



Robust approaches to risk and uncertainty in climate policy

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Topics

1. The nature of risk and uncertainty in climate change and responses thereto.
2. A selection of approaches and tools to deal with such uncertainty through robust policy-making.
3. Suggestions for robust policy.



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1. The nature of risk and uncertainty

- Robustness: performing without failure under a wide range of conditions.
- Policy: effective, efficient, equitable.
- Wide range of conditions → Risk, uncertainty

1. The nature of risk and uncertainty

Risk

Outcomes and
distribution known

Ambiguity

Outcomes known;
distribution
unknown

Fundamental Uncertainty

Neither outcomes nor
distribution known



Optimise ← → **Satisfice**



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2. Approaches and tools

- 2.1 Postures
- 2.2 Scenario-based planning
- 2.3 Long-term planning
- 2.4 Uncertainty Analysis and Valuation



2. Approaches and tools

2.1 Postures

2.2 Scenario-based planning

2.3 Long-term planning

2.4 Uncertainty Analysis and Valuation



2.1 Postures

- Shaping posture
- Adapting posture
- Reserving the right to play
- Big Bets
- Hedging
- No Regret Moves

Texts

- Obersteiner (2001) “Managing Climate Risk”
- Courtney, Kirkland, Viguerie (1997) “Strategy Under Uncertainty”



2. Approaches and tools

2.1 Postures

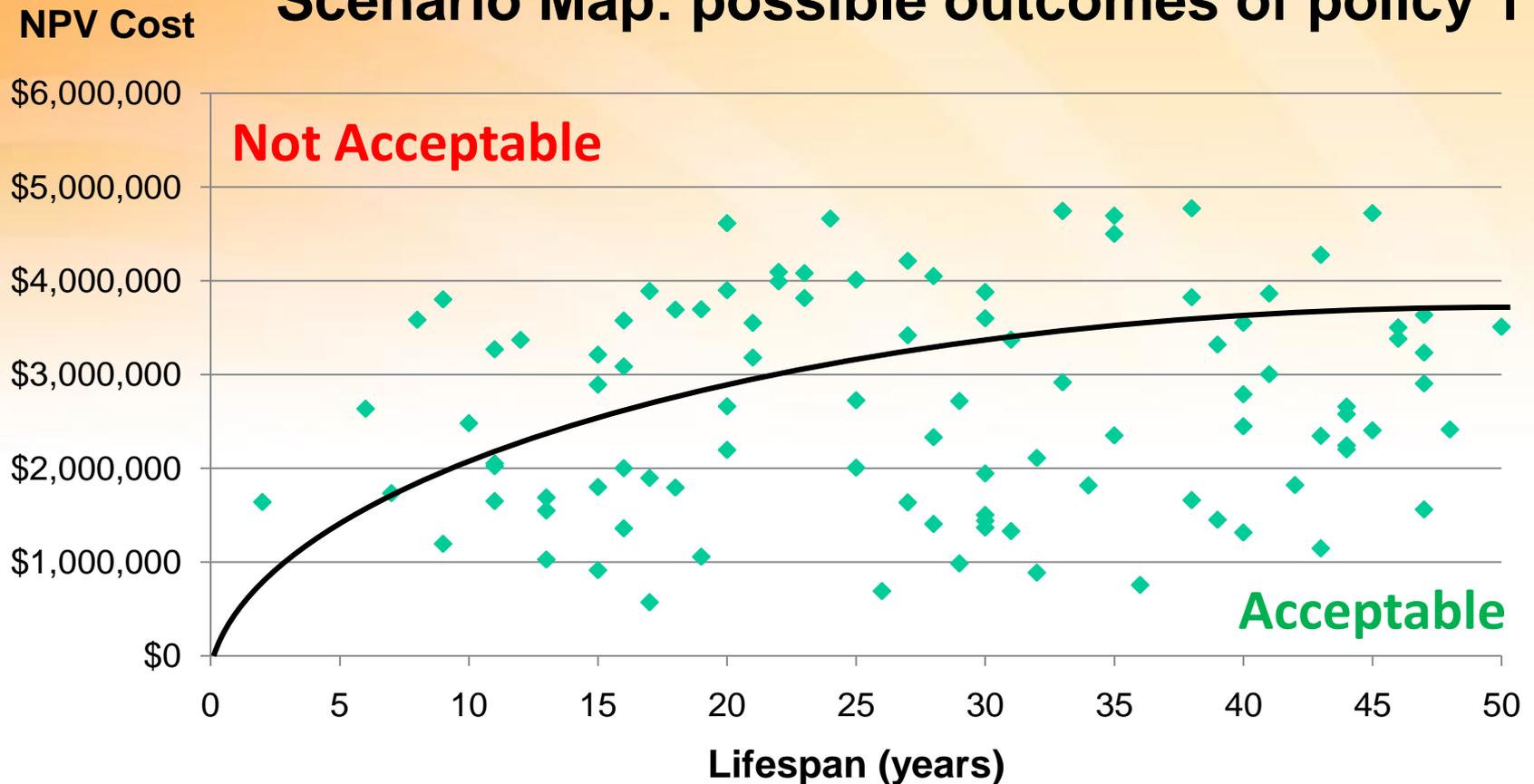
2.2 Scenario-based planning

2.3 Long-term planning

2.4 Uncertainty Analysis and Valuation

2.2 Scenario-based planning

Scenario Map: possible outcomes of policy 1



Texts: Lempert & Schlesinger (2000), Funke & Paetz (2007)

