ipcc

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POLICY RELEVANT SCIENTIFIC TECHNICAL TOPICS TO BE ADDRESSED IN THE IPCC AR5

Summary of comments from Governments and Organizations

(Prepared by the IPCC Secretariat)

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WMO UNEP

Summary of comments relating to the scoping of IPCC Fifth Assessment Report (AR5)

In its consideration of the scoping of AR5 the Panel at its 30th Session, held in Antalya, Turkey, 21-23 April 2009, agreed to invite governments and observer organizations to submit, before the end of May 2009, policy-relevant scientific technical topics they would like to be addressed in the AR5 and its Synthesis Report. This summary has been prepared by the IPCC Secretariat to assist reviewing the many valuable submissions and should not be considered as an alternative way of obtaining all the information in the submissions. It is strongly advised to also read the original contributions (**AR5-SCOP/INF.1**).

This summary considers the submissions of the following countries (37):

Barbados	Ireland	Spain
Belgium	Italy	Sri Lanka
Canada	Japan	Sudan
China	Kenya	Sweden
Colombia	Malaysia	Switzerland
Czech Republic	Mali	Thailand
Denmark	Maldives	Turkey
Dominican Republic	Mauritius	UK
Ecuador	Mexico	USA
Finland	Mongolia	
Germany	Netherlands	
Greece	New Zealand	
Hungary	Republic of Korea	
India	Slovakia	

The following IPCC observer organizations (13) also submitted their views:

EC	IOC of UNESCO	START
FAO	IPIECA	WHO
IAEA	IUCN	WMO
ICAO	UNEP	
ICC	UNFCCC	

Comments from other organizations (2):
IASC
SCAR

In order to indicate the distribution of submissions addressing the same topic, a simple color/character code was introduced: few [F], several [S] and many [M] submissions share common views. The order in the listings below is random.

1. General comments

- **Process**
  - keep preparation process transparent [S]
  - consider research outcomes of international programmes including ESSP, IGBP, WCRP, IHDP, FP7 on energy, environment etc. [F]
  - consider literature in non-UN languages, national reports and relevant 'grey' literature; mind the geographical balance of published literature [S]
  - improve cross working group linkages, in particular between WG II and III, through overlap in writing teams, joint workshops etc. [M]; agree on well-defined common terminology ('feedback', other definitions) [F]
  - involve experts from business and industry public-private partnerships and 'all' stakeholders during preparation of report [S]
  - consider the views of climate skeptics and provide the best scientific base to address their views [S]
  - find ways to provide assessed information on emerging science in shorter intervals [F]
  - involve more scientists from 'smaller' developing countries [F]
  - involve young scientists in the AR5 preparation process [F]
  - recognize the value of climate information service and delivery to sensitive sectors and for policy formulation [F]

- **Key issues to be considered in all WG reports**
  - assess climate change science, impacts, vulnerability and mitigation at regional/sub-regional scale and sector-by-sector [M]
  - develop new set of regions or sub-regions defined by climatic and socio-economical aspects [F]
  - address key uncertainties and future research needs identified in AR4 and enhance efforts towards greater integration of climate-related research across all disciplines [S]
  - develop consistent baselines for climate scenarios and consistent scenarios throughout the AR5 [F]
  - improve assessment of model uncertainties of all models used by WG I, II and III [S]; not only provide ranges of uncertainties but also information on the source of/basis for estimates, i.e. indicate whether uncertainty estimates are based on (i) objective science-based statistical methods, (ii) incomplete science and expert judgment, (iii) a range of assumptions (economic models) [F]
  - improve quantification of risk ('probability x magnitude of impact') to increase policy relevance [F]
  - assess 'safe level'/'dangerous interference with the climate system', 'thresholds'/'tipping points/elements', 'inevitable climate change', 'regional hot spots', and identify indices, consequences and options [M]
  - provide detailed cost-benefit and cost-efficiency analysis of all 'actions', in particular of integrated mitigation and adaptation, and explore links to economic development and sustainability [M]
  - indicate gaps in research and observational networks to drive climate observation and research agendas noting a shift from global to regional scales [S]
  - review synergies and tradeoffs of climate change policies with other multilateral environmental agreements (MEAs) and the Millennium Developmental Goals (MDGs) [S]
  - assess ethical dimensions of climate change and policy incl. human rights [S]
  - review the 'cumulative impact' of implementing the Kyoto Protocol and other multilateral environmental agreements on combating climate change and evaluate whether we are 'on track' with reduction targets [S]

