Uncertainty and learning – implications for climate policy

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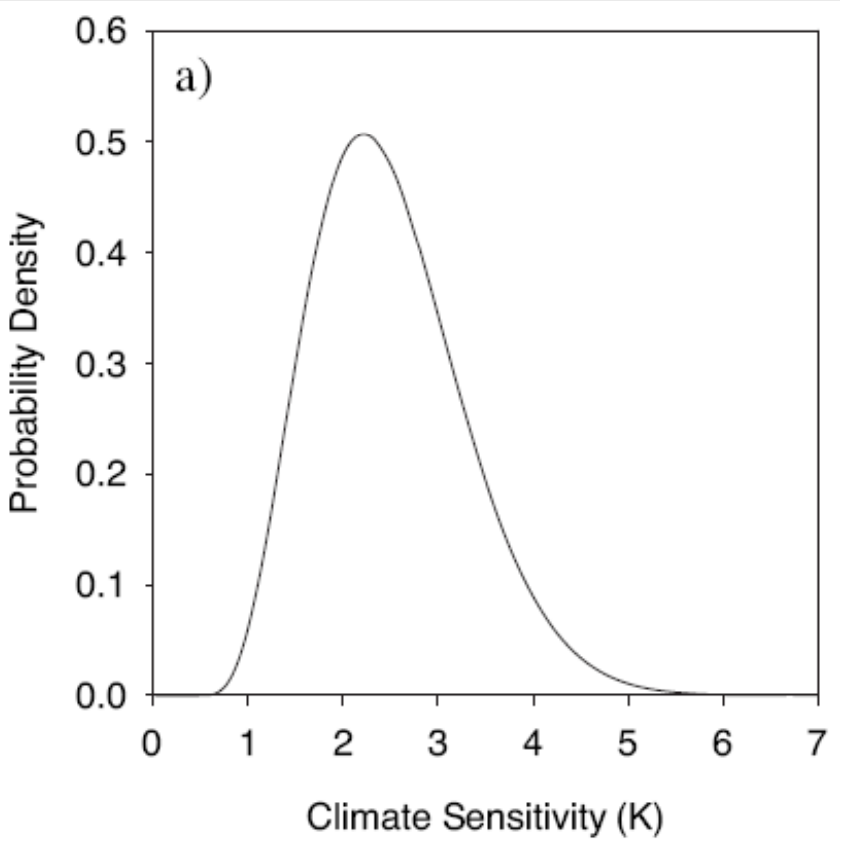
What is learning

Definition: Obtaining new information over time that leads to changes in uncertainty

Uncertainty may be reduced, increased, or shifted, and may even be misleading

Learning can occur as a result of new experiments, modeling, theory development, and/or observations



Why learning matters

Timing of emissions reductions

Value of flexibility

International agreements

Costs of emissions reductions

Damage costs

Risks of abrupt climate change

Prospects for learning

Climate sensitivity

20-40% reduction in uncertainty plausible over next several decades (Webster et al., 2008)

Carbon cycle

Discriminate among alternative models for carbon sinks over next several decades (O'Neill & Melnikov, 2008)

Development paths

1 in 5 chance that outlook for long-term population growth will shift 30% by 2020 (O'Neill & Sanderson, 2008)

