Commonwealth of Pennsylvania

PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

ANNUAL REPORT

FOR FISCAL YEAR 1989-90

July 1, 1989 - June 30, 1990

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October, 1990

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INTRODUCTION

The Pennsylvania Energy Development Authority's (PEDA) Annual Report for Fiscal Year 1989-90 (FY 89-90) is presented to the Governor and General Assembly pursuant to the Pennsylvania Energy Development Authority and Emergency Powers Act of 1982, P.L. 1213, No.280. The Annual Report is for the fiscal year that began on July 1, 1989 and ended on June 30, 1990.

The report provides detailed information on PEDA's revenue bond financing activity, and the fiscal status of the Energy Development Fund. Additionally, it describes projects awarded allocations in FY 89-90, as well as projects which received financial assistance in previous fiscal years that were completed or continued during this period.

PEDA concluded the sixth year of its financial assistance program at the close of FY 89-90. During the past year, the Board of Directors diligently attempted to further the Authority's mission of providing financial assistance to a wide range of energy projects, throughout the Commonwealth. PEDA committed approximately $2,103,470 to seventeen energy research, development and demonstration (RD&D) projects worth $7.5 million. Additionally, PEDA committed $89,137 to three projects aimed at preparing designs for a high efficiency, commercial-sized, anthracite-fired boiler. These commitments are the first phase of the three-phase Anthracite Commercial Boiler Design Competition project to develop a commercial-sized anthracite boiler to compete with currently more efficient oil and gas counterparts.

The Technical Advisory Committee established during FY 1988-89 continued its efforts to assist the PEDA staff in reviewing energy project and lending technical advise to the board. This Committee, made up of energy experts throughout the state, has greatly enhanced PEDA 's ability go forward with project that could benefit the economy and environment of the Commonwealth.

PEDA's Energy Development Plan (EDP) contains three central points which set the Authority's direction in FY 89-90:

- funding emphasis will be given to energy conservation or development technologies that show the greatest likelihood of near-term implementation;
- initiatives to provide opportunities for financial assistance to renewable resources and energy conservation projects shall be a priority; and,
- pursuit of projects that promote clean use of Pennsylvania coal shall be a priority.

As stated in the EDP, PEDA was created to finance projects that develop, promote, or more efficiently use Pennsylvania's energy resources. The Authority's primary goals are: to increase Pennsylvania coal production; to increase use of renewable fuels; to increase energy efficiency in buildings and industry; and, to maximize use of available federal, local and/or private financial resources. The Authority has developed a multi-faceted financial assistance program to achieve these goals. This program includes grants, venture capital, loans, loan guarantees, interest reduction and revenue bond financing.

PEDA's approach to affording opportunities for financial assistance in FY 89-90 was (1) to develop a comprehensive Financial Assistance Program Prospectus and application package; and, (2) to establish the application deadline within the fiscal year. The application deadline was established as January 16, 1990. Applications received attendant to this deadline were deliberated on April 10, 1990. The application deadline and financial assistance opportunities were published in the Pennsylvania Bulletin on September 23, 1990.

The prospectus approved by the board established the criteria and constraints for review of applications and allocation of financial assistance. The primary constraint focused on the location of projects, namely, they must be conducted entirely or largely within Pennsylvania. Technical, financial and project-related criteria were used by the board to make allocation decisions.

In addition to its general financial assistance program for FY 89-90, PEDA offered a program which was aimed at fostering research in a specific energy-related subject area. This program was the **Anthracite Commercial Boiler Design Competition.** This program was approved by the board at its annual meeting on October 24, 1989. The Anthracite Commercial Boiler Design Competition was announced in the Pennsylvania Bulletin on December 30, 1989. Proposals were due at PEDA on April 3, 1990.

SUMMARY OF FINANCIAL ASSISTANCE FOR ENERGY PROJECTS

Since its inception, PEDA has issued approximately $167 million in revenue bonds to three commercial energy ventures (Table 1): Humboldt Energy Center, Ebensburg Cogeneration Plant and the Clarion Project. In addition the Authority has allocated nearly $11.1 million to 107 RD&D projects (Table 2). PEDA has disbursed or committed approximately $9.4 million to 87 RD&D projects.

PEDA RD&D projects can be divided into four categories: Clean Coal Technology, Anthracite Development, General Coal Development (includes Bituminous Coal Development category of FY 1984 and FY 1985 in Table 2) and Non-Coal Development. As illustrated in Figure 1, 40% of the Authority's projects have focused on technologies that make coal a cleaner fuel. The non-coal development catagory accounted for twenty-one percent of all projects funded by PEDA. The balance of the PEDA-

TABLE 1

PEDA REVENUE BOND PROJECTS

Project Number	Name	Developer	Rev Bond Issue
84061	Humboldt Energy Center	Continental Energy Asso	39,000,000
85033	Clarion Project	Babcock & Wilcox Co	45,650,000
85034	Ebensburg Cogen Plant	Babcock & Wilcox Co	77,600,000
87048	Ebensburg Cogen Plant	Babcock & Wilcox Co	4,400,000
		TOTAL	$166,650,000

TABLE 2

PEDA FUNDED RD&D PROJECTS SUMMARY

Project Number	Contractor	Purpose	Project Category	PEDA Alloc	Alloc Type	Status
84002	PA Coal Mining Association	Coal Quality and Marketability Database	Bit Dev	411,000	Grant	Complete
84003	Francis Miller	Coal Preparation Technology Seminars	Bit Dev	16,500	Grant	Complete
84006	PA Coke Technology Inc	Non-Recovery Coking Process	Bit Dev	67,965	Grant	Complete
84007	Anthracite Industry Assn	Anthracite Marketing and Demonstrations	Anth Dev	453,780	Grant	Complete
84016	Lehigh University	Improved Coking via Ionic Hydrogenation	CC Tech	25,000	Grant	Complete
84017	Lehigh University	Fluidized Bed Coal Cleaning - Phase I	CC Tech	80,530	Grant	Complete
84020	Coal Tech Corporation	Advanced Cyclone Combustor - Stage II	CC Tech	150,000	Grant	Complete
84024	Erie School District	Enhanced Natural Gas Recovery	Non-Coal	37,500	Ven Cap	Complete
84025	Johnstown Corporation	Coal and Coal-MSW Cogen Feasibility	Non-Coal	28,715	Grant	Complete
84026	St Francis College	Coal and MSW Cogeneration Feasibility	Non-Coal	7,500	Grant	Complete
84034	Council for Labor & Ind	Conservation Improvements	Non-Coal	15,000	Grant	Complete
84035	Admiral Peary Vo-Tech Sch	Cogeneration Feasibility	Non-Coal	6,287	Grant	Rescinded
84038	CDA International Inc	Hospital Oper.Rm Energy Conservation	Non-Coal	35,000	Grant	Complete
84041	Bellefield Boiler Plant	Cogeneration Feasibility	Non-Coal	21,000	Grant	Complete
84042	BCR National Laboratory	Reactive Gas Coal Desulfurization - I	CC Tech	120,241	Grant	Complete
84043	BCR National Laboratory	Reichert Spiral Evaluation	CC Tech	50,000	Grant	Terminated
84044	Williams & Broome	Hydroelectric Power Barge Demonstration	Non-Coal	200,000	Ven Cap	Complete
84047	Enerco Associates	Pyrolysis of Waste Tires	Non-Coal	302,268	Ven Cap	Complete
84049	Allegheny Electric Coop	Energy Storage in Buildings	Non-Coal	35,000	Grant	Rescinded
84050	Control Techtronics Inc	Advanced Combustion Controller Demo	Non-Coal	15,000	Grant	Complete
84060	Babcock & Wilcox Company	CWF Conversion, Open Hearth Furnace	Bit Dev	69,000	Ven Cap	Rescinded

TABLE 2
(Continued)

PEDA FUNDED RD&D PROJECTS SUMMARY

Project Number	Contractor	Purpose	Project Category	PEDA Alloc	Alloc Type	Status
85003	Antrim Mining Company	FBC Power Plant Feasibility	Bit Dev	10,000	Grant	Complete
85004	Norton Hambleton Inc	Reverse Column Flotation Coal Cleaning	CC Tech	200,000	Ven Cap	Terminated
85005	Penn State University	CDS via Steam/Methane Pyrolysis	CC Tech	35,000	Grant	Complete
85006	R.A. Systems	Water Jet Assisted Coal Shearer	Bit Dev	27,000	Ven Cap	Terminated
85007	SEDA-COG	Primer on Domestic Anthracite Use	Anth Dev	29,000	Grant	Complete
85009	PA Coal Mining Association	LV Coal in Utility Boilers - Phase I	Bit Dev	58,783	Grant	Complete
85010	Anthracite Industry Assn	Anthracite Marketing and Conversions	Anth Dev	259,380	Grant	Complete
85011	Continental Cogen Corp	Anthracite Gasification	Anth Dev	35,000	Grant	Complete
85015	Hess & Fisher Engineering	Acid Mine Drainage Control Structures	Bit Dev	31,475	Grant	In Progress
85016	University of Pittsburgh	Liquid CO2 (LICADO) Coal Cleaning	CC Tech	84,908	Grant	Complete
85020	SEDA-COG	Heating Systems Conversion Feasibility	Anth Dev	10,000	Grant	Complete
85024	Kipin Industries Inc	Coal and Waste Co-Processing	Bit Dev	200,000	Ven Cap	Terminated
85025	Meadville Industrial Comm	Cogeneration Feasibility	Bit Dev	10,000	Grant	Complete
85026	PA Coke Technology, Inc	Non-Recovery Coke Production	CC Tech	350,000	Grant	Rescinded
85027	Coal Tech Corporation	Advanced Cyclone Combustor - Stage III	CC Tech	200,000	Grant	Complete
85028	Penn State University	SO_2 Sorbent Evaluation	CC Tech	25,000	Grant	Complete
85030	EXPORTech Company Inc	Magnetic Coal Cleaning - Phase I	CC Tech	15,934	Grant	Complete
85031	Lehigh University	Microbial Coal Desulfurization	CC Tech	50,000	Grant	Complete
85032	Penn State University	Surface Mining Software Development	Bit Dev	43,447	Grant	Complete
85035	Wilkes College ACDI	Anthracite Operators' Assistance	Anth Dev	154,685	Grant	Complete
86002	BCR National Laboratory	Reactive Gas Coal Desulfurization - II	CC Tech	114,983	Grant	Complete
86004	University of Pittsburgh	Controlled Burnout - Coal Refuse Piles	Gen Coal	149,931	Grant	Complete
86006	Penn State University	Mechanical Coal Cleaning Efficiency	CC Tech	33,727	Grant	Complete
86007	BCR National Laboratory	LV Coal in Utility Boilers - Phase II	Gen Coal	198,340	Grant	Complete
86008	PA Electric Company	Low NOx Burner Demonstration	CC Tech	400,000	Grant	In Progress
86009	PA Electric Company	CZD SO2 Reduction Demo - Phase I	CC Tech	100,000	Grant	Complete
86014	BCR National Laboratory	Ultrasonic Dewatering of Coal	Gen Coal	40,367	Grant	Terminated
86018	Anthracite Industry Assn	Anthracite Marketing and Conversions	Anth Dev	210,500	Grant	Complete
86022	Heyl & Patterson Inc	Micro-Bubble Flotation Coal Cleaning	CC Tech	150,000	Ven Cap	Terminated
86026	BCR National Laboratory	Coal/MSW Pyrolysis	Gen Coal	73,255	Grant	Complete
86028	Anthracite Industry Assn	Anthracite Trade Show	Anth Dev	26,505	Grant	Complete
86031	Humenick Wood Products	Wood Waste Combustion and Heat System	Non-Coal	24,108	Grant	Complete
86033	GRASP	Biothermal Composting Greenhouse	Non-Coal	33,960	Ven Cap	Rescinded
86035	EDCNP	Anthracite Development and Promotion	Anth Dev	15,810	Grant	Complete
86041	PA Anthracite Dev Corp	Anth Exploration with Radio Imaging	Anth Dev	30,000	Ven Cap	Rescinded
86043	Penn State University	Acid Mine Drainage Model	Gen Coal	142,175	Grant	In Progress
86046	EXPORTech Company Inc	Magnetic Coal Cleaning - Phase II	CC Tech	18,996	Ven Cap	Complete