- **Communication**
  - address how risks are perceived and which are barriers for action
  - illustrate findings though case studies and best practices [F]
  - focus on 'effective mass communication' and policy effectiveness [S]
  - better communicate uncertainties to policy makers and general public [F]

- **Scope and Structure of the Synthesis Report**
  - prioritize and focus on policy-relevant themes (rather than scientific disciplines) [S]; e.g. on (i) irreversible and non-linear processes, (ii) global feedbacks and severe impacts
  - be policy relevant but not policy prescriptive [S]
  - increase readability by making the Synthesis Report simpler and less condensed [F]
  - use chapter format as in AR4 over the Q&A-format used in TAR [F]
  - give a comprehensive picture of cross-cutting issues and become a true synthesis/integrated assessment of WG I, II and III [S]
  - indicate 'gaps in knowledge' to feed into climate research agendas [F]

- **Other issues**
  - reduce IPCC's carbon footprint through better use of teleconferencing and offsetting of emissions caused by travel [F]

2. Working Group I Report

- **Understanding and attributing climate change**
  - link detection and attribution studies to regional climate trends [S]
  - review current understanding of anthropogenic versus natural forcings and of their interactions and impact on climate [S]

- **Severe weather/climate events and extremes**
  - evaluate what will be the risks for extreme events under applied mitigation measures [F]
  - assess synergistic effects of anthropogenic and natural forcings on extreme events [F]
  - assess trends in intensity/frequency of extremes on a regional basis and provide projections of extremes [S]

- **Regional focus**
  - assess climate change at the regional – if possible: sub-regional – basis and develop short- and long-term regional climate projections [M]
  - improve emphasis on climate hot spots: the Mediterranean area, the polar regions, small island states, urban settlements/mega-cities, mountains [M]

- **Uncertainties in climate change assessment**
  - improve assessment of model uncertainties through consideration of sensitivity experiments [S]
  - assess sensitivity of systems, thresholds and early-warning indicators [S]
  - consider non-expert judgments and alternative methods for assessing uncertainty [F]

- **Climate modeling and projections**
  - put more emphasis on climate projection studies with focus on regional projections [M]
  - develop post-2100 scenarios and assess natural large-scale dynamics on a longer time-scale [S]
  - emphasize climate simulation ensembles and multidecadal climate predictions [S]
  - improve model representation of the cryosphere, chemical and biological feedbacks, C/N/P cycles, soil/surface cover/land use [S]

- **Atmosphere and radiative forcing**
  - assess climate change impact on – and role of – the mesosphere [F]
  - include climate change impact on – and role of – the stratosphere and its impact on surface climate [S]
  - assess research on ozone recovery [F]
  - consider latest research on biogenic volatile organic compounds [F]
  - review state-of-research on aerosols incl. air pollutants and their precursors, ozone precursors, sulphate aerosols, black carbon and impact their on radiative balance [M]
  - review alternative metrics available to determine CO_2 equivalence of GHG; explore relationship between emissions and increase in atmospheric concentrations of GHG and its CO_2 equivalent, including how emission reductions at local/national level impact atmospheric concentrations [S]
  - review methodology for GHG inventories and the concept of interchangeability within a 'basket' of emissions [F]
  - consider gases and forcings not covered by the Kyoto Protocol [F]
  - assess stability of methane hydrates and implications for atmospheric chemistry [F]
  - assess chemical and biological feedback processes incl. biogenic production of dimethyl sulfide, biogenic volatile organic compounds (BVOCs) [F]
  - explore aerosol-cloud-precipitation processes incl. state of knowledge, model representation, observational capabilities [M]
  - review radiative and precipitation properties of southern-hemisphere clouds, cirrus clouds and aviation contrails [F]

- **Hydrological cycle**
  - assess latest research on Earth's hydrology incl. water vapor's global warming potential, regional/global evaporation/precipitation changes, availability of ground and freshwater, variability in soil moisture, river run-off [M]
  - review water management policies and governance incl. changing needs of human populations and agriculture [S]

- **Climate monitoring**
  - continue documentation of observed climate changes [F]

- **Abrupt/irreversible events**
  - define 'tipping points'/'thresholds' past which the climate system may shift into potentially irreversible states with severe consequences for social, economic and natural systems [M]

- **Use of paleo-data**
  - find paleo-climatic analogues of non-linear climate responses/rapid climate changes [S]

- **Cryosphere**
  - assess irreversible, non-linear and feedback processes in the cryosphere and global/regional impacts from melting sea-ice, glaciers and permafrost, with special emphasis on Greenland and Antarctica [S]

