Cost-benefit analysis of climate change adaptation in the UK

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Contents

- Policy context
- The UK gov’ts approach
- Climate Change Risk Assessment
- Case study: flooding

The UK Government has a programmatic approach to adaptation...

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Statutory framework - Climate Change Act (2009):
Central coordination team - 40 people and approx £10m per year

Build adaptive capacity
- e.g. UK Climate Projections

Deliver adaptive actions
- e.g. Invest in infrastructure

Mainstream adaptation
- e.g. Departmental Adaptation Plans (DAPs)

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Spending decisions across Gov't are guided by cost-benefit analysis ...

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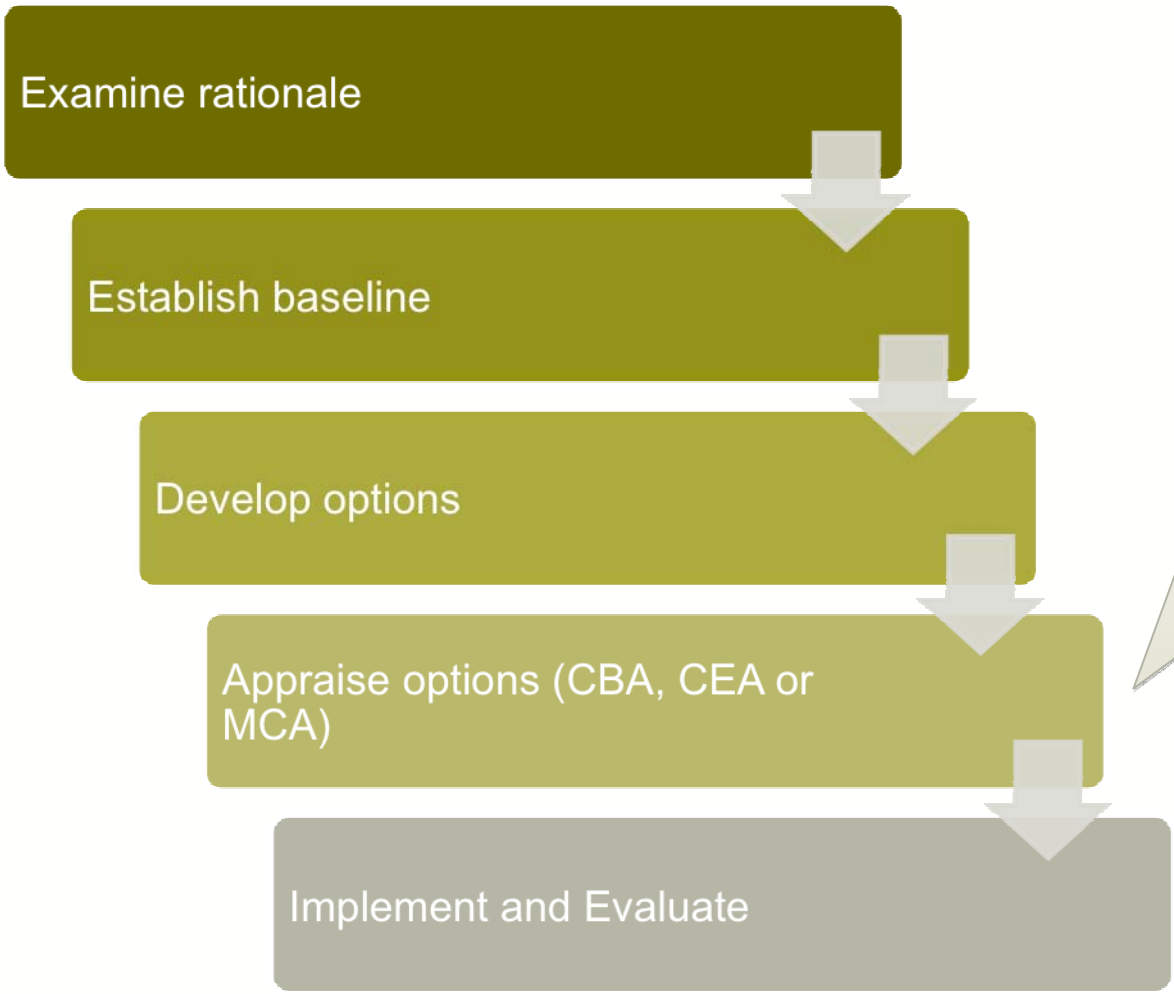

CBA:

1. Identify range of possible impacts relative to baseline
2. Express impacts in common metric (money)
3. Compare net benefits between options

... this framework can be applied to investments in adaptation...

