(Worksheet A) and a ''needy'' untaxed income worksheet (Worksheet B). The EIC question on the current form would be incorporated into the new Worksheet B. The current Worksheet B, which collects income exclusions, would become Worksheet C.

Note: A school suggested grouping untaxed income items by whether or not they had a tax form reference. The Secretary solicits comments on this suggestion in light of the proposed change to the current Worksheet A, above.

- Grade level. A school suggested that we add an additional code to the grade level question to differentiate first-year graduate/professional students from continuing graduate/professional students. The Secretary seeks comments on this proposed change.

In addition to comments on the draft 2001–2002 FAFSA, the Secretary requests comments on the following issues related to the FAFSA:

- Special circumstances. We received a suggestion to add a ''check-off block'' to the FAFSA to indicate special circumstances (*e.g.*, reduced income or dependency issues). The Secretary solicits comments on this suggestion.
- Net worth of assets. In the redesign of the 1999–2000 FAFSA, separate value and debt questions about assets were combined into single net worth questions. The Secretary invites comment on any effect that this change has made on the delivery of student financial aid.
- Single identifier. The Secretary is considering switching from the current, six-digit ''Federal School Code'' to a single, eight-digit identifier in the ''school codes'' section of the FAFSA (Step Six).

The Secretary is publishing this request for comment under the provisions of the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* Under that Act, ED must obtain the review and approval of the Office of Management and Budget (OMB) before it may use a form to collect information. However, under the procedure for obtaining approval from OMB, ED must first obtain public comment of the proposed form, and to obtain that comment, ED must publish this notice in the **Federal Register**.

In addition to comments requested above, to accommodate the requirements of the Paperwork Reduction Act, the Secretary is interested in receiving comments with regard to the following matters: (1) Is this collection necessary to the proper functions of the Department, (2) will this information be processed and used in a timely manner, (3) is the estimate of burden accurate, (4) how might the Department enhance the quality, utility, and clarity of the information to be collected, and (5) how might the Department minimize the burden of this collection on the respondents, including through the use of information technology.

Dated: October 28, 1999.

William E. Burrow,

Leader, Information Management Group, Office of the Chief Information Officer.

Office of Postsecondary Education

Type of Review: Revision.
Title: Free Application for Federal Student Aid (FAFSA).
Frequency: Annually.
Affected Public: Individuals and families.
Reporting and Recordkeeping Burden:
Responses: 11,134,376
Burden Hours: 7,073,050
Abstract: The FAFSA collects identifying and financial information about a student applying for Title IV, Higher Education Act (HEA) Program funds. This information is used to determine the student's financial need. The information is also used to determine the student's eligibility for grants and loans under the Title IV, HEA Programs. It is further used for determining a student's eligibility for State and institutional financial aid programs.

[FR Doc. 99–28640 Filed 11–1–99; 8:45 am]

BILLING CODE 4001–01–P

DEPARTMENT OF ENERGY

Notice of Restricted Eligibility in Support of Advanced Coal Research at U.S. Colleges and Universities

AGENCY: Federal Energy Technology Center (FETC), Pittsburgh, Department of Energy (DOE).

ACTION: Issuance of Financial Assistance Solicitation.

SUMMARY: FETC announces that, pursuant to 10 CFR 600.8(a)(2), and in support of advanced coal research to U.S. colleges and universities, it intends to conduct a competitive Program Solicitation and award financial assistance grants to qualified recipients. Proposals will be subjected to a comparative merit review by a technical panel of DOE subject-matter experts and external peer reviewers. Awards will be made to a limited number of proposers based on: the scientific merit of the proposals, application of relevant program policy factors, and the availability of funds.

DATES: This solicitation (available in both WordPerfect 6.1 and Portable Document Format (PDF)) will be released on DOE's FETC Internet site (http://fetc-ip.fetc.doe.gov/business/solicit/2000sol.html) on or about October 25, 1999. Applications must be prepared and submitted in accordance with the instructions in the Program Solicitation and must be received at FETC by December 13, 1999. Prior to submitting your application to the solicitation, periodiocally check the FETC Website for any amendments.

