

New Strategies for Adaptation and Mitigation

CENTRE FOR STRATEGIC ECONOMIC STUDIES
BUSINESS AND LAW
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Structure of talk

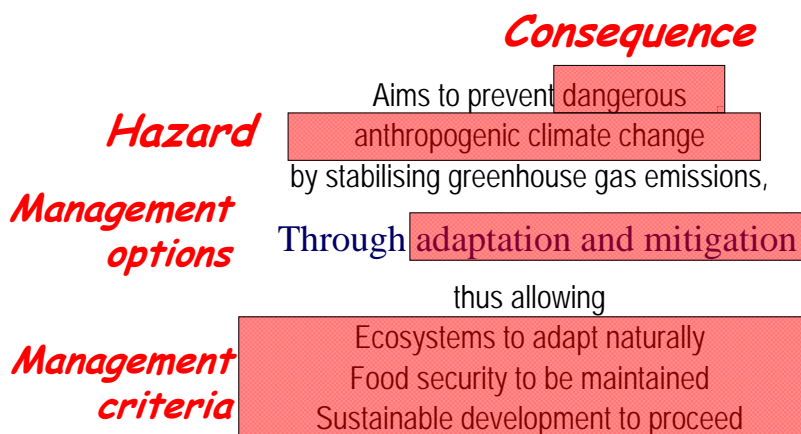
- Framing dynamic approaches to risk
- New emission scenarios
- How much climate do we need to adapt to by when?
- Financial crisis as mitigation opportunity

Current state of play

- Two different attitudes to risk:
 1. Econocentric
 2. Envirocentric
- Dynamic environment with substantial uncertainties
 1. What do we know now?
 2. What can we expect to know by when?
 3. Which uncertainties are intractable?
- How do we learn?
 1. Better models (scientific prediction)
 2. Learning by doing
 3. Systems approaches:
 - Testing assumptions of underlying uncertainty on decisions
 - Assessing contested risks and managing them jointly

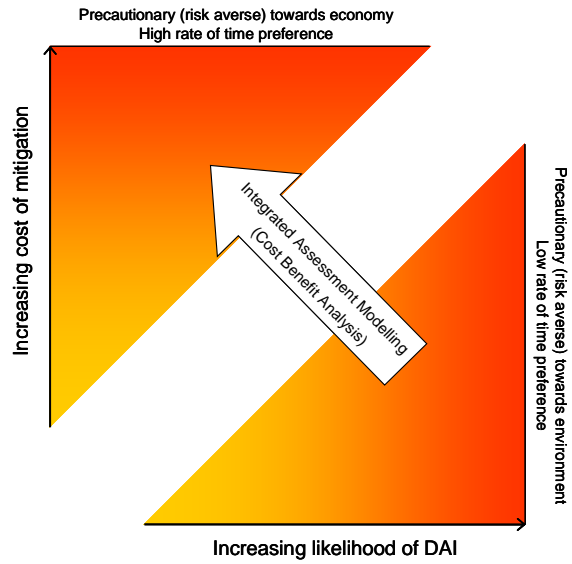
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Article 2 UNFCCC



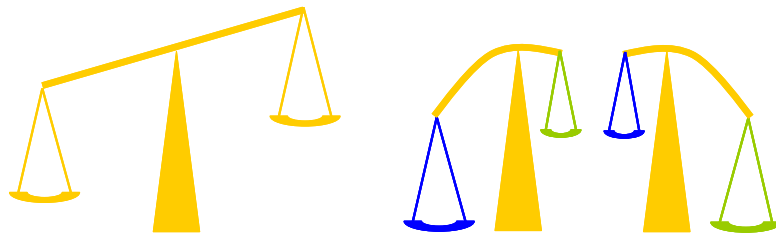
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Competing risk-averse views



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Risk aversion and rationality



