IPCC: Serving the Needs of its Members and Improvements for the Future

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Workshop on IPCC AR5, Putrajaya, Malaysia

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Thanks to the Belgian Federal Science Policy Office (BELSPO) and to my team at the Université catholique de Louvain for their support

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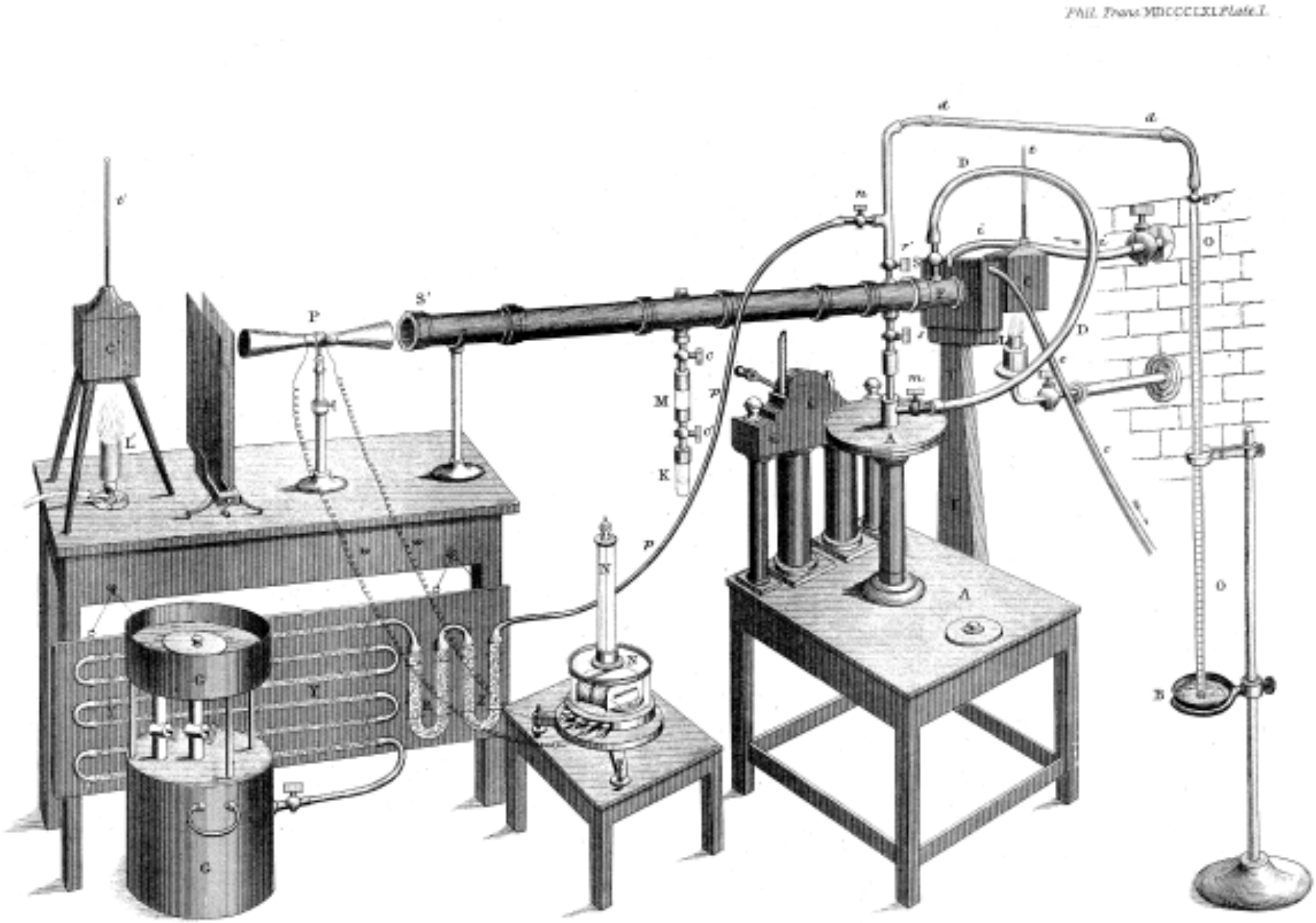
None So Deaf