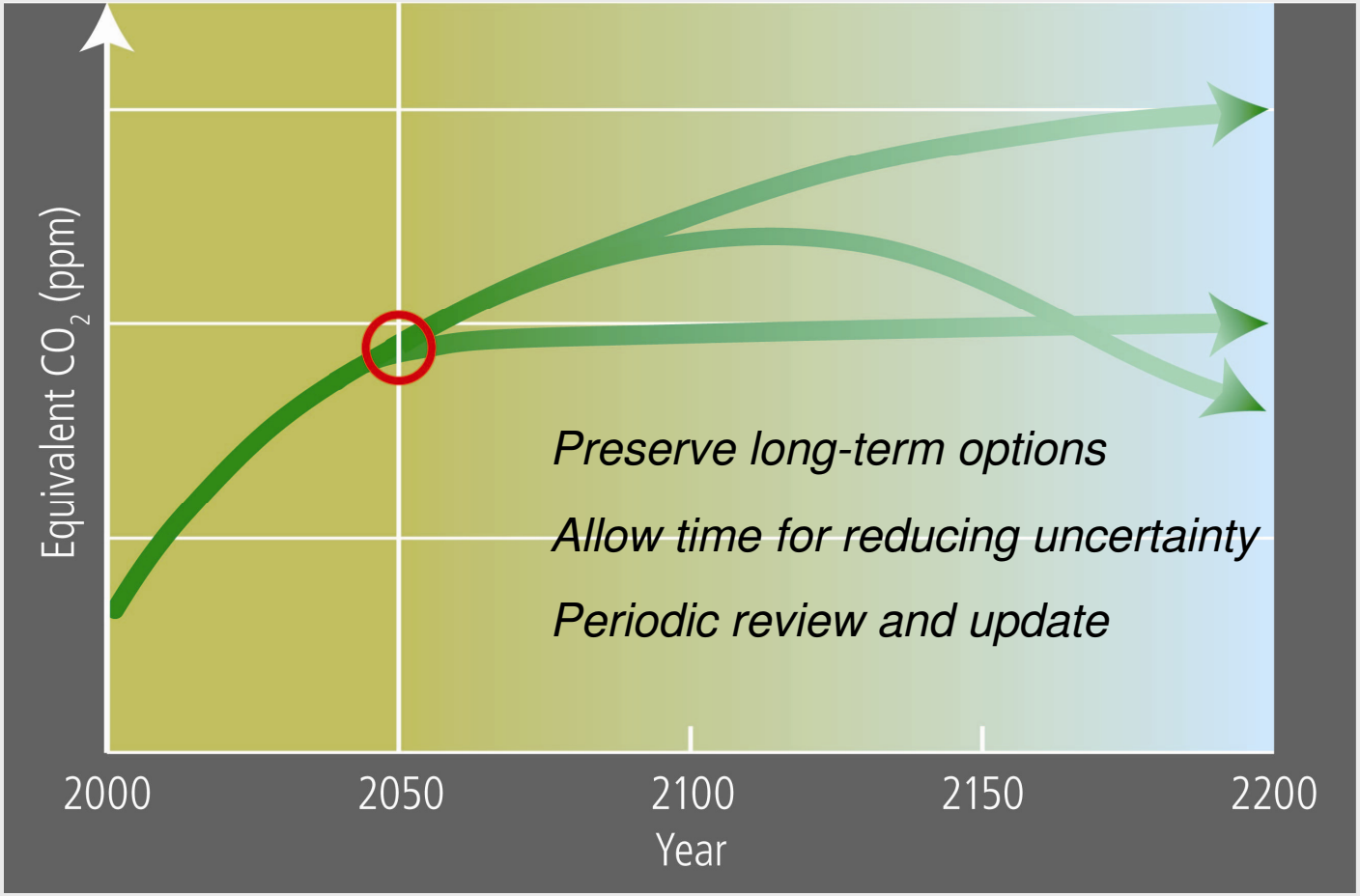
Abrupt climate change

Probably can't anticipate ocean circulation shutdown in time to avoid it (Keller et al.)

