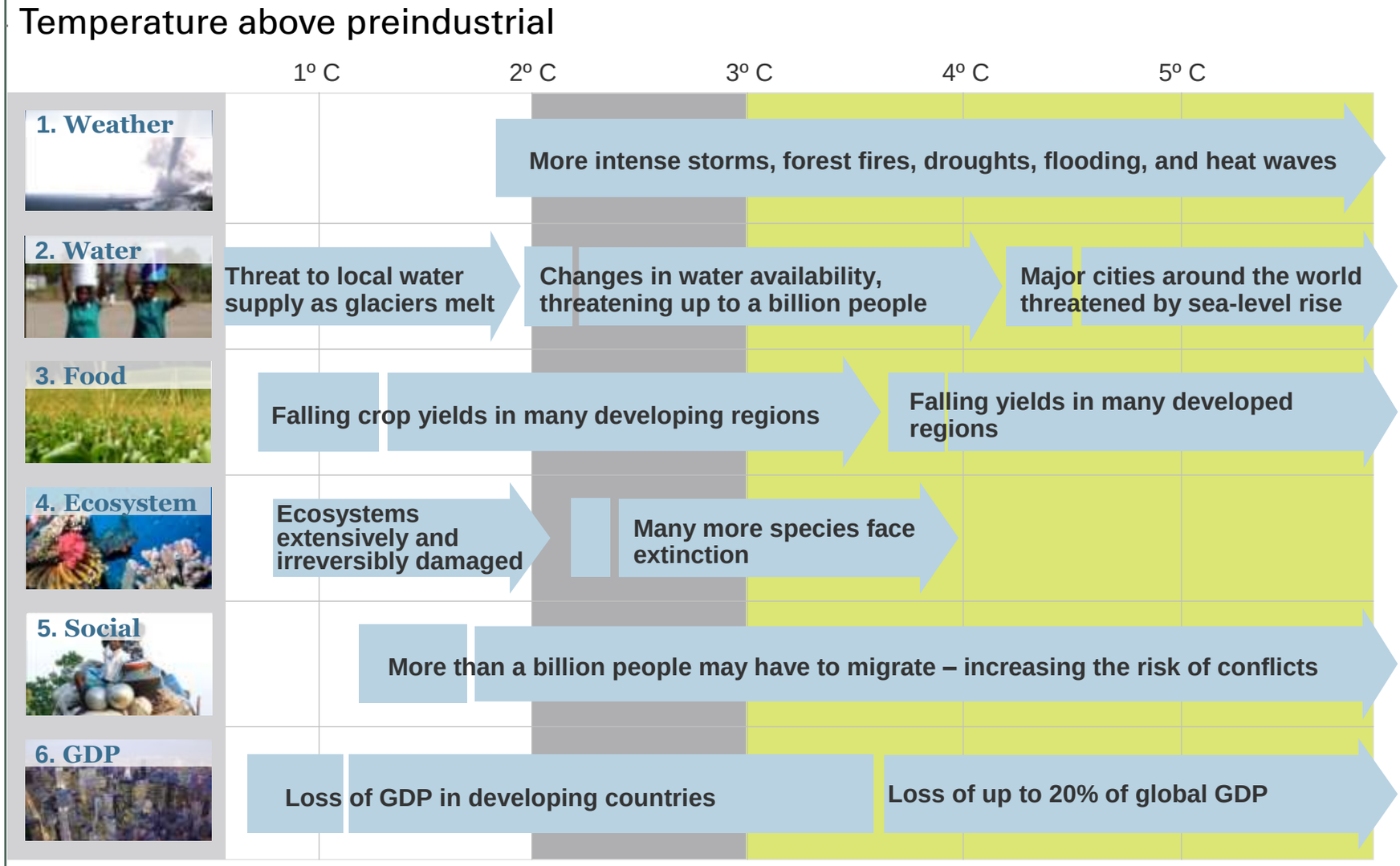
Scenario A1B

IPCC AR4 worst case scenarios



SOURCE: Stern Review; IPCC, 4TH Assessment Report, Climate Change 2007: Synthesis Report

