Office of Science
Notice 02-22

Integrated Assessment of Climate Change Research

Department of Energy

Office of Science Financial Assistance Program Notice 02-22; Integrated Assessment of Climate Change Research

AGENCY: U.S. Department of Energy

ACTION: Notice inviting grant applications.

SUMMARY: The Office of Biological and Environmental Research (OBER) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces interest in receiving applications for the Integrated Assessment of Climate Change Research Program. This notice is a follow on to previous notices published in the Federal Register. The program funds research that contributes to integrated assessment of climate change, and in particular, research to develop and improve methods and tools that focus on specialized topics of importance to integrated assessments. The research program supports the Administration's Climate Change Research activities and the U.S. Global Change Research Program goals to understand, model, and assess the effects of increasing greenhouse gas concentrations in the atmosphere. The program supports research to evaluate the economic costs and predicted responses to options that would mitigate the long-term increase in carbon dioxide and other greenhouse gases.

DATES: Applicants are encouraged (but not required) to submit a brief preapplication for programmatic review. Early submission of preapplications is suggested to allow time for meaningful dialogue.

The deadline for receipt of formal applications is 4:30 p.m., E.D.T., May 14, 2002, to be accepted for merit review and to permit timely consideration for award in Fiscal Year 2002 and early Fiscal Year 2003.

ADDRESSES: Preapplications, referencing Program Notice 02-22, should be sent E-mail to john.houghton@science.doe.gov.

Formal applications, referencing Program Notice 02-22, should be sent to: U.S. Department of Energy, Office of Science, Grants and Contracts Division, SC-64, 19901 Germantown Road, Germantown, MD 20874-1290, ATTN: Program Notice 02-22. This address must also be used when submitting applications by U.S. Postal Service Express Mail or any other commercial overnight delivery service, or when hand-carried by the applicant.

FOR FURTHER INFORMATION CONTACT: Dr. John Houghton, Environmental Sciences Division, SC-74, Office of Biological and Environmental Research, Office of Science, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, telephone: (301) 903-8288, E-mail: john.houghton@science.doe.gov, fax: (301) 903-8519. The full text of Program Notice 02-22, is available via the World Wide Web using the following web site address: http://www.science.doe.gov/production/grants/grants.html.

SUPPLEMENTARY INFORMATION: An integrated assessment of climate change is defined here as the analysis of the human (including economics), physical, and biological aspects of climate change from the cause, such as greenhouse gas emissions, through impacts, such as changes to unmanaged ecosystems, sea level rise, and altered growing conditions for crops. The primary emphasis is to represent all three aspects in such a way that actions to mitigate climate change may be evaluated. Integrated assessments are commonly based on predictions using a computer model.

A description of integrated assessment may be found in volume 3 of the report "Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report: Climate Change 2001". The reference is: Ferenc Toth, Mark Mwandosya, John Christiansen, Jae Edmonds, Brian Flannery, Carlos Gay-Garcia, Hoesung Lee, Klaus Meyer-Abich, Elena Nikitina, Atiq Rahman, Richard Richels, Ye Riqui, Arturo Villavicencio, Yoko Wake, and John Weyant, "Decision-Making Frameworks," Chapter 10 in Climate Change 2001: Mitigation, Cambridge University Press, 2001, (http://www.ipcc.ch/pub/reports.htm). A Special Issue of The Energy Journal entitled "The Costs of the Kyoto Protocol: A Multi-Model Evaluation", 1999, [ISSN 0195-6574] presents analyses from several integrated assessment models of predicted costs to meet various target emission scenarios. The web site for the Energy Modeling Forum (http://www.stanford.edu/group/EMF/home/index.htm) contains further background information.

The policy community uses integrated assessment models to evaluate specific policy options. This notice solicits research intended to provide a sound scientific foundation for predicting and analyzing benefits and costs of climate change, and possible policy options to mitigate it, some of which are not measured monetarily. The research funded as a result of this solicitation will be judged in part on its potential to develop and improve methods and models needed to support policy development. Policy analysis itself will not be funded.

