

(1) include field demonstrations of sufficient scale and number so as to demonstrate technical and economic feasibility;

(2) incorporate materials that increase engine efficiency; and

(3) cover advanced engine designs for electric and industrial power generation for a range of small-, mid-, and large-scale applications, including—

(A) mechanically recuperated gas turbines;

(B) intercooled gas turbines with steam injection or recuperation;

(C) gas turbines utilizing reformed fuels or hydrogen; and

(D) high efficiency, simple cycle gas turbines.

**(b) Program goal**

The goal of the program established under subsection (a) of this section shall be to develop heat engines that can achieve over 50 percent efficiency in the mid-term.

**(c) Program plan**

Within 180 days after October 24, 1992, the Secretary shall prepare and submit to the Congress a 5-year program plan, to be included in the plan required under section 13451(c) of this title, to guide the activities under this section. In preparing the program plan, the Secretary shall consult with appropriate representatives of industry, institutions of higher education, Federal agencies, including the Environmental Protection Agency and national laboratories, and professional and technical societies.

**(d) Proposals**

Within 1 year after October 24, 1992, the Secretary shall solicit proposals for conducting activities under this section.

**(e) Authorization of appropriations**

There are authorized to be appropriated to the Secretary for carrying out this section such sums as may be necessary to be derived from sums authorized under section 13451(e) of this title.

(Pub. L. 102-486, title XXI, § 2112, Oct. 24, 1992, 106 Stat. 3072.)

**§ 13473. Civilian nuclear waste**

**(a) Study**

The Secretary shall conduct a study of the potential for minimizing the volume and toxic lifetime of nuclear waste, including an analysis of the viability of existing technologies and an assessment of the extent of research and development required for new technologies.

**(b) Program**

Based on the results of the study required under subsection (a) of this section, the Secretary shall prepare and submit to Congress a 5-year program plan for carrying out a program of research and development on new technologies for minimizing the volume and toxic lifetime of, and thereby mitigating hazards associated with, nuclear waste.

**(c) Authorization of appropriations**

There are authorized to be appropriated to the Secretary for carrying out this section \$4,700,000

for fiscal year 1993 and such sums as may be necessary for fiscal year 1994.

(Pub. L. 102-486, title XXI, § 2113, Oct. 24, 1992, 106 Stat. 3073.)

**§ 13474. Fusion energy**

**(a) Program**

The Secretary shall conduct a fusion energy 5-year program, in accordance with sections 13541 and 13542 of this title, that by the year 2010 will result in a technology demonstration which verifies the practicability of commercial electric power production.

**(b) Program goals**

The goals of the program established under subsection (a) of this section shall include—

(1) a broad based fusion energy program;

(2) United States participation in the Engineering Design Activity of the International Thermonuclear Experimental Reactor (ITER) program and in the related research and technology development efforts;

(3) the development of technology for fusion power and industrial participation in the development of such technology;

(4) the design and construction of a major new machine for fusion research and technology development consistent with paragraphs (2) and (3); and

(5) research and development for Inertial Confinement Fusion Energy and development of a Heavy Ion Inertial Confinement Fusion experiment.

**(c) Management plan**

(1) Within 180 days after October 24, 1992, the Secretary shall prepare a comprehensive management plan for the fusion energy program. The plan shall include specific program objectives, milestones and schedules for technology development, and cost estimates and program management resource requirements.

(2) The plan shall also include a description of—

(A) United States participation in the Engineering Design Activity of ITER, including industrial participation;

(B) potential United States participation in the construction and operation of an ITER facility; and

(C) the requirements needed to build and test an inertial fusion energy reactor for the purpose of power production.

(3) As part of the plan required under paragraph (1), the Secretary shall evaluate the status of international fusion programs and evaluate whether the Federal Government should initiate efforts to strengthen existing international cooperative agreements in fusion energy or enter into new cooperative agreements to accomplish the purposes of this section.

(4) The plan shall also evaluate the extent to which university or private sector participation is appropriate or necessary in order to carry out the purposes of this section.

(5) The President shall include in the budget submitted to the Congress each year under section 1105 of title 31 a report prepared by the Sec-