FOR FURTHER INFORMATION, CONTACT: Ms. Debra A. Duncan, U.S. Department of Energy, Federal Energy Technology Center, P.O. Box 10940 (MS 921–107), Pittsburgh, PA 15236–0940; Telephone: 412–386–5700; Facsimile: 412–386–6137; e-mail: duncan@fetc.doe.gov.

SUPPLEMENTARY INFORMATION: Through Program Solicitation DE–PS26–00FT40676, the DOE is interested in applications from U.S. colleges and universities, as well as university-affiliated research centers submitting applications through their respective universities. Applications will be selected to complement and enhance research being conducted in related Fossil Energy programs. Applications may be submitted individually (*i.e.*, by only one college/university) or jointly (*i.e.*, by ''teams'' made up of (1) three or more colleges/universities, or (2) two or more colleges/universities and at least one industrial partner. Collaboration, in the form of joint proposals, is *encouraged* but not required.

Eligibility. Applications submitted in response to this solicitation must address coal research in one of the key focus areas of the Core Program or as outlined in the Innovative Concepts Program.

Background. The current landscape of the U.S. energy industry, not unlike that in other parts of the world, is undergoing a transformation driven by changes such as deregulation of power generation, more stringent environmental standards and regulations, climate change concerns, and other market forces. With these changes come new players and a refocusing of existing players in providing energy services and products. The traditional settings of how energy (both electricity and fuel) is generated, transported, and utilized are likely to be very different in the coming decades. As market, policy, and regulatory forces evolve and shape the energy industry both domestically and globally, the opportunity exists for university, government, and industry partnerships to invest in advanced fossil energy

technologies that can return public and economic benefits many times over. These benefits are achievable through the development of advanced coal technologies for the marketplace.

Energy from coal-fired powerplants will continue to play a dominant role as an energy source, and therefore, it is prudent to use this resource wisely and ensure that it remains part of the sustainable energy solution. In that regard, our focus is on a relatively new concept we call Vision 21. Vision 21 is a pathway to clean, affordable energy achieved through a combination of technology evolution and innovation aimed at creating the most advanced fleet of flexible, clean and efficient power and energy plants for the 21st century. Clean, efficient, competitively priced coal-derived products, and low-cost environmental compliance and energy systems remain key to our continuing prosperity and our commitment to tackle environmental challenges, including climate change. It is envisioned that these Vision 21 plants can competitively produce low-cost electricity at efficiencies higher than 60% with coal. This class of facilities will involve ''near-zero discharge'' energy plants—virtually no emissions will escape into the environment. Sulfur dioxide and nitrogen oxide pollutants would be removed and converted into environmentally benign substances, perhaps fertilizers or other commercial products. Carbon dioxide could be (1) concentrated and either recycled or disposed of in a geologically permanent manner, or (2) converted into industrially useful products, or (3) by creating offsetting natural sinks for CO_2.

Clean coal-fired powerplants remain the major source of electricity for the world while distributed generation, including renewables, will assume a growing share of the energy market. Technological advances finding their way into future markets could result in advanced co-production and co-processing facilities around the world, based upon Vision 21 technologies developed through universities, government, and industry partnerships.

This Vision 21 concept, in many ways is the culmination of decades of power and fuels research and development. Within the Vision 21 plants, the full energy potential of fossil fuel feedstocks and ''opportunity'' feedstocks such as biomass, petroleum coke, and other materials that might otherwise be considered as wastes, can be tapped by integrating advanced technology ''modules.'' These technology modules include fuel-flexible coal gasifiers and combustors, gas for fuels and chemical synthesis. Each Vision 21 plant can be built in the configuration best suited for its market application by combining technology modules. Designers of Vision 21 plant would tailor the plant to use the desired feedstocks and produce the desired products by selecting and integrating the appropriate ''technology modules.''