Auteur: @JohnKudelka

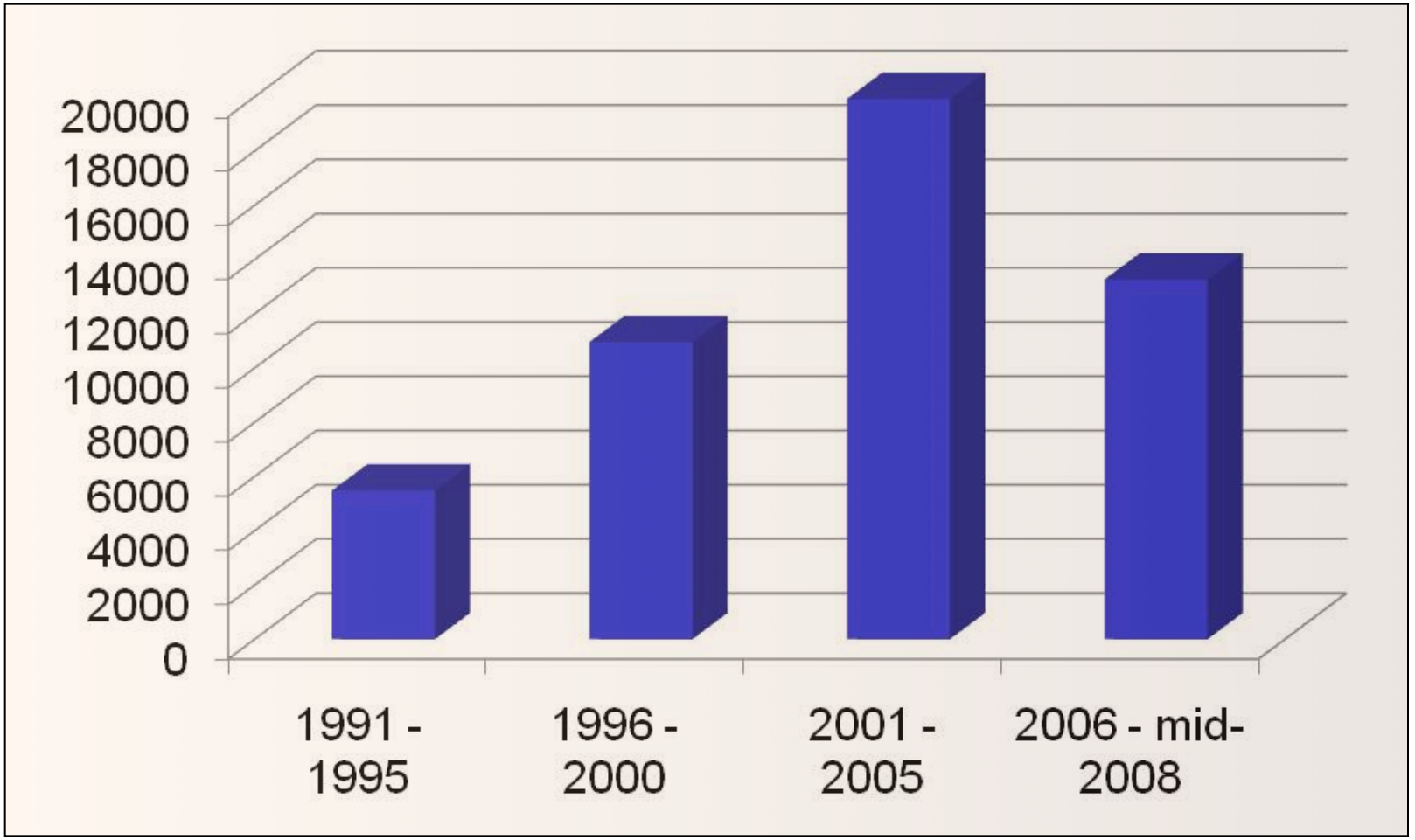
Plan

- **Some history: where do we come from?**
- IPCC mandate
- IPCC organization & procedures
- IPCC at the Science – Policy interface
- The future of IPCC: How can IPCC serve its members even better?



Tyndall (1861) measures radiation absorption by different gases

Number of papers published on climate change



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Why the IPCC ?

Established by WMO and UNEP in 1988

to provide **policy-makers** with an **objective source of information** about

- causes of climate change,
- potential environmental and socio-economic impacts,
- possible response options (adaptation & mitigation).

WMO=World Meteorological Organizatior

UNEP= United Nations Environment Programme

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Mandate of the IPCC

"The General Assembly […] endorses action of the World Meteorological Organisation and the United Nations Environment Programme in jointly establishing an Intergovernmental Panel on Climate Change to provide international coordinated scientific assessments of the magnitude, timing and potential environmental and socio-economic impact of climate change and realistic response strategies […]."

United Nations General Assembly
43rd session resolution, 6th December 1988

The role of the IPCC (1)

[To] assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.

Source : http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf

The role of the IPCC (2)

IPCC reports should be **neutral with respect to policy**, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies." (Principles Governing IPCC Work, paragraph 2)

Source : http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf

The role of the IPCC (3)

Review is an essential part of the IPCC process. Since the IPCC is an intergovernmental body, review of IPCC documents should involve **both** peer review **by experts and** review **by governments**.

Source : http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf

"The IPCC does not carry out research nor does it monitor climate related data or other relevant parameters. It bases its assessment mainly on peer reviewed and published scientific/technical literature."

NB: IPCC Reports are **policy-relevant, NOT policy-prescriptive**

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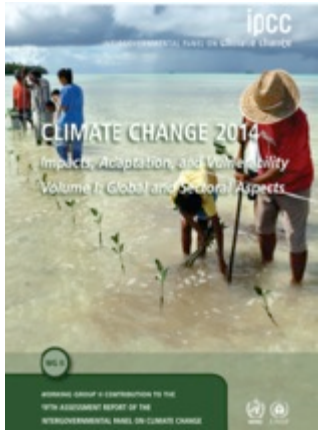

What is happening in the climate system?

What are the risks?

What can be done?

