

Supplementary Memo from GCI to the House of Commons Environmental Audit Committee Enquiry into the budgets in the UK Climate Act 2013.

The previous memo from GCI to EAC stands. With a view to strengthening what has already been written and said by GCI to the EAC 2013 Enquiry, the following information is added: -

1. A corrective point on the exchange between EAC and Juliet Slingo on the 12th of June 2013: -

a. First point - Martin Caton's question to Juliet Slingo:

"Aubrey Meyer said that the Met Office claimed to include all feedback effects in its projections on global emissions when it had not. Would you like to respond to that assertion?"

This is simply wrong. GCI said no such thing.

However, GCI's evidence to EAC 2013 did point at two specific things: -

1. GCI pointed out that the UKMO - without disclosing this to the EAC Enquiry 2009 - completely reversed their own stated meaning of 'coupled-carbon-cycle' modelling from a *positive* to a negative feedback [see major point two below];

2. GCI also pointed out that *UKMO's own disclosure of other feedback effects they had omitted* only occurred after pressure was brought to bear in the EAC Enquiry 2009. UKMO's disclosure did admit that they had indeed left out major feedback effects from their climate-modelling [which they described as potentially 'a big deal'] and it is also now true that they continue to omit these to this this day [all the way into IPCC AR5] preparation due to 'uncertainties' and 'complexity'.

To this GCI adds now two more points: -

3. Given what is already now years of delay in doing this including these other feedback effects - i.e. accomplishing the task of effectively and comprehensively modelling rates of global climate change on this global scale in the face of these omissions due to uncertainties and complexities - it is possibly [and some would say even probably - see statements below] in fact *an insurmountable task*.

4. And therefore that in these circumstances, it is at the very least misleading to the policy community, to continue to hold out the hope that this comprehensive 'climate-modelling' may yet emerge and will be accomplished in any meaningful time-frame in any useful way, when there is an even likelihood that it will not.

b. UKMO's [Julia Slingo's] reply to Martin Caton's question is meaningless: -

"Yes, it is absolutely untrue. To say that we don't include them is absolutely wrong."

Her reply: -

1. Avoids again the UKMO's own admission of the omitted feedback effects.

2. Restates what UKMO did with coupled-carbon feedbacks, but again with no reference to having turned what was a *positive* feedback into a *negative* feedback between IPCC AR4 [2007] and UK Climate Act [2008]!

3. Confirms that UKMO has now put this package as stated above into the IPCC AR5 preparations: -

"We have, as I think has already been made clear for the fifth assessment report, entered the fifth assessment with a full earth system model that includes feedbacks associated with the terrestrial carbon cycle. It includes dynamic vegetation, so this is the long-term changes in forests and shrub land and so on, ocean bio-geochemistry and interactive atmospheric chemistry.

To which she conspicuously adds: - "we have probably contributed more model simulations than virtually any other group in the world, so we take the IPCC process very seriously."

To all this GCI now adds two more obvious points which one would expect were obvious even to the UKMO: -

4. Modelling negative feedback into the coupled carbon cycle is only theoretically plausible as long as UKMO's 'climate-modelling' continues to omit all the other larger scale feedback effects [as they have already admitted], and

5. Actually doing this, would probably recognize a degree of increased concentrations and temperature rise that would make it even theoretically implausible for that coupled carbon cycle *positive* feedback to have been turned into a *negative* feedback effect as they now have modelled into the coupled carbon-cycle, in the first place.

2. Some further points clarifying the what is the iterative but undisclosed about-face on 'coupled-carbon-cycle' modelling performed by the UKMO in a trail that goes through the following sequence: -