The goal of Vision 21 is to effectively eliminate, at competitive costs, environmental concerns associated with the use of fossil fuel for producing electricity and transportation fuels. Vision 21 is based on three premises: that we will need to rely on fossil fuels for a major share of our electricity and transportation fuel needs well into the 21st century; that it makes sense to rely on a diverse mix of energy resources, including coal, gas, oil, biomass and other renewables, nuclear, and so-called ''opportunity'' resources, rather than on a reduced subset of these resources; and that R&D directed at resolving our energy and environmental issues can find affordable ways to make energy conversion systems meet ever stricter environmental standards.

To accomplish the program objective, applications will be accepted in two subprogram areas: (1) The Core Program and (2) the Innovative Concepts Program.

University Coal Research (UCR) Core Program

To develop and sustain a national program of university research in fundamental coal studies, the DOE is interested in innovative and fundamental research pertinent to coal conversion and utilization. The DOE anticipates funding at least one proposal in each focus area under the UCR Core Program; however, high-quality proposals in a higher ranked focus area may be given more consideration during the selection process. Research in this area is *limited* to the following eight (8) focus areas and is listed numerically in descending order of programmatic priority.

Core Program Focus Areas

1. Sulfur By-Products Made From Sulfur Dioxide

Hot- and warm-gas cleanup systems are currently under development to optimize the Integrated Gasification Combine Cycles (IGCC) system. In these cleanup systems, two integrated reactors remove hydrogen sulfide from the raw synthesis gas, resulting in an output stream of clean synthesis gas and a waste stream of concentrated sulfur dioxide. Hydrogen sulfide is removed from the raw synthesis gas by being adsorbed onto a sorbent material in a reducing atmosphere. The sulfur-laden sorbent is transferred to the regeneration reactor where oxygen reacts with the sulfur to form sulfur dioxide. Sulfur dioxide leaves the process, and the regenerated sorbent is cycled back to the adsorption reactor.

To improve the economics of synthesis gas contaminant cleaning, sulfur-based by-products will be made from the sulfur dioxide waste stream. Typically, the envisioned by-product is sulfuric acid, produced by conventional processes. More cost-effective means to produce a sulfur-containing by-product is necessary.

Grant applications are being sought for innovative processes for the creation of valuable by-products from sulfur dioxide. The sulfur dioxide feed stream into the process will be:

1. Between 480°C (900°F) and 760°C (1,400°F)
2. 400 psia maximum
3. 2%–14% sulfur dioxide (the rest of the stream is N_2/CO_2/steam)

Preliminary analysis must show process and/or cost improvement over conventional sulfuric acid production, and must show that there is a market for the product (if the product is not sulfuric acid).

2. Application of Industrial Ecology Principles to the Design of Vision 21 Systems

Systems Integration prescribes how to combine high-performance technology modules into safe, reliable, economic Vision 21 plants and, as such, is a critical part of Vision 21. Systems integration can be divided into three key subelements: systems engineering, dynamic response and control, and industrial ecology. For this solicitation, grant applications are sought that addresses the industrial ecology subelement as it relates to future Vision 21 plants.

In a broad sense, industrial ecology is a systems approach that focuses on the interaction of industrial and ecological systems. It seeks a closed-loop system of production and consumption in which material that would otherwise be discarded is reused, recycled, or remanufactured. Industrial ecology balances environmental protection with economic and business viability. In the context of Vision 21, industrial ecology aims to recycle, or utilize in some other manner, all process streams that would otherwise be regarded as wastes. It is desired to apply industrial ecology principles to the design of Vision 21 systems.

Grant applications are sought that addresses industrial ecology issues

relevant to Vision 21 plants. Examples of the technologies upon which the modules or subsystems that form the building blocks of Vision 21 plants depend include, but are not limited to, gas separation, gas stream purification, high-temperature heat exchange, fuel-flexible gasification, high-performance combustion, fuel-flexible combustion turbines and engine systems, fuel cells, and fuels and chemicals production. Applications can address one or more of these technologies, other technologies relevant to Vision 21, or hypothetical Vision 21 plant configurations. Proposed activities may include analytical studies and modeling, and small-scale experimental testing.