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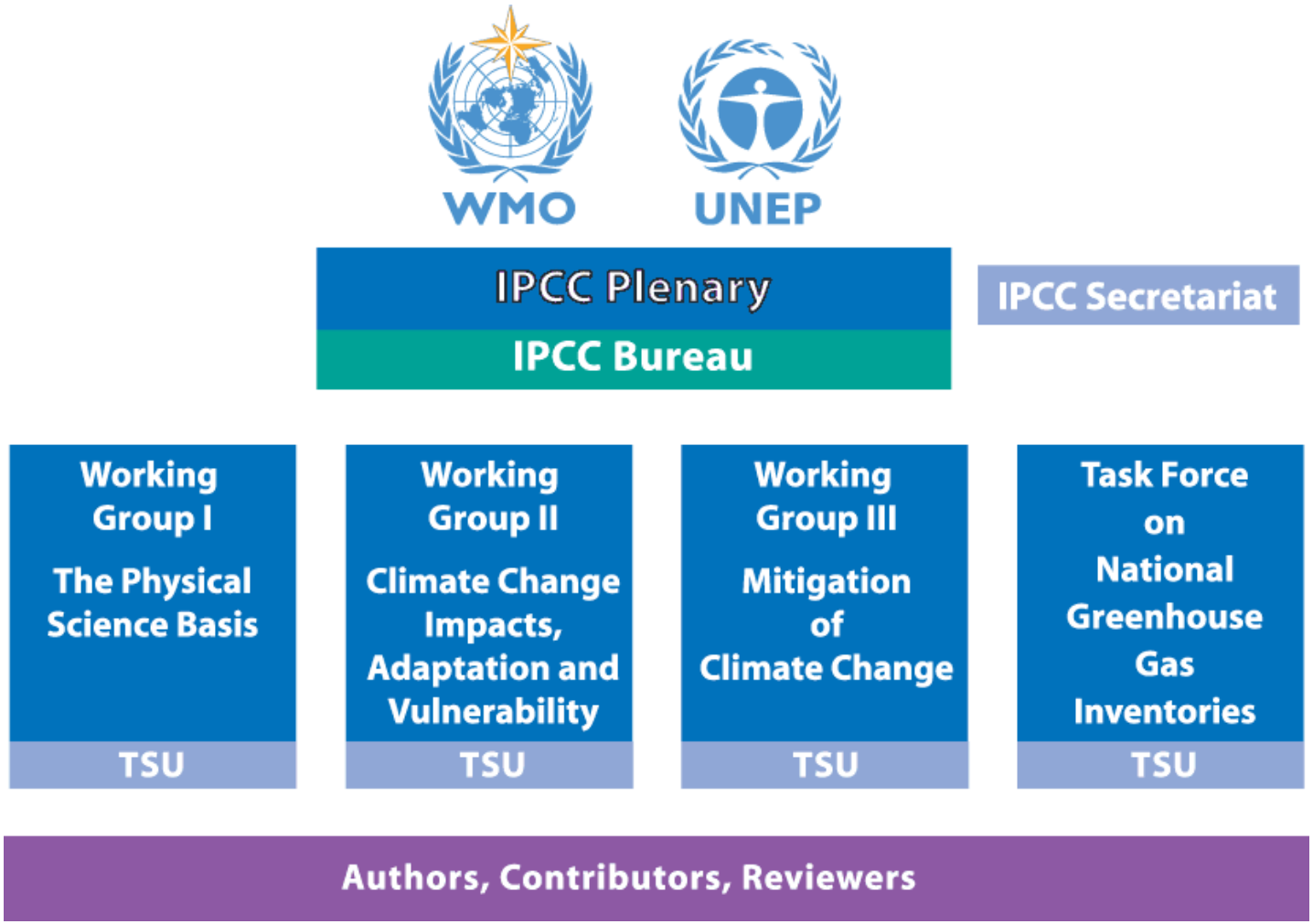
Structure of the Intergovernmental Panel on Climate Change



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IPCC writing cycle (5 years, 2500 scientists)

- **Plenary decides table of content of reports**
- **Bureau appoints world-class scientists as authors, based on publication record**
- **Authors assess all scientific literature**
- ***Draft* – Expert review (+ Review editors)**
- ***Draft 2 (+ Draft 1 Summary for Policy Makers (SPM)* – Combined expert/government review**
- ***Draft 3 (+ Draft 2 SPM)*– Government review of SPM**
- **Approval Plenary (interaction authors – governments) – *SPM and full report***
- ***NB: the authors have the last word for words that are in the SPM***

