



PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

1990-91 ANNUAL REPORT

July 1, 1990 - June 30, 1991

ROBERT P. CASEY
Governor

MARK S. SINGEL
Lieutenant Governor

ANTHONY T. SOSSONG
Chairman of the Board



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October 8, 1991



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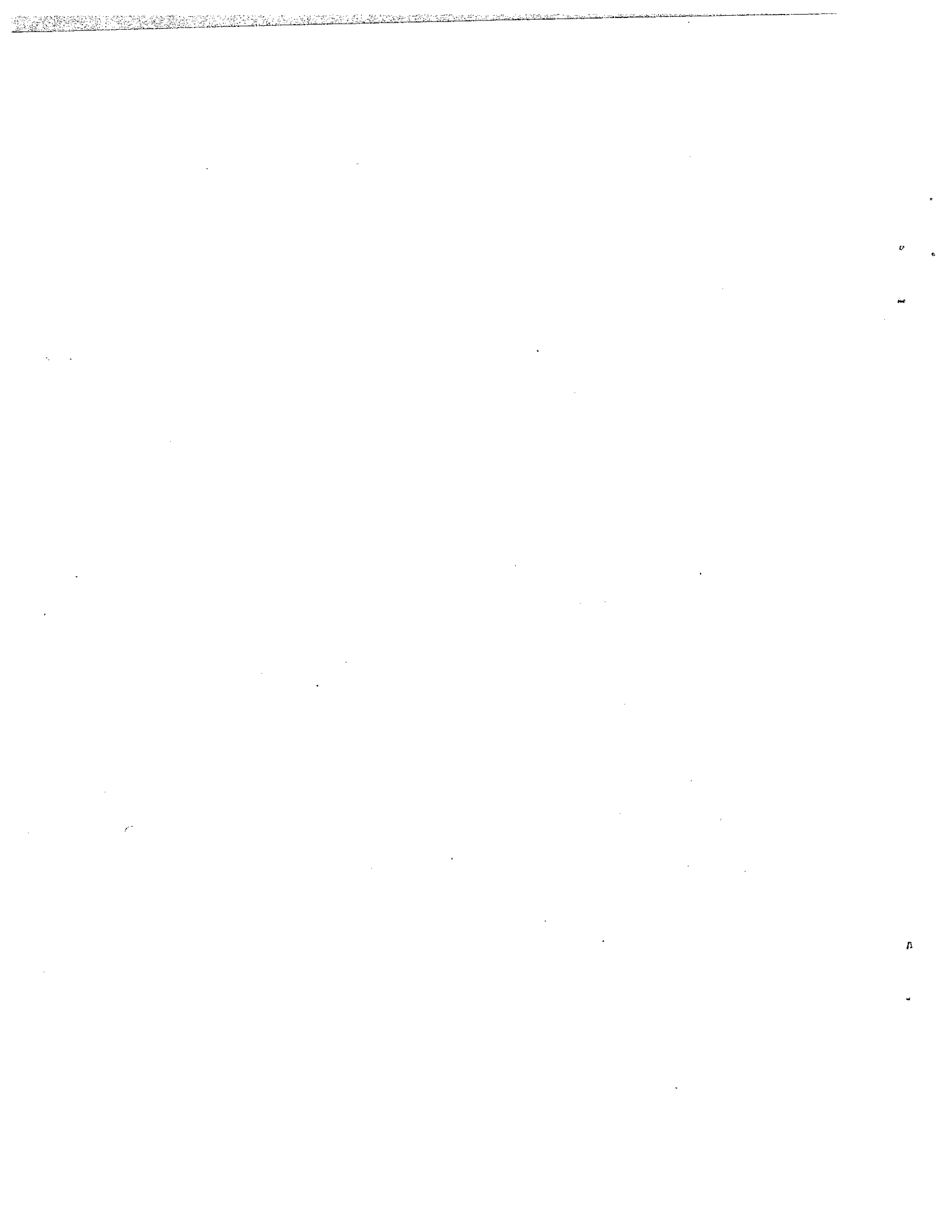
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Staff services provided by the Pennsylvania Energy Office.

INTRODUCTION

This past year has been a very successful year for the Authority. We dedicated the \$100 million Piney Creek Project, began commercial service for the \$110 million Ebensburg Cogeneration Plant, initiated a \$9.2 million federal clean coal technology project at the Pennsylvania Electric Company's Seward Powerplant, provided \$8.5 million in project financing for the Northern Appalachian Development Corporation gas drilling project, as well as numerous other projects focusing on energy development and conservation. A discussion of these and other projects are provided later in the Annual Report.

The Pennsylvania Energy Development Authority's (PEDA) Annual Report for Fiscal Year 1990-91 (FY 90-91) 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, 1990 and ended on June 30, 1991.

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 90-91, as well as projects which received financial assistance in previous fiscal years that were completed or continued during this period.

PEDA concluded the seventh year of its financial assistance program at the close of FY 90-91. 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 \$1,865,164 to fourteen energy research, development and demonstration (RD&D) projects worth \$6.4 million.

The Technical Advisory Committee continued its efforts to assist the PEDA staff in reviewing energy projects and lending technical advice to the board. This Committee, made up of energy experts throughout the state, has greatly enhanced PEDA's ability to go forward with projects 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 90-91:

- 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 90-91 were:

- to develop a comprehensive Financial Assistance Program Prospectus and application package; and,
- to establish the application deadlines within the fiscal year.

The application deadlines were established as January 3, 1991 and April 10, 1991. Applications received attendant to these deadlines were deliberated on February 21, 1991 and June 13, 1991 respectively. The application deadlines and financial assistance opportunities were published in the Pennsylvania Bulletin on September 8, 1990.

SUMMARY OF FINANCIAL ASSISTANCE FOR ENERGY PROJECTS

Since its inception, PEDDA has issued approximately \$176 million in revenue bonds to four commercial energy ventures (Table 1): Humboldt Energy Center, Ebensburg Cogeneration Plant, Piney Creek Project, and the Northern Appalachian Development Project. In addition, the Authority has allocated nearly \$13 million to 124 RD&D projects (Table 2). PEDDA has disbursed or committed approximately \$11 million to 100 RD&D projects.

PEDDA 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, roughly 43% of the Authority's projects have focused on technologies that make coal a cleaner fuel. The non-coal development category accounted for twenty percent of all projects funded by PEDDA. The balance of the PEDDA-supported RD&D projects are in the categories of anthracite development and general coal development. Nineteen projects, or 18.8% involved RD&D in each of these 2 categories. Monetarily, the Authority has committed the majority, \$6.0 million or 53% of its total energy RD&D commitment, to Clean Coal Technology (Figure 2). Commitments to coal projects equal \$9.1 million, or 87% of PEDDA's energy RD&D effort.

