

Global Calculator Climate-KIC Project Committee meeting 15th October 2014 Minutes

Attendees

Andrew Yool – National Oceanography Centre

Lenny Smith – LSE

Erica Thompson – LSE

Lucy Hayes – DECC

Tim Kruger – Oxford Martin School

Jason Lowe – Met Office

Nicole Kalas – Imperial College

Sophie Hartfield – DECC

Ellie Best – Edelman (from 3.30pm)

Andrea Karpati – Climate-KIC (will arrive at 3.30pm)

Juergen Kropp – PIK – dialling in (0049 331 288 2526)

Jason Lowe – Met Office

Project status update

Sophie updated the group on progress made so far in the Global Calculator project (see slide pack).

Action: Jason kindly offered to send over a link to an IIASA report on mitigation costs so we could sanity check the costs from the Global Calculator.

The Global Calculator will be demonstrated at the Climate-KIC Innovation Conference in Valencia on 30th October. Juergen Kropp and Tim Kruger confirmed they would be attending.

There is a strong chance that we will be presenting the Global Calculator at a side event at Lima COP, however this has not been confirmed. (Since the time of the meeting, we have received confirmation that we do have a side event on 5th December.) Jason mentioned that there would be a Met Office presence at the COP so they would be available to help out if needed. Juergen recommended that we should boost attendance at the event by printing out fliers, inviting people personally and having catering.

Methodology paper: endogenising non-CO2 emissions

Erica explained that currently SO₂ emissions are assumed to vary in proportion to fossil fuel emissions (relationship constant over time). This is a simplification because it is possible to envisage a situation where SO₂ emissions did not rise in proportion with fossil fuel emissions. For example, if countries such as China decided to reduce sulphur emissions from fossil fuel plants for local air quality reasons.

So Jason recommended that Erica should do a back of the envelope calculation based on RCP8.5 to work out how big an impact the SO₂ assumption has on temperature change. Then, if necessary, Erica could add a lever in the spreadsheet to allow the user to change the assumption about SO₂ emissions. This would not be a lever in the web tool as it's too specialised for most users, but it would be helpful functionality for the spreadsheet. **Action:** Erica to do this.

Methodology paper: extrapolating temperature calculation beyond 8000 GtCO₂

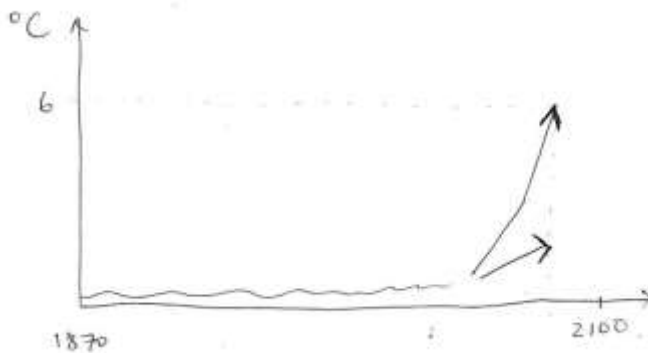
The group felt strongly that it was too risky to include the extrapolation of temperature changes beyond 8000 GtCO₂. It was possible to generate very high temperature increases using this method (e.g. 20C) which could be criticised and could distract from the robust analysis in the rest of the tool. Also, presenting results of 20C might make the 6C temperature increase appear moderate.

However we did need to find a way of making the user aware that temperature increases beyond 6C were very dangerous and not presented in the tool because they are not considered by the IPCC. Ideas on how we can do this:

- The thermometer could be remodelled such as the below. Then when the user has a pathway with over 8000 GtCO₂, then the top arrow would light up red.



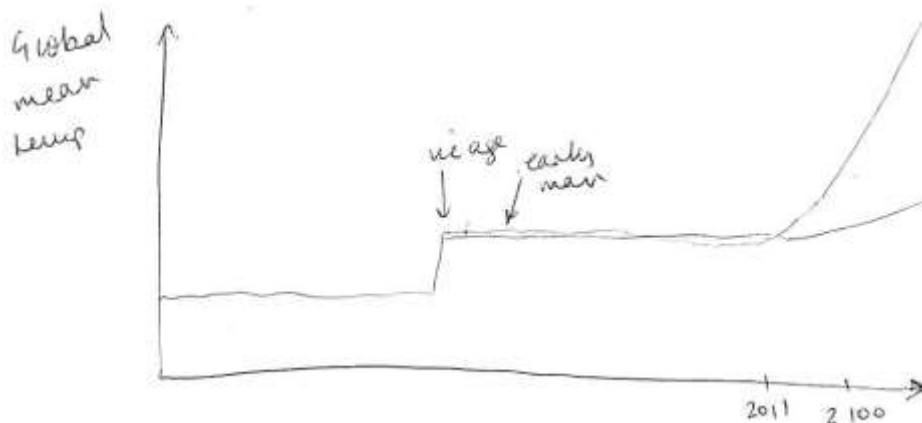
- The warning text when the user has a pathway over 8000 GtCO₂ should be something alarming such as: "This is a very high emissions pathway which could have very dangerous impacts on the climate because the top of your temperature range exceeds 6C. It is not possible to show the high/low temperature range for your pathway because it has more emissions than any considered by the IPCC science."
- The temperature over time graph could have arrows to indicate temperatures keep on rising beyond the point at which 8000 GtCO₂ is exceeded (e.g. see below). On the blank part of the screen we could have some text that said something like: "highly dangerous" (or some similar text from the IPCC).