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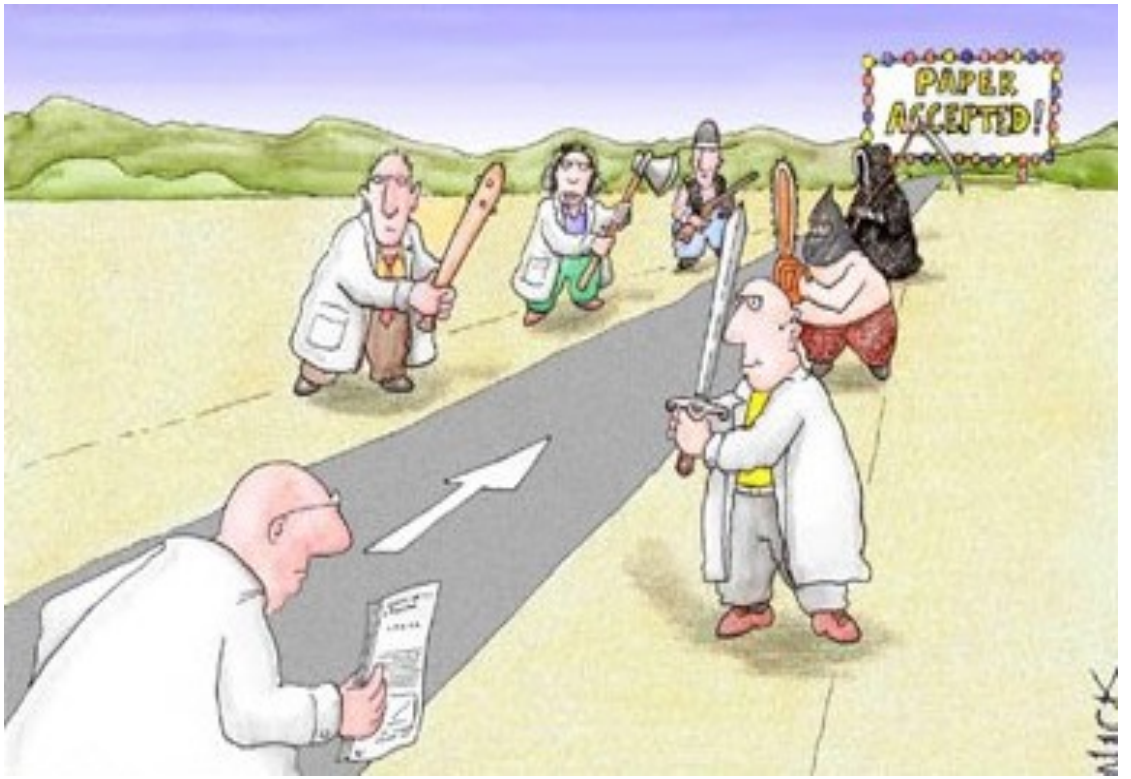
The Review Process

Review is an essential part of the IPCC process to ensure objective and complete assessment of the current information.

In the course of the multi-stage review process, both expert reviewers and governments are invited to comment on the accuracy and completeness of the scientific/technical/socio-economic content and the overall balance of the drafts.



IPCC Reports

5 Assessment Reports *(1990,1995, 2001, 2007, 2013-14)*

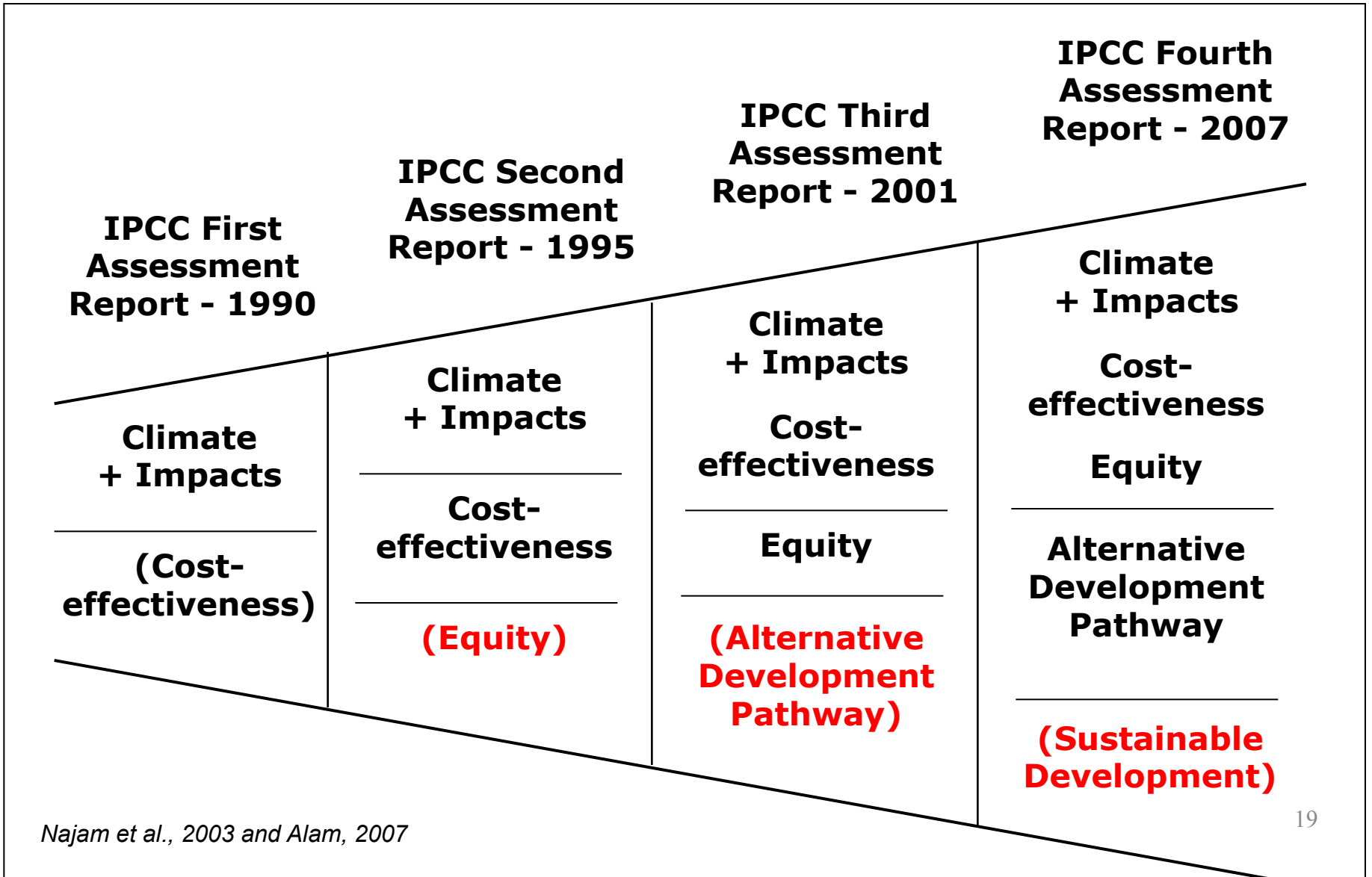
1992 Supplementary Report and 1994 Special Report