PEDDA's impact on energy RD&D in the Commonwealth is reflected in Figure 3. The Authority's \$11 million commitment has engendered an additional \$40 million investment from other sources, for a total of \$51 million in energy RD&D effort in Pennsylvania. Clearly, PEDDA has been most influential in developing clean coal technologies. The Authority's \$5.9 million commitment has generated an additional \$35 million investment in this area by parties interested in advancing clean coal technologies; each Authority dollar has been matched by roughly \$5.93 from project co-participants. Cost sharing figures by co-participants per each PEDDA dollar for general coal development, anthracite development and non-coal development are \$0.71, \$0.93 and \$1.67, respectively.

PEDDA received 34 applications for energy RD&D-related financial assistance during FY 1990-91, with a stated total value of approximately \$11.2 million; the aggregate request for Authority funds was about \$5.2 million. The board committed \$1,865,164 to 14 projects worth approximately \$6.4 million.

The majority of PEDDA's funding was oriented toward clean coal technology development in FY 90-91 (Figures 4-6). This fact is reinforced by looking at total cost (Figure 6) -- clean coal technology projects account for roughly 80% of PEDDA-sponsored energy RD&D effort. Anthracite development projects will combine \$128,822 in PEDDA funds with \$53,096 from other sources to foster \$181,918 in new anthracite-associated activity.

The composition of PEDDA RD&D project costs is presented in Figure 7. In FY 90-91, co-participants in PEDDA-funded energy RD&D projects have committed to bear 69% of total project cost, a decline from FY 89-90 where they carried 82% of costs associated with projects (Figure 8). Overall, co-participation remained steady at 79% of the costs related to projects supported by the Authority. PEDDA 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.

TABLE 1

PEDA REVENUE BOND PROJECTS

Project Number	Name	Developer	Rev Bond Issue
84061	Humboldt Energy Center	Continental Energy Associates	39,000,000
85033	Piney Creek Project	MidAtlantic Energy Group	45,650,000
85034	Ebensburg Cogen Plant	Babcock & Wilcox Co.	77,600,000
87048	Ebensburg Cogen Plant	Babcock & Wilcox Co.	4,400,000
90036	Northern Appalachian	Northern Appalachia Dev. Corp.	8,500,000
TOTAL			\$175,150,000

TABLE 2

PEDA FUNDED RD&D PROJECTS SUMMARY

FY 84-85

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 Perry 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 Technics 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

PEDA FUNDED RD&D PROJECTS SUMMARY
(Continued)

FY 85-86

Project Status	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 CO ₂ (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

FY 86-87

Project Number	Contractor	Purpose	Project Category	PEDA Alloc	Alloc Type	Status
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 NO _x Burner Demonstration	CC Tech	400,000	Grant	In Progress
86009	PA Electric Company	CZD SO ₂ 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	Humerick 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

PEDA FUNDED RD&D PROJECTS SUMMARY
(Continued)

FY 87-88

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 Transportation 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 Modification	CC Tech	25,000	Ven Cap	Terminated
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	Complete
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 Conservation	Non-Coal	44,934	Loan	Rescinded
87053	BCR National Laboratory	Coal Desulfur in Rot Kin Combustor	CC Tech	172,124	Ven Cap	In Progress
87055	GRASP	Energy Efficiency Gains in Row Homes	Non-Coal	45,000	Grant	Complete

FY 88-89

Project Number	Contractor	Purpose	Project Category	PEDA Alloc	Alloc Type	Status
88001	GE Transportation Systems	CWF-Fired Diesel Elec Locomotive - II	CC Tech	200,000	Ven Cap	Complete
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	Complete
88024	PA Electric Company	Weathered Coal Combustion Performance	Gen Coal	70,000	Grant	In Progress
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	Complete
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

* Allocation combined with Project # 89002

** Allocation combined with Project # 88033

TABLE 2

PEDA FUNDED RD&D PROJECTS SUMMARY
(Continued)

FY 89-90

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	In Progress
89004	University of Pittsburgh	Liquid CO ₂ (LICADO) Coal Cleaning	CC Tech	58,680	Grant	In Progress
89005	GE Transport Systems	CWF-Fired Diesel Elec Locomotive - III	CC Tech	200,000	Ven Cap	In Progress
89006	U.S. Steel Mining Co.	Coalbed Methane Recovery	Non-Coal	10,000	Grant	Rescinded
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	In Progress
89014	Penn State University	Alkaline Addition Study	CC Tech	250,000	Grant	In Progress
89016	Penn State University	Sorbent Performance Study	CC Tech	219,810	Grant	In Progress
89018	Penn State University	Oil Well Brine Treatment	Non-Coal	144,000	Grant	In Progress
89021	Lehigh University	Anthracite Waste Erosion Study	Anth Dev	153,796	Grant	In Progress
89022	Lehigh University	Flue Gas Clean-up w/Zeolite	CC Tech	41,205	Grant	In Progress
89023	Production Techniques Inc.	High-Speed Glass Bottle Coating	Non-Coal	74,213	Ven Cap	In Progress
89029	University of Pittsburgh	Cyclonic Separator Coal Cleaning	CC Tech	157,633	Grant	In Progress
89030	Zurn Industries, Inc.	Rotary Cascading Bed Boiler	CC Tech	150,000	Grant	Dr Contract
89032	GRASP	Attic Insulation Field Study	Non-Coal	65,000	Grant	In Progress
89033	Donlee Technologies	Shredder for Infectious Waste in CFBC	Anth Dev	32,169	Grant	In Progress
89034	B. Datta Research	Anthracite Coal Cleaning Process	Anth Dev	150,787	Grant	In Progress
89038	BCR National Laboratory	Coal Blends Impact Study	CC Tech	213,338	Grant	In Progress
89043	Mitech Energy Services	Fine Coal Cyclonic Separation	CC Tech	72,100	Grant	In Progress

* Allocation combined with Project # 89002

** Allocation combined with Project # 88033

ANTHRACITE COMMERCIAL BOILER DESIGN PROJECT
PHASE I PARTICIPANTS

Project Number	Contractor	Project Category	PEDA Alloc	Alloc Type	Status
8931001	Penn State University	Anth Dev	35,000	Grant	In Progress
8931002	Bucknell University	Anth Dev	29,537	Grant	In Progress
8931003	Advanced Waste Treatment Technologies	Anth Dev	24,600	Grant	In Progress

TABLE 2

PEDA FUNDED RD&D PROJECTS SUMMARY
(Continued)