- **Carbon cycle and biosphere**
  - in the context of GHG inventories assess changes to carbon stocks (biomass, soil) through land use change, biofuel production etc. and potential positive feedbacks on climate, and review state-of-science of carbon cycle feedbacks [M]
  - conduct climate system-biosphere modeling (incl. carbon, nitrogen, nutrients and other biogeochemical interactions) to assess GHG emissions from land use changes [S]

- **Oceans**
  - include carbon uptake by the oceans, ocean chemistry/circulation/heat budget changes, ocean acidification and its environmental impact [M]

- assess uncertainties in sea-level projections and provide regional impact information of sea level rise [**M**]
- assess internal variability of the oceans with a focus on decadal-multidecadal variability [**S**]
- review status of research on weakening and potential shutdown of the ocean conveyor belt [**F**]

- **Other issues**
  - assess science basis and full impact of aviation and shipping transport [**S**]

3. Working Group II Report

- **Scope and process**
  - widen focus on impacts other than those related to projected temperature increase [**F**]
  - engage resource managers and regional planning managers during the assessment preparation process
  - widen focus on detection and attribution of observed impacts

- **Adaptation policies and measures**
  - consider the challenge of climate change adaptation and maintaining sustained economies from the perspective of developing countries and small island states [**M**]
  - provide better estimates of needs for adaptation on a regional scale [**M**]; define 'safe adaptation level' and review limits of adaptive capacity [**F**]
  - assess applied adaptation policy and measures including barriers to implementation on a regional/sectoral basis; describe transitory adaptation processes; develop recommendations and best practices; analyze case studies and autonomous adaptation [**M**]
  - investigate autonomous adaptation and its implications [**F**]
  - assess temporal and spatial dynamics leading to more efficient adaptation [**F**]
  - evaluate the options to cope with 'inevitable' climate change [**F**]
  - evaluate possible role of adaptation as a strategic negotiation item in international environmental agreements [**F**]
  - assess efforts in strengthening institutional and financial frameworks for sustaining capacity building and enabling adaptation [**F**]
  - address opportunities for and gaps in policy support for community-based adaptation [**F**]

- **Economics, costs and benefits of adaptation**
  - provide financial mechanisms to low-carbon society/economy, objectives and framework for adaptation including institutional pathways [**S**]
  - evaluate effectiveness and benefits of adaptation measures, including co-benefits of adaptation and mitigation measures [**M**]
  - assess costs-benefits and cost-effectiveness of adaptation policies; assess costs of impacts and adaptation as well as costs of inactions and delayed actions [**M**]; factor in indirect costs from transactions, policy implementation costs etc. [**S**]
  - analyze insurance and compensation practices [**F**]
  - consider adaptation along with economic growth and sustainable development [**M**]
  - assess non-monetary impacts e.g. loss of biodiversity, populations at risks etc. [**F**]

- **Abrupt/irreversible changes and extreme events**
  - review consequences of rapid climate change, in particular in vulnerable geographic areas such as the Arctic, small island states [**F**]
  - focus stronger on the fact that changes in climate extremes have large impacts and that there is a need for adaptation to extreme events and natural variability [**F**]
  - assess resilience and vulnerability, in particular wrt. tipping points/elements and with a regional focus [**M**]
  - provide assessment of risks, their management and disaster prevention activities [**M**]

- **Impact and vulnerability assessment and uncertainties**
  - improve uncertainty estimates of medium to long-term impacts and at regional/sub-regional scales [**M**]
  - assess available vulnerability indices [**S**]
  - consider impacts on and resilience of biological systems, biodiversity, fragile ecosystems incl. the different ocean and mountain natural systems, wetlands, forests, grasslands, drylands and deserts as well as managed ecosystems [**M**]; review species at risk, genetic diversity; evaluate source/sink potential of the biosphere [**S**]
  - devote a separate chapter to impacts on oceans incl. ocean chemistry, acidification, circulation and heat budget changes [**F**]
  - assess human security-climate change relationship, integrate across a range of security themes e.g. food, water, energy and analyse how multiple stressors interact with human security incl. migration and conflicts, disaggregated by region [**M**]
  - increase emphasis on climate change impacts on health [**M**]
  - assess human rights implications of regional climate change impacts [**F**]
  - review impacts of climate change on hydropower and other alternative energy generation and mitigation options [**S**]
  - assess climate change impacts on water and its management [**M**]
  - assess sectoral interactions of climate change impacts: water and land use [**S**]
  - assess impacts on and current/future needs of the infrastructure and transport sectors [**F**]

- **Other issues**
  - assess climate change influence with respect to other human-induced stress factors causing environmental problems such as desertification, loss of biological diversity, coastal erosion, hydrogeological risk, diseases [**F**]
  - consider social ramification of changes in terms of employment, education policy, issues related to equity, gender and children, and assess the social acceptability of adaptation measures [**F**]