9 Special Reports *(1997,1999, 2000, 2005, 2011, 2012)*

Guidelines for National GHG Inventories, Good Practice Guidance *(1995-2006-2013)*

6 Technical Papers *(1996-2008)*

Background



Najam et al., 2003 and Alam, 2007

AR5 is the best ever

- Better integration of Mitigation and Adaptation
- Improved risk-management approach
- Evolving away from the non-mitigation SRES scenarios (SRES= Special Report on Emission Scenarios, 2000)
- Special effort to provide regional information when available
- Sustainable development & equity aspects
- More comprehensive treatment of economic aspects, and of cross-cutting issues
- Emerging issues handled (geo-engineering, …)
- Better handling & communication of uncertainties

Strengths of the IPCC

- ✓ **Mobilisation of thousands of multi-disciplinary experts worldwide**
- ✓ **Policy-relevant findings**
- ✓ **Widely used methodological reports**
- ✓ **Assessments relying on peer reviewed literature**
- ✓ **Review process involving experts and Governments**
- ✓ **Media attention and outreach activities**

Nobel Peace Prize for 2007

- **Shared, in two equal parts, between the Intergovernmental Panel on Climate Change (IPCC) and Albert Arnold (Al) Gore Jr. for « *their efforts to build up and disseminate greater knowledge about manmade climate change, and to lay the foundations for the measures that are needed to counteract such change*. »**

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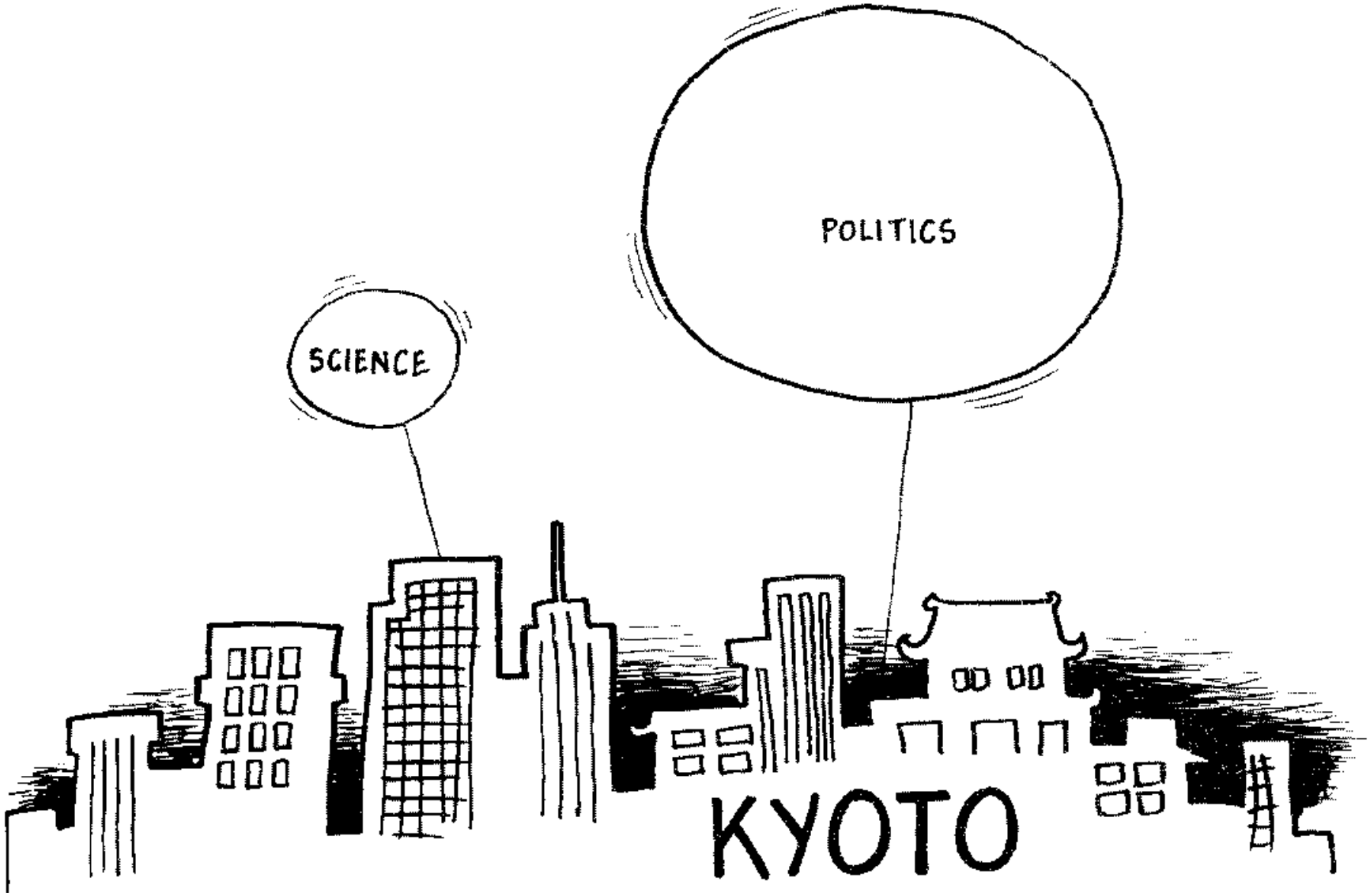