TABLE 2
(Continued)

PEDA FUNDED RD&D PROJECTS SUMMARY

Project Number	Contractor	Purpose	Project Category	PEDA Alloc	Alloc Type	Status
87001	Lehigh University	Fluidized Bed Coal Cleaning - Phase II	CC Tech	86,405	Grant	In Progress
87003	GE Transport Systems	CWF-Fired Diesel Elec Locomotive - I	CC Tech	200,000	Ven Cap	Complete
87005	CEEP Inc	Gasoline Vapor Recovery System	Non-Coal	44,959	Ven Cap	Rescinded
87006	PA ELectric Company	CZD SO2 Reduction Demo - Phase II	CC Tech	250,000	Ven Cap	Combined*
87010	PA Electric Company	CWF Combustion Tests and Demonstration	CC Tech	182,800	Grant	In Progress
87016	Lehigh University	FGC Catalyst-Sorbent Optimization	CC Tech	72,912	Ven Cap	Complete
87022	Anthracite Industry Assn	Anthracite Promotion to Utilities	Anth Dev	230,000	Grant	Terminated
87022	Penn State University	Anthracite Blending for Utilities	Anth Dev	200,300	Grant	In Progress
87023	Coal Dynamics Corp	Controlled Burnout - Deep Mine	Gen Coal	162,454	Ven Cap	Rescinded
87024	Control Techtronics Inc	Combustion Control Software Mod	CC Tech	25,000	Ven Cap	In Progress
87030	Penn State University	Coal Market/Quality Database Update	Gen Coal	18,028	Grant	Complete
87033	Rodale Research Center	Reduced Tillage for Energy Efficiency	Non-Coal	55,067	Grant	In Progress
87037	Florence Mining Company	Coal Cleaning (Agglomeration Enhance)	CC Tech	35,000	Ven Cap	Rescinded
87038	Good Samaritan Hospital	Hosp Waste Incin in Coal-Fired CFBC	Anth Dev	60,000	Grant	Combined**
87045	EXPORTech Company Inc	Magnetic Cleaning of Fine Coal	CC Tech	21,134	Ven Cap	Complete
87047	Energy Devel Services	Wind Data Acquisition	Non-Coal	14,000	Ven Cap	Rescinded
87052	Somerset Rural Elec Coop	Improved Industrial Energy Conserv	Non-Coal	44,934	Loan	In Progress
87053	BCR National Laboratory	Coal Desulfur in Rot Kiln Combustor	CC Tech	172,124	Ven Cap	In Progress
87055	GRASP	Energy Efficiency Gains in Row Homes	Non-Coal	45,000	Grant	In Progress
88001	GE Transport Systems	CWF-Fired Diesel Elec Locomotive - II	CC Tech	200,000	Ven Cap	In Progress
88003	PA Farmers' Association	Technical Assistance - Ag Energy Appl	Non-Coal	50,000	Loan	Rescinded
88007	Renewable Energy Inst	Wind Data Acquisition	Non-Coal	18,000	Ven Cap	In Progress
88009	Penn State University	Short Longwall Feasibility	Gen Coal	36,902	Grant	In Progress
88015	Coal Tech Corporation	Advanced Cyclone Combustor Demo	CC Tech	50,000	Ven Cap	In Progress
88024	PA Electric Company	Weathered Coal Combustion Performance	Gen Coal	70,000	Grant	Dr Contract
88025	Lehigh University	FGC Catalyst-Sorbent Pilot Testing	CC Tech	40,152	Ven Cap	In Progress
88030	Penn State University	Mining Permit Review Software	Gen Coal	69,546	Grant	Provisional
88033	Good Samaritan Hospital	Hosp Waste Incin in Coal-Fired CFBC	Anth Dev	98,682	Grant	In Progress
88034	Drexel University	RDF Combustion Characterization	Non-Coal	107,054	Grant	In Progress
88036	US Department of Energy	Anthracite R&D Needs Assessment	Anth Dev	20,000	Grant	Complete

TABLE 2
(Continued)

PEDA FUNDED RD&D PROJECTS SUMMARY

Project Number	Contractor	Purpose	Project Category	PEDA Alloc	Alloc Type	Status
89002	PA Electric Company	CZD SO_2 Reduction Demo - Phase II	CC Tech	750,000	Ven Cap	Provisional
89004	University of Pittsburgh	Liquid CO_2 (LICADO) Coal Cleaning	CC Tech	58,680	Grant	Dr Contract
89005	GE Transport Systems	CWF-Fired Diesel Elec Locomotive - III	CC Tech	200,000	Ven Cap	Provisional
89006	U.S. Steel Mining Co.	Coalbed Methane Recovery	Non-Coal	10,000	Grant	Provisional
89008	L.E. Smith Glass Co.	Oxy/Gas Burner Development	Gen Coal	74,447	Loan	Rescinded
89013	Penn State University	Anthracite Institute	Anth Dev	108,900	Grant	Provisional
89014	Penn State University	Alkaline Addition Study	CC Tech	250,000	Grant	Provisional
89016	Penn State University	Sorbent Performance Study	CC Tech	207,233	Grant	Provisional
89018	Penn State University	Oil Well Brine Treatment	Non-Coal	144,000	Grant	Dr Contract
89021	Lehigh University	Anthracite Waste Erosion Study	Anth Dev	153,796	Grant	Provisional
89022	Lehigh University	Flue Gas Clean-up w/Zeolite	CC Tech	41,205	Grant	Provisional
89023	Production Techniques Inc	High-Speed Glass Bottle Coating	Non-Coal	74,213	Ven Cap	Provisional
89029	University of Pittsburgh	Cyclonic Separator Coal Cleaning	CC Tech	157,633	Grant	Provisional
89030	Zurn Industries, Inc.	Rotary Cascading Bed Boiler	CC Tech	150,000	Grant	Provisional
89032	GRASP	Attic Insulation Field Study	Non-Coal	65,000	Grant	Provisional
89033	Donlee Technologies	Shredder for Infectious Waste in CFBC	Anth Dev	32,169	Grant	Provisional
89034	B. Datta Research	Anthracite Coal Cleaning Process	Anth Dev	150,787	Grant	Provisional
89038	BCR National Laboratory	Coal Blends Impact Study	CC Tech	213,338	Grant	Provisional
89043	Miltech Energy Services	Fine Coal Cyclonic Separation	CC Tech	72,100	Grant	Provisional

ANTHRACITE COMMERCIAL BOILER DESIGN COMPETITION
PHASE I AWARDS

Project Number	Contractor	PEDA Alloc	Alloc Type	Status
8931001	Penn State University	35,000	Grant	Draft Contract
8931002	Lehigh Coal & Navigation Co	29,537	Grant	Draft Contract
8931003	Advanced Waste Treatment Technologies	24,600	Grant	Draft Contract

* Allocation combined with Project # 89002
** Allocation combined with Project # 88033

supported RD&D projects are in the catagories of anthracite development and general coal development. Seventeen projects, or 19.5% involved RD&D in each of these 2 categories. Monetarily, the Authority has committed the majority, $4.6 million or 49% of its total energy RD&D commitment, to Clean Coal Technology (Figure 2). Commitments to coal projects equal $7.3 million, or 86% of PEDA's energy RD&D effort.

PEDA's impact on energy RD&D in the Commonwealth is reflected in Figure 3. The Authority's $9.4 million commitment has engendered an additional $35.3 million investment from other sources, for a total of $44.7 million in energy RD&D effort in Pennsylvania. Clearly, PEDA has been most influential in developing clean coal technologies. The Authority's $4.6 million commitment has generated an additional $29.7 million investment in this area by parties interested in advancing clean coal technologies; each Authority dollar has been matched by roughly $6.46 from project co-participants. Cost sharing figures by co-participants per each PEDA dollar for general coal development, anthracite development and non-coal development are $0.87, $1.05 and $1.83, respectively.

PEDA received 40 applications for energy RD&D-related financial assistance during FY 1989-90, with a stated total value of approximately $17.5 million; the aggregate request for Authority funds was about $7.5 million. The board committed $2,103,470 to 17 projects worth approximately $7.5 million.

The majority of PEDA's funding was oriented toward clean coal technology development in FY 89-90 (Figures 4-6). This fact is reinforced by looking at total cost (Figure 6) -- clean coal technology projects account for roughly 77% of PEDA-sponsored energy RD&D effort. Anthracite development projects will combine $444,311 in PEDA funds with $261,668 from other sources to foster $705,979 in anthracite-associated activity.

The composition of PEDA RD&D project costs is presented graphically in Figure 7. FY 89-90 saw a decline from the previous year in terms of attracting co-participant financial participation in projects funded by the Authority. The co-participant contribution versus each Authority dollar committed to FY 89-90 projects ratio is $4.45 and $3.74 through the six year history of the Authority's financial assistance program. Recently, Pennsylvania Electric Company's Confined Zone Dispersion (CZD) demonstration project has also been a significant factor in project co-participation growth.

In FY 89-90, co-participants in PEDA-funded energy RD&D projects have committed to bear 82% of total project cost whereas in FY 88-89, they carried 91% of costs associated with projects (Figure 8). Overall, co-participants have been responsible for 79% of the costs related to projects supported by the Authority. PEDA sustained its ability to attract co-participant financial commitment to energy-related RD&D projects in this fiscal year. This participation has come from industry, utilities, universities, equipment vendors, local and federal agencies, non-profit groups and other interested parties.

