Thoughts on prioritising future science in WCRP

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One way to frame WCRP's priorities

- WCRP should nurture and encourage scientists interested in fundamental climate science for its own sake, not just because of its importance.

- Society urgently needs information on how to mitigate and adapt to climate change based on strong, evaluated science

Are these two points compatible?

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'*Traditional climate science is not advancing quickly enough to shape public debate*'

'*Our business as usual is not enough*'

– Alex Hall, Turco lecture, AGU

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1. **Improved understanding of the factors affecting climate forcers** *to provide a firm basis for decision-making on the mitigation of climate change*

2. **Improved predictions on subseasonal to decadal time scales** *to provide longer warnings and relevant climate science input for decision-making on adaption*

3. **Better understanding of the response of the climate system to climate change** *to provide robust advice on adapting to climate change in the longer term*

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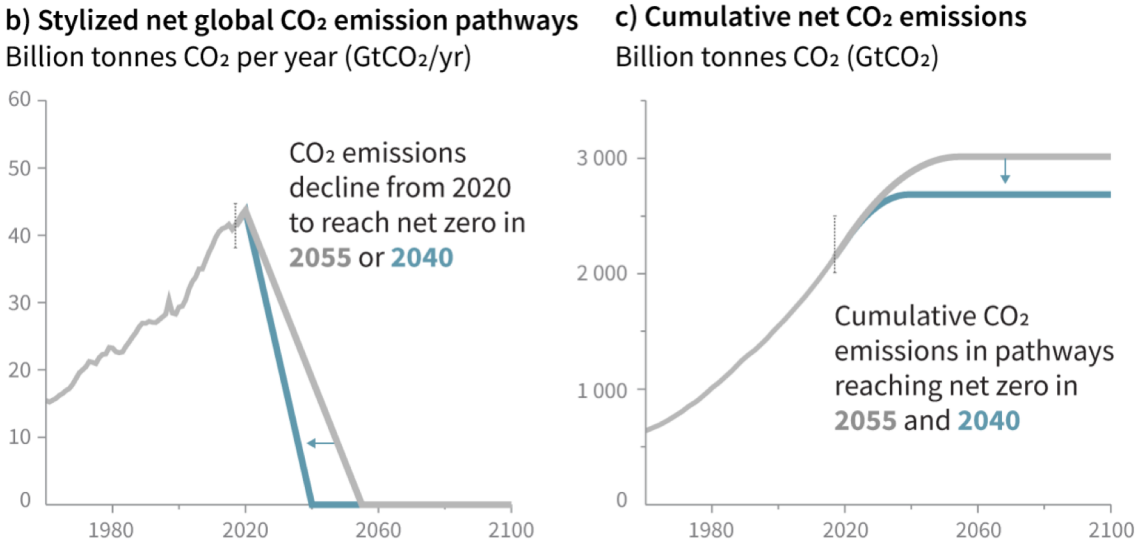

Climate impact(s), not just delta T, GWP, etc
Non-linearities of response need to be represented

Can we ensure that our coordination and promotion of fundamental research informs the decision-making processes involved here?

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1. **Improved understanding of the factors affecting climate forcers** *to provide a firm basis for decision-making on the mitigation of climate change*

    - How sensitive is the climate system to climate forcers? (Climate sensitivity, but not just for temperature)
    - Impact on energy cycle/balance
    - GHG and aerosol cycles and feedbacks, *esp aerosol/cloud feedbacks*
    - Observationally based knowledge and understanding of long and short term changes in climate forcers, past and future
    - Impact of large-scale GHG-removal processes
    - Use of metrics, quality of IAMs in decision-making
    - Climate intervention (geoengineering)
    - …..

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Don't have a figure, but the earlier the adaption measures are put in place (the investments made) the greater the number of events we will be prepared for (return on capital)

Critical thing is to provide high quality, evaluated scientific input into such decision-making processes – how do we know where we can make progress most quickly? And what climatic outcomes are we preparing for?

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- Limits of predictability at all spatial and temporal scales (internal dynamics)
- Short and long term responses of climate system to external forcing
- Mechanisms underlying teleconnections between different parts of the climate system, including role of stratosphere
- Changing intensities of climate phenomena (, storms, melting events..) and response of biological (habitats, species..) and physical aspects of biosphere (fires, increased aridity…) under climate stress
- How will the system respond if GHGs decrease (many hystereses)
- …

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How should the various initiatives we are going to discuss be judged?

From SPARC SSG:
support for a major interpretative initiative to trawl though existing datasets from models and observations – could produce the quickest results – build a global community of data users in all countries – developing tools using latest techniques

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