Agarwal et al., 1999

The IPCC assessments have influenced global action on an unprecedented scale

1. The First Assessment Report (FAR, 1990) had a major impact in defining the content of the UNFCCC
2. The Second Assessment Report (SAR, 1996) was largely influential in defining the provisions of the Kyoto Protocol
3. The Third Assessment Report (TAR, 2001) focused attention on the impacts of climate change and the need for adaptation
4. The Fourth Assessment Report (AR4, 2007) informed the decision on the ultimate objective (2°C) and is creating a strong basis for a post Kyoto Protocol agreement
5. The Fifth Assessment Report (AR5, 2013-14) will inform the review of the 2°C objective, and be the context for preparing the post-Durban 2015 agreement

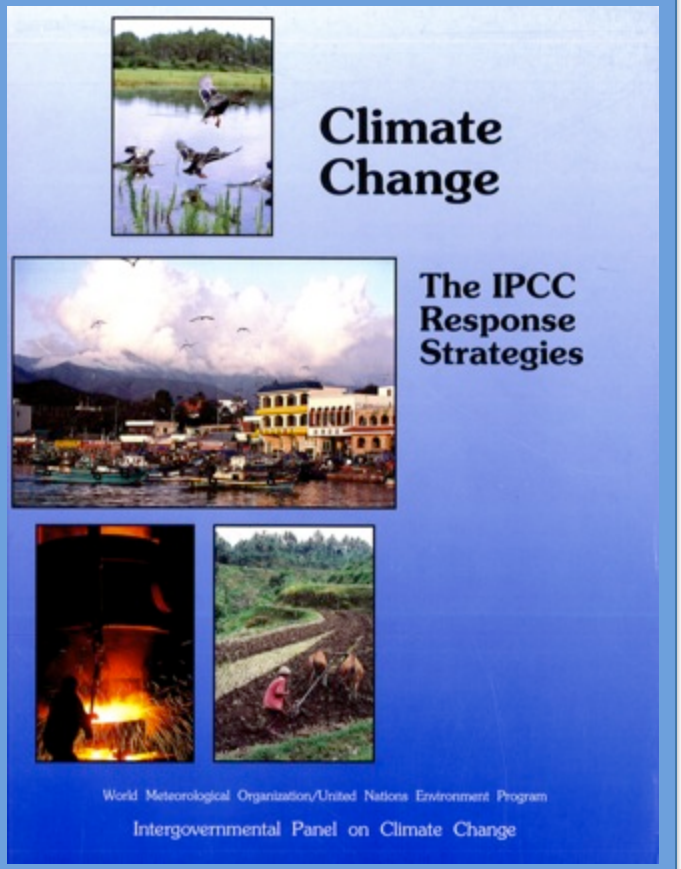
IPCC – UNFCCC relationship: long and productive

Two examples

The IPCC is older than the UNFCCC!

First Assessment Report (FAR, 1990)

The IPCC Response Strategies



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IPCC FAR (1990): Possible elements for inclusion in a Framework Convention on Climate Change (1)

An article would set out the general obligations agreed to by the parties to the Convention, for example:

- The adoption of appropriate measures to protect against the adverse effects of climate change, to limit, reduce, adapt to, and, as far as possible, prevent climate change in accordance with the means at the disposal of individual countries and their scientific and technical capabilities; and to avoid creating other environmental problems in taking such measures

IPCC, FAR, 1990, p. 264

IPCC FAR (1990): Possible elements for inclusion in a framework Convention on Climate Change (2)

- The protection, stabilization, and improvement of the composition of the atmosphere in order to conserve climate for the benefit of present and future generations;

- Taking steps having the effect of limiting climate change but that are already justified on other grounds

IPCC, FAR, 1990, p. 264

Bali: COP Decision about IPCC AR4 (Decision 5/CP.13)

- The Conference of the Parties,
- 1. Welcomes the Fourth Assessment Report of the Intergovernmental Panel on ClimateChange;
- 2. Expresses its appreciation and gratitude to all those involved in the preparation of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change for their excellent work;
- 3. Recognizes that the Fourth Assessment Report represents the most comprehensive and authoritative assessment of climate change to date, providing an integrated scientific, technical and socio-economic perspective on relevant issues;

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Bali action plan (december 2007)

- ***The Conference of the Parties*,**
- ***(…) Responding* to the findings of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change that warming of the climate system is unequivocal, and that delay in reducing emissions significantly constrains opportunities to achieve lower stabilization levels and increases the risk of more severe climate change impacts,**
- ***Recognizing* that deep cuts in global emissions will be required to achieve the ultimate objective of the Convention and emphasizing the urgency *(NOTE 1)* to address climate change as indicated in the Fourth Assessment Report of the IPCC,**
- **1. *Decides* to launch a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its fifteenth session, by addressing, inter alia: …**
- ***Note 1: Contribution of Working Group III to the Fourth Assessment Report of the IPCC, Technical Summary, pages 39 and 90, and Chapter 13, page 776.***