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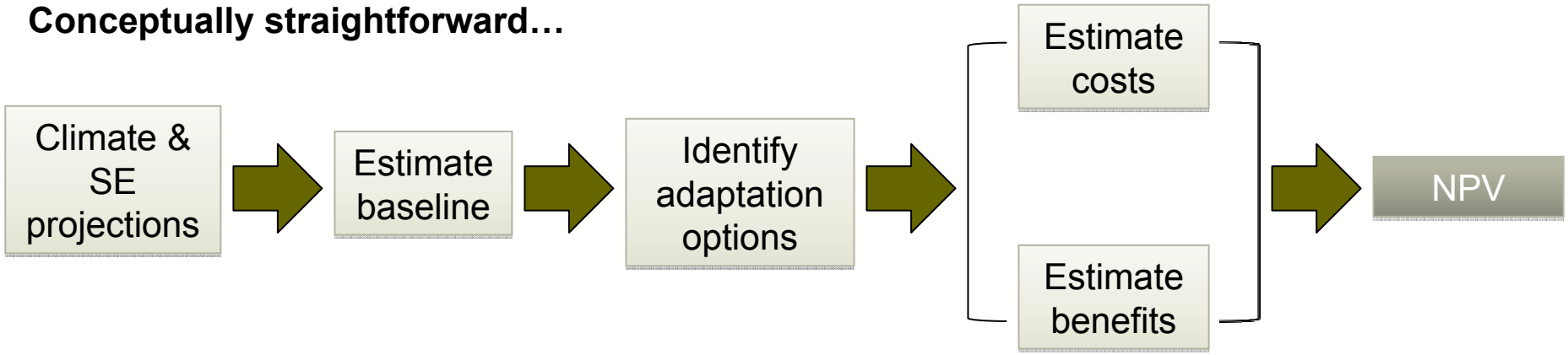
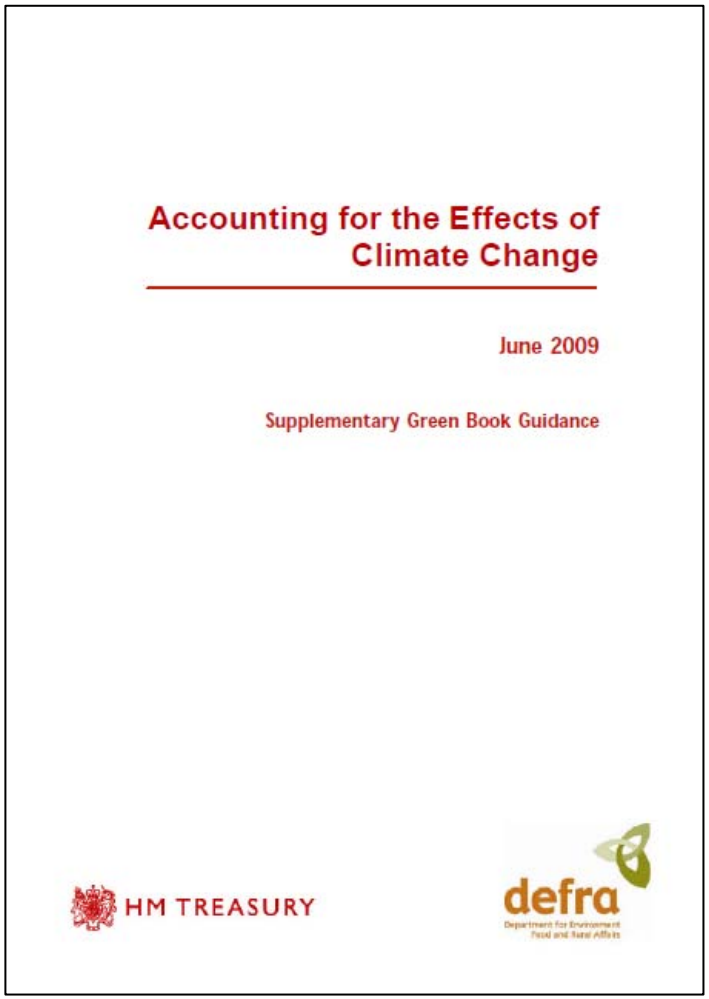
Conceptually straightforward…