FY 90-91

Project Number	Contractor	Purpose	Project Category	PEDA Alloc	Alloc Type	Status
90002	NOXSO Corporation	SO ₂ /NO _x Flue Gas Clean-up	CC Tech	188,177	Grant	Dr Contract
90003	Penn State University	Short Longwall Mining Devel.: Phase II	Gen Coal	45,749	Grant	Provisional
90004	GE Transportation Systems	CWF-Fired Diesel Locomotive: IV	CC Tech	200,000	Ven Cap	Provisional
90005	Mitech Energy Services, Inc.	Heavy Medium Cyclone Coal Cleaning	CC Tech	69,232	Grant	In Progress
90008	PA Electric Company	Fine Coal Cleaning/CWS Pilot Plant	CC Tech	249,380	Grant	Dr Contract
90011	Tampella Power Corporation	Improve SO ₂ Capture in CFB Boilers	CC Tech	175,000	Grant	Provisional
90012	Shawmut Development Corp.	Enhanced Recovery of Natural Gas	Non-Coal	221,800	Loan	Rescinded
90013	Rodale Research Center	Energy Efficiency in Agriculture	Non-Coal	10,000	Grant	Dr Contract
90022	Lehigh University	Flue Gas Clean-up w/Zeolite: Phase II	CC Tech	71,795	Grant	Provisional
90025	Washington Energy Proc'ing	Use of Ultra Fine Coal in FBC	CC Tech	155,248	Grant	Provisional
90027	Lehigh University	Dry Coal Purifier (D-CoP) Pilot Plant	CC Tech	250,000	Grant	Provisional
90029	Penn State University	Recovery of Low Ash Anthra Tailings	Anth Dev	85,227	Grant	Provisional
90030	Penn State University	Anthracite Institute - Year 2	Anth Dev	43,595	Grant	Provisional
90034	BCR National Laboratory	Fine Coal Drying w/Vibrofluidization	CC Tech	99,961	Grant	Provisional

CATEGORICAL DISTRIBUTION OF PROJECTS
(through seven years of program)

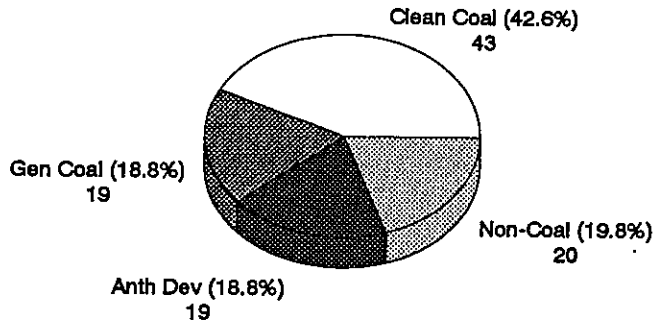


Figure 1

DISTRIBUTION OF PEDA FUNDS
(through seven years of program)

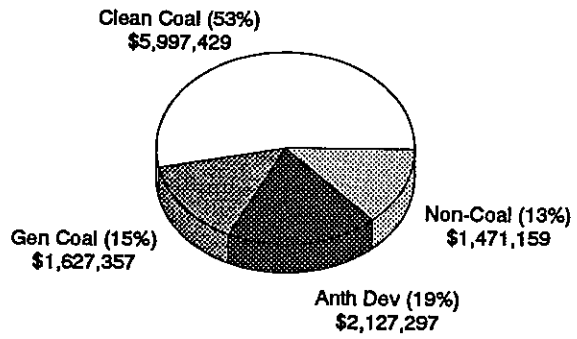


Figure 2

TOTAL COST
(through seven years of program)

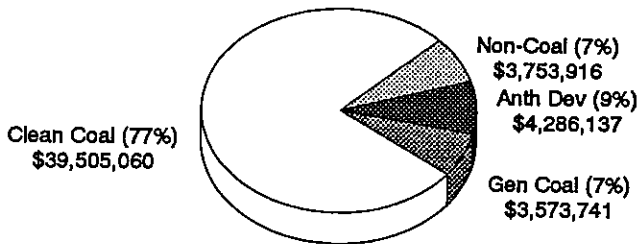


Figure 3

CATEGORICAL DISTRIBUTION OF PROJECTS (FY 90-91)

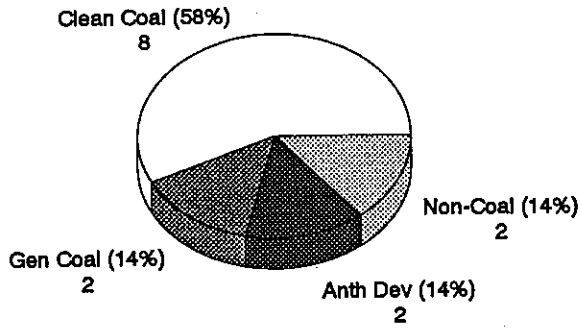


Figure 4

DISTRIBUTION OF PEDA FUNDS (FY 90-91)

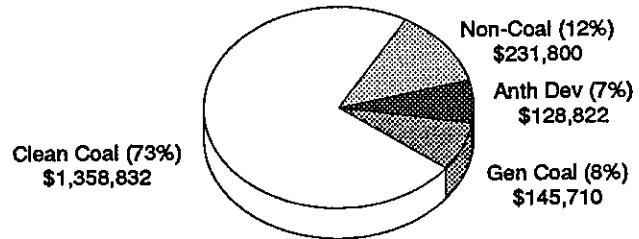


Figure 5

TOTAL COST (FY 90-91)