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Contribution of Working Group III to the Fourth Assessment Report of the IPCC,

- **Technical Summary, page 39:**

Table TS.2: *Classification of recent (Post-Third Assessment Report) stabilization scenarios according to different stabilization targets and alternative stabilization metrics [Table 3.5].*

Category	Additional radiative forcing (W/m^2)	CO_2 concentration (ppm)	CO_2-eq concentration (ppm)	Global mean temperature increase above pre-industrial at equilibrium, using "best estimate" climate sensitivity[a), b)] (°C)	Peaking year for CO_2 emissions[c)]	Change in global CO_2 emissions in 2050 (% of 2000 emissions)[c)]	No. of assessed scenarios
I	2.5-3.0	350-400	445-490	2.0-2.4	2000 - 2015	-85 to -50	6
II	3.0-3.5	400-440	490-535	2.4-2.8	2000 - 2020	-60 to -30	18
III	3.5-4.0	440-485	535-590	2.8-3.2	2010 - 2030	-30 to +5	21
IV	4.0-5.0	485-570	590-710	3.2-4.0	2020 - 2060	+10 to +60	118
V	5.0-6.0	570-660	710-855	4.0-4.9	2050 - 2080	+25 to +85	9
VI	6.0-7.5	660-790	855-1130	4.9-6.1	2060 - 2090	+90 to +140	5
						Total	177

Notes:

a) Note that global mean temperature at equilibrium is different from expected global mean temperatures in 2100 due to the inertia of the climate system.

b) The simple relationships $T_{eq} = T_{2\times CO2} \times \ln([CO_2]/278)/\ln(2)$ and $\Delta Q = 5.35 \times \ln([CO_2]/278)$ are used. Non-linearities in the feedbacks (including e.g., ice cover and carbon cycle) may cause time dependence of the effective climate sensitivity, as well as leading to larger uncertainties for greater warming levels. The best-estimate climate sensitivity (3 °C) refers to the most likely value, that is, the mode of the climate sensitivity PDF consistent with the WGI assessment of climate sensitivity and drawn from additional consideration of Box 10.2, Figure 2, in the WGI AR4.

c) Ranges correspond to the 15th to 85th percentile of the Post-Third Assessment Report (TAR) scenario distribution. CO_2emissions are shown, so multi-gas scenarios can be compared with CO_2-only scenarios.

Note that the classification needs to be used with care. Each category includes a range of studies going from the upper to the lower boundary. The classification of studies was done on the basis of the reported targets (thus including modelling uncertainties). In addition, the relationship that was used to relate different stabilization metrics is also subject to uncertainty (see Figure 3.16).

Contribution of Working Group III to the Fourth Assessment Report of the IPCC,

- **WGIII Chapter 13, page 776, referred to by Bali action plan**

Box 13.7 The range of the difference between emissions in 1990 and emission allowances in 2020/2050 for various GHG concentration levels for Annex I and non-Annex I countries as a group[a]

Scenario category	Region	2020	2050
A-450 ppm CO_2-eq[b]	Annex I	–25% to –40%	–80% to –95%
	Non-Annex I	Substantial deviation from baseline in Latin America, Middle East, East Asia and Centrally-Planned Asia	Substantial deviation from baseline in all regions
B-550 ppm CO_2-eq	Annex I	-10% to -30%	-40% to -90%
	Non-Annex I	Deviation from baseline in Latin America and Middle East, East Asia	Deviation from baseline in most regions, especially in Latin America and Middle East
C-650 ppm CO_2-eq	Annex I	0% to -25%	-30% to -80%
	Non-Annex I	Baseline	Deviation from baseline in Latin America and Middle East, East Asia

Notes:

[a] The aggregate range is based on multiple approaches to apportion emissions between regions (contraction and convergence, multistage, Triptych and intensity targets, among others). Each approach makes different assumptions about the pathway, specific national efforts and other variables. Additional extreme cases – in which Annex I undertakes all reductions, or non-Annex I undertakes all reductions – are not included. The ranges presented here do not imply political feasibility, nor do the results reflect cost variances.

[b] Only the studies aiming at stabilization at 450 ppm CO_2-eq assume a (temporary) overshoot of about 50 ppm (See Den Elzen and Meinshausen, 2006).

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Some of the Challenges:

- Assess and synthesize the increasing body of literature
- Further improve policy-relevance, without becoming policy-prescriptive
- Provide better regional information
- Improve developing countries participation
- Continue to improve quality and readability (review, procedures for quality control)
- Innovate to allow easier « updating »?
- Engage in more outreach and/or collaboration with others for wider dissemination?

Future of the IPCC: process led by the Panel

- At the end of an assessment report cycle
- Procedures: size, structure and composition of the IPCC Bureau to be reviewed at least one Panel session after the next election
- Discussion on the future of the IPCC started at Plenary 37 in November 2013
  - task group chaired by New Zealand and Saudi Arabia
  - next meeting in september
  - currently seeking input from scientists involved in IPCC
  - public website : http://ipcc.ch/apps/future/

Task group / Future of the IPCC: objectives

- help the IPCC to continue to improve its operation and products, by providing options regarding:
  - the future products of the IPCC;
  - the appropriate structure and modus operandi for the production of these IPCC products;
  - enhancement of the participation and contribution of developing countries in the future work of the IPCC.