3. Improved Synthesis Gas Contaminant Cleanup

Optimization of IGCC processes for cogeneration, and coproduction applications have the potential to significantly reduce capital cost and operations cost of IGCC plants. An expected requirement of successful cogeneration and/or coproduction applications is to make the synthesis gas made from coal, petroleum coke and/or petroleum residuals clean enough to meet the stringent gas quality requirements for use with a cogeneration or coproduction process.

Grant applications are being sought to research and begin development of innovative ideas for gas cleaning systems. Though interest remains in separation via adsorption, other novel and innovative techniques are of primary interest. Solids separation or filtration is *not* being sought, unless it is a side-benefit of the chemical cleanup process. These innovative gas cleaning systems must operate above 250°C (480°F). Preliminary analysis must show process and/or cost improvement over conventional cleanups, and over the expected performance of systems currently under development. Gas purity goals shall be:

Sulfur: <100 ppb for fuel cells; <60 ppb for chemical production
Chlorine: <100 ppb for fuel cells; <10 ppb for chemical production
Ammonia: <2000 ppm for fuel cells; <10 ppm for chemical production

4. Solid Oxide Fuel Cells (SOFC)—A Promising Energy Conversion Technology

SOFC are a very promising energy conversion technology for utilization of fossil fuels. It is envisioned that fuel cells may be a key component in an integrated coal-based Vision 21 power plant. The high temperatures of operation (necessary for adequate ionic conductivity and kinetics) conventionally require layered ceramic materials in a solid state configuration. A research opportunity that currently exists in making high-power-density SOFC a commercial reality involves improving the mechanical and sealing characteristics such that the structure is statically and dynamically robust.

Grant applications are sought to improve the static and dynamic structural and sealing characteristics of SOFC. The temperature range of interest is 500°C to 1,100°C, although individual concepts do not have to be applicable to the entire range. The concepts and materials proposed must be compatible with a fully functional SOFC stack with a lifetime of 40,000 hours. Integrated stack concepts or individual component issues can be addressed. The concepts and materials must not be economically detrimental to the fuel cell capital or operating costs. Proposals must address structural issues, sealing issues or both, and the stated lifetime, compatibility, and economic criteria.

5. Fundamental Data To Support the Efficient Design of Advanced Coal-Based Power Systems

The DOE has devoted a significant amount of effort to generating data and elucidating the mechanisms of coal behavior (pyrolysis, char reactivity, mineral matter transformations, NO_X formation, *etc.*) under conventional atmospheric combustion and gasification conditions. This information has made it possible to improve the accuracy of comprehensive computational combustion models to the point where equipment designers have begun to use codes to lead state-of-the-art boiler development efforts. Unfortunately, these same models can not be expected to accurately forecast the performance of power systems that differ significantly from those in use today (*i.e.*, those for which the codes were originally developed).

Future power systems designs will be influenced by many factors, including fuel availability, environmental constraints, the availability of advanced technologies, co-production requirements, etc. While specifics would be difficult to predict with certainty, a significant number of future power systems designs are likely to rely on a variant of one or more of the following combustion/gasification approaches:

- Pulverized coal combustion at atmospheric or elevated pressures in recycled CO_2 atmospheres containing oxygen.
- Fuel flexible, oxygen blown high pressure coal-based gasifiers capable of operating on mixtures of (predominantly) coal and biomass.

Designers of advanced systems will also benefit from the availability of predictive models that enable effective design, or evaluation of the performance of potential designs. Unfortunately, relatively little data available in the literature is directly applicable to the behavior of coals under the aforementioned combustion conditions. The bulk of experiments reported in the literature have been performed under atmospheric pressure utilizing conventional atmospheres, although limited high pressure data is available.

