This is a complete solicitation document.

**DATES:** The deadline for receipt of applications is 4:00 p.m. MDT, March 22, 1995.

ADDRESSES: Applications shall be submitted to: B. G. Bauer, Contracting Officer; Procurement Services Division; U. S. Department of Energy; Idaho Operations Office; 850 Energy Drive, MS 1221; Idaho Falls, Idaho 83401–1563. [NUMBER DE-PS07–95ID13346]

FOR FURTHER INFORMATION CONTACT: Dallas Hoffer, Contract Specialist, Telephone (208) 526–0014, Facsimile (208) 526–5548.

### SUPPLEMENTARY INFORMATION:

## A. Background

Projects sponsored by the DOE Office of Industrial Technologies (OIT) are based on the needs and concerns of industry. The program advances technology to the point of commercialization. Historically, activities have focused on industrial competitiveness, the development of energy efficient, environmentally benign technology and equipment. As part of this program, this solicitation for DOE financial assistance applications is being issued.

## **B. Project Description**

DOE anticipates awarding one or more Cooperative Agreements in accordance with DOE Financial Assistance regulations appearing at Title 10 of the Code of Federal Regulations, Chapter II Subchapter H, Part 600 as a result of this solicitation, and funds are available. Federal funds appropriated for this solicitation are approximately \$2,000,000 and are to be used to fund the entire research effort. The Catalog of Federal Domestic Assistance Number for this program is 81.078. All projects shall be cost shared by DOE and the participant. Applicants should be aware that any awardee shall be required to have a cost share of not less than 20% of the total cost of the program for the research and development phases and 50% of the total cost of the program for the demonstration phase. For the purpose of cost share determination, Phase I and Phase II tasks are considered to be research and development while Phase III tasks are demonstration. NO FEE OR PROFIT WILL BE PAID TO THE AWARD RECIPIENTS. Under Cooperative Agreements it is anticipated there will be substantial involvement by DOE

DOE suggests, but does not require, a multi-phase approach and projects may be initiated at the bench scale (Phase I), laboratory/pilot scale (Phase II), or

demonstration (Phase III), levels. Individual project duration will not exceed 3 years. Project(s) with durations of less than 3 years and in any phase of development are eligible, if conclusive evidence is presented that previous phase(s) have been completed successfully. All applications with project periods of 3 years or less will be given equal consideration. The period of performance for the first phase is anticipated to be 12 months. At the end of Phase I, provided satisfactory progress has been made and funds are available, DOE may award a continuation of work to undertake further development if the participant demonstrates a continuing need for federal assistance, shows sufficient progress in the research effort, has completed the work in compliance with a mutually agreed management plan, and identifies the new research planned.

The objective of this solicitation is research, development and demonstration of new and advanced technologies to assist the glass industry to remain competitive, reduce energy consumption, and reduce negative environmental impacts. Utilizing the recommendations of the flat, fiber, container and specialty glass industry sectors the below listed priority research subject areas have been identified. Proposals for research in areas not included in the list below will not be considered. Proposals shall have applications that cut across two or more of the flat, fiber, container or specialty glass industry sectors. Applications must identify the priority area being addressed, explain why industry is not already performing the proposed research, and why DOE funding is appropriate.

## **C. Glass Industry Research Priorities**

This solicitation is to be focused on the following glass industry research priorities identified by the industry.

#### 1. Materials

a. Develop improved, cost effective refractories that have greater service capabilities, do not contain materials that are classified as hazardous, or that are well suited for applications of oxyfuel and gas reburn.

#### 2. Equipment

a. Develop equipment that will improve energy recovery from the melter (for example: preheating of glass cullet and batch raw materials, generation of electricity, or drive processes). b. Improve recycling equipment (i.e. recycled material sorting, separation, size reduction, processing).

c. Develop equipment to recycle facility waste products and remove or render harmless hazardous material.

d. Develop improved, cost effective air emissions systems or optimized furnace designs to meet the more stringent regulations of the future (i.e. removal of  $NO_X$ ,  $SO_X$  and particulate emissions). Integrated process improvements are preferred over add on devices.

e. Improve process water treatment and control.

## 3. Computer Modeling

a. Develop models to improve basic understanding of the glass chemistry. This includes chemical kinetics of premelting, solid state reactions, batch melting and reactions in glass, chemical equilibria and solubility data, and chemical kinetics during (re)fining.

b. Study effect of gas bubbles on the physical and transport properties of the glass melt.

c. Develop models with ability to correlate furnace design and operation with glass quality, or elimination of defects.

d. Develop furnace models that can calculate transient thermal and chemical behavior and can be used to develop methods to optimize energy use and reduce air emissions.

e. Develop models to optimize fuel combustion and heat release, heat transfer models to calculate glass melting and temperature conditioning, or improved combustion models for prediction of pollutant production.

# 4. Instrumentation and Control

a. Advanced instrumentation to measure glass chemical and physical properties required for optimizing production (cost effective non-contact or direct contact types).

b. Develop non-contact stress analyzers and surface property analyzers.

c. Develop low cost direct contact sensors that can be used in molten glass so that relatively large arrays can be used to provide information to improve process control.

d. Develop improved monitoring and process control systems to reduce air emissions.

e. Instrumentation to measure refractory thickness (condition/ serviceability).

f. Develop methods to correlate numerical data and operating parameters and use them for development of control systems (i.e. expert, fuzzy logic, or neural networks)