Future work of the IPCC

- The Panel further agreed that the Task Group will draw on multiple sources, including submissions from members of the IPCC (questionnaire).
- The questionnaire is structured around the three objectives agreed by the Panel at its 37th Session.
- A dedicated webpage : http://www.ipcc.ch/apps/future/

Future work of the IPCC: Questionnaire

A. What should be the future products of the IPCC?
B. What would be the appropriate structure and modus operandi for the production of these IPCC products?
C. Ways to ensure enhancement of the participation and contribution of developing countries in the future work of the IPCC
D. Other matters

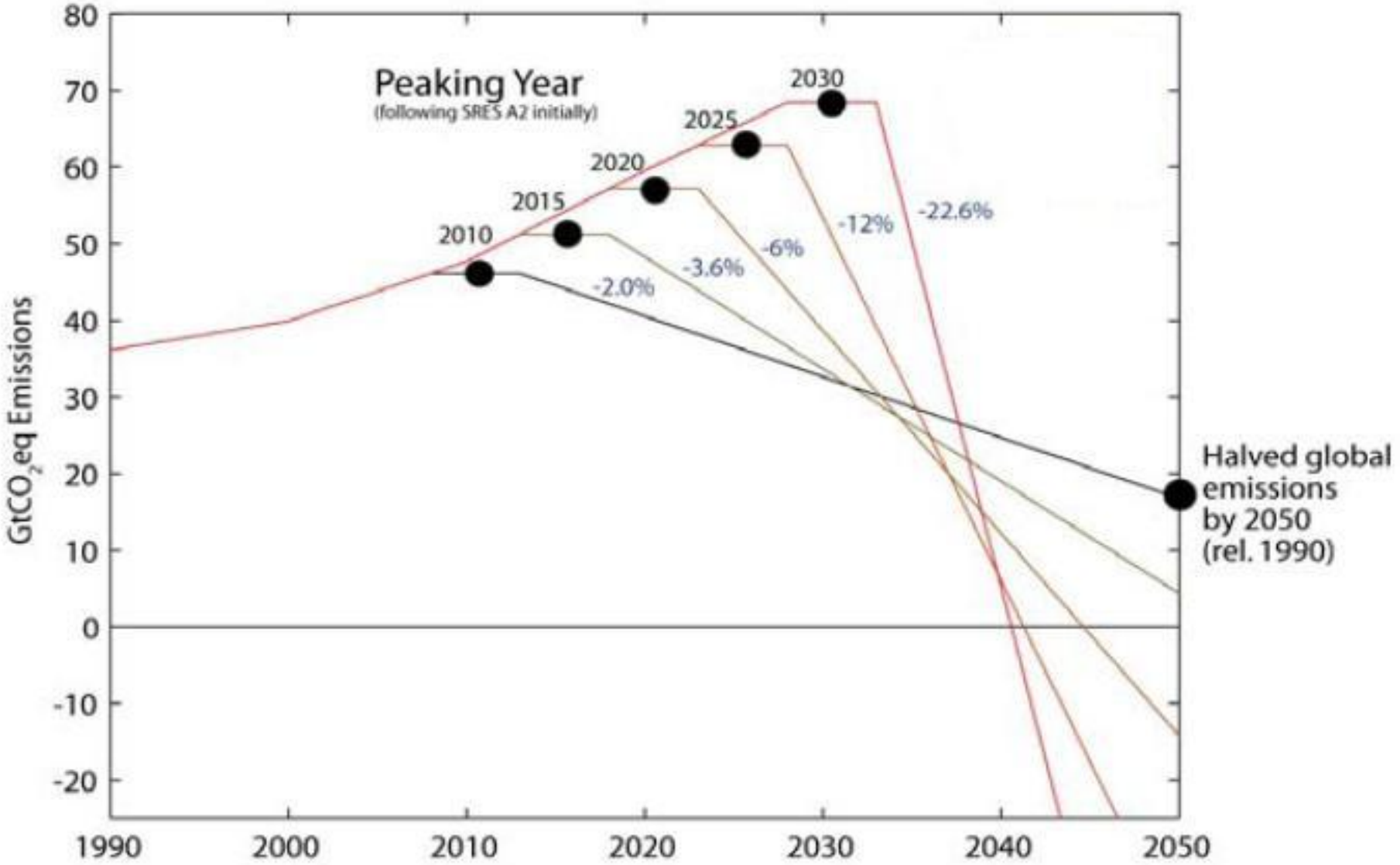
"This really is an innovative approach, but I'm afraid we can't consider it. It's never been done before."

Conclusion (1):

Science has a lot to offer to understand better this un-named "Party" of UNFCCC, with whom one can*not* negotiate:

The Climate System, governed by the laws of Nature

The more we wait, the more difficult it will be



Source: Meinshausen et al. - Nature, 30th April 2009

Conclusion (2):

IPCC is eager to continue serving the climate and sustainable development process, with policy relevance, without being policy-prescriptive

Useful links:

- www.ipcc.ch :IPCC
- www.climatechange2013.org :WGI
- www.climateadaptation2014.org :WGII
- www.climatechange2014.org :WGIII
- www.climate.be/vanyp : my slides and other documents
- **On Twitter: @JPvanYpersele**

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