CATEGORICAL DISTRIBUTION OF PROJECTS
(through six years of program)

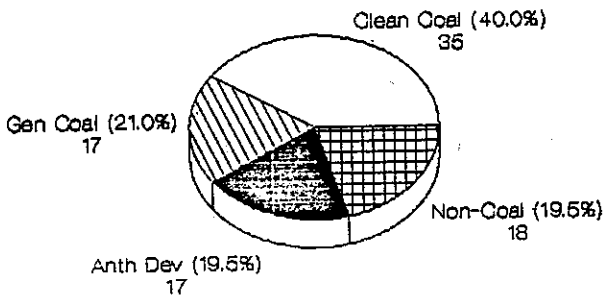

Figure 1

CATEGORICAL DISTRIBUTION OF PROJECTS
(FY 89-90)

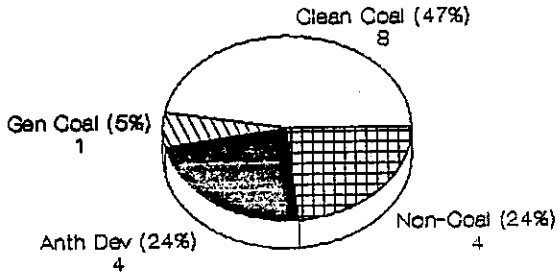

Figure 4

DISTRIBUTION OF PEDA FUNDS
(through six years of program)

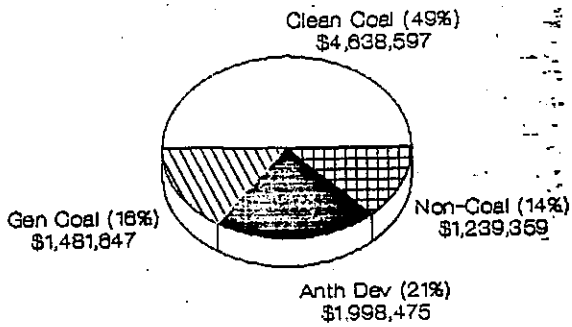

Figure 2

DISTRIBUTION OF PEDA FUNDS
(FY 89-90)

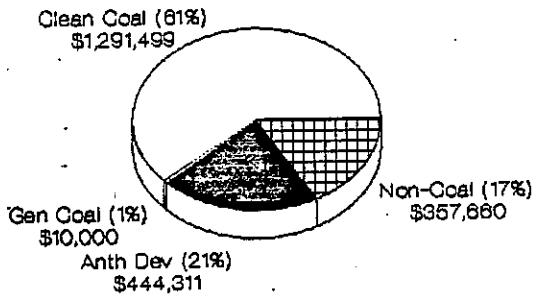

Figure 5

TOTAL COST
(through six years of program)

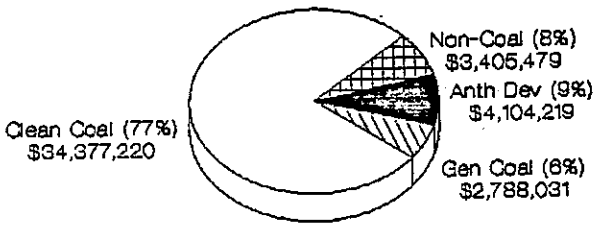

Figure 3

TOTAL COST
(FY 89-90)

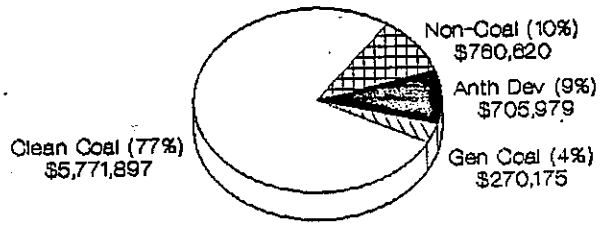

Figure 6

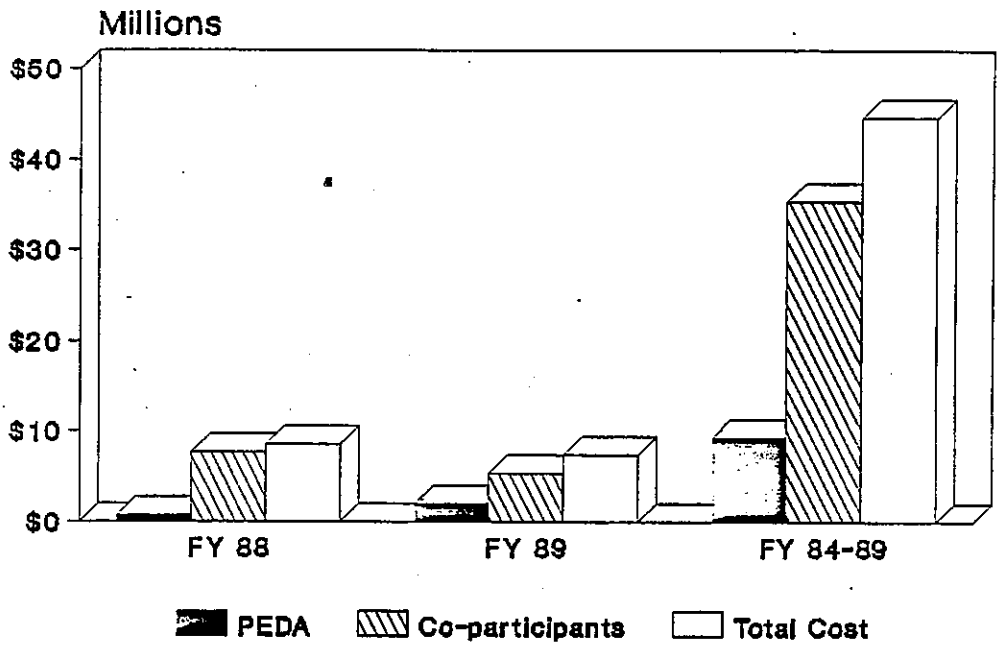

Figure 7

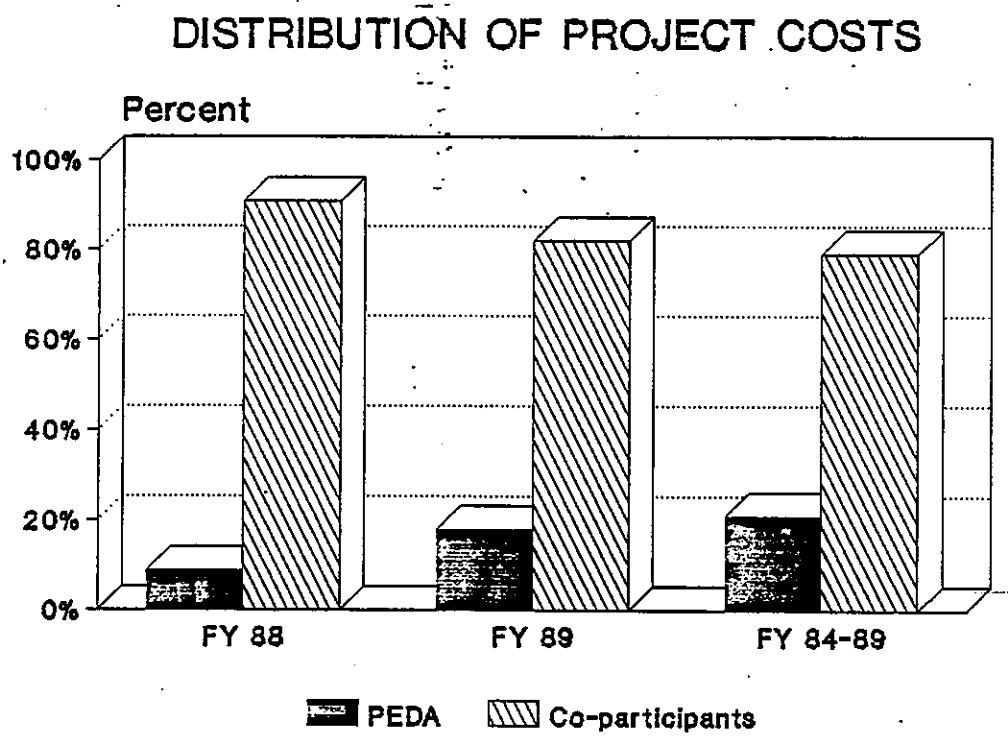

Figure 8

PEDA PROJECT HIGHLIGHTS

Introduction

The Authority's energy development and conservation program is summarized in the following paragraphs. Table 1 presents concise information on the three commercial energy projects for which PEDA has issued revenue bonds. Synoptic data for PEDA RD&D projects are supplied in Table 2. Table 3 summarizes details for the three projects approved under the Anthracite Commercial Boiler Design Competition initiative. For discussion on Authority RD&D projects completed in FY 89-90, refer to Appendix A; RD&D projects in progress are described in Appendix B.

Commercial Projects

The Authority is involved in three coal-related commercial scale energy projects -- Humboldt Energy Center, Ebensburg Cogeneration Plant and the Clarion Project -- via approximately $167 million in PEDA revenue bonds (Table 1). These projects will dispose of refuse from historic coal mining activity which is an environmental hazard (for example, source of acidic run-off and site of spontaneous combustion fires). Jointly, the projects will employ about 400 workers during peak construction; permanent employment will be provided to roughly 65 persons. The $258 million corporate project cost suggests an initial influx of millions of dollars into Pennsylvania's economy, with sustained monetary and tax revenue flows for many years thereafter.

Humboldt Energy Center

The Humboldt Energy Center (HEC) is a 135 megawatt, anthracite refuse-fueled integrated gasification combined cycle cogeneration plant located in the Humboldt Industrial Park near Hazleton. The plant is fully constructed and has been commissioned. HEC has been selling 100 megawatts of power to Pennsylvania Power & Light Company since March 1989. Due to this facility, additional tenants have been attracted to the industrial park, resulting in a doubling of employment.

Ebensburg Cogeneration Plant

Construction of the Ebensburg Cogeneration Plant (ECP), a 52 megawatt bituminous coal refuse fired fluidized bed combustion installation, is underway, with the facility currently 78% complete. Engineering, procurement and construction activities are proceeding generally on schedule. It is expected that the plant will be operation during the fall of 1990.

Clarion Project

During Fiscal Year 1989-90 ownership rights to the Clarion Project has changed from the Babcock-Wilcox Company to the Mid-Atlantic Energy Company. PEDA staff has worked with the new comapny to allow for a smooth transition of ownership. Proceeds of the PEDA bond issue for the Clarion Project, a bituminous coal refuse fired fluidized bed combustion small power production facility, continue to be held in escrow. Supplemental tax-exempt financing for this project, through the Clarion County Industrial Development Authority, is now expected to be completed in September, 1990. PEDA staff anticipates construction to commence during the fall of 1990.

Clean Coal Technology Projects

PEDA's 35 clean coal technology projects are distributed as follows: pre-combustion, 15 (43%); emissions reduction during combustion, 9 (26%); flue gas clean-up, 6 (17%); and conversion of coal to a cleaner fuel, 5 (14%). Generally, the Authority's clean coal technology projects center on research and development, with only limited demonstration. However, several projects will benefit the environment by reducing pollutants at commercial sites.

Promising pre-combustion coal cleaning projects at the research level include Lehigh University's fluidized bed approach, the University of Pittsburgh's LICADO (Liquid Carbon Dioxide) process and Cyclonic Agglomerator coal cleaning-by-separation method, and Miltech Energy Services' heavy media cyclonic separation coal cleaning. The LICADO process continues to shows commercial promise; it has attracted the interest of the US Department of Energy and Westinghouse Electric Corporation. B. Datta Research is adapting a bituminous coal cleaning process to clean anthracite coal to produce low ash anthracite.

In an effort to optimize coal utilization, Penn State University is continuing the Anthracite Industry Associations's efforts to promote anthracite and anthracite/bituminous coal blends to utilities and BCR National Laboratory is conducting research and bench-scale testing on several coal blends and their impact on boiler system performance.

Pennsylvania Electric Company's demonstration of Bechtel's confined zone dispersion (CZD) flue gas clean-up process could prove to be an effective and cost effective means for utility power plants, many of which were built in the 1950s, to reduce their sulfur emissions for compliance with pending Clean Air legislation. This project has gained the support of the U.S. Department of Energy under its Clean Coal Technology program. The project will take place at Pennsylvania Electric's Seward Station generation facility located near Johnstown, Pennsylvania.