… but some significant practical challenges

Data	Non-market costs and benefits; climate sensitivity, etc.
Equity	CBA looks at efficiency for the UK as a whole
Uncertainty	Pervasive uncertainty about the future climate

We've produced guidance to help address the practical challenges...



Data

- UK Climate Projections '09
- EVRI database
- Case studies

Equity

- Equity-weighting
- 3.5% discount rate (declining after 30 years)
- Option to use lower discount rates for large scale, irreversible decisions (Stern approach)

... with a focus on dealing with uncertainty

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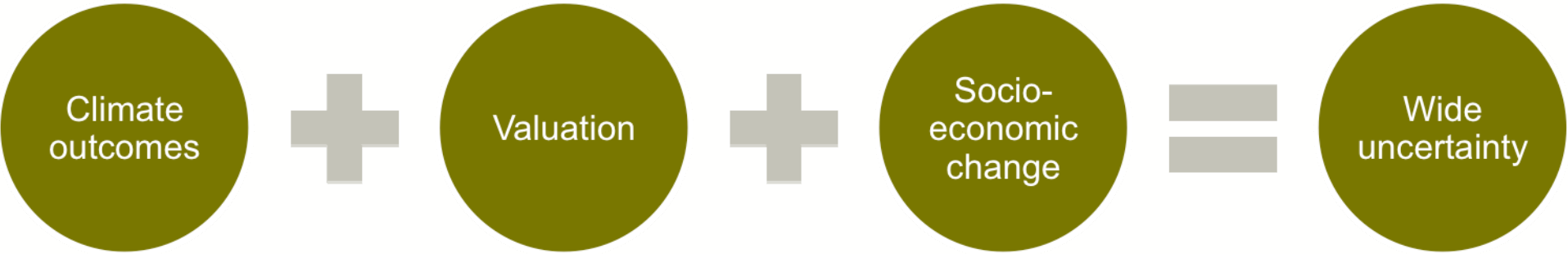
3 major sources of uncertainty...



… and the suggested response

Flexibility	Use ROA to capture value of flexibility
Sensitivity tests	Identify how the results are affected by different assumptions
Monitoring	Pervasive uncertainty about the future climate

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We are also producing a strategic overview of the UK's adaptation needs...

Climate Change Risk Assessment (published 2012)

Adaptation assessment (Mid 2012)

Indicative scale of costs & benefits

Priorities for adaptation policy

Integral to the Government's planned adaptation programme ...

Focus	Policy priorities – decisions in the next 5 years
Consistency	Use existing Government appraisal framework
Integration	Uses results of existing policy levers – DAPs, Reporting power

... balancing the need for rigour with practicality

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Potential complexity...	...proposed approach
570 risks – excluding cross-sectoral	**Pilot** alternative approaches
Probabilistic climate projections – 3 emissions scenarios	**Expert engagement** and stakeholder workshops
Multiple time periods	**Semi-quantitative** analysis used in many sectors
Geographic detail – 4 countries	**Focus** on policy priorities – role of Government