The program will concentrate support on the topics described below. Applications that involve development of analytical models and computer codes will be judged partly on the basis of whether they include proposed tasks to document and make the models and model codes available to the community. The following is a list of topics that are high priority. Topics proposed by principal investigators that fall outside this list will need strong justification to be considered for funding. Research projects in these elements are intended to fill critical gaps in current integrated assessments.

A. Technology Innovation and Diffusion. This is a primary focus of the Integrated Assessment of Climate Change Research Program. Assumptions regarding technology innovation and diffusion are some of the most important contributors to overall uncertainty in predicting future emissions of greenhouse gases. A key area of interest is research to improve the ability of the

integrated assessment models to represent technological change as a function of variables that are determined by the model ("endogenizing technological change") rather than postulated as static input to the model.

One particular difficulty in modeling technological change is in representing the penetration of new technologies. Over the 21st century, the typical timeframe of the integrated assessment models, technologies need to be invented, innovated upon, and diffused to the sectors in which they are used. Several questions need to be addressed, such as: How rapidly do these technological changes take place? What influences the rates? If the model assigns a price for a new technology that is lower than competing technologies, how should the dynamic adoption of the technology be modeled? What can be learned from historical precedents that would lead to better understanding of the processes and therefore to better modeling?

The rate and nature of technology diffusion from the more-developed nations to developing nations is not well understood. Predicting economic structural change in developing nations is also problematical. Much of the uncertainty in integrated assessment models comes from the difficulty in predicting the response of the energy sector and greenhouse gas emissions in developing nations to both regulation and technological innovations in more-developed nations. How can historical precedents be used to understand and model the future movement of technologies across national borders?

This research will help provide tools to address other policy-relevant questions such as the following, as they relate to greenhouse gas emissions:

What effect would various policy options have on "carbon leakage", the movement of emissions of greenhouse gases away from nations with relatively regulated emissions to ones with relatively unregulated emissions?

How can the impact of research and development on invention, innovation, and adoption be simulated and modeled quantitatively?

How do innovation and/or diffusion relate to measurable parameters of research and development, such as public and private research and development, investments, or regulations?

B. Evaluation of Scenarios Used to Drive Integrated Assessment Models. The Intergovernmental Panel on Climate Change recently published a Special Report on Emission Scenarios (SRES) (http://www.ipcc.ch/pub/reports.htm#sprep). These scenarios describe various possible directions for future development and are used as input into the Integrated Assessment models. The scenarios include projections of economic growth, population dynamics, and technology development that vary by time and locale.

This notice solicits research to evaluate the existing SRES scenarios. Some combinations of values, for instance high per capita income growth and high population growth, are less likely than other combinations. Research should investigate which combinations of values are important enough to be represented by a particular scenario. The research would investigate whether the scenarios selected by the SRES adequately represent the underlying uncertainty.

Would it be beneficial to add scenarios or is it possible to reduce the number? Research into demography per se, such as population dynamics and predictions of age distribution, is not being solicited. The research proposed under this topic should rely primarily on existing demographic data and evaluate that data in the context of demographic scenarios used in integrated assessment.

Program Funding

It is anticipated that up to $1,000,000 will be available for multiple awards to be made in Fiscal Year 2002 and early Fiscal Year 2003 in the categories described above, contingent on the availability of appropriated funds. Applications may request project support up to three years, with out-year support contingent on the availability of funds, progress of the research and programmatic needs. Annual budgets are expected to range from $30,000 to $150,000 total costs. Funds for this research will come from the Integrated Assessment Research program.

Collaboration

Applicants are encouraged to collaborate with researchers in other institutions, such as: universities, industry, non-profit organizations, federal laboratories and Federally Funded Research and Development Centers (FFRDCs), including the DOE National Laboratories, where appropriate, and to include cost sharing and/or consortia wherever feasible. Additional information on collaboration is available in the Application Guide for the Office of Science Financial Assistance Program that is available via the World Wide Web at: http://www.science.doe.gov/production/grants/Colab.html.