Non-Coal Development Projects

Nine non-coal projects are part of the Authority's energy RD&D program. These projects deal with increased energy efficiency in rowhouses, industry and agriculture; and renewable energy resource assessment and utilization. For example, Production Techniques, Inc., a has developed a patented glass bottle coating process which has the potential for eliminating the need to melt different colored glass separately. This coating could have a favorable impact on the glass recycling industry by eliminating the need to separate different colored glass. Production Techniques will be building a high speed bottle coating line to demonstrate its concept.

New Initiatives

Anthracite Commercial Boiler Design Competition

In setting the direction and establishing the priorities for PEDA's FY 89-90 program, the Board of Directors approved a program aimed at addressing a specific needed research A review of existing anthracite-fired commercial boiler systems has revealed a need for improved technology to enhance the ability of Pennsylvania anthracite to compete favorably with fuel oil and natural gas. PEDA solicited proposals to foster the development of one or more high-performance, anthracite-fired boiler systems suitable for meeting space heating and hot water requirements of large buildings. A multi-phase program was developed; system design, laboratory R&D and bench-scale testing, and site demonstration. Three responses were received for Phase I, system design, of the boiler: Penn State University, Lehigh Coal and Navigation Company, and Advanced Waste Treatment Technologies.

FISCAL STATUS

PEDA ended FY 89-90 with a net available balance of $1,525,921. Though the Authority has total assets of $6,389,957, $4,864,036 are committed to projects ($4,817,822) and operations ($46,214), but not yet spent. Administration costs, including personnel, operating and fixed assets expenses, totaled $244,086. However, the Authority received $544,323 in interest from funds invested by the State Treasurer. The board is pleased to report that, once again, PEDA's operation imposed no costs to taxpayers, and the full amount of Commonwealth funds was available for financial assistance. Summaries of the Authority's fiscal status are presented in Tables 3, 4, 5 and 6. These statements were prepared by the Comptroller's Office, Commonwealth of Pennsylvania.

TABLE 3

PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

STATEMENT OF FUNDS AVAILABLE

INCEPTION OF FUND TO JUNE 30, 1990

RECEIPTS		
Transfer from General Fund	$10,300,000.00	
Interest on Investments	2,052,556.72	
Commitment Fees	75,750.00	
Application Fees	21,085.00	
Venture Capital Repayments	1,126.99	
Reimbursement - Operating Expenditures	5,000.00	
Miscellaneous	33,936.00	
AVAILABLE FOR DISBURSEMENT		$12,489,454.71
DISBURSEMENTS		
Grants/Venture Capital	$ 4,876,208.67	
Operating Expenses	1,223,288.83	
Total Disbursements	$ 6,099,497.50	
TOTAL FUNDS AVAILABLE		**$ 6,389,957.21**

TABLE 4

PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

BALANCE SHEET

JUNE 30, 1990

ASSETS			
Cash			$ 882.10
Short Term Investments			6,345,000.00
Accrued Interest			44,075.11
TOTAL ASSETS			$6,389,957.21
LIABILITIES & NET WORTH			
LIABILITIES			
TOTAL LIABILITIES			$ 0.00
NET WORTH			
General Fund Appropriations	$10,300,000.00		
Grant Disbursements	4,876,208.67		
		$5,423,791.33	
Net Earnings from Operations		966,165.88	
			$6,389,957.21
TOTAL LIABILITIES AND NET WORTH			$6,389,957.21

TABLE 5

PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

COMPARATIVE STATEMENT OF FUNDS AVAILABLE

FOR THE TWELVE MONTH PERIOD ENDING JUNE 30

	1989		1990	
TOTAL AVAILABLE FUNDS - July 1		$4,161,643		$5,004,987
RECEIPTS				
Transfer from General Fund	$1,500,000		$1,500,000	
Interest on Investments	426,892		544,323	
Application Fees	3,700		4,485	
Venture Capital Repayments	73		0	
Reimbursement - Operating Expenditures	0		0	
Miscellaneous	25,000		8,936	
Total Receipts		$1,955,655		$2,057,744
AVAILABLE FOR DISBURSEMENT		$6,117,308		$7,062,731
DISBURSEMENTS				
Grants/Venture Capital	$ 885,392		$ 428,688	
Operating Expenses	226,928		244,086	
Total Disbursements		$1,112,320		$ 672,774
GROSS FUNDS AVAILABLE		$5,004,988		$6,389,957 (a)
COMMITMENTS				
Grants/Venture Capital	$2,605,714		$4,817,822 (b)	
Operating	46,892		46,214	
Total Commitments		$2,652,606		$4,864,036
NET FUNDS AVAILABLE		**$2,352,382**		**$1,525,921** (c)

(a) Cash, $882; Investments, $6,345,000; Interest, $44,075
(b) Encumbered, $1,504,861; Unencumbered, $3,312,961
(c) Unexpended/uncommitted funds at close of fiscal year

TABLE 6

PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

RECONCILIATION OF COMMITMENTS

JUNE 30, 1989

M.E.	Contractor	Commitments	Disbursements	Balance
485-015	Hess & Fisher Engineers	31,475.00	28,291.25	3,183.75
485-016	University of Pittsburgh	84,908.00	78,581.68	6,326.32
486-004	University of Pittsburgh	149,931.00	149,782.90	148.10
486-007	BCR National Laboratory	271,715.00	271,715.00	0.00
486-008	PA Electric Company	400,000.00	0.00	400,000.00
486-043	Penn State University	142,175.00	97,566.77	44,608.23
487-001	Lehigh University	86,405.00	0.00	86,405.00
487-010	PA Electric Company	182,800.00	0.00	182,800.00
487-022	Anthracite Industry Assn	29,700.00	27,271.05	2,428.95
487-024	Control Techtronics Inc	25,000.00	17,983.46	7,016.54
487-033	Rodale Research Center	55,067.00	41,844.62	13,222.38
*487-052	Somerset Rural Elec Coop	44,934.00	0.00	44,934.00
487-053	BCR National Laboratory	206,428.00	0.00	206,428.00
487-055	GRASP	45,000.00	43,220.82	1,779.18
488-001	GE Transportation Sys	200,000.00	0.00	200,000.00
488-007	Renewable Energy Inst	18,000.00	5,462.42	12,537.58
488-009	Penn State University	36,902.00	7,760.12	29,141.88
488-015	Coal Tech Corporation	50,000.00	32,539.51	17,460.49
*873-4022	Penn State University	200,300.00	0.00	200,300.00
*883-4024	PA Electric Company	70,000.00	0.00	70,000.00
883-4025	Lehigh University	40,152.00	0.00	40,152.00
*883-4030	Penn State University	69,546.00	0.00	69,546.00
883-4033	Good Samaritan Hospital	158,682.00	0.00	158,682.00
883-4034	Drexel University	107,054.00	14,513.56	92,540.44
883-4036	US Department of Energy	20,000.00	20,000.00	0.00
*893-4002	PA Electric Company	750,000.00	0.00	750,000.00
*893-4004	University of Pittsburgh	58,680.00	0.00	58,680.00
*893-3005	GE Transportation Sys	200,000.00	0.00	200,000.00
*893-4006	U.S. Steel Mining Company	10,000.00	0.00	10,000.00
*893-4013	Penn State University	108,900.00	0.00	108,900.00
*893-4014	Penn State University	250,000.00	0.00	250.000.00
*893-4016	Penn State University	207,223.00	0.00	207,223.00
*893-4018	Penn State University	144,000.00	0.00	144,000.00
*893-4021	Lehigh University	153,796.00	0.00	153,796.00
*893-4022	Lehigh University	41,205.00	0.00	41,205.00
*893-3023	Production Techniques, Inc.	74,213.00	0.00	74,213.00
*893-4029	University of Pittsburgh	157,633.00	0.00	157,633.00
*893-4030	Zurn Industries, Inc.	150,000.00	0.00	150,000.00
*893-4032	GRASP	65,000.00	0.00	65,000.00
*893-4033	Donlee Technologies	32,169.00	0.00	32,169.00
*893-4034	B. Datta Research	150,787.00	0.00	150,787.00
*893-4038	BCR National Laboratory	213,338.00	0.00	213,338.00
*893-4043	Miltech Energy Services	72,100.00	0.00	72,100.00
*893-1001	Penn State University	35,000.00	0.00	35,000.00
*893-1002	Lehigh Coal & Navig. Co.	29,537.00	0.00	29,537.00
*893-1003	Advanced Waste Trtmt Tech.	24,600.00	0.00	24,600.00
	Total	$5,654,355.00	$ 836,533.16	$4,817,821.84

* Unencumbered Commitments

APPENDIX A

PEDA RD&D PROJECTS COMPLETED IN FISCAL YEAR 1989

APPLICANT

University of Pittsburgh
3500 Fifth Avenue
Pittsburgh, PA 15260

S. H. Chiang
412/624-3973

Allegheny County

PROJECT NUMBER

485-016

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	85-86

PROJECT DESCRIPTION

The work under this grant represents Phase I of a multi-phase project. Under this project, the University of Pittsburgh will be conducting experiments on its LICADO coal cleaning process. The LICADO (liquid carbon dioxide) process, invented by the University of Pittsburgh, uses liquid CO_2 as a medium to beneficiate ultra-fine (-200 mesh) coal. Phase I focused on the mechanism of the LICADO process and its effectiveness in producing clean coal. Experiments were conducted in a batch reactor.

PROJECT STATUS

The work under Phase I has been successfully completed. Significant sulfur reductions were observed during coal cleaning using the LICADO process, for example, Pennsylvania Upper Freeport bituminous coal containing 23.4% ash and 1.30% total sulfur was cleaned to a product containing 3.8% ash and 0.74% total sulfur, 75% Btu recovery and minimal moisture content in single-stage processing.

FINANCIAL SUMMARY

Total Project Cost:	$149,566.51
Applicant Share:	$ 71,477.68
PEDA Share:	$ 78,088.83
PEDA Allocation:	$ 84,908.00

REMAINING PEDA BALANCE

$6,326.32

PROJECT START DATE

April 4, 1986

PROJECT COMPLETION DATE

December 31, 1989

APPLICANT

University of Pittsburgh
350 Thackeray Hall
Pittsburgh, PA 15260

Dr. Ronald D. Neufeld
412/624-5362

Allegheny County

PROJECT NUMBER

486-004

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
General Coal	86-87

PROJECT DESCRIPTION

The University of Pittsburgh is involved in a project focused on energy production from controlled burnout of coal refuse piles in Pennsylvania. Burnout control is a techniqu3e that employs ventilation and suction to accelerate combustion of a waste coal pile until extinction. These refuse deposits possess calorific values ranging between 2,000 and 6,000 Btu/lb; they are both an unused potential energy source and an environmental hazard. Laboratory research included characterizing and evaluating properties of coal waste piles in Pennsylvania for suitability to Burnout Control, and correlating energy potential to properties of waste coal piles.

PROJECT STATUS

This project has been successfully completed. Laboratory pilot systems show exhaust gas temperatures of a refuse pile to be over 1,000 ^{o}C with 65% to 96% utilization of the original; Btu value of the coal refuse. Air emission evaluations show NO_x emissions to be low, but a scrubber would be needed for SO_2 removal.