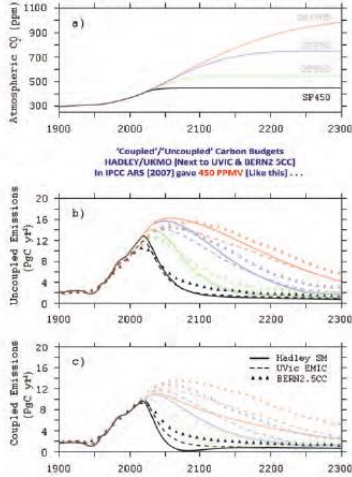
- a. After some years of development through the C4MIP programme led by Betts Cox et al, results of the UKMO/C4MIP work was published in IPCC AR4 [2007] where UKMO's 'coupled-carbon-cycling' showed that concentrations would be significantly *higher* and *rising* than with 'uncoupled-carbon-cycling'.
- b. The reverse of this was then made into law in the UKCA [2008] where UKMO's 'coupled-carbon-cycling' showed that concentrations would be significantly *lower* and *falling* than with 'uncoupled-carbon-cycling' [as was shown in IPCC AR4].
- c. If this was 'true' [realistic accurate] it is something to which the UKMO would have been conspicuously drawing attention, as in terms of UNFCCC-compliance [achieving safe and stable atmospheric concentrations of GHG] it was 'good news' in the sense that 'the problem was not as bad as we thought'.
- d. However, when the matter was then addressed by UKMO in the EAC Enquiry [2009] and on this very point, Jason Lowe reported that concentrations would be significantly *higher* and *rising* than with 'uncoupled-carbon-cycling' – see the evidence given.
- e. Consequently, in doing this, it is not inaccurate to say that the UKMO were *concealing* in the EAC Enquiry [2009] this very point [in other words *specifically not reporting*] the 'good news' that concentrations were portrayed in the UK Climate Act as significantly *lower* and *falling* than with 'uncoupled-carbon-cycling' then http://www.gci.org.uk/images/Volta_Face_UKMO_.pdf

UKMO'S ABOUT-FACE ON THE EFFECT OF COUPLED CARBON-CYCLE MODELLING

Below is what was published in IPCC AR4 WG1 [2007]
 Hadley Coupled & Uncoupled for 450 PPMV [solid black lines].
 'Coupled-emissions' have to be lower than 'uncoupled-emissions'
 to achieve the 450 PPMV concentrations outcome.

This would mean also that if the uncoupled budget was held constant, and the model was then 'coupled', the PPMV outcome would be significantly higher than 450 PPMV, due to what Mr Richard Betts of the UKMO calls 'weaker sinks'. This was repeated to EAC [2009] by Mr Jason Lowe [UKMO].

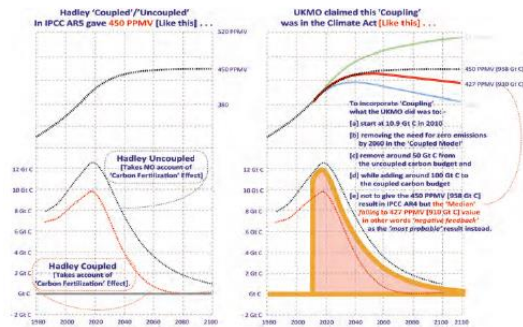
UKMO claim this 'Coupled Modelling' is in UKCA



Here is what became law in the UK Climate Act [UKCA 2008] compared with Hadley Coupled & Uncoupled IPCC AR4 for 450 PPMV. The Carbon-Budget in the Act [solid pinkish colour] is larger than UKMO's 'Coupled-Budget' & smaller than their 'Uncoupled-Budget' [in IPCC AR4 2007] where 'Coupled-emissions' need to be lower than 'uncoupled-emissions' to achieve the 450 PPMV concentrations outcome in IPCC AR4 [2007].

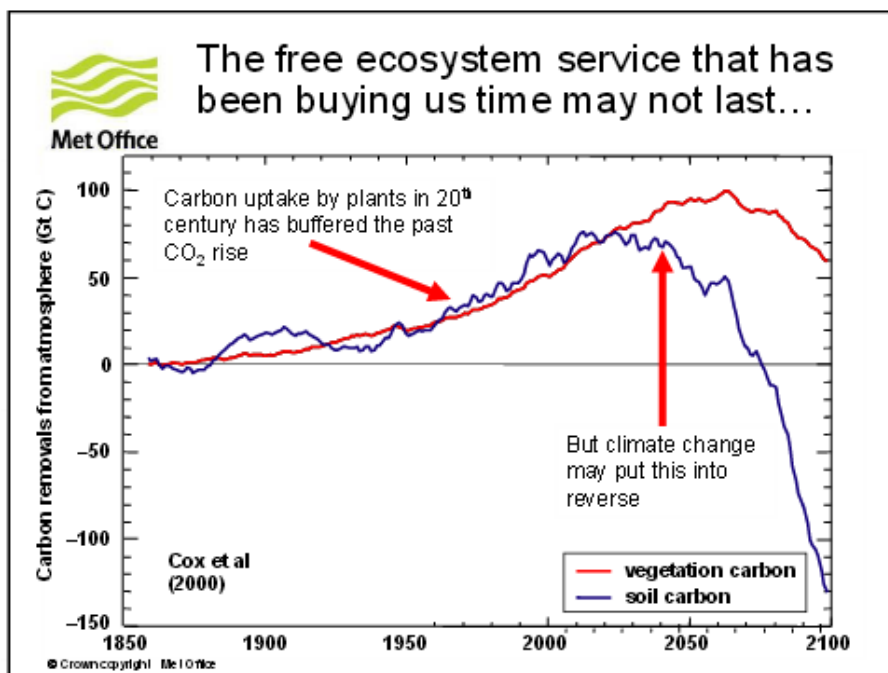
However, in this comparison a new feature is revealed in UKCA [2008]. For this, UKMO produced a 'coupled-emissions-budget' that was larger than the 'coupled-emissions-budget' in their IPCC AR4 exercise, but it also - AND THIS IS THE POINT AT ISSUE - resulted in:-