Insights for policy

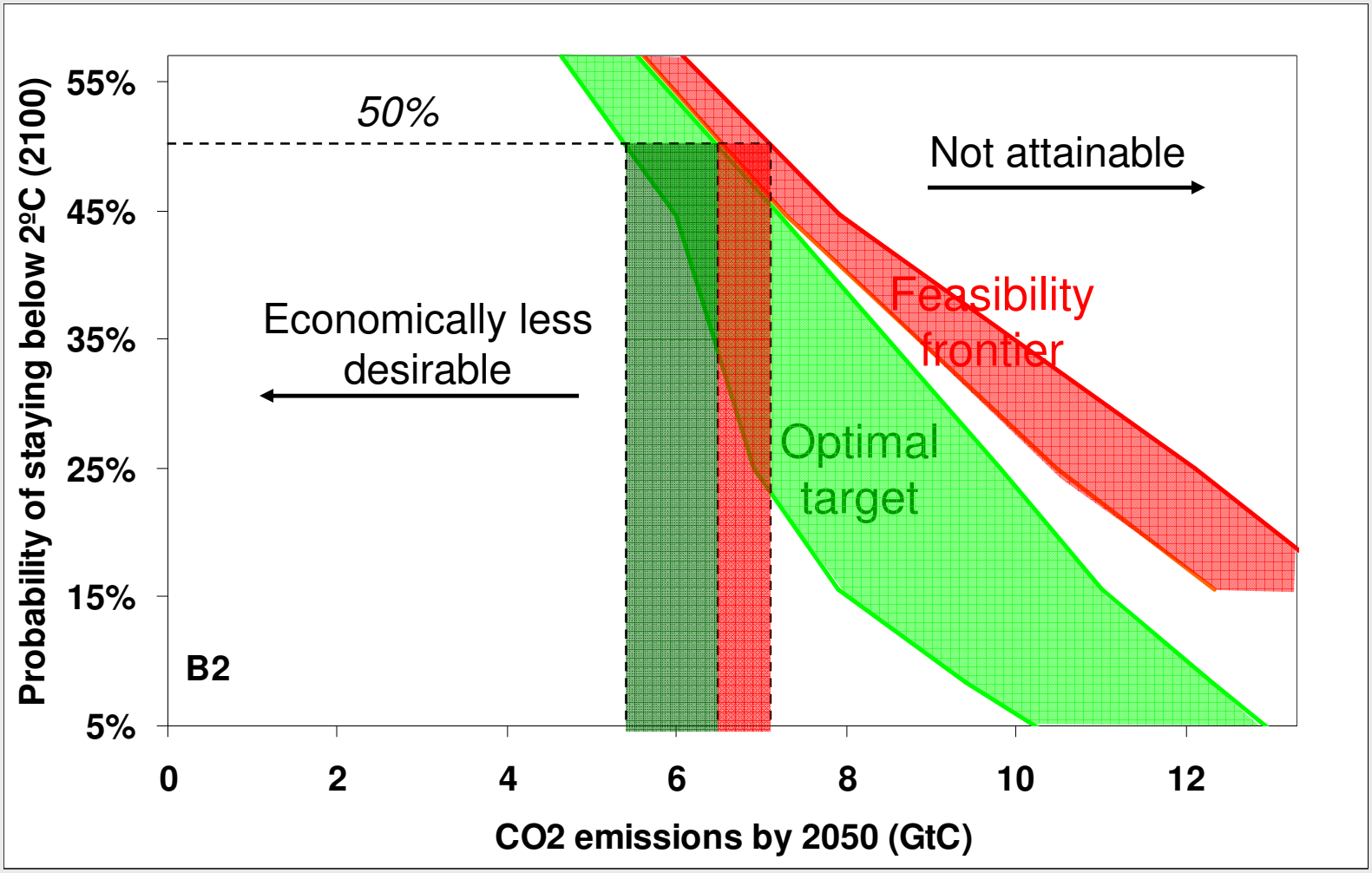
1. Don’t wait to learn
2. Be prepared for course corrections
3. Consider a wide range of possibilities
4. Keep options open
5. Hedge against outcomes where learning won’t help

Keeping Options Open Through Mid-Century Targets



Based on O'Neill et al., 2005.