FINANCIAL SUMMARY

Total Project Cost:	$194,229.95
Applicant Share:	$ 44,447.05
PEDA Share:	$149,782.90
PEDA Allocation:	$149,931.00

REMAINING PEDA BALANCE

$148.10

PROJECT START DATE

May 7, 1989

PROJECT COMPLETION DATE

January 1, 1990

APPLICANT

BCR National Laboratory
500 William Pitt Way
Pittsburgh, PA 15238

John A. DeMarchis
412/826-3030

Allegheny County

PROJECT NUMBER

486-007

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
General Coal	86-87

PROJECT DESCRIPTION

This project represented Phase II of a three-phase program to introduce low volatile Pennsylvania bituminous coal (LV coal) into utility boilers. LV coals may be a technically and economically viable SO_2 emissions compliance option for utilities in the northeastern United States. This phase addressed utility concerns relative to burning LV coal. Utilities participating in the project are New England Power Service Company, United Illuminating Company, and Pennsylvania Electric Company.

PROJECT STATUS

The results from Phase II revealed no major problems with the combustion, emissions, and boiler operating characteristics of the tested LV coals, as related to the targeted boilers. For the targeted boilers used, LV coal can be economically advantageous over compliance coals from other states due to transportation and mining costs. Plans are continuing to secure a location for a test burn of LV coal.

FINANCIAL SUMMARY

Total Project Cost:	$332,276.93
Applicant Share:	$ 64,858.48
PEDA Share:	$267,418.45
PEDA Allocation:	$271,715.00

REMAINING PEDA BALANCE

$4,296.55

PROJECT START DATE

December 8, 1986

PROJECT COMPLETION DATE

February 28, 1990

APPLICANT

U.S. Department of Energy
Pittsburgh Energy Tech. Ctr.
P.O. Box 10940
Pittsburgh, PA 15236-0940

Dr. Frederick R. Brown
412/892-6268

Allegheny County

PROJECT NUMBER

883-4036

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Anthracite	88-89

PROJECT DESCRIPTION

The U.S. Department of Energy, through its subcontractor. Eos Technologies, is analyzing the potential for increasing anthracite use by (1) investigating anthracite resources and their present uses; (2) assessing opportunities for expanding existing markets and developing new ones; and (3) defining specific R&D needs and applications of the results of such R&D. During this project, the state-of-the-art relative to end-use equipment will be examined, along with opportunities for improving their environmental performance, efficiency and operation.

PROJECT STATUS

This project has been successfully completed. The contractor submitted a Final Report which included recommendations that served as a basis for the Anthracite Research program adopted by the Board.

FINANCIAL SUMMARY

Total Project Cost:	$21,592.00
Applicant Share:	$10,796.00
PEDA Share:	$10,796.00
PEDA Allocation:	$20,000.00

REMAINING PEDA BALANCE

$ 9,204

PROJECT START DATE

June 21, 1989

PROJECT COMPLETION DATE

February 28, 1990

APPENDIX B

PEDA RD&D PROJECTS IN PROGRESS

APPLICANT

Hess & Fisher Engineers, Inc.
36 North Second Street
Clearfield, PA 16830

Wilson Fisher, Jr.
814/765-7541

Jefferson County

PROJECT NUMBER

485-015

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY **FISCAL YEAR**

General Coal 85-86

PROJECT DESCRIPTION

This project is an evaluation study of alternative sediment and erosion control methods. The study's main objective is to obtain quantifiable data to provide regulatory agencies with documentation to justify use of innovative sediment control techniques. It is anticipated that the results from this study will be disseminated to Pennsylvania's surface mining industry.

PROJECT STATUS

The project is essentially completed. Preliminary results indicate that some innovative methods control sediment runoff as well as conventional methods. The Authority is waiting for a final report to be submitted by the contractor.

FINANCIAL SUMMARY

Total Project Cost:	$87,975
Applicant Share:	$56,500
PEDA Share:	$31,475

REMAINING PEDA BALANCE

$3,183.75

PROJECT START DATE

June 9, 1986

PROJECT COMPLETION DATE

June 1, 1989

APPLICANT

Pennsylvania Electric Company
1001 Broad Street
Johnstown, PA 15907

A. A. Slowik
814/533-8217

Cambria County

PROJECT NUMBER

486-008

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	86-87

PROJECT DESCRIPTION

Pennsylvania Electric Company is hosting a project to demonstrate a low NO_x burner at its Homer City generating station in Indiana County, Pennsylvania. This demonstration is part of a program sponsored by the Electric Power Research Institute (EPRI) to evaluate the performance of low NO_x burner systems. These burners will be retrofitted to a pre-1971 New Source Performance Standards boiler. Comparisons between data obtained before, immediately after, and well after burner conversion will accurately and conclusively assess performance of the selected low NO_x burner system. Low NO_x burners appear to be the simplest and cheapest means of achieving significant NO_x emission reductions in utility boilers.

PROJECT STATUS

To date, baseline emissions testing has been completed. New burner barrels and tips await installation upon shutdown of facility for maintenance.

FINANCIAL SUMMARY

Total Project Cost:	$4,600,000
Applicant Share:	$4,200,000
PEDA Share:	$ 400,000

REMAINING PEDA BALANCE

$400,000

PROJECT START DATE

July 21, 1987

PROJECT COMPLETION DATE

December 31, 1990

APPLICANT

Penn State University
114 Kern Building
University Park, PA 16802

William D. Moir
814/863-0587

Centre County

PROJECT NUMBER

486-043

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY **FISCAL YEAR**

General Coal 86-87

PROJECT DESCRIPTION

The Pennsylvania State University is engaged in a project to develop a statistical model to predict acid mine drainage (AMD) from proposed coal mining sites. The project is comprised of three tasks: (1) overburden characterization via (a) quantitative phase characterization based upon x-ray diffraction analysis, (b) grain-size distribution measurement of pyrite grains in selected samples with computer-controlled scanning electron microscopy, and (c) quantification of the reactivity and amount of pyrite and carbonate minerals by evolved gas analysis; (2) simulated weathering (leaching) experiments to study rates and quantities of acid production; and (3) development of a predictive model based upon data collected from tasks 1 and 2.

PROJECT STATUS

Progress has been made on overburden characterization and simulated weathering experiments. Improvements have been made to the current method of determining the acid neutralization potential of overburden. A contract amendment is in process to extend the contract completion date from June 30, 1990 to December 31, 1990 to finalize work under the contract.

FINANCIAL SUMMARY

Total Project Cost:	$223,521
Applicant Share:	$ 81,346
PEDA Share:	$142,175

REMAINING PEDA BALANCE

$44,608.23

PROJECT START DATE

July 1, 1987

PROJECT COMPLETION DATE

June 30, 1990

APPLICANT

Lehigh University
Energy Research Center
Packard Laboratory
Bethlehem, PA 18015

Dr. Richard Streeter
215/758-3020

Northampton County

PROJECT NUMBER

487-001

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY: Clean Coal

FISCAL YEAR: 87-88

PROJECT DESCRIPTION

This project is the second phase of a project undertaken by Lehigh University to investigate the application of fluidization to coal cleaning. This phase will develop fluidized bed coal cleaning to the point where field demonstration of the technology is imminent. At least three Pennsylvania coals will be evaluated in the course of this project.

PROJECT STATUS

The performance characterization tests in the batch bed have been completed (task 1). Major efforts are now focused on task 2 activities. Work has been accomplished under tasks 5 and 7 also.

FINANCIAL SUMMARY

Total Project Cost:	$461,810
Applicant Share:	$375,405
PEDA Share:	$ 86,405

REMAINING PEDA BALANCE

$86,405

PROJECT START DATE

July 1, 1988

PROJECT COMPLETION DATE

June 30, 1991

APPLICANT

Pennsylvania Electric Company
1001 Broad Street
Johnstown, PA 15907

A. A. Slowik
814/533-8217

Cambria County

PROJECT NUMBER

487-010

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	87-88

PROJECT DESCRIPTION

The purpose of this project is to show the technical feasibility of co-firing coal-water slurry fuel (CWSF) and coal in pulverized coal (PC) utility boilers. The project involves firing CWSF at pilot and demonstration scales. In addition to the Authority, project participants include Pennsylvania Electric Company (Penelec), New York State Electric and Gas Company, Jim Walter Resources (JWR), Pennsylvania State University (PSU), Management and Technical Services, and CLI Corporation. The project comprises four phases, (1) CWSF Formulation and Characterization, (2) Combustion Behavior of CWSFs, (3) Combustion Behavior when Co-firing CWSF and PC and, (4) CWSF Demonstration Tests.

PROJECT STATUS

The contract for this project was executed in April, 1990. Penelec started work on the project and subcontracts were issued to the other project team participants. An agreement was prepared to replace CQDC and Kaiser Engineers with CLI Corporation which will be responsible for the preparation of coal water slurry for Phases I and II of the project.

FINANCIAL SUMMARY

Total Project Cost:	$262,777
Applicant Share:	$ 79,977
PEDA Share:	$182,800

REMAINING PEDA BALANCE

$182,800

PROJECT START DATE

March 27, 1990

PROJECT COMPLETION DATE

December 31, 1991

APPLICANT

Penn State University
114 Kern Building
University Park, PA 16802

William D. Moir
814/863-0587

PROJECT NUMBER

873-4022

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Anthracite	87-88

PROJECT DESCRIPTION

This contract is for second phase of the two-phase utility coal blending project. Phase I was completed by the Anthracite Industry Association with the procurement of New York State Electric and Gas Company to participate in the project. Phase II work includes laboratory combustion testing of several anthracite/bituminous coal blends and anthracite pellets/ bituminous coal blends. Combustion testing will be conducted at Penn State's Combustion Laboratory.

PROJECT STATUS

The contract has been signed by both Penn State and PEDA and is currently being circulated for final review; execution is expected in the late Summer of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$222,556
Applicant Share:	$ 22,256
PEDA Share:	$200,300

REMAINING PEDA BALANCE

$200,300

PROJECT START DATE

July 1, 1990

PROJECT COMPLETION DATE

June 30, 1992

APPLICANT

Control Techtronics, Inc
99 South Cameron Street
Harrisburg, PA 17101

John West
717/257-5440

Dauphin County

PROJECT NUMBER

487-024

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY **FISCAL YEAR**

Clean Coal 87-88

PROJECT DESCRIPTION

Control Techtronics, Inc. (CTI) received financial assistance from PEDA to complete a program that would enable them to market their multi-loop combustion controller and data acquisition (MCD) computer for use on coal-fired fluidized bed combustors (FBC). Funds were to be used to complete the following tasks; 1) modify CTI's software package and bench test the MCD computer; 2) demonstrate the MCD computer on the FBC at York-Shipley pilot plant facility in York, PA; and, 3) demonstrate the MCD computer on a commercial installation at a plant built by York Energy Systems, Inc. in Womelsdorf, PA.

PROJECT STATUS

CTI modified their software package for application of the MCD unit on a FBC and bench tested the MCD computer at their office. A unit with instructions was sold to York-Shipley for installation and demonstration. The unit was installed but no testing has taken place. With respect to the third task, the construction of the FBC facility in Womelsdorf (site of the commercial installation) has been delayed for close to a year, PEDA recently received notice from CTI that construction may begin before the end of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$75,000
Applicant Share:	$50,000
PEDA Share:	$25,000

REMAINING PEDA BALANCE

$7,016.54

PROJECT START DATE

August 1, 1988

PROJECT COMPLETION DATE

December 31, 1990

APPLICANT

Rodale Research Center
R. D. #1, Box 323
Kutztown, PA 19530

Dr. Robert Hart
215/683-6383

Berks County

PROJECT NUMBER

487-033

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Non-Coal	87-88

PROJECT DESCRIPTION

The Rodale Research Center received financial assistance to conduct research aimed at solving numerous problems related to energy use for field cultivation on farms in Pennsylvania. The research focused on approaches to be used by farmers to reduce primary tillage in farming systems without an increased reliance on herbicides. The core program was an experiment called the "Low Input, Reduced Tillage (LIRT) trial which compared three cropping systems and four tillage regimes.