- [a] a PPMV pathway where concentrations are falling and not rising
- [b] which completely reverse Mr Betts' argument [that concentrations would be rising and not falling with coupling]
- [c] Jason Lowe UKMO giving evidence to EAC [2009] re-iterating that concentrations would rise & not fall for 'coupling'
- [d] in other words concealing this change from the EAC 2009 and now denying there was a change in the EAC 2013 enquiry.



- f. Finally, two years after the Climate Act became law and three months after UKMO/Lowe had given this evidence to the EAC Enquiry 2009, UKMO [Lowe Betts et al] were presenting their work at a conference in Oxford in September 2009.

In this presentation UKMO again contradicting the coupled carbon cycle modelling in the UK Climate Act that clearly modelled *negative* feedback, they presented a truly massive *positive* feedback effect in the coupled carbon cycle modelling shown [from forest die-back] as this summary graphic unambiguously indicates.



Mr Richard Betts, a civil servant at the UKMO, seems to have led the UKMO's whole programme on coupled carbon cycle modelling through C4MIP to the results published in IPCC AR4 [2007].

When all these example of their work and the dates of its presentation were put to him, he explained the UKMO's contradictions away publicly [and on a well-known 'climate-contrarian website' - Bishop's Hill] in the following manner.

For simply pointing out these discrepancies, omissions and contradictions in the UKMO's output, this entertainingly uncivil servant mounted the UKMO's defence of it all by stating there simply that GCI: -

- [a] was a 'well-known alarmist scare-monger'
- [b] 'did not understand climate-science'
- [c] 'failed to recognize that these were *all different models*' [!]

Moreover, he: -

- [d] refused to recognize any discrepancies in the UKMO performance
- [e] and refused to discuss the matter further.

g. All-in-all, the UKMO's performance in this matter is remarkable.

For the contrarians it now all represents evidence of UKMO coming round to their way of thinking. For the record it is evidence of an extraordinary attitude and deterioration in the UKMO's noticeably unreliable and even erratic performance standards.

3. **As a living demonstration of the fact that CH4 release from the already melting permafrost and is combustibile, this video from a year or two ago is a striking demonstration of a present reality: -**
<http://www.youtube.com/watch?v=YegdEOSQotE>



4. **A statement from Dr Ulrich Loening about this matter**
5. **A statement from Dr Mayer Hillman about this matter**

Others have been asked for their views and in due course I expect there to be more statements.

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## **House of Commons Environmental Audit Committee.**

### **Comments on The Question of positive feedback in climate modelling.**

**From Dr Ulrich Loening, former Director of the Centre for Human Ecology, University of Edinburgh.**

10th July 2013

#### **This untruth cannot be left to stand.**

I write at the suggestion of Aubrey Meyer, Global Commons Institute to give my reaction to key climate-feedbacks in the UKMO's UK-Climate-Act.

My justification for being involved in this is that I was for many years close to several research groups on resource modelling, (these include the Balaton Group who make a feature of not publicising their deliberations but helping participants in their understanding, and the Edinburgh EU funded resource accounting programme) including climate scientists who were authors or co-authors of IPC reports. I am not in any way a climate scientist; I did consult some Edinburgh climate modellers.

I have examined the submission that Aubrey Meyer has made to your Committee, and understood the issues but not the detail.

As I understand it, the Climate Act is based on modelling information of projected global temperature rises that omit some possibly key feedbacks from the models; and that the Met Office has more recently explained that this is indeed the case. There is therefore a discrepancy between the terms in the Act and the realities of scientific understanding.