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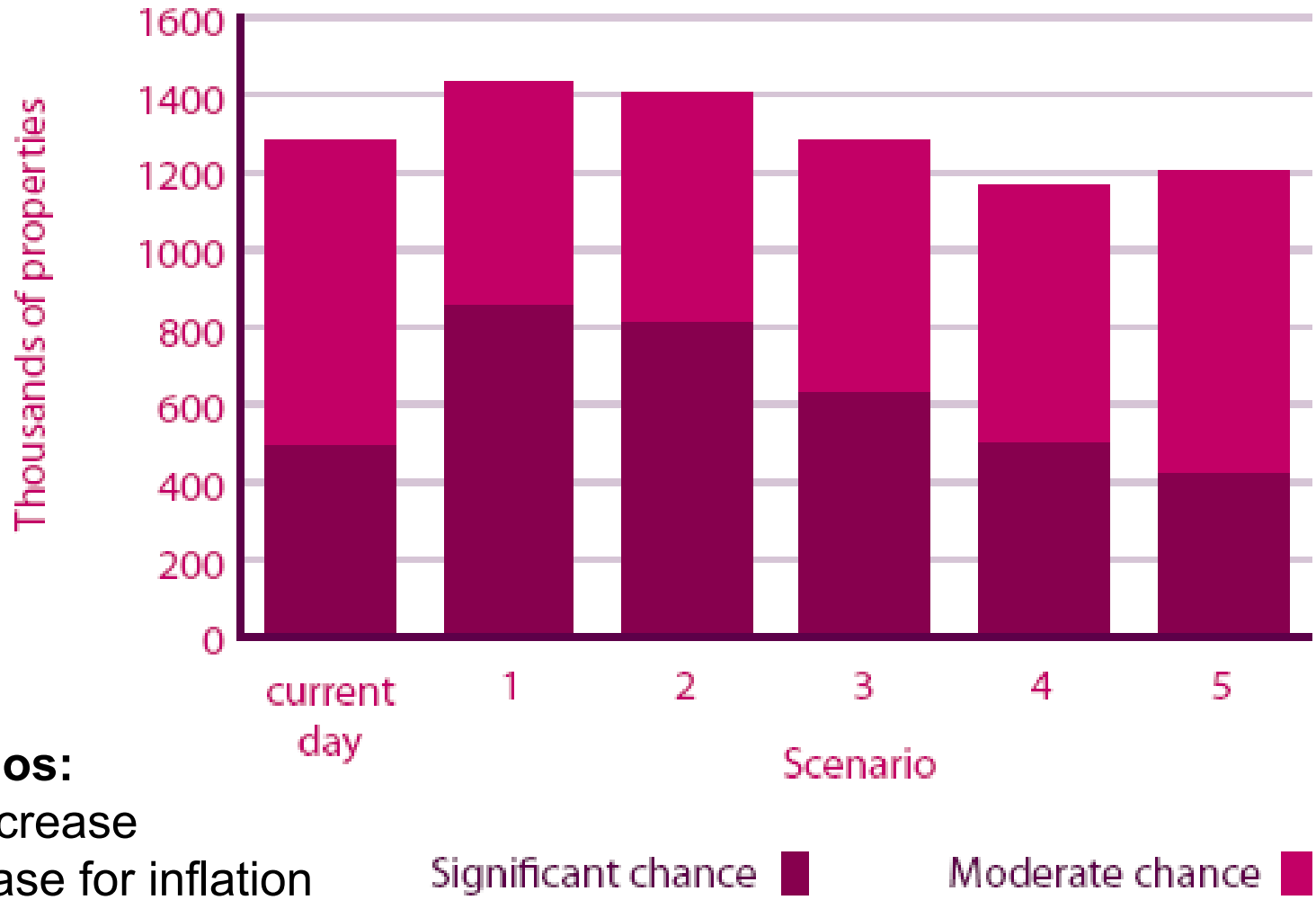
Increased flooding will be one of the main climate change impacts...