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Environmentally risk-averse

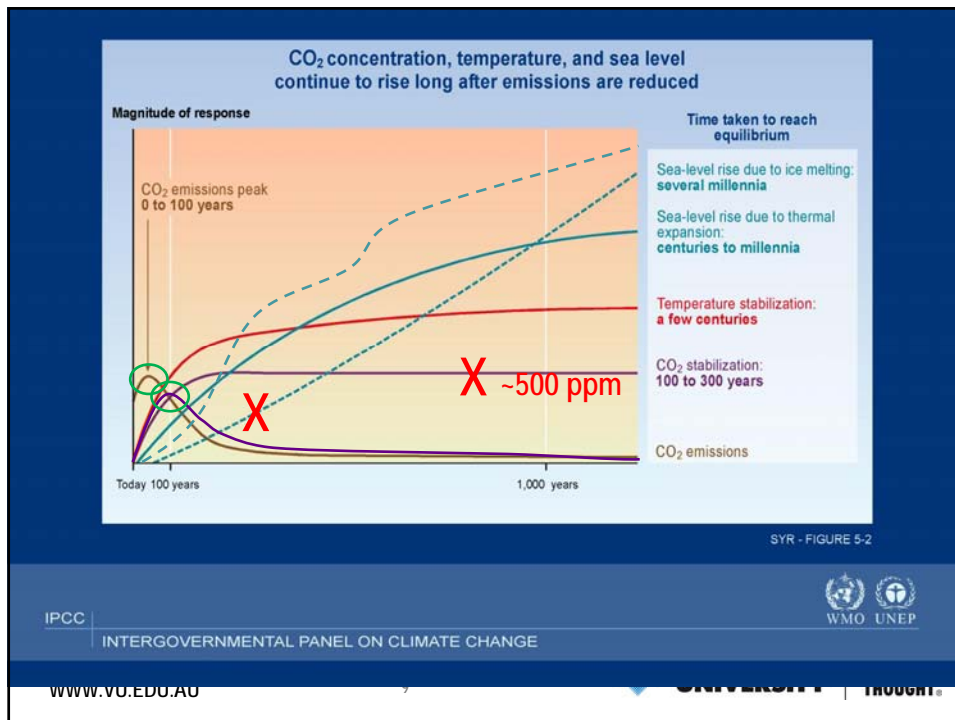
- Risk-averse to environmental damages
- Focus on level of stabilisation avoiding dangerous climate change
- Guarantee of “safe” climate levels and CO₂ levels to match – sufficient to retain ice sheets, large ecosystems, developing country livelihoods and coastal megacities
- Recent work by Hansen suggests long-term ice-sheet loss at current levels of CO₂. Is this safe?

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Economically risk-averse

- Risk-averse to economic damages
- Focus on costs of climate policies
- Want stable carbon price
- Averse to early adoption, uneven policies internationally
- Subject to hyperbolic discounting of climate risks, large uncertainties minimise long-term costs

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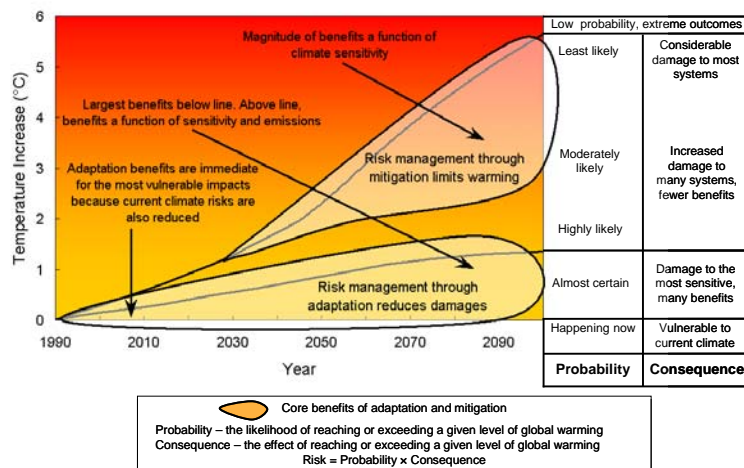
Problems with planning long-term pathways to “safe” climate