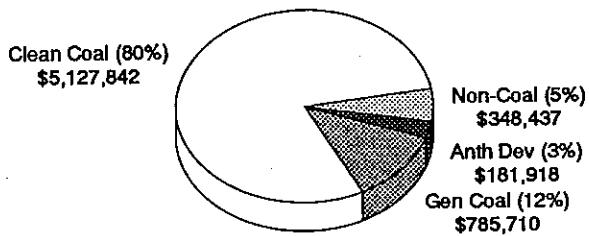


Figure 6

DISTRIBUTION OF PROJECT COSTS

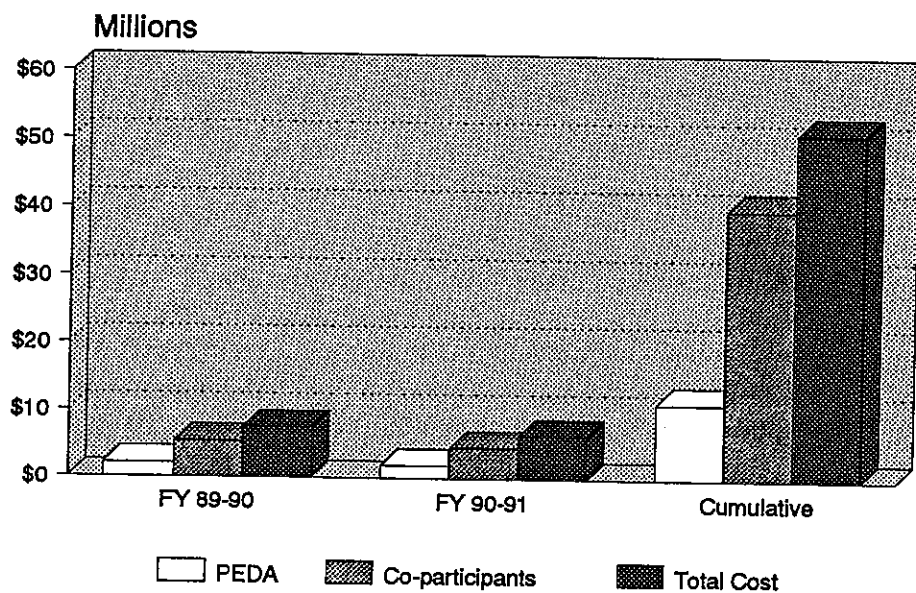


Figure 7

DISTRIBUTION OF PROJECT COSTS

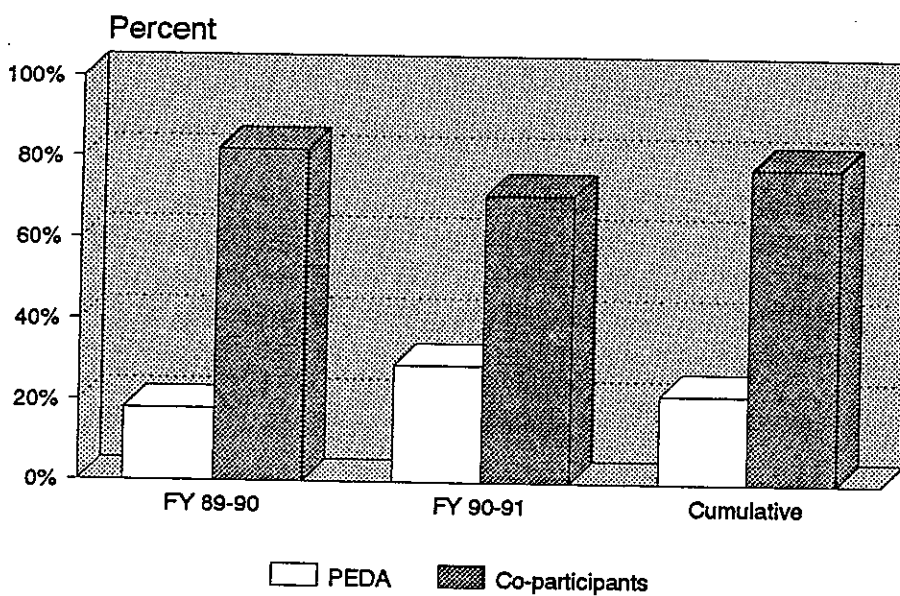


Figure 8

PEDA PROJECT HIGHLIGHTS

The Authority's energy development and conservation program is summarized in the following paragraphs. Table 1 presents concise information on the four commercial energy projects for which PEDA has issued revenue bonds. The Authority's RD&D projects are summarized in Table 2. Table 2 also provides detail on the three projects under the Anthracite Commercial Boiler Design Competition initiative. For discussion on Authority RD&D projects completed in FY 90-91, 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, Piney Creek Project, and the Northern Appalachian Development Corporation Project -- via approximately \$176 million in PEDA revenue bonds (Table 1). Three of 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). The fourth project involves the commercial development of gas wells in much of western Pennsylvania. Jointly, the projects will employ about 400 workers during peak construction; permanent employment will be provided to roughly 65 persons. The nearly 270 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 essentially complete. On November 27, 1990 the plant was synchronized with the Pennsylvania Electric Company. During FY 90-91 in excess of \$3 million was received as a result of power sales. Other than several technical issues the plant is a fully operational, commercial installation.

Piney Creek Project

As referred to in last years annual report the ownership rights to the Clarion Project (now called the Piney Creek Project) changed from the Babcock-Wilcox Company to the Mid-Atlantic Energy Company. Proceeds of the PEDA bond issue for the Piney Creek Project, a bituminous coal refuse fired fluidized bed combustion small power production facility, have been utilized to begin construction of the plant. PEDA staff continued to monitor the construction by reviewing monthly reports and visiting the site.