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A framework for decisionmakers

Please find the full study at www.swissre.com/climatechange

ECONOMICS OF CLIMATE ADAPTATION

Dr. David N. Bresch, Head Sustainability & Emerging Risk Management
Swiss Re, on behalf of the ECA group

The ECA working group's aim: Help decision-makers assess and address total climate risk

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Objectives:

- Provide decision makers with the facts and methods necessary to design and execute a climate adaptation strategy
- Supply insurers, financial institutions, and potential funders with the information required to unlock and deepen global risk transfer markets

Key features:

- Developed a methodology to quantify local total climate risks, meaning it looked at the combination of
  - today's climate risk,
  - the economic development paths that might put greater population and value at risk
  - the additional risks presented by climate change.

Swiss Re's role:

- Lead contributor to the research. Swiss Re defined the assessment and risk modelling approach and provided overall risk assessment knowledge

Economics of climate adaptation (ECA) study group

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GEF — The **Global Environment Facility** (GEF) is a trust fund partnership among 178 countries, international institutions, non-governmental organizations (NGOs), and the private sector	**Climate Works** is a newly formed global philanthropic network organized to win the battle against climate change
UNEP — The **United Nations Environment Programme** (UNEP) is an international inter-governmental organization established by the General Assembly of the United Nations	**Standard Chartered** operates in many of the world's fastest growing markets, and derives over 90 per cent of its profits from the emerging trade corridors of Asia, Africa and the Middle East
Swiss Re — **Swiss Re** is a leading global reinsurer, was a lead contributor to the research, risk assessment and quantification	**McKinsey & Company** drove the analytical execution and contributed to the fact base
The Rockefeller Foundation — The **Rockefeller Foundation** is a global philanthropic corporation	The **European Commission** is the executive branch of the EU responsible for proposing legislation, implementing decisions, upholding the Union's treaties.

The working group studied eight regions with diverse climate hazards

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Methodology

TEST CASE ON HULL, UK – FOCUS ON RISK FROM MULTIPLE HAZARDS

Where and from what is the State most at risk?

We evaluated relevant hazards across the country to identify key areas most at risk

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Hull

UK, Hull:

Hazards	Impact	Comments
Flooding (river or flash		• Biggest damage to the UK with ~$2.8 billion damage, likely to increase due to climate change
Winter storms		• High threat to the UK with approximately $1,4 million damage, likely to increase due to climate change
Storm surge/ sea level rise		• Significant risk on the east coast of the UK
Heat wave		• While UK not at such a high risk compared to central/southern Europe, 2003 heat wave with impacts on mortality; very likely to rise with climate change
Snow		• Not frequent in UK, but with severe disruption for economic activity in case of event; likely to decrease with climate change

- Low impact
- High impact
- Examined further

- While heat waves and snow storms are important risks to the United Kingdom, the focus of our work was on flooding, winter storms, and storm surge/sea level rise
- The area of Hull was examined due to its high vulnerability to all three hazards and high concentration of assets, incomes, and lives

1 Intergovernmental Panel on Climate Change (IPCC) 2007, (for medium scenario of GHGs)1

SOURCE: EPA, National Hurricane Center, NOAA, AIR Worldwide Corporation, team analysis\

What is the magnitude of the expected loss?

We developed 3 scenarios for climate change

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Hull

UK, Hull

- Key uncertainties exist around climate change resulting in highly variable predictions and outcomes
  - Future development of emissions and global warming uncertain
  - Local impact of climate change on weather variables uncertain
- Development of 3 different scenarios required to account for these uncertainties

2030 scenarios	Description
1 **Today's risk**	• No change in climate, historical events used as baseline
2 **"Moderate" change**	• A2 scenario as underlining global emission scenario • Varying parameters for each return period, (storm surge height increase 16-26 cm; increase in extreme precipitation up to 3.3%
3 **"High" change**	• Worst case assumptions within the hazard modeling used (storm surge height increase of 31-42 cm; increase of 8.3% in extreme precipitation)

What is the magnitude of the expected loss?