Proposals submitted under this topic should present a program of carefully crafted laboratory-scale experimentation aimed at defining the critical processes controlling combustion behavior under (1) oxygen-blown gasification conditions (*e.g.*, pressures to 1000 psi, high temperatures and oxygen levels approaching 100%), (2) atmospheric combustion conditions relying upon elevated oxygen levels (over 35%) with concomitant high CO_2 atmospheres (greater than 60%), or (3) pressurized combustion conditions relying upon elevated oxygen levels (over 35%) with concomitant high CO_2 atmospheres (greater than 60%). Proposed work may focus on pollutant formation, char reactivity or ash behavior. Experiments should be performed with a range of commercially relevant coals and coal blends. If any portion of the test program is devoted to examining the behavior of coal/biomass blends, must be limited when compared to the proposed coal effort. Further, coal/biomass tests must focus on the behavior of biomass fuels with the potential to achieve commercial significance. The project must carefully integrate data collection and modeling of critical subprocesses. Note that the goal of this effort is to generate data on kinetics and mechanisms that will supplement, clarify or broaden the applicability of existing submodels dealing with NO_X formation, ash behavior or char reactivity.

6. Water Gas Shift With Integrated H_2/CO_2 Separation Process

Options currently under study to obtain deep reduction in CO_2 from power stations are mainly directed to removing CO_2 from a power station's flue gases, i.e., post-combustion decarbonization. Pre-combustion decarbonization is an alternative approach to reducing greenhouse gases from power generation. In this approach, a fossil fuel such as coal is gasified and the product gas is converted to a clean gaseous fuel with

a minimal carbon content, *e.g.*, hydrogen or hydrogen-rich gas mixtures.

Augmenting the water-gas shift reaction (WGS) via hydrogen separation technology offers the promise of making hydrogen from coal with zero pollution for fuel cell and other applications. One method to circumvent thermodynamic equilibrium limitations is to move the equilibrium displacement to the product side. From the energy-efficiency viewpoint, this should be achieved by continuous removal of one product component directly at its place of formation.

A promising approach to achieve this objective is to demonstrate the feasibility of driving the WGS reaction toward higher levels of hydrogen production by removal of hydrogen from the product stream. This means that the WGS reaction must be driven far to the right, and that the hydrogen produced must be separated from the remaining gases at elevated temperatures and pressures. To achieve the goals of the concept, it is assumed that a hydrogen separation device is used to obtain a pure hydrogen product stream as well as to drive the shift reaction toward further hydrogen production.

The hydrogen separation device could be a catalytic membrane reactor, in which the WGS reaction is combined with hydrogen separation from the reaction mixture in one reactor, using membranes selectively permeable to hydrogen. Alternatively, capture or removal of CO_2 from the product gas following WGS, sorption/desorption, or other promising technology could be a viable option.

Grant applications are invited that address scientific issues emerging from the above concept as stated below:

A. Experimental and theoretical WGS studies are needed at temperatures above 450 °C to determine reaction kinetics such that the driving force for separation can be maintained sufficiently high, such as required when using membranes, to be economically feasible. The effects of reaction conditions, steam addition, and trace contaminants in the synthesis gas feed on the reactions kinetics need to be obtained and modeled. Grant applications should propose research that would address these issues.

B. Grant applications are sought for novel H_2-separation or CO_2-capture technologies that concentrate hydrogen for use with fuel cells or other applications. Technologies proposed can operate at any temperature above 0 °C but must have an application in mind and must have potential for being less expensive than current technologies for hydrogen production, e.g., Pressure Swing Adsorption.

7. Sulfur Reduction

Restrictions on sulfur content in gasoline and diesel fuels continue to become more stringent. Reduction of the residual sulfur contents in fossil fuels becomes more costly because the remaining sulfur compounds are the most refractory and difficult to remove. Design of processes for elimination of sulfur while keeping costs at a minimum represents a significant challenge to the science of catalysis. Many of the traditional catalysts for desulfurization carry out hydrogenation co-currently with sulfur removal, resulting in excessive consumption of this expensive reagent. Grant applications are sought for novel approaches to the reduction of sulfur in transportation fuels to part-per-million levels while using minimal amounts of hydrogen. Novel approaches are encouraged—for example, combination of selective adsorption with catalytic desulfurization, activation of refractory sulfur compounds, or the application of computational methods to the design and control of desulfurization catalysts and processes.