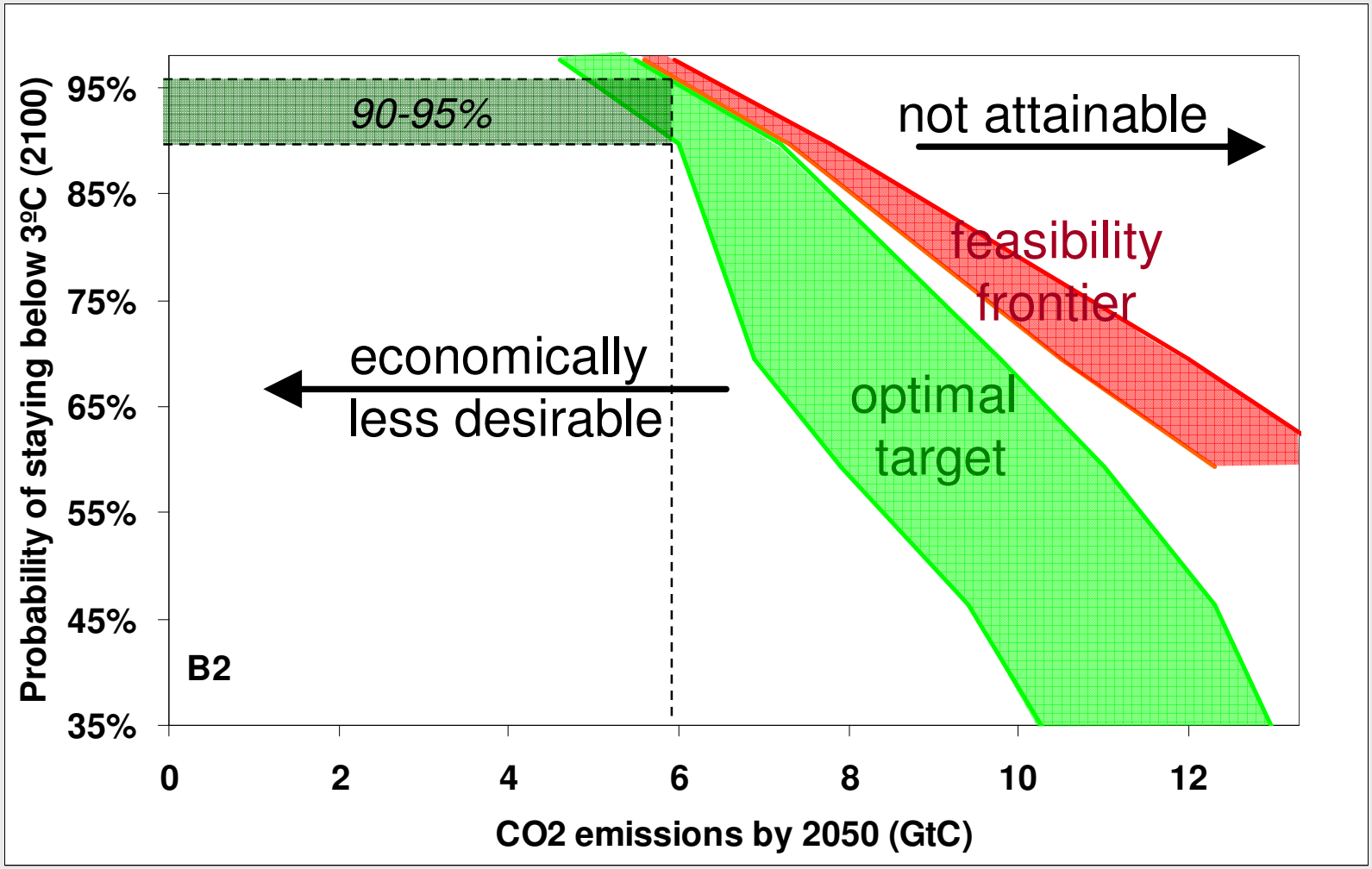
2 ºC feasibility frontier, B2 reference scenario