The terms negative feedback and positive feedback tend to be used with equal abandon. It is important first to stress that these are not just opposites but effectively very different phenomena. Negative feedback exerts self-control and is therefore limiting and becomes predictable; positive feedback is self-propagating and is therefore likely to grow out of control without limit and become unpredictable.

The MO's omission of positive feedbacks from the modelling that is used to estimate emission budgets is therefore very serious.

My first reactions were that this omission was poor science, with the consequence is that the omissions amounted to fraud.

However, there are real problems: firstly because of the uncertainties about the scale of positive feedbacks, like the melting of permafrost, they are too difficult to model properly. Indeed one might justifiably argue that large positive feedbacks cannot be modelled because of their very nature; more research would improve the situation but not solve it sufficiently to allow coupling into the climate models.

Secondly, the resulting errors in the modelling could have serious political and implementation consequences. It is for this reason that IPCC has repeatedly under-estimated the likely effects of rising greenhouse gas concentrations, (as can be seen from the lengthy discussions about detailed wording)

These two problems and others like them are, as the MO explained, why the more long term and difficult positive feedbacks were omitted.

However, this untruth cannot be left to stand. Budget emission scenarios must be realistic; otherwise the consequences can become worse. At the very least positive feedbacks must be coupled into the models sufficiently to give a budget which avoids the onset of the largest potential positive feedbacks; once they start in earnest, it is too late to stop them.

My understanding is that the Climate Act would require updating to accommodate the coupling. The question then becomes how to deal politically with this frightening "inconvenient truth." To continue as at present knowing that full coupling would entail a stricter carbon budget, would expand the fraud into a wider context. The solution is of course up to your Committee, but I can suggest that a reasonable guess about what to budget can be made, such that warming remains limited to below what would set positive feedbacks in train. In other words, the fraud can be avoided by being honest about it, and presenting the best plausible carbon budget.

The scenarios proposed by Aubrey and the Global Commons Institute to remain within these limits, seem realistic and achievable. The essential fairness in the C&C process would one would think and hope, enable all nations to join in. I have over many years supported the GCI initiatives, and still hope that this would allow the UK to set the tone and agenda.

**House of Commons Environmental Audit Committee.  
Comments on The Question of positive feedback in climate modelling.**

**From Dr Mayer Hillman  
Senior Fellow Emeritus at the Policy Studies Institute, University of Westminster.  
10th July 2013**

[UKMO's] outcome is not dissimilar to one in which it had deliberately omitted this contribution to the process of target setting.

The concentration of carbon dioxide in the global atmosphere is clearly linked to climate change. It is not only rising alarmingly but, it would appear, doing so exponentially. It has now reached a level not experienced on the planet for millions of years. One does not have to be a climate scientist to understand that there are contributory factors to this other than the direct one of fossil fuel burning.

It is recognised, not least by the UKMO, that a major one is the process of feedback from this burning which is resulting in higher temperatures and thus leading to the level rising still further. The melting of the polar ice caps and loss of snow cover in the tundra regions of Russia and Canada, for example, is seriously diminishing the albedo effect of that cover and releasing growing volumes of methane, a far more potent greenhouse gas than carbon dioxide. Higher temperatures, as well as deliberate felling of significant areas of tropical rainforests, are a cause for extreme concern about the consequences of the loss of their 'sink' function in limiting the rising level of carbon dioxide in the atmosphere.

It stands to reason that policy formation employed in determining reliable targets to counter the worst effects of climate change are wholly unreliable unless they are incorporated as far as is at all possible into the modelling process used to this end. And insofar as they cannot be incorporated owing to the unavailability of research allowing for this, it should be stated explicitly so that this omission is fully reflected in the advice given to policy makers. To date, the UKMO has not done this. The outcome is not dissimilar to one in which it had deliberately omitted this contribution to the process of target setting. Given that there are growing grounds for realising that emissions from the feedbacks may well be exceeding those from the direct burning of fossil fuels, this grave aspect of policy needs to be satisfactorily and transparently rectified as a matter of extreme urgency.

Otherwise, politicians, within and outside the Coalition, civil servants within the various government departments, local authorities, the business community and those active in the various fields of relevant policy will continue to take as the received scientific wisdom that the target agreed by the main political parties of an 80% reduction by 2050 on carbon dioxide emissions over the 1990 level (as contained in the Climate Act) is hugely challenging but nevertheless represents a sufficient one to adequately address the problem of climate change.