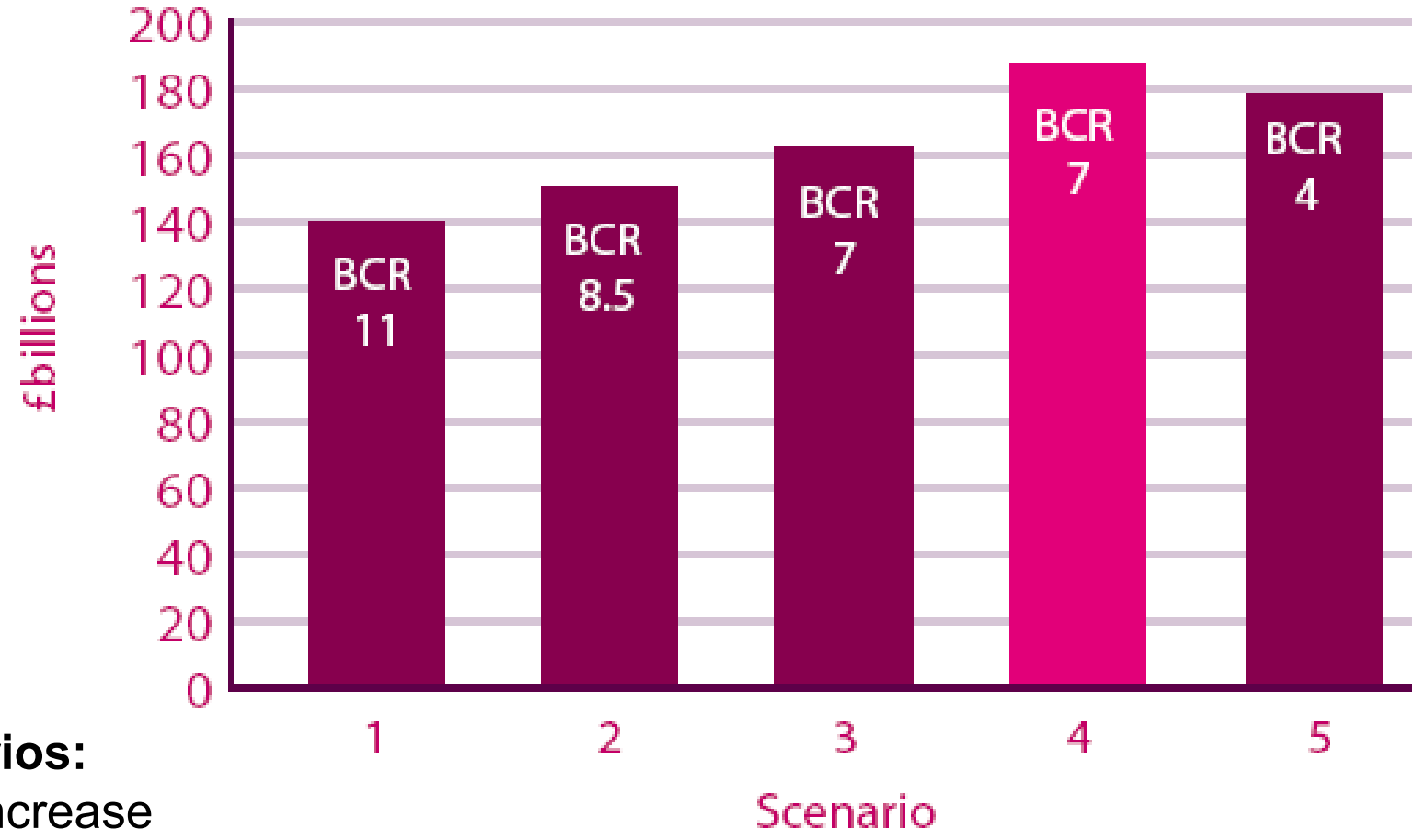
Scenarios:

1: No increase

2: Increase for inflation

3, 4, 5: Varying increases

... And recent analysis has assessed the net benefits of action to address this



Scenarios:

1: No increase

2: Increase for inflation

3, 4, 5: Varying increases

BCR = benefit-to-cost ratio

Some messages from the flooding analysis

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Scale of potential benefits	Option 4 entails increasing spend by 80% to £1bn per year, with a BCR of 7:1
Need for local analysis	This set strategic picture, but also need local assessment – e.g. Thames Estuary
Range of options	Analysis only considered investment actions – need to consider other ways of reducing climate risk