4. Working Group III Report

- **Scope and process**
  - involve experts from business and industry in preparation of report [**S**]
  - provide examples of implemented mitigation policies from industry, voluntary actions etc. [**F**]
  - mind that business and industry will use the WG III report as guidance for planning and actions on technology advances, investments etc. [**F**]
  - recognize climate information services and delivery as integral component of for mitigation [**F**]

- **Scenarios**
  - assess low-level stabilization scenarios and pathways and their feasibility [**S**]
  - use mitigation scenarios based not only on emitted gases but their chemical constituents ('life cycle analysis') [**F**]
  - assess regional differences in emission baselines, pathways and mitigation potentials [**F**]
  - base mitigation studies on a 'diversified', second-best not on a 'perfect world': use dynamic scenarios based on limited participation, trade, technology choice/options/advances etc. [**M**]
  - focus mitigation studies on an average global temperature increase of 2°C above pre-industrial times [**F**]
  - assess implications of peaking time of emission levels [**F**]
  - evaluate economy-wide interactions in integrated assessment models [**F**]

- **Costs of mitigation**
  - provide financial mechanisms/cost concepts, objectives and framework for mitigation by considering different sectors, regions, developmental stages, environmental conditions, investments and technological change [**M**]

- **Mitigation potential, policies and measures**
  - assess mitigation policy and measures including barriers to implementation, mitigation options, instruments, costs, uncertainties, and linkages to other policy areas and storylines (population, society, development, economy); list experiences with implemented mitigation policies ('case studies') [**M**]
  - assess state-of-science in sectoral approaches [**S**]
  - assess potential environmental, economic and social consequences including spillover effects, of emission reduction activities of developing countries [**F**]
  - develop regionally-based climate scenario-to-policy translation tools [**S**]
  - improve assessment of mitigation-adaptation-sustainability policy linkages [**M**]
  - analyze economic instruments and policy incentives in mitigation [**S**]
  - evaluate what is the impact of implementing the Kyoto Protocol on combating climate change [**F**]
  - evaluate how terrestrial systems such as forests link to the global carbon credit market and CDMs [**F**]
  - provide estimate of mitigation potential from agriculture for the full food production chain, disaggregated by production mode, region, size, and from forestry activities [**M**]
  - assess mitigation potential according to needs not just sectors (food, transport etc.) [**F**]

- **Economy and sustainability**
  - assess implication of mitigation options for sustainability and economic development; assess economy-climate win-win options [**M**]

- **Technology development and transfer**
  - review distribution patterns of low-carbon technology (past, current, future) [**F**]
  - assess positive and negative aspects of geo-engingeering strategies such as carbon capture/storage [**M**]
  - assess conventional and new energy production technology incl. nuclear (fission, fusion) [**M**]
  - assess fossil reservoirs, fuel production and usage and fuel pricing, include uncertainty analysis [**M**]
  - assess food-biofuel competition [**M**]
  - address introduction of technological advances and its impact on economy, the environment etc. [**M**]
  - evaluate accessibility, transfer approaches, costs and obstacles of low-carbon/low-emission technologies and their mitigation potentials, in particular for developing countries, and assess mechanisms that can give long-term stable incentives for R & D and new technologies [**M**]

- **Time scales**
  - identify time scales to implement and achieve emission reductions under particular mitigation options [**M**]
  - analyze advantages/disadvantages of short-time versus longer time commitments in mitigation strategies [**M**]

- **Other issues**
  - study socio-economic consequences for developing countries of response measures taken by developed countries [**F**]
  - include atmospheric chemistry of agents not treated by the Kyoto Protocol and name mitigation options [**F**]

- assess mitigation potential of aviation and maritime transport encompassing technical, operational and market-based measures [**S**]
- assess available methods for carbon footprint calculations of products and services [**F**]
- address human dimensions in mitigation policy incl. changes to behavior, lifestyle, consumption, diet, education, habitat, economic development, and assess social acceptability of mitigation policies [**S**]

5. Cross-cutting Themes

- Scenarios: consistent baselines and consistent scenarios
- Costing, economics and sustainable development
- Biomass, food and fuel production, and carbon credits
- Forests and deforestation
- Water: desertification, water resource management and governance
- Transportation
- Urbanization
- Climate engineering
- Global Warming Potential, alternative metrics and new gases (not covered by the Kyoto Protocol)
- Ice sheet stability and sea-level rise
- Integration of adaptation and mitigation
- Uncertainties and risks