PROJECT STATUS

The LIRT trial was completed at the end of 1989 and a two-year summary report was submitted to PEDA on February 20, 1990. Preliminary conclusions stated in this report are that overall energy savings from no-till with herbicides (the current no-till practice) are doubtful because of the increased dependency (compared with other tillage methods) on petrochemicals. If a winter annual cover crop that can be controlled by mowing is established, however, no-till without herbicides is possible. The contract expired on May 15, 1990 and PEDA is awaiting a final program report.

FINANCIAL SUMMARY

Total Project Cost:	$135,067
Applicant Share:	$ 80,000
PEDA Share:	$ 55,067

REMAINING PEDA BALANCE

$13,222.38

PROJECT START DATE

May 15, 1988

PROJECT COMPLETION DATE

May 15, 1990

APPLICANT

Somerset Rural Electric Coop.
Industrial Prky. P.O. Box 270
Somerset, PA 15501

Harold E. Nicholson
814/445-4106

Somerset County

PROJECT NUMBER

487-052

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Non-Coal	87-88

PROJECT DESCRIPTION

Somerset Rural Electric was awarded $45,000 to establish a low-interest energy loan fund to provide an incentive for industrial firms to improve their energy efficiency. A firm interested in participating would submit to technical energy audit to determine the potential for energy savings and to identify energy conservation measures. After PEDA reviews the completed energy audits and renders the energy improvements eligible for a loan, PEDA will disburse the funds on a project-per-project basis to be administered by Somerset according to an approved financing plan.

PROJECT STATUS

PEDA received one completed energy audit and application for an energy improvement loan in July, 1989. The application was incomplete and Somerset was notified of the deficiencies. Somerset failed to submit a complete loan application prior to the contract expiration date on September 7, 1989. PEDA granted Somerset an extension of the contract to September 7, 1990 with the hope that a suitable financing plan would be submitted by Somerset. As of June 22, 1990, Somerset has failed to submit any loan applications to PEDA as required by the Loan Agreement.

FINANCIAL SUMMARY

Total Project Cost:	$281,236
Applicant Share:	$236,302
PEDA Share:	$ 44,934

REMAINING PEDA BALANCE

$44,934

PROJECT START DATE

September 7, 1988

PROJECT COMPLETION DATE

September 7, 1990

APPLICANT

BCR National Laboratory
500 William Pitt Way
Pittsburgh, PA 15238

John A. DeMarchis
412/826-3030

Allegheny County

PROJECT NUMBER

487-053

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	87-88

PROJECT DESCRIPTION

This project is aimed at evaluating a modified rotary kiln combustor for burning Pennsylvania coal and coal wastes, with limestone injection for SO_2 emissions control. Objectives of the project are: (1) to prove the feasibility of burning high-sulfur bituminous coal and coal wastes, and anthracite refuse cofired with bituminous coal, with the injection of limestone for control of SO_2 emissions; (2) to determine the calcium/sulfur ratio necessary for operation of the rotary kiln; (3) to define the parameters for limestone injection into the kiln's secondary combustion chamber; (4) to evaluate the technical and economic merits of a commercial scale rotary kiln combustor; and (5) to ascertain the need for further testing of the kiln prior to commercial deployment.

PROJECT STATUS

The contract for this project was executed in April 1990. A project team kick-off meeting was held on June 21, 1990. BCR National Laboratory is currently executing their contracts with the other project participants and preparing a master schedule for the project.

FINANCIAL SUMMARY

Total Project Cost:	$326,084
Applicant Share:	$119,656
PEDA Share:	$206,428

REMAINING PEDA BALANCE

$206,428

PROJECT START DATE

March 15, 1990

PROJECT COMPLETION DATE

June 30, 1992

APPLICANT

Grass Roots Alliance for
a Solar Pennsylvania
3500 Lancaster Avenue
Philadelphia, PA 19104

Joan Schiff
215/222-0319

Philadelphia County

PROJECT NUMBER

487-055

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY Non-Coal

FISCAL YEAR 87-88

PROJECT DESCRIPTION

GRASP received financial assistance to conduct field research of thermal bypasses from attics of flat-roofed rowhouses common to Philadelphia. Thermal bypasses have been identified as a possible cause for poor performance of attic insulation. The research project is designed to develop methods and models capable of maximizing the energy savings of attic insulation while minimizing associated moisture problems.

PROJECT STATUS

GRASP developed an instrumentation package to measure the impacts of attic insulation treatments and provide the data needed to develop a valid computer model to measure attic performance. GRASP instrumented the attics of six occupied rowhouses to collect data on temperature changes, relatives humidities, heating system status, pressure differences, and wood moisture content. Using the model, GRASP analyzed the impact of various types of insulation treatments. GRASP completed their project on June 30, 1990 and is preparing a draft final report.

FINANCIAL SUMMARY

Total Project Cost:	$55,838
Applicant Share:	$10,838
PEDA Share:	$45,000

REMAINING PEDA BALANCE

$1,779.35

PROJECT START DATE

October 6, 1988

PROJECT COMPLETION DATE

June 30, 1990

APPLICANT

GE Transportation System
2901 East Lake Road
Erie, PA 16531

Dr. Paul L. Flynn
814/875-3162

Erie County

PROJECT NUMBER

488-001

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	88-89

PROJECT DESCRIPTION

This project will cover second-year activity for General Electric Transportation Systems' five-year project to develop a diesel electric locomotive fired with coal-water fuel. During the second year, the contractor will (1) prepare detailed test plans for the applied R&D needed for the proposed locomotive power system concept; (2) modify the test facilities as described in the approved test plans; (3) conduct the tests in accordance with the approved test plans and analyze and interpret the test data; (4) conduct a subsystem component testing and development program; and (5) develop the test plan, procure and assemble the necessary test equipment, commission the test facilities, and conduct the integrated system test.

PROJECT STATUS

The contractor completed detailed test plans, conducted preliminary tests, and now is working on subsystem component testing. Conversion of the test locomotive is nearly complete, the 12-cylinder engine tests will start in the Fall of 1990, and emissions tests are ongoing. Completion is expected by December 31, 1990.

FINANCIAL SUMMARY

Total Project Cost:	$6,723,000
Applicant Share:	$6,523,000
PEDA Share:	$ 200,000

REMAINING PEDA BALANCE

$200,000

PROJECT START DATE

March 15, 1990

PROJECT COMPLETION DATE

December 31, 1990

APPLICANT

Renewable Energy Institute
1953 Old State Road
Waterford, PA 16441

John D'Angelo
814/796-6022

Erie County

PROJECT NUMBER

488-007

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Non-Coal	88-89

PROJECT DESCRIPTION

REI received financial assistance to purchase and install a tower on a site on the Pennsylvania shore of Lake Erie to collect site specific wind data. Data parameters will include wind speed, wind direction, as well as other pertinent data required to determine the feasibility of the use of commercial wind machine to generate electricity in this part of the state.

PROJECT STATUS

REI has purchased and installed a wind tower and began collection of data on June 20, 1990. The project was delayed for a year due to the grantee's enrollment in a 9-month course at Colorado Mountain College. PEDA staff will plan a trip to Erie to observe the tower and take some photographs as soon as arrangements can be made with the grantee.

FINANCIAL SUMMARY

Total Project Cost:	$20,000
Applicant Share:	$ 2,000
PEDA Share:	$18,000

REMAINING PEDA BALANCE

$12,537.58

PROJECT START DATE

November 16, 1989

PROJECT COMPLETION DATE

December 31, 1990

APPLICANT

Penn State University
114 Kern Building
University Park, PA 16802

William D. Moir
814/863-0610

Centre County

PROJECT NUMBER

488-009

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY **FISCAL YEAR**

General Coal 88-89

PROJECT DESCRIPTION

The Pennsylvania State University will examine all aspects of a 200-foot longwall face. Ventilation, subsidence, coal handling, movement, productivity and development requirements will be studied. The short- and long-term effects of both standard and short longwalls on groundwater will be assessed. The results from the three year effort will be used by the industry sponsor to decide on establishing an in-mine demonstration of the short longwall mining method.

PROJECT STATUS

The project is now about 60% complete. The contractor's efforts are currently focused on the hypothetical mine, and the selection of some important design parameters in relation to subsidence and ground control. These include depth of mining, widths of panel and pillar and potential weight of strata failure, among others. Comparisons have been made between short-longwall and standard longwall mining methods.

FINANCIAL SUMMARY

Total Project Cost:	$61,902
Applicant Share:	$25,000
PEDA Share:	$36,902

REMAINING PEDA BALANCE

$29,141.88

PROJECT START DATE

July 14, 1989

PROJECT COMPLETION DATE

June 30, 1992

APPLICANT

Coal Technology Corporation
P.O. Box 154
Merion, PA 19066

Dr. Bert Zauderer
215/667-0442

Lycoming County

PROJECT NUMBER

488-015

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY **FISCAL YEAR**

Clean Coal 88-89

PROJECT DESCRIPTION

Coal Tech Corporation is continuing development and demonstration of its advanced slagging cyclone coal combustor through multi-day operation of the test unit. In this project, Coal Tech will study the following operational and performance factors: (1) additional parametric studies to optimize SO_2 and NO_x reduction, with capture of sulfur in the slag, in an environmentally safe form; (2) accumulation of operational data to clarify interactions among injected sorbent, gaseous sulfur compounds, and scrubber water; (3) conclusive establishment of the thermal and mechanical methods for blockage-free operation of the combustor's slag tap; and (4) demonstration of the combustor's durability through round-the-clock operation and testing.

PROJECT STATUS

The final test burns under this project were completed in May 1990. This project is also being funded under the U.S. Department of Energy's Clean Coal Technology program, and will be the first project under the Clean Coal program to be successfully completed. Final data analysis will be completed shortly with the final report due in early Fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$201,375
Applicant Share:	$151,375
PEDA Share:	$ 50,000

REMAINING PEDA BALANCE

$4,683.17

PROJECT START DATE

August 16, 1989

PROJECT COMPLETION DATE

September 30, 1990

APPLICANT

Pennsylvania Electric Company
1001 Broad Street
Johnstown, PA 15907

R. D. Stoessner
814/533-8666

Cambria County

PROJECT NUMBER

883-4024

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
General Coal	88-89

PROJECT DESCRIPTION

This project is being conducted by the Pennsylvania Electric Company to increase the understanding of changes in physical and chemical properties of bituminous coal which is naturally weathered (i.e., exposed to ambient conditions). As a result of weathering, this coal contains essentially no pyritic sulfur due to the oxidation of pyrite. Therefore, utilization of this coal may be a means of complying with SO_2 emission standards. Combustion data will be collected during test burns of weathered coal blends with fresh coal, in a pulverized coal utility boiler, to confirm results of previous laboratory investigations.

