Global Change Scenarios: Their Development and Use
Synthesis and Assessment Product 2.1b, US CCSP

Responses to comments by Eric Holdsworth and William Fang,
Edison Electric Institute.
November 1, 2006

NOTE: These reviewers submitted a single integrated set of comments on Parts A and B, including six long "general comments," each including multiple points, plus specific comments keyed pages of the reports. Because of the structure of their comments – with many separate points contained within the longer comments, and many comments pertaining only to Part A – we have had to excerpt and, in many cases, paraphrase parts of their comments in order to separate the specific points that applied to part B.

"First General Comment": Two points within this comment pertain to Part B:

1) They request clarification of the role of the FACA committee, and object to the suggestion that the FACA committee has authority to approve the products.

   Response: The CPDAC (the FACA committee) is providing substantive criticism and review of the report, and assessing the authors' responses to expert-review and public comments. Because the criticisms received from the committee have been cogent, constructive, and helpful, we have been happy to address their comments and the question of whether or not the committee has formal authority to approve the product has not come up.

2) They request clarification of how Parts A and B were coordinated.

   Response: The work of the two groups has been coordinated by periodic consultations among the chairs and DOE liaisons, and through one person who served as a member of both author teams.

"Fifth General Comment": Three points within this comment pertain to Part B, all of which are objections to the report's presentation of arguments for and against explicit treatment of probabilities in scenarios, and the conclusion cautiously advocating more attempts to present such explicit judgments.

1) (pg 22) They state that the report does not address the practical objections raised to quantification of probabilities: 1) the difficulty of integrating multiple sources of uncertainty and the judgments of multiple experts about them; 2) the non-intuitive nature of using probability distributions to communicate with non-expert users.

   Response: The report addresses these objections, in Section 4.6.5 and elsewhere. In sum, the responses are
   1) This is indeed difficult, but there is no clear alternative, it is done in many other decision domains, and there are numerous elicitation devices to facilitate it. See,

for example, the forthcoming SAP on Uncertainty.
2) The risks of misunderstanding are at least as great from presenting scenarios with no information about likelihood or uncertainty, e.g., users taking a middle scenario as the way it will be, or supplying their own less informed probability estimates as many authors have done with the SRES scenarios. Moreover, as we discuss in Section 4.4, there are many visual and graphical devices, and means of expressing likelihood judgments with intermediate specificity, that can help expand users' understanding of probabilistic results, as discussed and illustrated in Section 4.4.

2) (pg 24) They reject the recommendation for scenario developers to be more explicit about their likelihood judgments, on the basis that assigning probabilities and judging the magnitudes of various risks are the responsibility of democratically elected policy-makers: "Making decisions by leaning on the crutch of probability judgments formed by others may make it easier for decision-makers, but it undermines their responsibility".

Response: We strongly disagree. To accept this criticism would be to reject the legitimacy of any expert input into characterizing risks to inform democratic policy-making. The report's recommendation that scenario developers should be more explicit about probability judgments in no way obtrudes on the authority of democratic policy-makers, since it leaves to them, appropriately, all responsibility for making decisions. Moreover, the report's call for greatly increased transparency in scenarios and their underlying reasoning, including the basis for the recommended probability judgments, is precisely intended to increase the ability of policy-makers to substitute their own judgments of risks for those of scenarios developers, if they so choose.

3) They assert that calling for more explicit representation of uncertainty contradicts the report's previous use of the terms "plausible" and "potential" in defining the status of the conditions represented in scenarios.

Response: We find no contradiction between these. Stating that something represents "plausible" or "potential" future conditions in no way excludes the possibility of attempting to use relevant information and expert judgment to provide sharper and more explicit representation of its likelihood.

"Sixth General Comment": This comment contains three specific criticisms of Part B's conclusions and recommendations, the latter two of which focus specifically on the recommendation for establishment of a program to promote development of more useful scenarios and scenario-related methods.

1) They object that the conclusions and recommendations are not responsive to the statement of tasks in the prospectus because they lack recommendations for improving the scenario development process. In particular, they state that the report appears to contain only one recommendation.

Response: Although the report does not specifically separate "recommendations" from "conclusions", by our count at least two dozen of the conclusions clearly indicate directions for improving scenarios. The recommendations have been sharpened and clarified substantially in the most recent revisions.