- Climate risks do not stabilise for centuries to millennia
- Feedbacks unknown. They include:
 - Loss of carbon from global forests
 - Water wars and climate-induced regional collapse
 - Ice-sheet rapid melts and break-up, perhaps exacerbated by polar albedo increases
 - Loss of large-scale ecosystem function

Although it is impossible to guarantee a safe climate with our current knowledge, it is possible to avoid dangerous outcomes by acting now and learning as we go:

- By 2020–2030, ice-sheet behaviour better known
- By 2020 regional trends in climate better known
- By 2030, performance of sinks better known
- By 2015–2020 carbon markets well understood
- By 2015–2030, new technologies emerging, current marginal tech is established

Framing climate change risk



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The new global growth path

- Global growth has accelerated in the past decade, driven by the developing countries, especially China and India
- This growth is energy and coal intensive, and likely to continue
- Realistic projections of energy use and CO₂ emissions to 2030 are above the SRES marker scenarios, including A1FI

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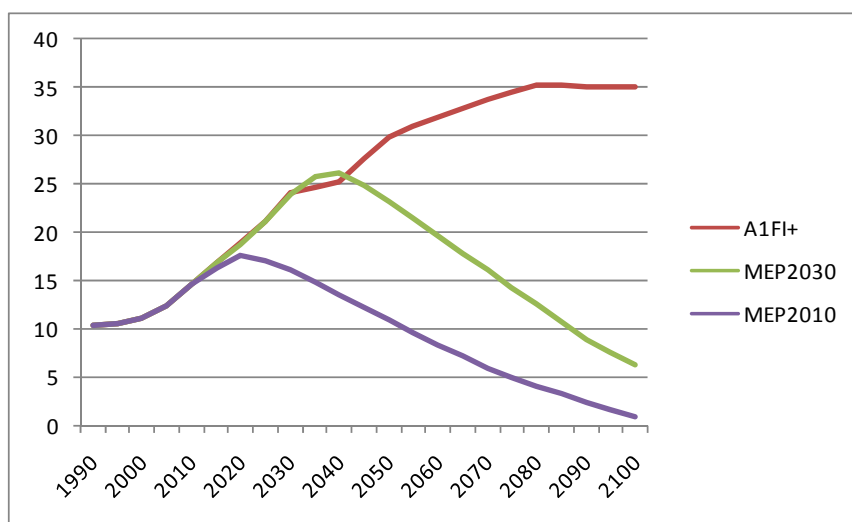
Three climate scenarios

- High growth, no climate policy: resembles SRES A1FI on steroids
- High growth to 2030, then “minimum emissions path”: resembles the SRES A1B on steroids
- Aggressive reductions from 2010 on “minimum emissions path”

We use the range MEP2030 to A1FI+ to represent reference scenarios
We use the range MEP2010 to MEP2030 to represent policy scenarios

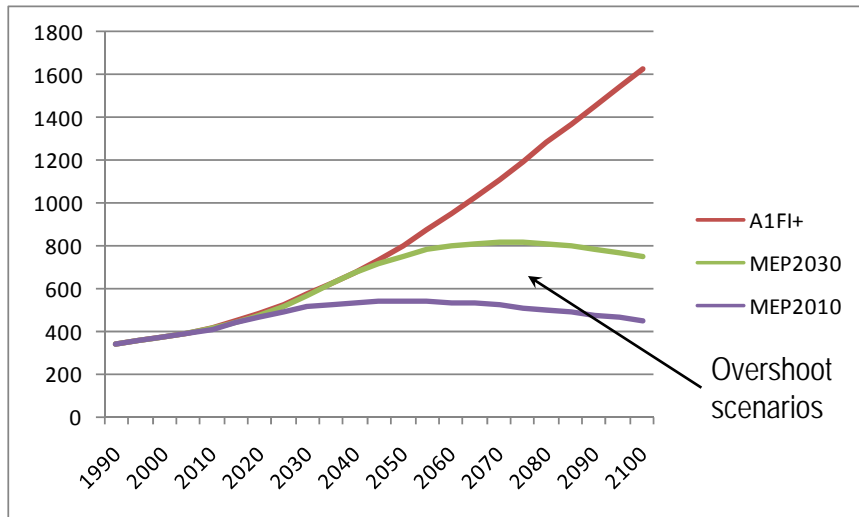
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Emissions (GtC/year)