PROJECT STATUS

The contract is currently being circulated for review; execution is expected in the late Summer of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$100,000
Applicant Share:	$ 30,000
PEDA Share:	$ 70,000

REMAINING PEDA BALANCE

$70,000

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Lehigh University
Dept. of Chemical Engineering
Building 111, MTC
Bethlehem, PA 18015

Dr. Richard Streeter
215/758-3020

Northampton County

PROJECT NUMBER

883-4025

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	88-89

PROJECT DESCRIPTION

The purposes of this project is to continue development of a catalyst-sorbent for the removal of sulfur dioxide and nitrogen oxides from coal-derived combustion gases to assess the commercial viability of this technology. In addition to Lehigh University and the Authority, project participants include Pennsylvania Power and Light Company (PP&L) and Baltimore Gas and Electric Company. Project objectives are: (1) to test an optimal catalyst-sorbent (determined from previous work) for a continuous three-month period on a slip stream of flue gas from PP&L's Martins Creek Generating Station; and, (2) to determine the amount of rhodium which can be replaced by palladium without decreasing the poisoning resistance of the catalyst.

PROJECT STATUS

The contract was executed for this April 1990. Work is now underway at Lehigh University.

FINANCIAL SUMMARY

Total Project Cost:	$45,152
Applicant Share:	$ 5,000
PEDA Share:	$40,152

REMAINING PEDA BALANCE

$40,152

PROJECT START DATE

March 15, 1990

PROJECT COMPLETION DATE

January 31, 1991

APPLICANT

Penn State University
114 Kern Building
University Park, PA 16802

R. Killoren
814/865-1372

Centre County

PROJECT NUMBER

883-4030

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY **FISCAL YEAR**

General Coal 88-89

PROJECT DESCRIPTION

This project is for the Pennsylvania State University to develop a comprehensive surface mining permit review software package. The first phase of this project will focus on Modules 3, 7 , and 8 of the Pennsylvania Department of Environmental Resources' permit application package.

PROJECT STATUS

Contract preparation has not started for this project. The applicant has not yet secured the necessary matching funds as required by the Board in its approval.

FINANCIAL SUMMARY

Total Project Cost:	$122,046
Applicant Share:	$ 52,500
PEDA Share:	$ 69,546

REMAINING PEDA BALANCE

$69,546

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Good Samaritan Hospital
Fourth & Walnut Streets
Lebanon, PA 17042

Robert Hoffman
717/272-7611

Lebanon County

PROJECT NUMBER

883-4033

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Anthracite	88-89

PROJECT DESCRIPTION

With funding provided by the Department of Energy (DOE) and PEDA, Penn State University, Skelly & Loy, and Donlee Technologies performed research to determine the feasibility of co-combusting infectious hospital wastes with coal in a circulating fluidized bed combustor (CFBC) in an environmentally safe manner. The project is comprised of five major tasks: 1) an evaluation of existing CFBC incineration technologies and the identification of the principal hazardous materials in hospital wastes; 2) development of a waste handling system; 3) design a pilot plant demonstration plan; 4) perform pilot plant combustion tests, stack emission analysis, and fly ash and bottom ash analyses; and, 5) design full-scale facility.

PROJECT STATUS

Tasks 1-4 have been completed. Results of the emissions and ash analyses are being reviewed for incorporation into a draft report of the testing program. The full-scale facility has been designed and the contractual arrangements are underway between DOE, the Veteran's Administration (VA), Donlee Technologies, Skelly & Loy, and PEDA to construct an incineration facility at the VA Hospital in Lebanon, PA. After review of the emissions and ash analyses report, application will be made to the Department of Environmental Resources (DER) for air quality and solid waste permits.

FINANCIAL SUMMARY

Total Project Cost:	$1,096,174
Applicant Share:	$ 937,492
PEDA Share:	$ 158,682

REMAINING PEDA BALANCE

$21,614.05

PROJECT START DATE

December 29, 1989

PROJECT COMPLETION DATE

December 31, 1991

APPLICANT

Drexel University
32nd & Chestnut Streets
Philadelphia, PA 19104

Nicholas Cernansky
215/895-2284

Philadelphia County

PROJECT NUMBER

883-4034

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Non-Coal	88-89

PROJECT DESCRIPTION

Drexel University has proposed a two-year project comprised of two major tasks: 1) perform laboratory studies to characterize the devolatilization dynamics of a broad range of refuse derived fuel (RDF) pellets and fluff samples; and, 2) perform an industrial pilot plant scale combustion study to determine the performance of the RDF pellets in a circulating fluidized bed combuster. The goal of this project is to develop technology for the implementation of processed municipal solid waste as an energy producing fuel (RDF).

PROJECT STATUS

Drexel University has purchased and installed the thermogravimetric analysis (TGA) system. A series of experiments focusing on the devolatilization of cellulose were performed to verify the proper operation of the TGA system. Drexel performed tests on a coal impregnated RDF pellet to design an experimental program for the investigation of the effects of initial sample mass, heating rate, maximum sample temperature, and oxygen content on the kinetics of thermal devolatilization.

FINANCIAL SUMMARY

Total Project Cost:	$147,392
Applicant Share:	$ 40,338
PEDA Share:	$107,054

REMAINING PEDA BALANCE

$92,540.44

PROJECT START DATE

January 5, 1990

PROJECT COMPLETION DATE

June 30, 1992

APPLICANT

Pennsylvania Electric Company
1001 Broad Street
Johnstown, PA 15907

A. A. Slowik
814/533-8217

Cambria County

PROJECT NUMBER

893-4002

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY **FISCAL YEAR**

Clean Coal 89-90

PROJECT DESCRIPTION

This project is a demonstration of a new process to remove sulfur and nitrogen pollutants from the flue gas leaving coal-fired boilers. The Pennsylvania Electric Company will host the site for a demonstration of Bechtel Corporation's confined zone dispersion (CZD) process at its Seward Station electrical generating facility located near Johnstown, Pennsylvania. The PEDA contract for this project represents participation in Phase II of this three-phase project. Specifically, the funds will be used for equipment purchases by Pennsylvania Electric Company in retrofitting the facility for the demonstration.

PROJECT STATUS

The contract is currently being circulated for review; execution is expected in the late Summer of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$8,510,200
Applicant Share:	$7,760,200
PEDA Share:	$ 750,000

REMAINING PEDA BALANCE

$750,000

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

University of Pittsburgh
350 Thackeray Hall
Pittsburgh, PA 15260

Dr. S. H. Chiang
412/624-9658

Allegheny County

PROJECT NUMBER

893-4004

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY | **FISCAL YEAR**

Clean Coal | 89-90

PROJECT DESCRIPTION

This is Phase II of the University of Pittsburgh's LICADO coal cleaning process. (see Appendix A, Project Number 485-016 for Phase I) The LICADO (liquid carbon dioxide) process, invented by the University of Pittsburgh, uses liquid CO_2 as a medium to beneficiate ultra-fine (-200 mesh) coal. Phase II comprises three tasks: equipment development, testing of continuous operation, and engineering and economic analysis. Preliminary tests with Upper Freeport coal have yielded high clean coal values, with good separation between coal and mineral matter.

PROJECT STATUS

A 10 lb/hr continuous contact LICADO circuit is currently being operated to examine factors that affect clean coal quality and yield as functions of operating conditions, and to provide a database for commercial development of the LICADO process. PEDA staff is working with the applicant to develop a contract work statement and meet the Board conditions of the award. It is anticipated that this project will be under contract in the Fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$91,000
Applicant Share:	$32,320
PEDA Share:	$58,680

REMAINING PEDA BALANCE

$58,680

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

GE Transportation Systems
2901 East Lake Road
Erie, PA 16531

Dr. Paul L. Flynn
814/875-3162

Erie County

PROJECT NUMBER

893-3005

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	89-90

PROJECT DESCRIPTION

This contract covers activities for the third year of General Electric Transportation Systems' five year project to develop a diesel electric locomotive fired with coal-water fuel. Specific tasks for this third year will be qualification testing of the 12-cylinder engine in the laboratory and the transfer of the engine to the test locomotive. Track tests will be performed on the locomotive on GE's test track. Development will continue on a full flow emissions system and a production electronic fuel injection system. Long term durability tests will be started on two cylinders of a full size 8-cylinder engine.

PROJECT STATUS

PEDA staff is working with the applicant to develop the contract work statement. In order to coordinate efforts with the U.S. Department of Energy, a major contributor to the project, the contract will not be executed until work is completed under the second year contract. It is anticipated that the second year contract will be completed by the end of the 1990 calendar year.

FINANCIAL SUMMARY

Total Project Cost:	$4,245.186
Applicant Share:	$4,045.186
PEDA Share:	$ 200,000

REMAINING PEDA BALANCE

$200,000

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

United States Steel Mining Co.
600 Grant Street, Room 1880
Pittsburgh, PA 15219

Charles E. Clonch
412/433-6911

Greene County

PROJECT NUMBER

893-4006

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
General Coal	89-90

PROJECT DESCRIPTION

This project involves the initiation of a coalbed methane recovery project at the Cumberland Mine, Greene County. The project will integrate an active degasification effort into current mining operations and investigate the potential commercialization of the coalbed methane/gob gas resources. Marketability of the recovered product will be also analyzed.

PROJECT STATUS

PEDA staff is working with the applicant to develop a contract work statement and meet the Board conditions of the award. It is anticipated that this project will be under contract in the Fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$270,175
Applicant Share:	$260,175
PEDA Share:	$ 10,000

REMAINING PEDA BALANCE

$10,000

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Penn State University
114 Kern Building
University Park, PA 16802

Robert Killoren
814/865-3396

Centre County

PROJECT NUMBER

893-4013

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Anthracite	89-90

PROJECT DESCRIPTION

The project will establish an Anthracite Institute at Penn State University. The Institute will be a joint public/private partnership between the Anthracite Industry and the University. The function of the Institute is to provide technical extension services to current and potential customers, and to coordinate and expand the University's anthracite research program.

PROJECT STATUS

The University is assembling the Anthracite Industry Advisory Committee. Once established the University will prepare for approval by the Committee for the activities of the Institute. This work plan will be the basis for the Authority contact to provide funds for the Institute's operation. It is expected that the Institute will be functioning by the fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$121,000
Applicant Share:	$ 12,100
PEDA Share:	$108,900

REMAINING PEDA BALANCE

$108,900

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Penn State University
114 Kern Building
University Park, PA 16802

Robert Killoren
814/865-3397

Centre County

PROJECT NUMBER

893-4014

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY **FISCAL YEAR**

Clean Coal 89-90

PROJECT DESCRIPTION

This project will analyze the chemical effects of alkaline addition to mining overburden in the neutralization of acid mine drainage from a surface coal mine. This project will directly observe and measure the use of alkaline addition over an extended period of time in an operating surface mine demonstration site, the Kauffman mining operation in Clearfield County, and investigate the cause of differences between observed water quality and calculated quality, in order to develop improved procedures for preventing acid drainage. The results of this project could substantially increase permittable coal resources.

PROJECT STATUS

The contract is currently being circulated for review; execution is expected in the late Summer of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$280,000
Applicant Share:	$ 30,000
PEDA Share:	$250,000

REMAINING PEDA BALANCE

$250,000

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Penn State University
114 Kern Building
University Park, PA 16802

Robert Killoren
814/865-3396

Centre County

PROJECT NUMBER

893-4016

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	89-90

PROJECT DESCRIPTION

The purpose of this project is to maximize the cost effectiveness of air quality compliance in fluidized bed combustion (FBC) power plants using Pennsylvania sorbent products. This is to be accomplished by using sorbent evaluation techniques developed at Penn State's Combustion Laboratory to provide calcium utilization efficiency data which sorbent suppliers and customers can use to evaluate within the context of cost. Both sorbent suppliers and circulating fluidized bed combustion power plant operators will derive the technical benefits of this program.