- Temperature maps: we agreed a few changes:
 - When emissions exceed 8000 GtCO₂, the user should see a picture of the hottest map we have with some text that says, “The top of your temperature range is even hotter than this map.” The precipitation and ocean acidification maps should have similar messages.
 - The temperature scale should go from -2C to “above 10C” and, if possible, a better colour palette would be selected.
 - To help prevent people from thinking the maps are a time series, each map should have a dot over the temperature legend to indicate the global mean temperature change in that model run.
 - To prevent people thinking the maps are a time series, the grey globe should be replaced with a black one (with continents outlined in white) with text that said: “Another possible scenario...”
 - **Action:** Erica to rework the maps.

Physical changes – temperature time series

We agreed to prepare a historic time series that made the point that 4C is a world-changing temperature adjustment by showing that 4C is the difference between now and the last ice age. To do this, Erica would plot a graph that goes back 50-100,000 years. Then plot the user’s pathway’s temperature increase alongside it. E.g. The graph would look something like the one below. **Action:** Erica to do this.



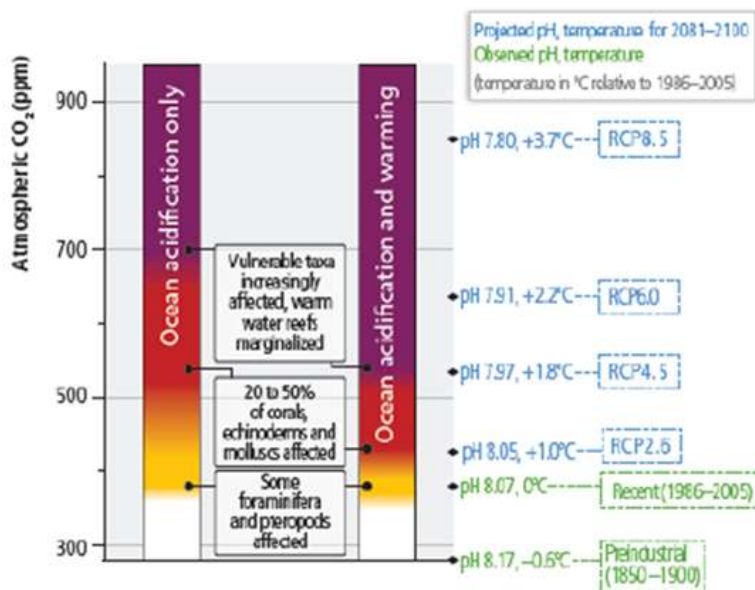
We could also include a link to IPCC historic time series of temperature change that go back even further in time.

Physical changes – ocean acidification

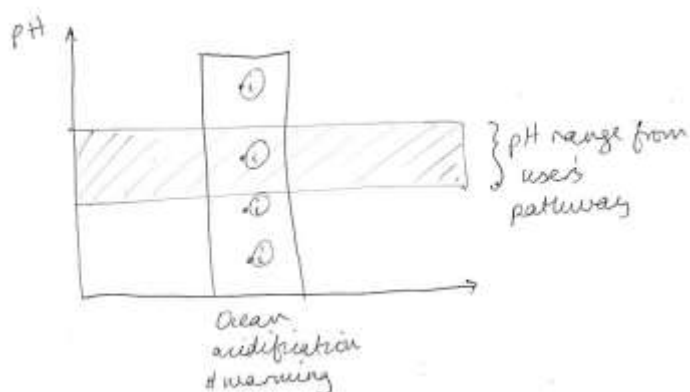
The group discussed the possibility of plotting the location of corals and other sensitive sea life on the ocean acidification map, but concluded that this would be too much work in the limited time left. But we would include a link to the IPCC maps for location of corals.

However it was agreed that we should include a “burning embers” diagram. Andrew Yool shared details of a draft such diagram which is due to receive sign off at end November (see below). We agreed to wait until end November then, if it was signed off, we would add it to the tool. This would be fairly simple because it uses pH values which can be included in the spreadsheet. **Action:** Erica to add pH values to the spreadsheet. **Action:** Andrew to let us know when the burning embers diagram is signed off. **Action:** Lucy to ask Phil if there was any more bubble text that could be added to the diagram.