The economic value at risk is comprised of two components – economic growth and climate change

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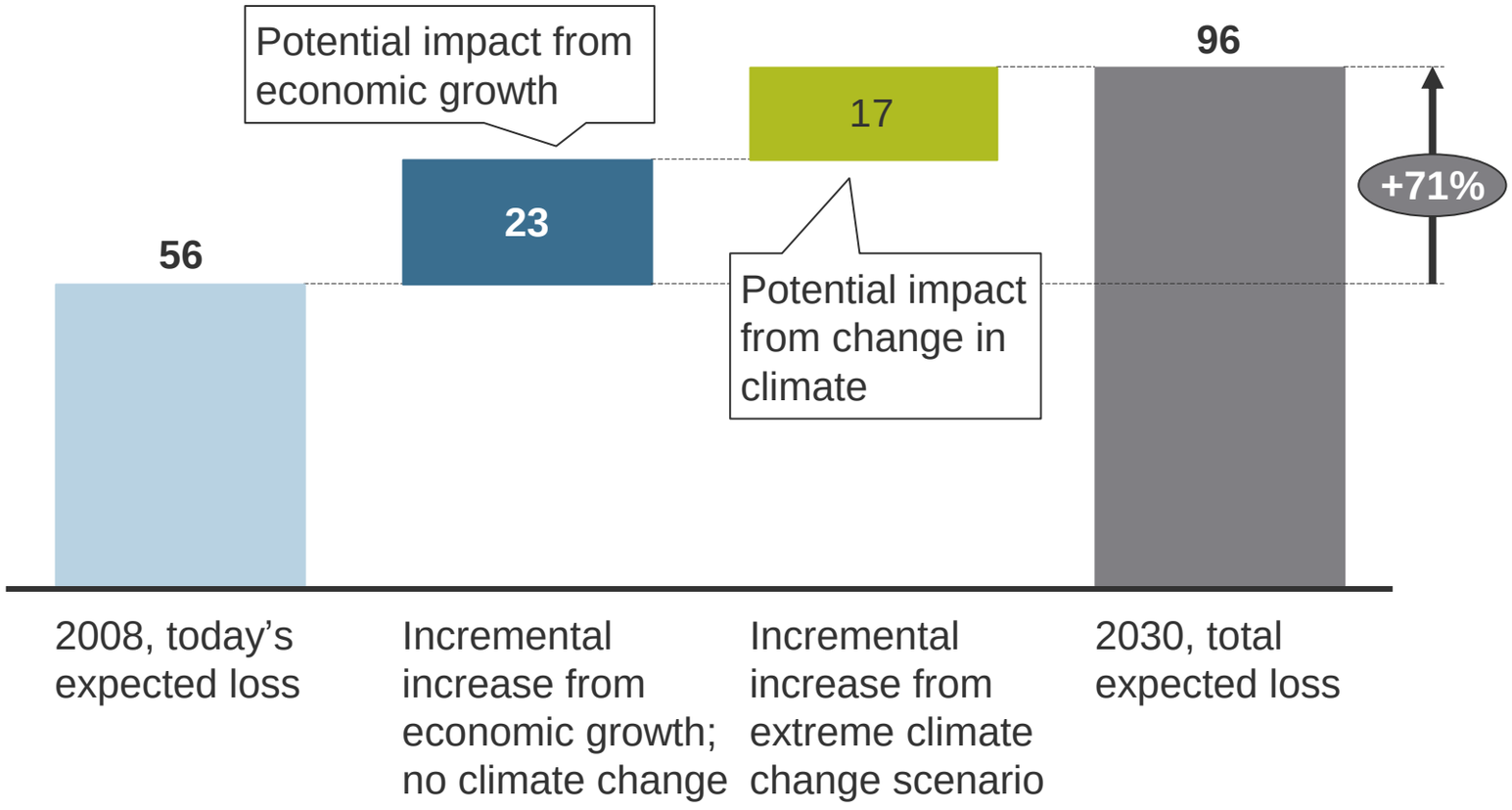
Hull

UK, Hull

Expected loss from exposure to climate
Extreme climate scenario, USD millions



What measures should be considered?