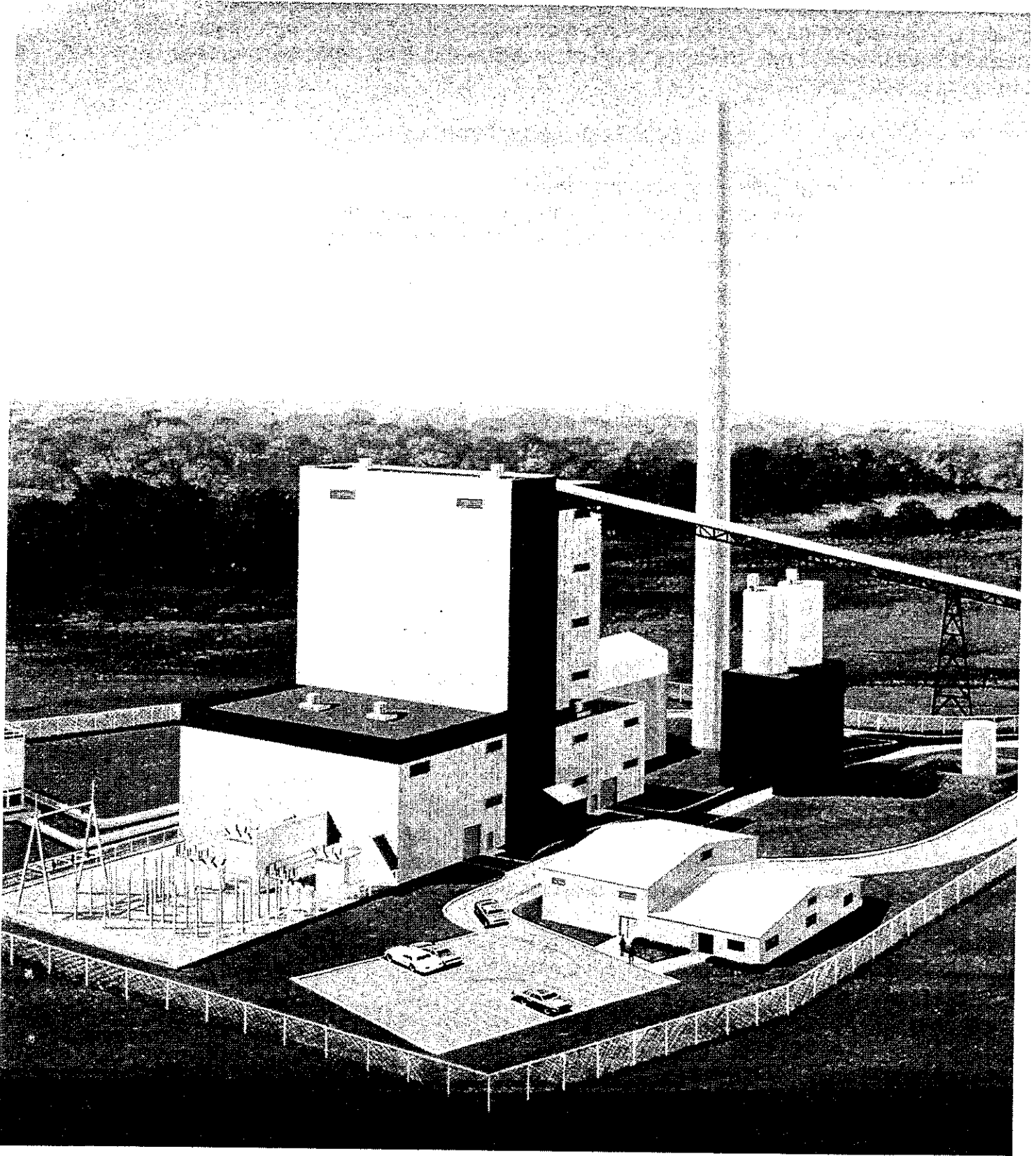


Illustration of the Piney Creek Cogeneration Plant -- a bituminous coal refuse fired fluidized bed combustion small power production facility.

Northern Appalachian Development Corporation Project

On September 28, 1990 participants, including the Authority, closed on the project financing for the Northern Appalachian Development Corporation Project. Authority bonds totalling \$8.5 million will be used to provide financing for a project consisting of the design, engineering and installation of equipment to produce and process natural gas from wells to be located at various sites throughout Pennsylvania.

Clean Coal Technology Projects

PEDA's 43 clean coal technology projects are distributed as follows: pre-combustion, 19 (44%); emissions reduction during combustion, 9 (21%); flue gas clean-up, 8 (19%); and conversion of coal to a cleaner fuel, 7 (16%). 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.

Construction commenced during the fiscal year on the Pennsylvania Electric Company's demonstration of Bechtel Corporation's confined zone dispersion (CZD) flue gas clean-up process. This \$9.2 million project will be completed in during the summer of 91, go through parametric testing for several months and begin continuous operation throughout 1992. If successful, this technology will not only allow for the continued use of hundreds of thousands of tons of Pennsylvania coal at the Seward plant but could prove to be an effective means for utility power plants, many of which were built in the 1950s, to reduce their sulfur emissions for compliance with the new Clean Air Amendments. The U.S. Department of Energy under its Clean Coal Technology program has provided one half of the project costs for the project.

The Authority continues to support promising coal cleaning projects and has initiated several new projects. New projects awarded allocations during FY 90-91 include:

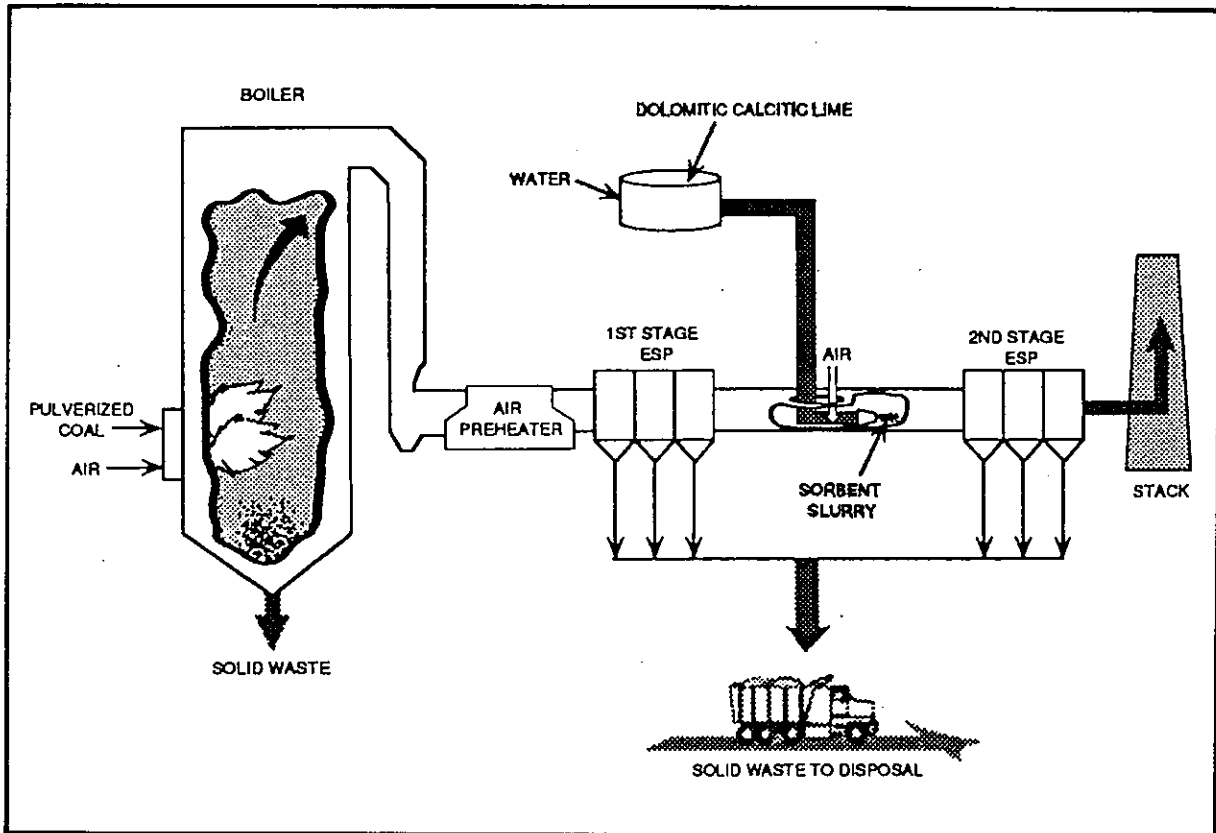
- the NOXSO Corporation's novel flue gas clean-up process that removes both SO₂ and NO_x,
- the Washington Energy Processing Incorporated's fine coal cleaning process and its use as a feedstock to fluidized bed boilers, and
- the BCR National Laboratory's fine coal drying with vibrofluidization.