2.2 Scenario-based planning

Scenario Map: possible outcomes of policy 2

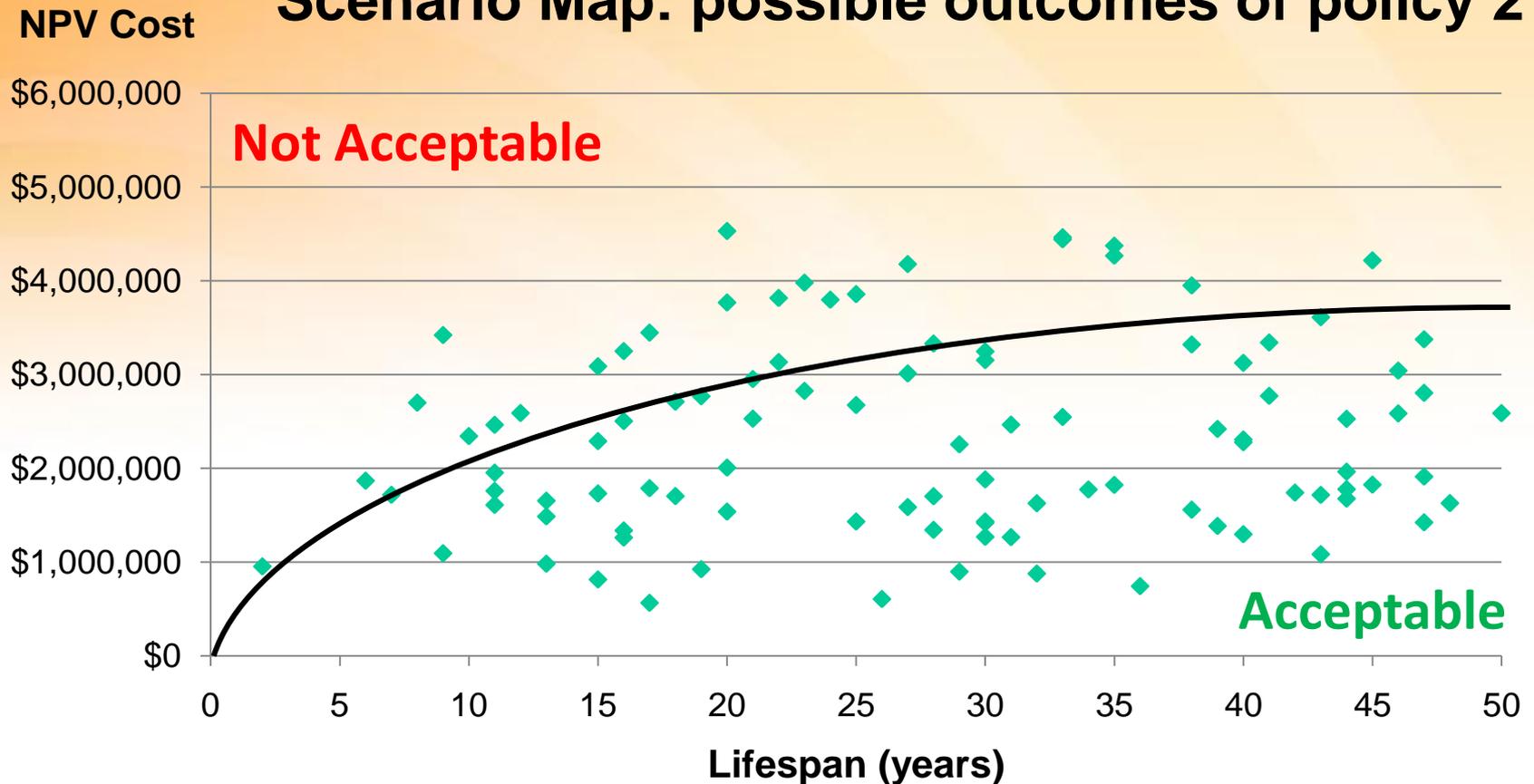


Diagram based on Lempert 2011 NCCARF Adaptation Masterclass presentation



2. Approaches and tools

2.1 Postures

2.2 Scenario-based planning

2.3 Long-term planning

2.4 Uncertainty Analysis and Valuation



2.3 Long-term planning

- Pre-commitments
- Triggers
- Narratives
- Stretch goals
- Legitimacy-building goals
- Evolution over time

Texts

- Lempert & Popper (2009) “Shaping Tomorrow Today”



2.3 Long-term planning

- Pre-commitments and triggers
 - Default reductions
 - Requirement to explain deviation from advice
 - Reviews by independent bodies
 - Auctioning in advance
- Stretch goals: inspiration
- Legitimacy-building goals: competence
- Evolution over time: use of information



2. Approaches and tools

2.1 Postures

2.2 Scenario-based planning

2.3 Long-term planning

2.4 Uncertainty Analysis and Valuation

2.4 Uncertainty Analysis and Valuation

1. Probability-weighted values of the output variables
 2. Optimal decisions in the light of imperfect knowledge
 3. A measure of risk or dispersion about the outcome
 4. The value of information for key variables
- How much to reduce?
 - When to reduce?
 - How to reduce?
 - Who should reduce resp. where to reduce?
 - Who should pay for the reductions?
- Texts**
- Peterson (2006) “Uncertainty and economic analysis of climate change”



2.4 Uncertainty Analysis and Valuation

1. Probability-weighted values of the output variables
 2. Optimal decisions in the light of imperfect knowledge
 3. A measure of risk or dispersion about the outcome
 4. The value of information for key variables
- Sensitivity Analysis
 - Uncertainty Propagation
 - Sequential Decision-Making Under Uncertainty
 - Value of (quasi-options)



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3. **Suggestions for robust policy.**



3. Suggestions for robust policy

- Worst-case, not typical case
- Vulnerability-response, rather than prediction-action
- Flexibility
 - Diversity
 - Portfolio
- Hedging
- Information
 - Feedback, learning
- Pre-commitments
- Narratives
- Triggers
- Value of options
- Institutional capability



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