Managing total climate risk requires a cost-effective adaptation portfolio

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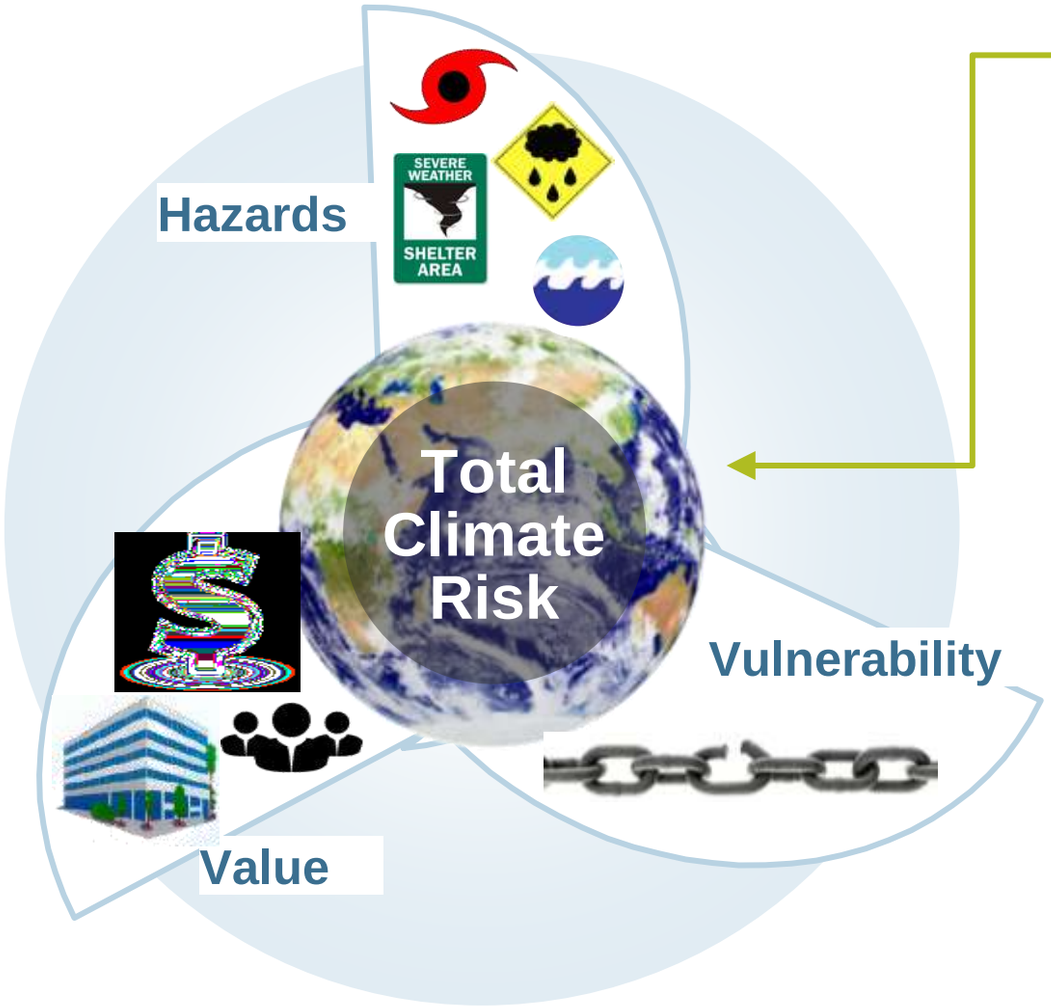

Portfolio of responses

- Infrastructure and asset- based responses
- Technological and procedural optimization responses
- Systemic and behavioral responses
- Risk transfer and contingent financing

What measures should be considered?