Anthracite Development Projects

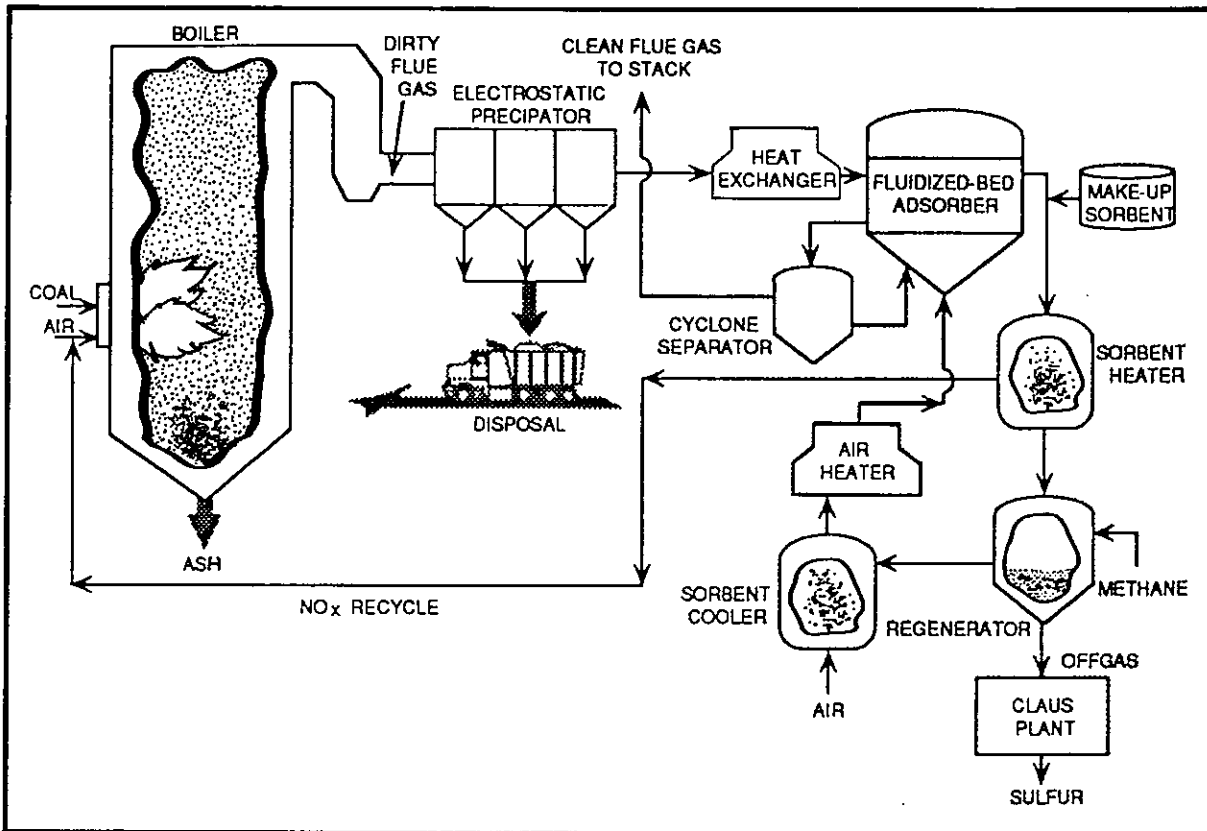
During FY 90-91 the Authority provided financial support for the establishment of the Anthracite Institute. The Institute will focus on providing technical services to the industry and be the focal point for generating new research project from the Anthracite region. In addition, the Penn State University project (Project #873-4022) involving the testing of anthracite in utility boilers resulted in a test burn at New York State Electric and Gas Company's Jennison Power Plant.

Non-Coal Development Projects

One additional non-coal project was added to the nine non-coal projects as part of the Authority's energy RD&D program. This project, being conducted by the Rodale Research Center, will measure the energy impacts of innovative agricultural techniques. The existing projects deal with increased energy efficiency in rowhouses, recycling, renewable energy resource assessment, and the development of an oil brine treatment technique.



Flow diagram of Penelec/Bechtel confined zone dispersion (CZD) flue gas desulfurization project (PEDA project #893-4002).



Flow diagram of NOXSO Corporation's NOXSO process which removes both sulfur and nitrous oxides from the flue gas of utility boilers (PEDA project #9003-4002).

FISCAL STATUS

PEDA ended FY 90-91 with a net available balance of \$1,104,834. Though the Authority has total assets of \$6,717,081, \$5,612,247 are committed to projects (\$5,609,658) and operations (\$2,589), but not yet spent. According to the attached financial statements, administration costs, including personnel, operating and fixed assets expenses, totaled \$249,864 for the year. Due to the severe financial situation in the Commonwealth of Pennsylvania during this fiscal year, the Office of Budget restricted PEDA's operating expenditures to \$250,000. Actual operating costs for PEDA totaled \$279,052, with the excess expenditures carried over to the 1991-92 fiscal year.

However, the Authority received \$512,319 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

ENERGY DEVELOPMENT FUND

STATEMENT OF REVENUES AND EXPENDITURES

INCEPTION OF FUND TO JUNE 30, 1991

<u>REVENUES:</u>	
Interest on Investments	\$ 2,564,875.79
Application Fees	24,535.00
Commitment Fees	175,750.00
Venture Capital Repayments	1,479.75
Miscellaneous Revenue	<u>34,144.25</u>
TOTAL REVENUES	2,800,784.79
<u>EXPENDITURES:</u>	
Grants/Venture Capital	5,665,550.62
Operating Expenses	<u>1,468,153.41</u>
TOTAL EXPENDITURES	<u>7,133,704.03</u>
REVENUES UNDER EXPENDITURES	(4,332,919.24)
<u>OTHER FINANCING SOURCES:</u>	
Transfer from General Fund	11,050,000.00
<u>REVENUE AND OTHER FINANCING SOURCES OVER EXPENDITURES (FUND BALANCE):</u>	<u>\$ 6,717,080.76</u>

TABLE 4

PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

ENERGY DEVELOPMENT FUND

BALANCE SHEET

JUNE 30, 1990

<u>ASSETS</u>	
Cash	\$ 756.08
Short Term Investments	6,682,000.00
Accrued Interest Receivable	<u>34,324.68</u>
TOTAL ASSETS	\$ 6,717,080.76
<u>LIABILITIES & FUND BALANCES</u>	
LIABILITIES:	\$ 0.00
FUND BALANCES:	
Reserved:	
Grants/Venture Capital Commitments	
Encumbered	4,081,199.91
Unencumbered	1,528,458.00
Operating Encumbrances	<u>2,589.00</u>
Unreserved:	
Undesignated	<u>1,104,833.85</u>
TOTAL FUND BALANCES	<u>6,717,080.76</u>
TOTAL LIABILITIES AND FUND BALANCES	\$ 6,717,080.76