Overall conclusions

Applicability	Basic approach of CBA is applicable to adaptation
Case for action	CBA evidence essential for making case for action in UK context
Breadth of coverage	Risk of focussing on areas that are easy to monetise – role for complementary approaches
More Information	michael.mullan@defra.gsi.gov.uk www.defra.gov.uk/adaptation

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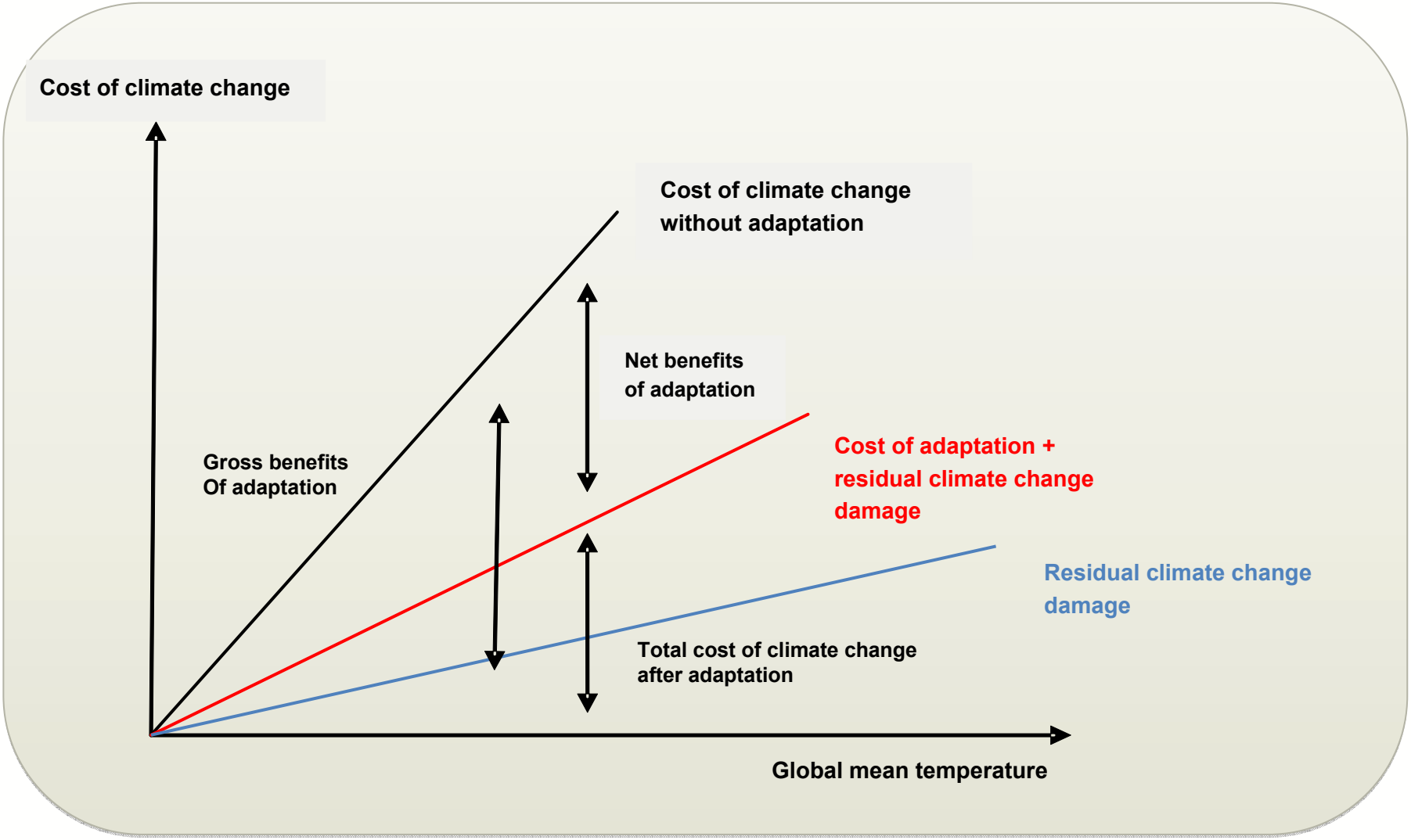
BACKGROUND MATERIAL