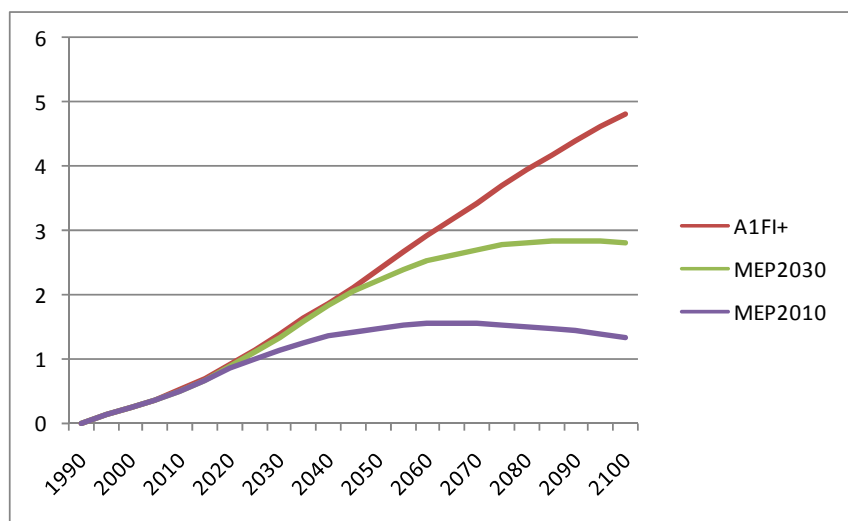
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Concentrations (all gases ppm CO₂e)



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Mean global warming (°C)



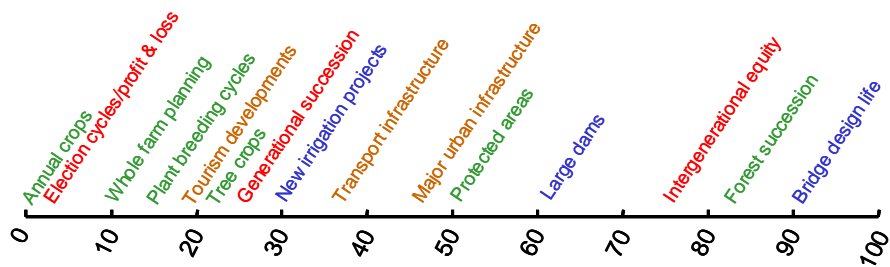
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Framing adaptation – how much climate do we need to adapt to by when?

- Goal setting
- Where do we want to go? (aspirational goals)
- How do we want to get there?

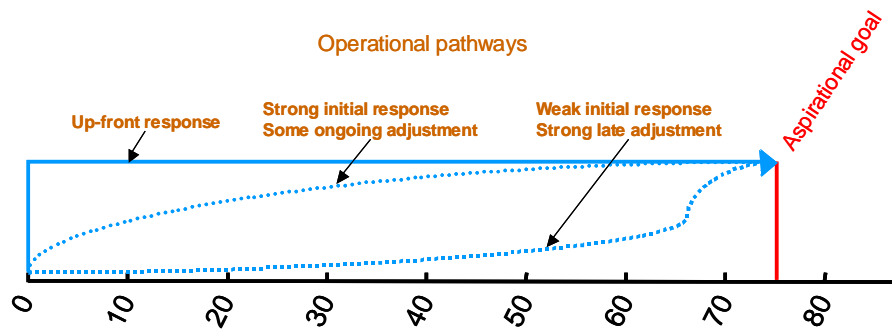
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Planning horizons



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Operational pathways and aspirational goals