TABLE 5

PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

COMPARATIVE STATEMENT OF FUNDS AVAILABLE

FOR THE TWELVE MONTH PERIOD

ENDING JUNE 30

	<u>1990</u>	<u>1991</u>
TOTAL AVAILABLE FUNDS - July 1	\$ 5,004,987	\$ 6,389,957
RECEIPTS:		
Transfer from General Fund	\$ 1,500,000	\$ 750,000
Interest on Investments	544,323	512,319
Application Fees	4,485	3,450
Commitment Fees	0	100,000
Venture Capital Repayments	0	353
Miscellaneous	<u>8,936</u>	<u>208</u>
Total Receipts	<u>\$ 2,057,744</u>	<u>\$ 1,366,330</u>
AVAILABLE FOR DISBURSEMENT	\$ 7,062,731	\$ 7,756,287
DISBURSEMENTS:		
Grants/Venture Capital	\$ 428,688	\$ 789,342
Operating Expenses	<u>244,086</u>	<u>249,864</u>
Total Disbursements	<u>\$ 672,774</u>	<u>\$ 1,039,206</u>
GROSS FUNDS AVAILABLE	\$ 6,389,957	\$ 6,717,081
COMMITMENTS:		
Grants/Venture Capital	\$ 4,817,822	\$ 5,609,658
Operating	<u>46,214</u>	<u>2,589</u>
Total Commitments	<u>\$4,864,036</u>	<u>\$ 5,612,247</u>
NET FUNDS AVAILABLE	\$ 1,525,921	\$ 1,104,834

TABLE 6

PENNSYLVANIA ENERGY DEVELOPMENT AUTHORITY

RECONCILIATION OF COMMITMENTS

JUNE 30, 1991

ME #	Contractor	Commitments	Disbursements	Balance
485-015	Hess & Fisher Engineers	31,475.00	31,475.00	0.00
486-043	Penn State University	142,175.00	127,456.38	14,718.62
487-001	Lehigh University	86,405.00	72,992.23	13,412.77
487-010	PA Electric Company	182,800.00	14,235.35	168,564.65
487-024	Control Techtronics Inc	25,000.00	25,000.00	0.00
487-053	BCR National Laboratory	206,428.00	89,220.31	117,207.69
487-055	GRASP	45,000.00	43,220.82	1,779.18
488-007	Renewable Energy Inst	18,000.00	8,200.86	9,799.14
488-009	Penn State University	36,902.00	12,947.54	23,954.46
863-4008	PA Electric Company	400,000.00	0.00	400,000.00
873-4022	Penn State University	147,343.00	0.00	147,343.00
*873-4022	Penn State University	52,957.00	0.00	52,957.00
883-4024	PA Electric Company	70,000.00	0.00	70,000.00
883-4025	Lehigh University	40,152.00	12,295.86	27,856.14
*883-4030	Penn State University	69,546.00	0.00	69,546.00
883-4034	Drexel University	107,054.00	14,513.56	92,540.44
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
893-4013	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	219,810.00	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	4,038.28	149,757.72
893-4022	Lehigh University	41,205.00	9,238.97	31,966.03
893-3023	Production Techniques, Inc.	74,213.00	3,824.00	70,389.00
893-4029	University of Pittsburgh	157,633.00	0.00	157,633.00
893-4030	Zum Industries, Inc.	130,000.00	0.00	130,000.00
*893-4030	Zum Industries, Inc.	20,000.00	0.00	20,000.00
893-4032	GRASP	5,000.00	40,140.84	24,859.16
893-4033	Donlee Technologies	32,169.00	27,491.76	4,677.24
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	69,330.00	59,944.00	9,386.00
893-1001	Penn State University	35,000.00	0.00	35,000.00
893-1002	Bucknell University	29,537.00	0.00	29,537.00
893-1003	Advanced Waste Trtmt Tech	24,600.00	0.00	24,600.00
9003-4002	NOXSO Corporation	188,177.00	0.00	188,177.00
*9003-4003	Penn State University	45,749.00	0.00	45,749.00
*9003-3004	GE Transportation Sys	200,000.00	0.00	200,000.00
9003-4005	Miltech Energy Services	69,232.00	0.00	69,232.00
*9003-4008	PA Electric Company	249,380.00	0.00	249,380.00
*9003-4011	Tampella Power Corp.	175,000.00	0.00	175,000.00
*9003-4013	Rodale Research Center	10,000.00	0.00	10,000.00
*9003-4022	Lehigh University	71,795.00	0.00	71,795.00
*9003-4025	Washington Energy Process.	155,248.00	0.00	155,248.00
*9003-4027	Lehigh University	250,000.00	0.00	250,000.00
*9003-4029	Penn State University	85,227.00	0.00	85,227.00
*9003-4030	Penn State University	43,595.00	0.00	43,595.00
*9003-4034	BCR National Laboratory	99,961.00	0.00	99,961.00
		\$6,232,599.00	\$ 622,941.09	\$5,609,657.91

* Unencumbered Commitments

APPENDIX A

**PEDA RD&D PROJECTS COMPLETED
IN FISCAL YEAR 1990 - 91**

<p><u>APPLICANT</u></p> <p>Rodale Research Center R. D. #1, Box 323 Kutztown, PA 19530</p> <p>Dr. Robert Hart 215/683-6383</p> <p>Berks County</p>	<p><u>PROJECT NUMBER</u></p> <p>487-033</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Non-Coal 87-88</p>
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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 a final program report was submitted.

<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$135,067 Applicant Share: \$ 80,000 PEDA Share: \$ 55,067</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$0.00</p>	<p><u>PROJECT START DATE</u></p> <p>May 15, 1988</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>May 15, 1990</p>
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APPLICANT

GE Transportation System
2901 East Lake Road
Erie, PA 16531

Dr. Bertrand D. Hsu
814/875-2110

Erie County

PROJECT NUMBER

488-001

TYPE OF ASSISTANCE

Venture Capital

FUNDING CATEGORY

Clean Coal

FISCAL YEAR

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 all work under this phase of their project covered by this contract. A final report is being prepared and expected to be submitted in early Fall 1991.

FINANCIAL SUMMARY

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

REMAINING PEDA BALANCE

\$0.00

PROJECT START DATE

March 15, 1990

CONTRACT TERMINATION DATE

December 31, 1990

<p><u>APPLICANT</u></p> <p>Coal Tech Corporation P.O. Box 154 Merion, PA 19066</p> <p>Dr. Bert Zauderer 215/667-0442</p> <p>Lycoming County</p>	<p><u>PROJECT NUMBER</u></p> <p>488-015</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Venture Capital</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 88-89</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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 SO₂ 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.</p>	
<p><u>PROJECT STATUS</u></p> <p>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 was the first project under the Clean Coal program to be successfully completed. All final report material has been submitted.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$201,375 Applicant Share: \$151,375 PEDA Share: \$ 50,000</p> <p><u>REMAINING PED A BALANCE</u></p> <p>\$0.00</p>	<p><u>PROJECT START DATE</u></p> <p>August 16, 1989</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>September 30, 1990</p>

<p><u>APPLICANT</u></p> <p>Good Samaritan Hospital Fourth & Walnut Streets Lebanon, PA 17042</p> <p>Robert Hoffman 717/272-7611</p> <p>Lebanon County</p>	<p><u>PROJECT NUMBER</u></p> <p>883-4033</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Anthracite 88-89</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>With funding provided by the Department of Energy (DOE) and PEDDA, 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.</p>	
<p><u>PROJECT STATUS</u></p> <p>All work covered under PEDDA's contract has been completed. Since this is part of a larger DOE project which is ongoing, PEDDA will continue to monitor its progress.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$1,096,174 Applicant Share: \$ 937,492 PEDDA Share: \$ 158,682</p> <p><u>REMAINING PEDDA BALANCE</u></p> <p>\$0.00</p>	<p><u>PROJECT START DATE</u></p> <p>December 29, 1989</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>December 31, 1991</p>

APPENDIX B

PEDA RD&D PROJECTS IN PROGRESS

Please Note: The contract termination date is not necessarily the project completion date. Please refer to the "PROJECT STATUS" section for a complete project update.