Adaptation measures were prioritized according their costs and benefits

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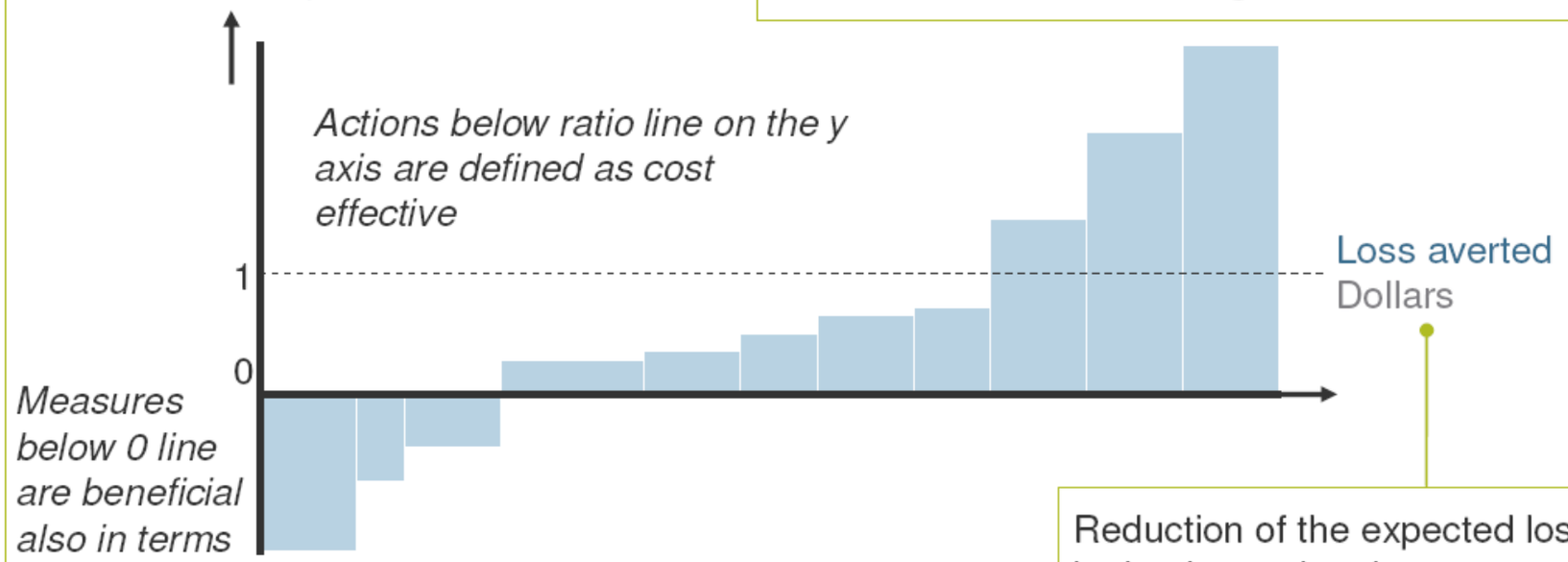
- Benefits include the loss averted and additional revenues (if applicable)
- Costs include capital and operating expenses as well as potential operating savings generated – and therefore can be negative



- Costs and benefits calculated using existing practices and costs
- Cost per unit of benefit is a NPV calculation discounted at local rates

What measures should be considered?

The initial portfolio of responses cost-effectively averts much of the expected losses