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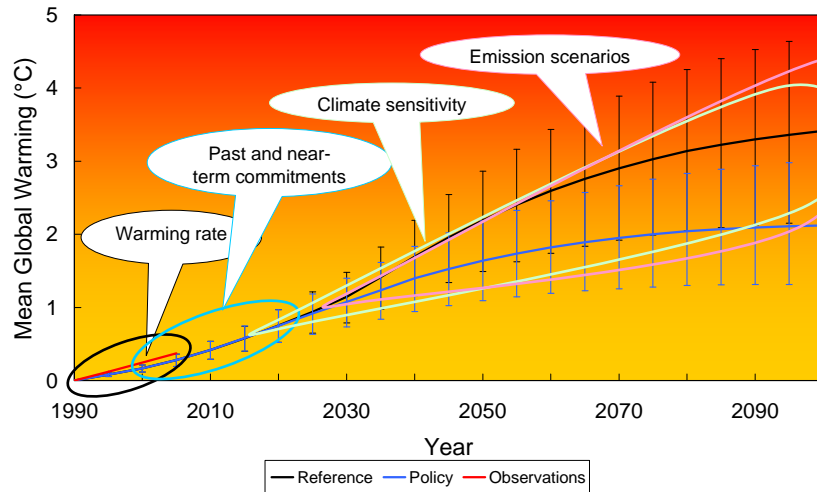
How much climate change needs to be adapted to by when

Types of climate information required:

- Climate variability (daily to decadal)
- Ongoing rate of change
- Past and near term commitments to climate change
- Climate sensitivity
- Regional climate change projections
- Greenhouse gas emission policies (Mitigation)

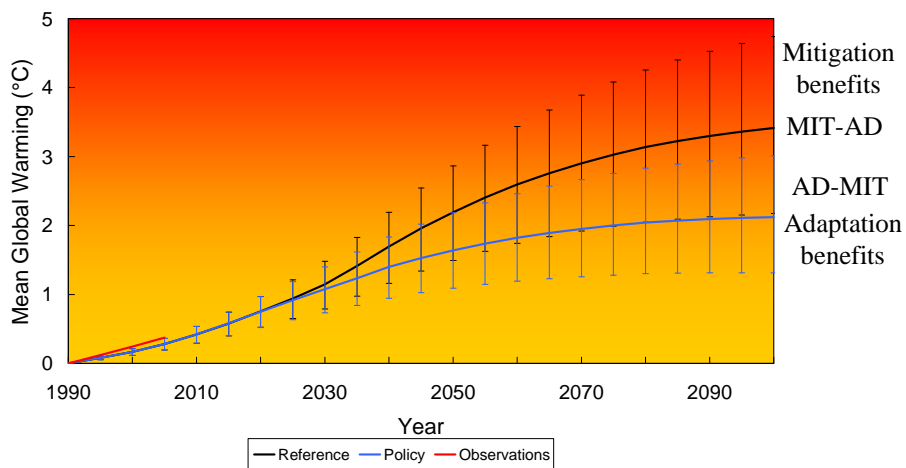
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Reference and policy scenarios for hedging adaptation and mitigation



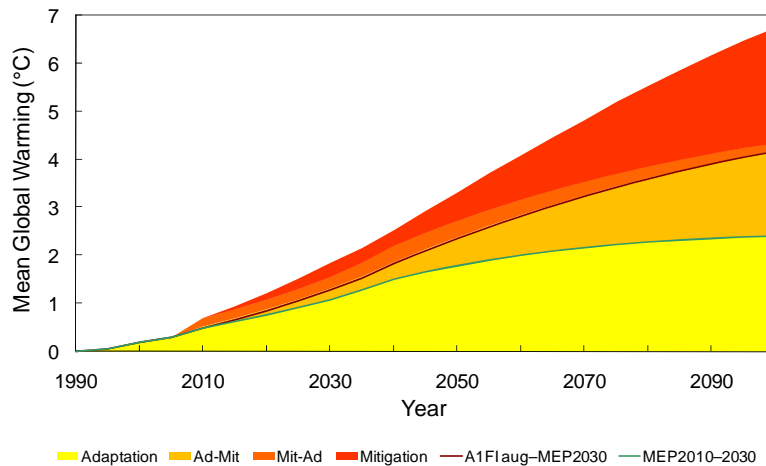
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Hedging adaptation and mitigation – reference and policy scenarios