8. Fischer-Tropsch (FT) Catalysts

The production of ultraclean fuels for the transportation sector is of prime concern to the fossil fuels industry. The conversion of synthesis gas to high-molecular-weight hydrocarbons by the FT reaction provides products that are free from both sulfur and aromatic hydrocarbons. These highly desirable properties combined with the high cetane numbers inherent to straight chain aliphatic compounds makes the FT synthesis an important component of the overall strategy for providing ultraclean fuels, particularly diesel fuels. Although the chemistry of FT catalysts is well studied, possibilities to significantly improve the performance of both the catalyst and the process still remain. For example, slurry-phase reactors may be used to improve the control of temperatures within commercial-sized reactors for this strongly exothermic reaction, but such reactors place extra demands on the catalyst. The preferred catalysts for slurry reactors are in the form of small particles, typically from 1 to 100 microns in diameter. Key characteristics desired in the ideal catalyst are a combination of resistance to attrition, high activity, long lifetime, resistance to poisoning, and ease of separation from the high-molecular-weight hydrocarbons in the reactor. An important goal in this area of research is to achieve an appropriate blend of these catalyst properties so that long-term, efficient operation of commercial-scale reactors can be reliably achieved. In particular, achieving an efficient separation of small catalyst particles from viscous waxy products with less than 0.01 weight % catalyst carryover remains a problem. Grant proposals are sought to solve these problems specifically for iron-based catalysts. Novel approaches are encouraged. That is, incorporation of catalyst properties that may circumvent problems of catalyst/wax separation or heat transfer, thus alleviating the inherent problem of current processes are more desirable than small incremental improvements to the state-of-the-art.

UCR Innovative Concepts Program

The goal of the Innovative Concepts program is to develop unique approaches for addressing fossil energy-related issues. These approaches should represent significant departures from existing approaches, not simply incremental improvements. The Innovative Concepts Program seeks ''out-of-the-box'' thinking; therefore, well-developed ideas, past the conceptual stage, are not eligible for the Phase I Innovative Concepts Program. Applications under the Innovative Concepts Program are invited from individual college/university researchers. Joint applications (as described under the Core Program) will also be accepted, although no additional funds will be made available for joint versus individual applications. Unlike the Core Program, student participation in the proposed research project is strongly encouraged; however, this is not a requirement in the Phase I Innovative Concepts Program.

Beginning in FY2001, a new initiative, the Phase II Innovative Concepts Program, will be featured in the UCR Solicitation. The goal of the Phase II Innovative Concepts Program is to solicit additional research in areas included in the Phase I Program. Funding for Phase II grants will be limited to a total of $200K over a 3-year period and student participation will be required. Only awardees of a Phase I grant from the previous year will be considered for Phase II.

As the twenty-first century approaches, the challenges facing coal and the electric utility industry continue to grow. Environmental issues such as pollutant control, both criteria and trace pollutants, waste minimization, and the co-firing of coal with biomass, waste, or alternative fuels will remain important. The need for increased efficiency, improved

reliability, and lower costs will be felt as an aging utility industry faces deregulation. Advanced power systems, such as a Vision 21 plant, and environmental systems will come into play as older plants are retired and utilities explore new ways to meet the growing demand for electricity.

Innovative research in the coal conversion and utilization areas will be required if coal is to continue to play a dominant role in the generation of electric power. Topics, like the ones that follow, will need to be addressed. Technical topics like the ones that follow, will need to be answered but are not intended to be all-encompassing. It is specifically emphasized that other subjects for coal research will receive the same evaluation and consideration for support as the examples cited.

Innovative Concepts Technical Topics

Development of Membranes for CO_2 Separation

Possible applications of membranes to coal-based systems include the separation of CO_2 from the flue gas effluent of coal-fired power plants. Inorganic membranes are preferred because of their refractory behavior and the possibility of improving their resistance to environmental attack through a suitable choice of ceramic material and associated fabrication process. Since the kinetic diameters of CO_2 and N_2 molecules are relatively close to each other (0.36 nm and 0 .40 nm, respectively), an enhanced separation of the two gases can only be accomplished via selective interactions between the molecules and the membrane surface. Molecular modeling would aid the synthesis of membranes for the selective separation of CO_2, while kinetic modeling would establish the potential flux of gases in membrane systems.