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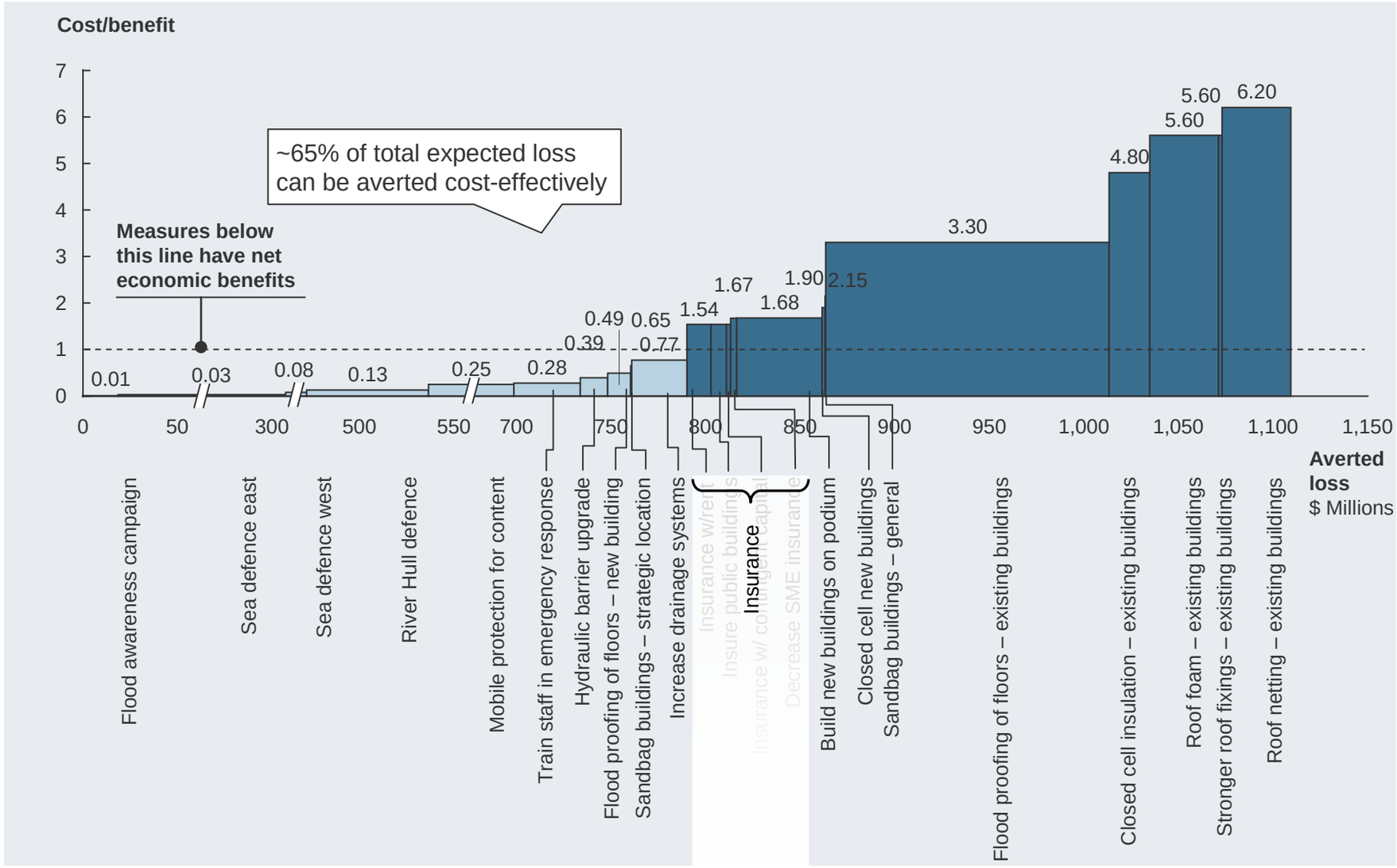
Hull

EXTREME CLIMATE CHANGE

Example Hull, UK



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The main functions of risk transfer

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Risk transfer

Benefits

- Caps losses, protects livelihood from catastrophic events
- Smoothes costs, reduces volatility
- Increases willingness to invest
- Provides incentives ("price signals")

Costs

- Expected loss plus markup for production and distribution

Please find the full study at www.swissre.com/climatechange

How can measures be implemented?