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Hedging strategies between reference and policy scenarios with high policy uncertainty



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Adaptation needs strong climate policy

- Business as usual may require hedging of up to 4°C globally by 2100
- Market failure needs funds to flow from a carbon price to adaptation
- Investment in natural infrastructure – terrestrial ecosystems, water resources, marine systems are urgently needed

Short-term climate uncertainties are largely biophysical and very difficult to reduce with better science – need risk management approaches

Long-term climate uncertainties are largely policy-related and rely on strong policy and implementation

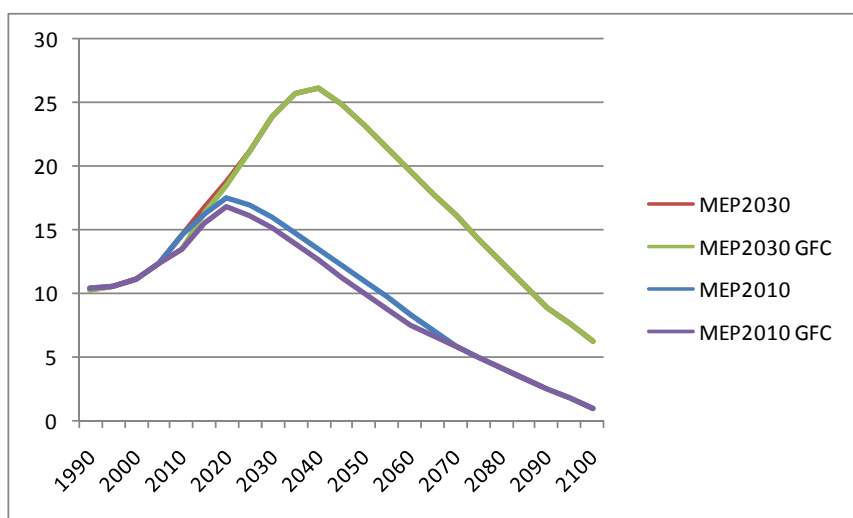
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Testing the joint impacts of the GFC and climate policy for mitigation

- GFC applied through 10% reduction in fossil fuel and industrial emissions in 2010 in OECD, 12.5% in transition economies, 5% in most developing countries. Half that in 2015, quarter in 2020, full recovery by 2025.
- Obama's US policy of -14% GHG by 2020, and -83% by 2050, from a baseline of 2005 applied to the whole of the OECD. Reductions continued at same rate beyond 2050.

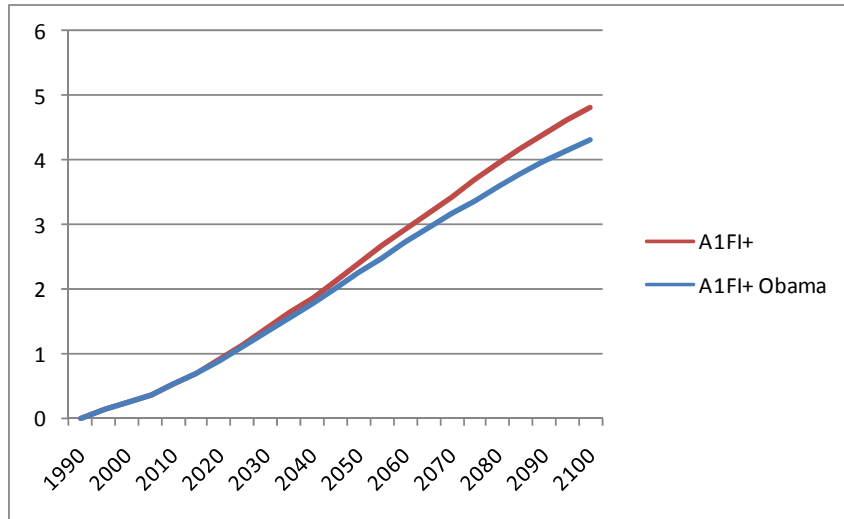
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Simulated impact of GFC on emissions (GtC/year)