Preapplications

A brief preapplication is strongly encouraged (but not required) prior to submission of a full application. The preapplication should identify on the cover sheet the institution, Principal Investigator name, address, telephone, fax and E-mail address, title of the project, and proposed collaborators. The preapplication should consist of a one to two page narrative describing the research project objectives and methods of accomplishment. These will be reviewed relative to the scope and research needs of the Integrated Assessment of Climate Change Research Program. Please note that notification of a successful preapplication is not an indication that an award will be made in response to the formal application.

Merit Review

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following evaluation criteria listed in descending order of importance as codified at 10 CFR 605.10(d):

1. Scientific and/or Technical Merit of the Project,
2. Appropriateness of the Proposed Method or Approach,
3. Competency of Applicant's Personnel and Adequacy of Proposed Resources,
4. Reasonableness and Appropriateness of the Proposed Budget.

The evaluation will include program policy factors, such as the relevance of the proposed research to the terms of the announcement and the agency's programmatic needs. Note, external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Non-federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

Information about the development and submission of applications, eligibility, limitations, evaluation, selection process, and other policies and procedures may be found in 10 CFR Part 605, and in the Application Guide for the Office of Science Financial Assistance Program. Electronic access to the Guide and required forms is made available via the World Wide Web at: http://www.science.doe.gov/production/grants/grants.html. DOE is under no obligation to pay for any costs associated with the preparation or submission of applications if an award is not made.

The research project description must be 15 pages or less, exclusive of attachments and must contain an abstract or summary of the proposed research. All collaborators should be listed with the abstract or summary. On the grant face page, form DOE F 4650.2, in block 15, also provide the PI's phone number, fax number, and E-mail address. Attachments include curriculum vitae, a listing of all current and pending federal support and letters of intent when collaborations are part of the proposed research. Curriculum vitae should be submitted in a form similar to that of NIH or NSF (two to three pages), see for example: http://www.nsf.gov/bfa/cpo/gpg/fkit.htm#forms-9.

RELATED FUNDING OPPORTUNITIES: Investigators may wish to obtain information about the following related funding opportunities:

National Oceanic and Atmospheric Administration (NOAA): Within the context of its Human Dimensions of Global Change Research Program, the Office of Global Programs of the National Oceanic and Atmospheric Administration will support research that identifies and analyzes how social and economic systems are currently influenced by fluctuations in climate, and how human behavior can be (or why it may not be) affected based on information about variability in the climate system. The program is particularly interested in learning how advanced climate information on seasonal to yearly time scales, as well as an improved understanding of current coping mechanisms, could be used for reducing vulnerability and providing for more efficient adjustment to these variations. Notice of this program is included in the Program Announcement for NOAA's Climate and Global Change Program, which is published each spring in the Federal Register. The deadline for proposals to be considered in Fiscal Year 2002, is expected to be in summer 2002. Information will also be available on our website: http://www.ogp.noaa.gov/mpe/csi/econhd/index.htm. For further information, contact: Nancy Beller-Simms Office of Global Programs; National Oceanic and Atmospheric Administration; 1100 Wayne Ave., Suite 1225; Silver Spring, MD 20910; telephone: (301) 427-2089, ext. 180; Internet: nancy.beller-simms@ogp.noaa.gov or Caitlin Simpson; Office of Global Programs; National Oceanic and Atmospheric Administration; 1100 Wayne Ave., Suite 1225; Silver Spring, MD 20910; telephone: (301) 427-2089, ext. 152; Internet: simpson@ogp.noaa.gov.

National Science Foundation (NSF): As in Fiscal Year 2001, NSF will support research and related activities associated with the dynamics of coupled natural and human systems through its

Biocomplexity special competition. The Biocomplexity 2002 announcement can be accessed at http://www.nsf.gov/pubs/2002/nsf02010/nsf02010.html. The deadline for submission of proposals for the Fiscal Year 2002, competition was January 24, 2002. NSF staff expect the competition to continue in future fiscal years, although deadlines may be earlier in the fiscal year and the focus may change somewhat. (The Fiscal Year 2003 deadline may be as early as October 2002.) Potential applicants should consult the NSF Web site for updates.

The Catalog of Federal Domestic Assistance Number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR Part 605.

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for Resource Management

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