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Global overview: Expected loss averted by adaptation measures

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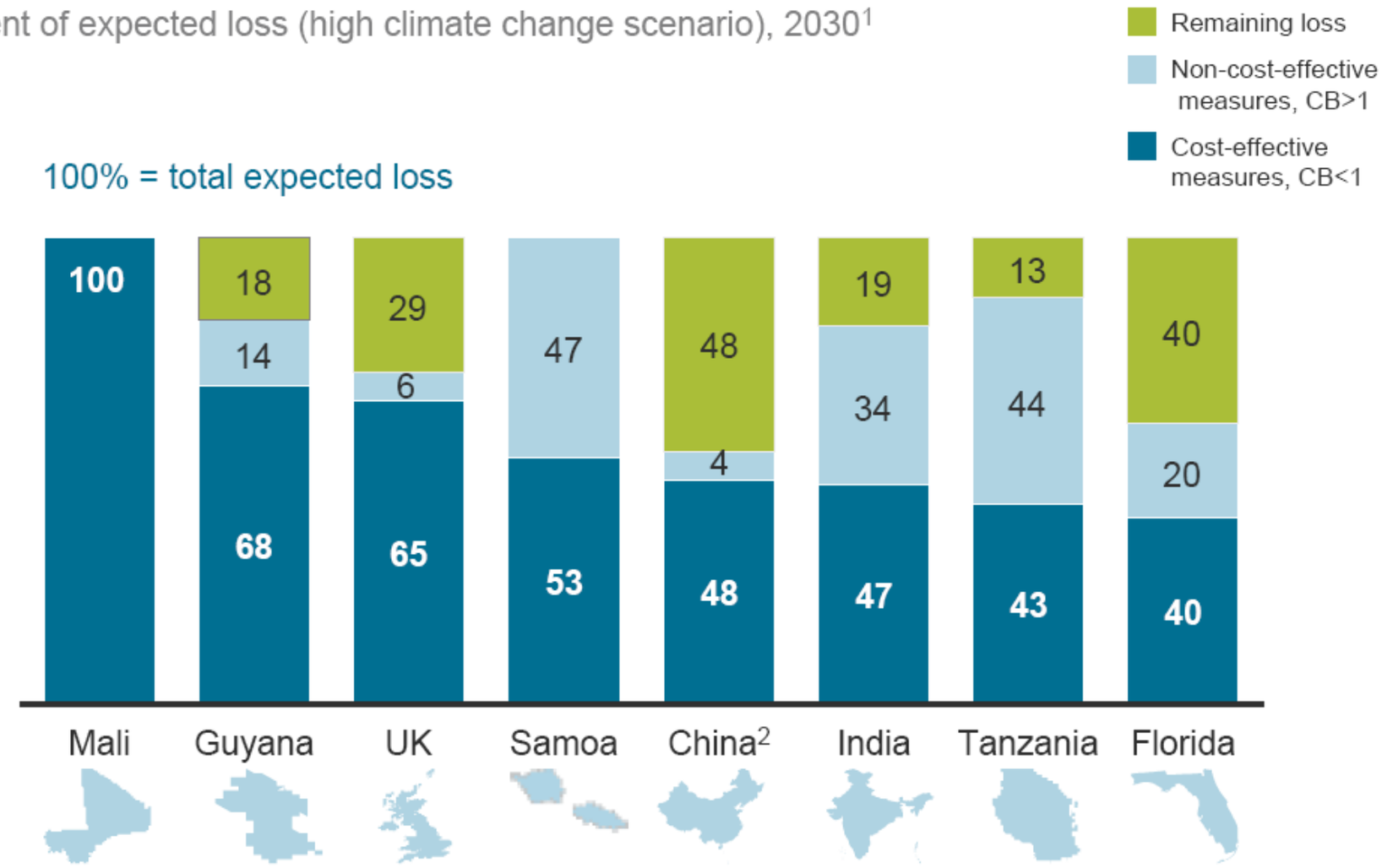
Percent of expected loss (high climate change scenario), 2030[1]



1 Based upon select regions analyzed within the countries (e.g., Mopti, Mali; Georgetown, Guyana Hull, UK; North and Northeast China; Maharashtra, India; Central regions of Tanzania; Southeast Florida, U.S.)
2 Based upon moderate scenario data and analysis

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