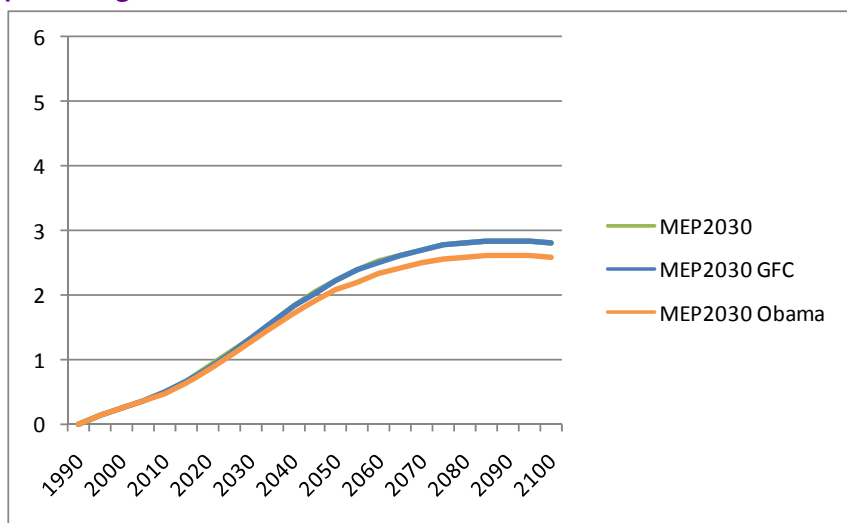
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Simulated impact of Obama policy in OECD on A1FI+ (in °C)



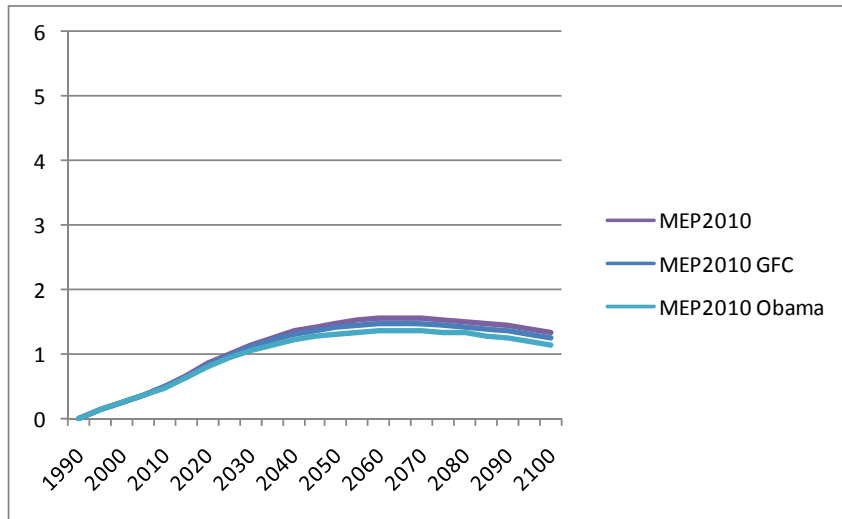
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Simulated impact of GFC and Obama policy in OECD on MEP2030 (in °C)



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Simulated impact of GFC and Obama policy in OECD on MEP2010 (in °C)



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GFC and climate policy

- GFC provides no direct advantage to managing climate risks if a wait and see approach allows emissions to recover to previous levels
- If reduced emissions between 2010–2020 are used as a springboard to a lower emissions path by immediate action, direct risks can be reduced significantly
- Applying an “Obama-style” emissions reduction plan to the OECD, can be an effective pathway to delivering an overshoot emissions scenario, with developing countries following 5–15 years after, on less stringent pathways

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What do we know now?

- Enough to act – acting will provide the knowledge we need to continue
- Climate risks are too large to take a cautious approach, especially those that incorporate current market failures
- Adaptation needs strong climate policy to hedge long-term risks (30+ years)
- Climate policy needs to integrate economic and climate risks and has not done so yet
- The global financial crisis provides an opportunity if consequent reductions in emissions are used as a springboard and not converted into “hot air”

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