2) They object that the report's recommendation that CCSP establish a program to promote development of more useful scenarios and improved scenario-related methods does not say specifically what changes should be made in scenarios to make them more useful.

Response: The report does make several specific recommendations for how to make scenarios more useful for particular types of users, for how to treat uncertainty in scenarios, for how to handle coordination of multiple models used in scenario development, and for how to structure stakeholder involvement in scenario development. Beyond these, however, the recommendation to establish the new program is crucial, because one of the report's broadest conclusions is that there has not been enough resources or sustained attention devoted to scenario methods, or enough consideration of the specific scenario-related information needs of particular types of decision-makers.

3) (pg 28) They a) "question" whether supporting the proposed scenario development activity is a proper role for CCSP in meeting the requirements of the 1990 Global Change Research Act; b) "question" whether scenarios should command the level of resources implied by the recommendation, relative to the total investment of resources in addressing the climate issue; c) "question" whether this is an appropriate job for research and assessment organizations; and d) assert that the recommendation violates the mandate of SAP 2.1b as defined in the prospectus.

Responses:

a) The call for periodic assessments in the GCRA is utterly clear. While the Act is not specific about what precise activities comprise an "assessment," it is clear that developing, applying, evaluating, and adapting/updating scenarios are a necessary component of many assessments, so undertaking these activities is entirely consistent with the Act.

b) Relative to the total investment in global change research, assessment, and response, the resources being discussed here, for scenario methods or for all assessment activities, are a very small fraction that can yield high value. An indication of how cheap assessment and scenario-related activities are is provided by the scale of funding of the present 21 Synthesis and Assessment Products under the CCSP, which the former director of CCSP has estimated are costing less than $10 million total over three years, compared with roughly $2 billion per year total US global change and climate change research funding. A few tenths of a percent of the total research budget does not seem like a lot for activities that may be crucial to synthesizing and drawing useful decision support out of the research.

c) and d) No support is provided for these claims – nor indeed for any of the four – and we frankly find these last two insupportable. Producing more useful scenarios and advancing methods to produce and use them would appear to be essential to improving the effectiveness of assessments. The mandate of SAP 2.1b gives no indication of any restriction that could conceivably be violated by this recommendation.

Specific Comments: (keyed to page/line on the public comment draft of Part B)

D. **Part B, p. 48, lines 16-17** The sentence beginning on line 16 is an overstatement in support of the SRES scenarios, particularly in light of the discussion of criticisms referred to on p. 49.

Response: While there are some valid criticisms to be leveled against SRES, as we discuss in the passage referred to and elsewhere, these in no way invalidate the overall favorable assessment of the advances achieved by SRES.

E. **Part B, p. 50, lines 19 and 21-22** We recommend that the word "critics" on line 19 be changed to "statistician and economist." In addition, we urge that the sentence beginning on line 21 be changed to read as follows: "Their contentions were widely circulated." Calling Castles and Henderson "critics" and referring to their comments and those of the publication The Economist and others "Climate-Change Skeptics" is pejorative and biased, particularly when one sees that some of the Part B authors were "participants" in the IPCC SRES "process" (see p. 15).

Response:
Since Castles and Henderson advanced forcefully argued criticisms of the SRES scenarios that were widely circulated by themselves and others, it is neither inaccurate nor pejorative to call them "critics."

It is difficult to find any merit in the suggestion of bias in favor of the SRES when 1) the Report provides extensive, thoroughly argued criticisms of SRES as well as recognition of its achievements – including serious criticisms that have not been previously publicized, and; 2) Only one of the eight Part B authors was a SRES participant, while several others have been highly critical of SRES.

The report does not characterize Castles and Henderson as "climate-change skeptics," but rather states that "their criticism was widely circulated and repeated by prominent climate-change skeptics". It is neither inaccurate nor pejorative to call Patrick Michaels a "climate-change skeptic." This is also an accurate characterization of the writing of The Economist on this issue, since they gave prominent and favorable coverage to the Castles/Henderson critique, yet did not report the resolution of the subsequent debate that their claims of exaggerated emissions growth were, if not outright wrong, at best unimportant.