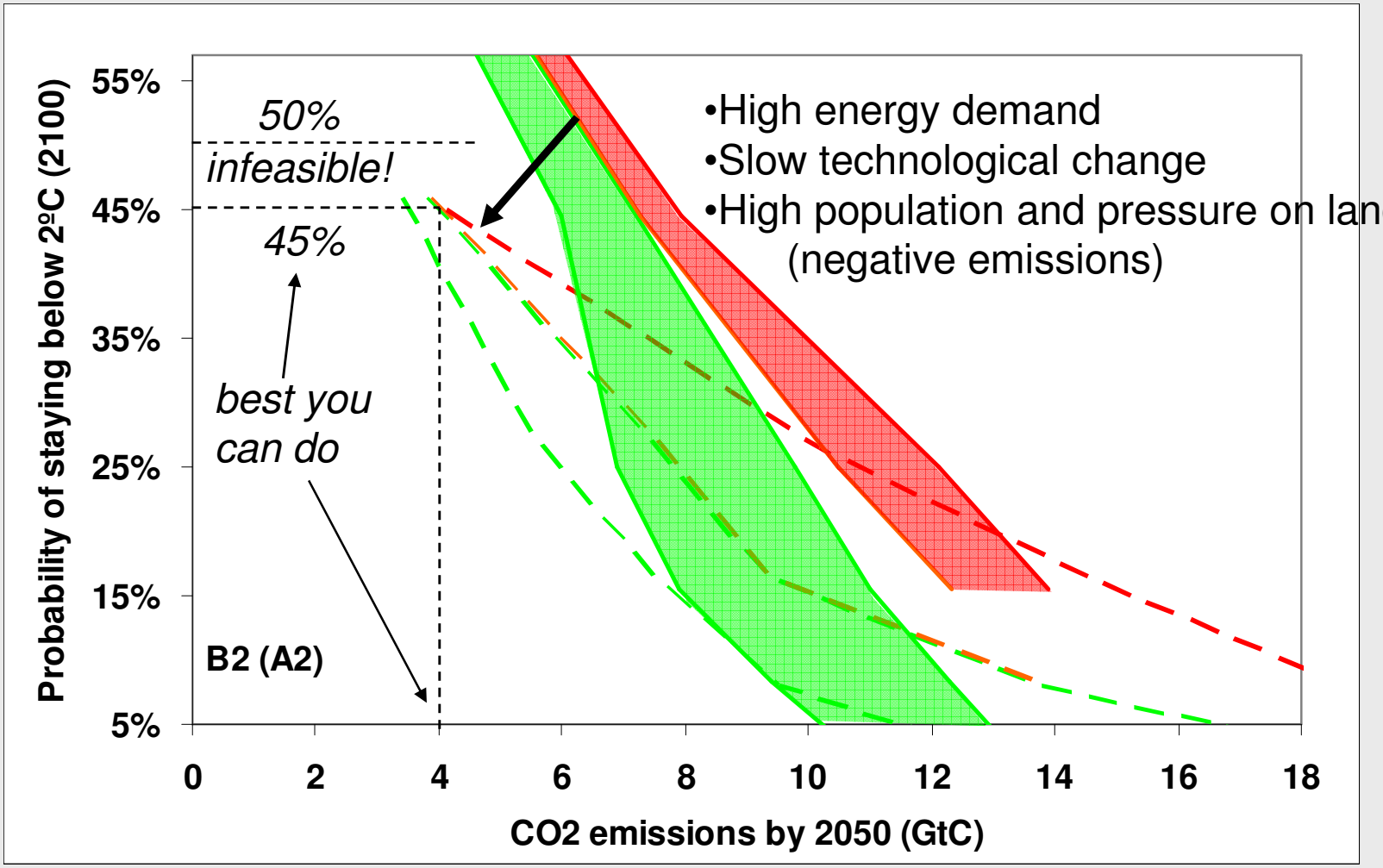
Based on Forest et al CS PDF

B2 Baseline

3 ºC feasibility frontier, B2 reference scenario



2 ºC feasibility frontier, Baseline uncertainty



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