(B) Risk for marine species impacted by ocean acidification only, or additionally by warming extremes



The final diagram would look something like the below. By hovering over the “i” the user would see bubble text.



Physical changes – sea level rise

Erica explained that global average sea level rise was very uncertain. Also, sea level rise by country/region depends on the model run and assumptions made about adaptation and this data is not readily available mapped to temperature change or emissions. So, unfortunately the group had to conclude that Erica would not have time to include sea level graphics in this version of the tool (as the spreadsheet and web tool are being locked down by 4th November).

Instead, the group agreed that we would mention sea level rise in the “detailed impacts” section, discussed below.

Human impacts – detailed impacts

The group agreed this would be a really useful graphic. Some changes we agreed to make:

- The left hand side of the bar should begin at cumulative emissions today.
- We should include results for RCP2.6, RCP6 and RCP8.5. We agreed to have two dots for RCP 2.6, four dots for RCP6 and eight dots for RCP8.5 – this was to give the user an immediate visual clue that climate impacts are expected to get worse at a non-linear rate.
- When the user hovers over these dots, it should bring up some bubble text taken directly from the IPCC. The group agreed that ideally (if we had more time), the impacts text presented would be randomly chosen from the full list of impacts text from the IPCC. But we did not have time to do this.
- Instead, we agreed that for RCP2.6, we should include a negative impact and a negative/positive impact. Specifically we agreed to use the IPCC text about sea level rise and species extinction. Presenting this balanced picture of RCP2.6 will mitigate the risk that we are accused of being too alarmist about low levels of climate change.
- We should include the full list of impact statements made by the IPCC about the RCP pathways in our background documentation.
- Cumulative emissions in the user’s pathway should be indicated either by “filling the bar” with colour (the user could even see the bar fill up with colour, as an animation). Or we could just mark the position on the bar with a vertical line and label. The latter would be easier for Markus to implement so we would probably do this.
- **Action:** Erica to re-draft mock up for Markus and prepare the bubble text.

Human impacts – extreme events

Jason described some work done by Met Office to plot the location of recent extreme weather events on a map. If this was readily available, we could use this instead of Erica's three illustrative extreme weather events. **Action:** Jason to check if this map is available.

But given we are very tight for time, if this map is not readily available for inclusion, then we would use Erica's three illustrative extreme weather events instead.

This tab should include some text at the top that says something like: "Events like these are becoming much more likely as GHG emissions increase." **Action:** Lucy to send over the standard DECC text on attribution.

Human impacts – weather forecasts

The group watched the World Meteorological Organisation (WMO) weather reports: www.wmo.int/media/climatechangeimpact.html The WMO is an agency of the UN and these videos are endorsed by Ban Ki-moon.

The group were nervous that linking to these videos could put us at risk of over simplifying the climate science: it is impossible to know with certainty what weather events will happen in the future, we only know that the risk of more extreme ones is likely to increase. The group discussed mitigating the risk of this criticism by linking to more than one such study. Jason mentioned that Nigel Arnell had produced some plausible narratives of the future – we could link to these. **Action:** Sophie to contact Nigel. **Action:** rest of group to consider if there were any other such videos or narratives we could link to.

Key messages

Overall comment: we should make the point that there are many different ways of reducing emissions and the tool allows users to explore these. Then explain that we have generated some plausible pathways, and they tell us the following messages.

Comments on the climate science:

- We should consider making the point that global mean temperature increase of 2C is not "safe": we can expect some dangerous impacts.
- Make clear that 2C is a political judgement.

Comments on GGR:

- Need to emphasise speculative nature of the technologies and evidence base.
- The references to iron filings in the ocean are incorrect.
- Tim Kruger expressed a preference to exclude numbers for GGR because the evidence base for this is very speculative.

Action for group: please send Sophie any comments on the key messages.

Action: Lucy to send over the standard DECC text on whether climate scientists are in agreement that climate change is man-made, for use in the key messages.

Communications strategy

Sophie circulated a communications strategy paper at the meeting. The group broadly agreed with it. Comments received:

- Nicole updated the group on the organisations who had committed to providing an example pathway. These were: NEPAD, Oak Ridge National Laboratory, RSPB, University of Surrey and INRA (French National Institute for Agricultural Research).
- Lenny made the good point that we should plan to have adequate resources in place to deal with queries received after the launch. Also, we should have resource available to help businesses that decide they would like to design an example pathway. When new organisations generate example pathways, we can use this as a news item.
- Ellie (Edelman) explained that we can get some media coverage in our target countries by giving news groups such as Bloomberg or Reuters early access to the tool. But if we want to make a big impact on those countries, we may want to tailor our messages to them and this would require a more focused strategy.

Action for group: please send Sophie any comments on the communications strategy.