PROJECT STATUS

The contract is currently being circulated for review; execution is expected in the late Summer of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$246,926
Applicant Share:	$ 39,703
PEDA Share:	$207,223

REMAINING PEDA BALANCE

$207,223

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Penn State University
114 Kern Building
University Park, PA 16802

Robert Killoren
814/865-3396

Centre County

PROJECT NUMBER

893-4018

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY **FISCAL YEAR**

Non-Coal 89-90

PROJECT DESCRIPTION

Penn State will perform extensive field testing on the treatment of various brines produced from oil reservoirs throughout the state. Previous research at Penn State resulted in a benchscale model of a brine treatment method and some initial testing. The effectiveness of the treatment method and the effects of temperature changes will be tested on at least five different brines. The testing procedure will follow recommendations of the Department of Environmental Resources. A database will be developed with a resultant software package to design appropriately scaled treatment systems in the field.

PROJECT STATUS

PEDA prepared the contract and mailed it to Penn State for signature on June 28, 1990.

FINANCIAL SUMMARY

Total Project Cost:	$160,000
Applicant Share:	$ 16,000
PEDA Share:	$144,000

REMAINING PEDA BALANCE

$144,000

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Lehigh University
526 Brodhead Avenue
Bethlehem, PA 18015

John Cheezum
215/758-3024

Northampton County

PROJECT NUMBER

893-4021

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Anthracite	89-90

PROJECT DESCRIPTION

The overall objective of this research is to develop guidelines for the selection of anthracite culm feedstock and to determine bed material characteristics to minimize erosion in fluidized bed combustors. The long-range goal of this research is to develop a quality control system for the proper selection of anthracite feedstock that will minimize bed material erosivity. The major technical objectives of this research area are: (a) modify existing test equipment and conduct literature review of bed material characterization and erosivity, (b) erosion test bed materials, (c) characterize the composition, size and shape of bed materials, and (d) develop engineering correlations between erosivity and bed material characterization.

PROJECT STATUS

The contract has been prepared for this project. It has completed the in-house review process and was sent to Lehigh University officials for signature on June 28, 1990. The project is two years in duration and involves Air Products and Chemicals, Inc., as a sponsor.

FINANCIAL SUMMARY

Total Project Cost:	$193,796
Applicant Share:	$ 40,000
PEDA Share:	$153,796

REMAINING PEDA BALANCE

$153,796

PROJECT START DATE

July 1, 1990

PROJECT COMPLETION DATE

June 30, 1993

APPLICANT

Lehigh University
526 Brodhead Avenue
Bethlehem, PA 18015

Mary Jo Hill
215/758-3023

Northampton County

PROJECT NUMBER

893-4022

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY Clean Coal

FISCAL YEAR 89-90

PROJECT DESCRIPTION

This project is to determine, through laboratory research and testing, the absorption behavior of NO_x and SO_x from a flue gas stream onto a low-cost mordenite material. Mixed gases and coal flue gases will be used for the tests. This project will provide the necessary data and characterization of mordenite aggregates for a subsequent engineering study dealing with design and modeling for utility power plant use.

PROJECT STATUS

The contract is currently being circulated for review; execution is expected in the late Summer of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$61,205
Applicant Share:	$20,000
PEDA Share:	$41,205

REMAINING PEDA BALANCE

$41,205

PROJECT START DATE

July 1, 1990

PROJECT COMPLETION DATE

June 30, 1991

APPLICANT

Production Techniques, Inc.
P.O. Box 896
Hallstead, PA 18822

Robert D. Turner
717/879-5373

Susquehanna County

PROJECT NUMBER

893-3023

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY	FISCAL YEAR
Non-Coal	89-90

PROJECT DESCRIPTION

Production Techniques, Inc. (PTI) will receive financial assistance to build a high speed bottle coating line to prove out the economic and technical advantages of an innovative bottle coating process, as well as the energy savings to the glass container industry. PTI/Brandt Division has developed a glass container coating (patented and marketable) having the potential for eliminating the need to melt different colored glasses. Energy savings potential results from greatly increased use of glass cullet, thus reducing energy required to melt glass and greater energy efficiency from melting clear flint glass.

PROJECT STATUS

The contract is currently being circulated for review; execution is expected in the late Summer of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$198,427
Applicant Share:	$124,214
PEDA Share:	$ 74,213

REMAINING PEDA BALANCE

$74,213

PROJECT START DATE

July 1, 1990

PROJECT COMPLETION DATE

December 31, 1990

APPLICANT

University of Pittsburgh
350 Thackeray Hall
Pittsburgh, PA 15260

Josephine Hatley
412/624-7400

Allegheny County

PROJECT NUMBER

893-4029

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	89-90

PROJECT DESCRIPTION

This project is being conducted to develop an improved fine coal cleaning method based on the application of cyclonic separation to selective agglomeration processes. The goal of this project is to successfully develop a cyclonic agglomeration system which would provide an effective technology for fine coal cleaning making major Pennsylvania coal reserves more environmentally acceptable and commercially marketable to utility and other users.

PROJECT STATUS

PEDA staff is working with the applicant to develop a contract work statement. It is anticipated that this project will be under contract in the Fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$234,405
Applicant Share:	$ 76,772
PEDA Share:	$157,633

REMAINING PEDA BALANCE

$157,633

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Zurn Industries, Inc.
1422 East Avenue
Erie, PA 16503

Robert Seibel
814/452-6421

Erie County

PROJECT NUMBER

893-4030

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	89-90

PROJECT DESCRIPTION

This project will use an existing rotary cascading bed boiler to obtain data for and complete the design of a transportable combustion system to cleanly burn high sulfur, high ash and caking Pennsylvania coals and coal wastes and to co-burn coal in combination with certain industrial and municipal wastes. This project will consist of two phases: (1) the test/demonstration burns of selected Pennsylvania coals, coal wastes and fuels derived from industrial and/or municipal wastes co-fired in an existing rotary boiler; and (2) design of a transportable rotary boiler unit engineered to burn Pennsylvania coal products.

PROJECT STATUS

PEDA staff is working with the applicant to develop a contract work statement. It is anticipated that this project will be under contract in the Fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$304,017
Applicant Share:	$154,017
PEDA Share:	$150,000

REMAINING PEDA BALANCE

$150,000

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Grass Roots Alliance for
a Solar Pennsylvania
3500 Lancaster Avenue
Philadelphia, PA 19104

Joan Schiff
215/222-0318

Philadelphia County

PROJECT NUMBER

893-4032

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Non-Coal	89-90

PROJECT DESCRIPTION

GRASP will identify 100 flat-roof rowhouses for insulation treatments and energy use studies from applications for the weatherization program at the PHDC. Fifty houses will receive "optimized" treatment(direct air-sealing of all bypasses, tight-packing cellulose in accessible areas, blown-in cellulose for full coverage), and 50 houses will receive "standard" treatment(blowing fiberglass for full treatment). Elapsed time meters will be installed on gas heaters visible through a window for reading. Fuel savings from each of the different treatments will be determined.

PROJECT STATUS

The contract is currently being circulated for review; execution is expected in the late Summer of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$106,290
Applicant Share:	$ 41,290
PEDA Share:	$ 65,000

REMAINING PEDA BALANCE

$65,000

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

DONLEE Technologies
693 North Hills Road
York, PA 17402

E. J. Coulthard
717/755-1081

York County

PROJECT NUMBER

893-4033

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY **FISCAL YEAR**

Anthracite 89-90

PROJECT DESCRIPTION

A key research component of the Good Samaritan Hospital infectious waste incinerator program (PEDA grant #883-4033) is to test an actual full-scale waste shredding and feeding system. Donlee will purchase, install and demonstrate the viability of the infectious waste shredder/feeder at their pilot plant location in York, Pennsylvania prior to its installation at the site of the full-scale circulating fluidized bed facility.

PROJECT STATUS

PEDA staff is working with the applicant to develop a contract work statement. It is anticipated that this project will be under contract in the Fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$223,396
Applicant Share:	$191,227
PEDA Share:	$ 32,169

REMAINING PEDA BALANCE

$32,169

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

B. Datta Research
617 Tampico Court
Pittsburgh, PA 15239

Rabinder Datta
412/795-3693

Allehgeny County

PROJECT NUMBER

893-4034

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY | FISCAL YEAR

Anthracite | 89-90

PROJECT DESCRIPTION

The objectives of this project are to determine the effectiveness and economics of an advanced beneficiation system for cleaning Pennsylvania anthracite coals to 1% - 4% ash. The project will include: (1) an engineering study of the variables to optimize the process; (2) provide technical data to evaluate the process for further scale-up; and (3) obtain data and conduct a conceptual engineering and economic analysis of the process.

PROJECT STATUS

The applicant is working to fulfill the Board conditions of the award. Recent Board action at its June 26, 1990 meeting modified an original condition that the applicant have the project reviewed by the Advisory Board of the newly organized Anthracite Institute. The applicant is now securing the participation of two anthracite coal companies. It is anticipated that a contract will be prepared in the Fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$167,787
Applicant Share:	$ 17,000
PEDA Share:	$150,787

REMAINING PEDA BALANCE

$150,787

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

BCR National Laboratory
500 William Pitt Way
Pittsburgh, PA 15238

Joseph Yerushalmi
412/826-3030

Allegheny County

PROJECT NUMBER

893-4038

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	89-90

PROJECT DESCRIPTION

The main goal of the proposed research is to carry out a systematic series of lab and bench-scale tests to obtain a better understanding of the underlying properties of coal blends relative to their constituent coals, so as to assess potential impacts on the performance of the boiler system. The tests relate to six critical areas of boiler plant operations: (1) coal storage and handling, (2) grinding, (3) combustion behavior, (4) ash deposition, (5) ash collection, and (6) particulate and gas emissions. The tests will span such phenomena as flowability, friability, weathering and self-heating, grindability, combustion characteristics, ash slagging and fouling propensity, and projected plant emissions.

PROJECT STATUS

The applicant has not pursued the preparation of a contract. Rather, they are attempted to develop a larger coal blending project involving local utilities in the research program. It is anticipated that this project will go forward in the fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$238,338
Applicant Share:	$ 25,000
PEDA Share:	$213,338

REMAINING PEDA BALANCE

$213,338

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A

APPLICANT

Miltech Energy Services
P.O. Box 501
Ligonier, PA 15658

Francis Miller
412/238-3255

Westmoreland County

PROJECT NUMBER

893-4043

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY	FISCAL YEAR
Clean Coal	89-90

PROJECT DESCRIPTION

This project intends to use a patented heavy medium cyclone cleaning process for low gravity separation of ash and sulfur from coal and froth flotation for medium control and recovery of the fine coal. The project will also include the development of a plan for taking the new process from development to fruition as well as a Central Pennsylvania coal supply study, laboratory research, conceptual design, and a business plan.

PROJECT STATUS

PEDA staff is working with the applicant to develop a contract work statement and meet the Board conditions of the award. It is anticipated that this project will be under contract in the Fall of 1990.

FINANCIAL SUMMARY

Total Project Cost:	$161,820
Applicant Share:	$ 89,720
PEDA Share:	$ 72,100

REMAINING PEDA BALANCE

$72,100

PROJECT START DATE

N/A

PROJECT COMPLETION DATE

N/A