Applications are sought to investigate inorganic membranes, including novel synthetic methods that are technically and economically feasible. Large separation factor and high permeability are essential to achieve desired results in a single stage. A target performance that combines a permeability of 3×10^{-7} mol/(m² s Pa) and CO_2/N_2 selectivity of 100 is an approximate guideline. The proposed work should be consistent with the Vision 21 concept, novel in nature, and may include, but must not be limited to a review of prior research related to this focus area.

Identification of Promising Vision 21 Configurations

The Vision 21 concept encompasses the idea of interchangeable modules that can be assembled into various configurations that may co-produce power, fuels, or high-value chemicals. Configurations may include a gasifier and a power-generating facility with a specific fuel or chemical production capability. However, many different configurations are possible.

Novel concept grant applications are being sought to examine the feasibility of advanced central station energy plants that produce some combination of power, fuels, and chemicals from fossil fuel feedstocks, perhaps with biomass and/or opportunity feedstocks (e.g., petroleum coke, municipal solid waste, etc.). Process heat and steam may also be produced. Configurations may use internally generated wastes, combustion byproducts, or low-grade heat in ways that improve environmental performance, efficiency, and/or economics. The study should include mass and heat balance calculations along with sensitivity studies of the economics of the proposed processes.

Efficient Power Cycles

The thermal efficiency of a conventional coal-fired steam (Rankine) cycle is 33–35% from coal's heating value to electricity. The other 65–67% of the energy is lost during the conversion process of power generation. By increasing the operating temperatures and pressures over the supercritical condition of steam, the cycle efficiency can be increased to 42–45% (based on coal's higher heating value). However, there are limitations in materials for high-temperature applications. On the other hand, a system with a binary working fluid of ammonia and water has shown an improved cycle efficiency of 45–50% by extracting heat from hot streams at variable boiling temperatures of the ammonia-water mixtures. The cost has been a concern for commercializing this binary system.

Grant applications are being sought for:

A. Binary fluid cycles that demonstrate the potential for a higher cycle efficiency than the conventional system. Also, working fluids other than steam are of interest (*e.g.*, CO_2 is an interesting possibility).

B. Concepts for a bottoming cycle to extract the low-temperature heat from the flue gas of a coal-fired plant in an economical way. By reducing a typical stack gas temperature of 350–380°F to 180–200°F, the plant efficiency can be increased by 3–5%. The cost has been an issue for the low-temperature heat recovery system.

C. New concepts that could be drastically different from the conventional system using a gas or steam turbine (*e.g.*, fuel cells) to generate electricity from coal.

Awards. DOE anticipates awarding a financial assistance grant for each project selected. Approximately $3 million will be available for the Program Solicitation. An estimated $2.5 million is budgeted for the UCR Core Program and should provide funding for approximately one to three (1–3) financial assistance awards in each of the eight (8) focused areas of research. The maximum DOE funding for individual colleges/universities applications in the UCR Core Program varies according to the length of the proposed performance period as follows:

Performance period	Maximum funding
0–12 months	$80,000
13–24 months	140,000
25–60 months	200,000

The maximum DOE funding for UCR Core Program joint applications is $400,000, requiring a performance period of 36 months.

Approximately $0.5 million is budgeted for the UCR Innovative Concepts Program and should provide support for approximately ten (10) financial assistance awards. The maximum DOE funding for UCR Innovative Concepts Program awards is $50,000, with 12-month performance periods.

Issued in Pittsburgh, Pennsylvania on October 25, 1999.

Raymond D. Johnson,

Contracting Officer, Acquisition and Assistance Division.

[FR Doc. 99–28599 Filed 11–1–99; 8:45 am]

BILLING CODE 6450–01–P

ENVIRONMENTAL PROTECTION AGENCY

[FRL–6468–5]

National Advisory Council for Environmental Policy and Technology, (NACEPT) Standing Committee on Compliance Assistance

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notification of public advisory NACEPT standing committee on compliance assistance meeting; open meeting.

SUMMARY: Pursuant to the Federal Advisory Committee Act, Pub. L.