Office of Science
Notice 99-11

Fundamental Research in Carbon Management

Department of Energy
Office of Science

Office of Science Financial Assistance Program Notice 99-11; Fundamental Research in Carbon Management

Agency: U.S. Department of Energy

Action: Notice inviting grant applications.

SUMMARY: The Office of Basic Energy Sciences (BES), of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving applications for research grants in the area of fundamental research underlying potential strategies to reduce or limit gaseous carbon production from fossil fuel use. Research areas of particular interest include: Geosciences research related to understanding the geophysics and geochemistry of potential reservoirs appropriate for subsurface sequestration of carbon dioxide; Energy Biosciences research related to chemical and cellular mechanisms of carbon fixation in plants; Chemical Sciences research related to enhancing our molecular level understanding of CO2 production and utilization chemistry relevant to managing our carbon resources including, but not limited to, such areas as combustion and chemical dynamics, photochemical conversion, electrochemical energy storage and conversion, catalysis, and membrane separation science; and Materials Science research related to ceramics, metals, polymers and other materials needed for higher efficiency power systems. Carbon Management is a cooperative activity within DOE between the Office of Science and the Office of Fossil Energy. Participants within the Office of Science include both the Office of Basic Energy Sciences and the Office of Biological and Environmental Research.

DATES: Applicants are strongly encouraged to submit a brief preapplication. All preapplications, referencing Program Notice 99-11, should be received by DOE by 4:30 P.M., E.S.T., February 16, 1999. A response to the preapplications discussing the potential program relevance and encouraging or discouraging a formal application generally will be communicated to the applicant within 14 days of receipt.

The deadline for receipt of formal applications is 4:30 P.M., E.S.T., April 1, 1999, in order to be accepted for merit review and to permit timely consideration for award in Fiscal Year 1999.

ADDRESSES: All preapplications, referencing Program Notice 99-11, should be sent to Dr. Nicholas B. Woodward, Division of Engineering and Geosciences, SC-15, Office of Science, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290.

Formal applications, referencing Program Notice 99-11, must 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 99-11. 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: For questions concerning research topics in specific technical areas, contact the following individuals in the appropriate division of interest: Dr. Nicholas B. Woodward (301-903-4061; e-mail: nick.woodward@oer.doe.gov), Division of Engineering and Geosciences, SC-15, Office of Science, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, division telephone (301) 903-5822, fax (301) 903-0271.

Dr. Gregory L. Dilworth, Division of Energy Biosciences, SC-17, Office of Science, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, division telephone (301) 903-2873, fax (301) 903-1003, e-mail: greg.dilworth@oer.doe.gov

Dr. William Millman, Division of Chemical Sciences, SC-14, Office of Science, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, division telephone (301) 903-5804, fax (301) 903-4110; e-mail: william.millman@oer.doe.gov

Dr. Craig Hartley, Division of Material Sciences, SC-13, Office of Science, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, division telephone (301) 903-3427, fax (301) 903-9513, e-mail: craig.hartley@oer.doe.gov.

The full text of Program Notice 99-11 is available via the Internet using the following web site address: http://www.er.doe.gov/production/grants/grants.html.

SUPPLEMENTARY INFORMATION: The production of fuels and chemicals by plants and microorganisms and the interconversion of greenhouse gases requires a better understanding of plant biochemistry, physiology, molecular biology, and the structure and function of sub-cellular components, and of enzymes. Improvements in combustion to reduce carbon emissions requires a molecular mechanistic fundamental understanding in chemical dynamics and theoretical chemistry and physics. Conversion of sunlight to energy requires an understanding in many areas of science, including solid state physics, photochemistry, photosynthesis, photosynthetic and nonphotosynthetic carbon fixation, plant and microbial carbon biochemistry, regulatory control of plant assimilate allocation and transport, and molecular regulatory mechanisms controlling carbon metabolism. Fundamental, molecular level insights into cross-cutting chemical and physical processes, for example catalysis, chemical and membrane separations, and electrochemical energy storage and conversion, are expected to significantly impact carbon management. The search for increased efficiency in energy production and use requires fundamental knowledge in ceramics, metals, polymers, solid state chemistry, and condensed matter physics for materials that can withstand higher temperatures, have lower coefficients of friction, and are stronger and lighter. Disposal of carbon dioxide into geological formations requires a fundamental understanding of geometric, structural, and hydrologic properties of reservoirs and of multiphase, nonlinear transport of fluids in porous and fractured media during sequestration time-scales of greater than 100 years.

Additional information on the BES Research Program, including those elements which are not a part of this solicitation, is available at the following web site: http://www.er.doe.gov/production/bes/bes.html. For researchers who do not have access to the world wide web, please contact Dr. Nicholas B. Woodward, Geosciences Research Program, SC-15; U.S. Department of Energy; 19901 Germantown Road; Germantown, MD 20874-1290; phone (301) 903-5822; fax (301) 903-0271; nick.woodward@oer.doe.gov; for this information.

Investigators may also wish to obtain information about related funding opportunities in the Office of Science, Office of Biological and Environmental Research whose programs are described at web site address: http://www.er.doe.gov/production/ober/ober_top.html and in the Office of Fossil Energy whose programs are described at web site address: http://www.fe.doe.gov/.

Program Funding

It is anticipated that up to $4 million will be available for multiple grant awards to be made in FY 1999, contingent on the availability of appropriated funds. Multiple year funding of grant awards is expected, and is also contingent on the availability of appropriated funds, progress of the research, and continuing program need.

Applications received by the Office of Science under its normal competitive application mechanisms may also be deemed appropriate for consideration under this announcement and may be funded under this program.

Applicants are strongly 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. A parallel announcement with a similar potential total amount of funds will be issued to DOE Federally Funded Research and Development Centers. All projects will be evaluated using the same criteria, regardless of the submitting institution.

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 an 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, submission of applications, eligibility, limitations, evaluation, the 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.er.doe.gov/production/grants/grants.html. On the SC grant face page, form DOE F 4650.2, in block 15, also provide the PI's phone number, fax number and e-mail address. The research description must be 20 pages or less, exclusive of figure illustrations, and must contain an abstract or summary of the proposed research (to include the hypotheses being tested, the proposed experimental design, and the names of all investigators and their affiliations). 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.

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

John Rodney Clark
Associate Director of Science
for Resource Management

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