Underlying argument for domestic action on adaptation



Source: Stern (2006)

...including uncertainty

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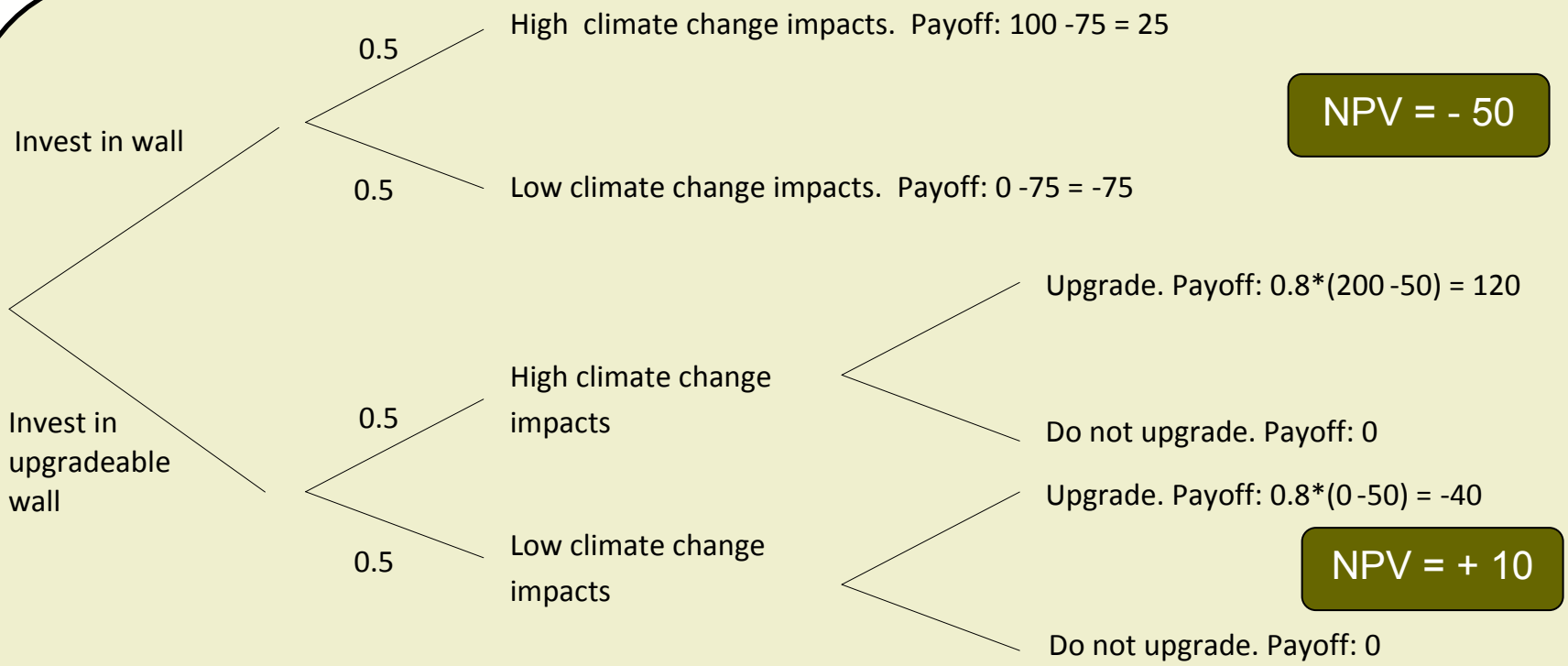
Flexibility is an important response to uncertainty, especially for decisions with long-term consequences



Consistent with the existing Green Book approach to policy appraisal
- discounting, non-market valuation, sensitivity analysis