<p><u>APPLICANT</u></p> <p>Penn State University 114 Kern Building University Park, PA 16802</p> <p>Dr. Alan Davis 814/865-6543</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>486-043</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>General Coal 86-87</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>Project is essentially complete. The results of this project are being used to characterize the overburden in Project # 893-4014. The contract expired on June 30, 1991. Penn State is currently preparing the final report on the project. No additional expenditures will be incurred by Penn State under the project.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$223,521 Applicant Share: \$ 81,346 PEDA Share: \$142,175</p> <p><u>REMAINING PED A BALANCE</u></p> <p>\$14,718.62</p>	<p><u>PROJECT START DATE</u></p> <p>July 1, 1987</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>June 30, 1991</p>

APPLICANT

Pennsylvania Electric Company
 1001 Broad Street
 Johnstown, PA 15907

Steven T. Higgins
 814/533-8883

Cambria County

PROJECT NUMBER

863-4008

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY

Clean Coal

FISCAL YEAR

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

New contract issued June 7, 1991 to begin modifications. Installation set for summer 1991 while facility is shutdown for maintenance.

FINANCIAL SUMMARY

Total Project Cost: \$6,300,000
 Applicant Share: \$5,900,000
 PEDAs Share: \$ 400,000

REMAINING PEDAs BALANCE

\$400,000

PROJECT START DATE

May 22, 1991

CONTRACT TERMINATION DATE

June 30, 1992

<p><u>APPLICANT</u></p> <p>Lehigh University Packard Laboratory Bethlehem, PA 18015</p> <p>Dr. Edward K. Levy 215/758-4090</p> <p>Northampton County</p>	<p><u>PROJECT NUMBER</u></p> <p>487-001</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 87-88</p>
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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

Laboratory scale equipment has been refined and coals have been tested on the unit. Currently, data is being evaluated in preparation for pilot plant scale-up. A contract amendment extending the termination date to December 31, 1991 is currently being negotiated between the Authority and the Contractor.

FINANCIAL SUMMARY

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

REMAINING PED A BALANCE

\$13,412.77

PROJECT START DATE

July 1, 1988

CONTRACT TERMINATION 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

Clean Coal

FISCAL YEAR

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

Currently, Penelec is conducting slurry stability tests. Penn State is beginning to prepare slurry mixtures from filter cake and initiate combustion testing of the fuel. Transportability of the fuel appears to be a major problem with the project.

FINANCIAL SUMMARY

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

REMAINING PEDA BALANCE

\$155,721.13

PROJECT START DATE

March 27, 1990

CONTRACT TERMINATION DATE

December 31, 1991

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

Clean Coal

FISCAL YEAR

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 SO₂ 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 SO₂ 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

BCR conducted a test burn in Jan/Feb 1991 of the anthracite culm feedstock in an operable kiln combustor (Zurn/Pedco combustor) to determine design parameters regarding heat transfer. BCR is currently reviewing the data and will notify the Authority of its results.

FINANCIAL SUMMARY

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

REMAINING PEDA BALANCE

\$88,515,51

PROJECT START DATE

March 15, 1990

CONTRACT TERMINATION DATE

June 30, 1992

APPLICANT

Penn State University
 114 Kern Building
 University Park, PA 16802

William D. Moir
 814/863-0587

Centre County

PROJECT NUMBER

873-4022

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY

Anthracite

FISCAL YEAR

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

To date, six coals (one bituminous and five anthracite) have been blended and bench tested. Test apparatus for the traveling grate stoker is being readied for use. Several binders were analyzed for use in the anthracite pellet investigation.

FINANCIAL SUMMARY

Total Project Cost: \$222,556.
 Applicant Share: \$ 22,256
 PEDDA Share: \$147,343

REMAINING PEDDA BALANCE

\$147,343

PROJECT START DATE

July 1, 1990

CONTRACT TERMINATION DATE

June 30, 1992

APPLICANT

Renewable Energy Institute
 0172 Hwy 133 C-2
 Carbondale, CO 81623

John D'Angelo
 (303) 963-9632

Erie County

PROJECT NUMBER

488-007

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY

Non-Coal

FISCAL YEAR

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. Consistent collection of data, however, began in December, 1990. The project has been delayed for a few months due to the wind tower being damaged by an early spring ice storm. The contractor is currently in the process of repairing the tower to resume collection of data. PEDAs staff traveled to Erie to observe the damage to the tower and take some photographs.

FINANCIAL SUMMARY

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

REMAINING PEDAs BALANCE

\$9,799.14

PROJECT START DATE

November 16, 1989

CONTRACT TERMINATION DATE

December 31, 1991

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

General Coal

FISCAL YEAR

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 continues forward with efforts 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. The project will continue under # 90003-4003.

FINANCIAL SUMMARY

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

REMAINING PEDAs BALANCE

\$17,908.02

PROJECT START DATE

July 14, 1989

CONTRACT TERMINATION DATE

June 30, 1992

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

General Coal

FISCAL YEAR

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 SO₂ 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 contractor is currently working to get all subcontracts in place. Initial characterization of coal pile has been completed.

FINANCIAL SUMMARY

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

REMAINING PEDAs BALANCE

\$70,000

PROJECT START DATE

November 26, 1990

CONTRACT TERMINATION DATE

December 31, 1991

<p><u>APPLICANT</u></p> <p>Lehigh University Dept. of Chemical Engineering Bethlehem, PA 18015</p> <p>Dr. Harvey G. Stenger, Jr. 215/758-5057</p> <p>Northampton County</p>	<p><u>PROJECT NUMBER</u></p> <p>883-4025</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Venture Capital</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 88-89</p>
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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

Construction of the test apparatus is near completion. Tests continue on determining the optimum amount of mordenite needed for the monolith reactor cells. Preparations for test site installation at PP&L's Martins Creek Generating Station continue.

FINANCIAL SUMMARY

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

REMAINING PEDAL BALANCE

\$18,368.62

PROJECT START DATE

March 15, 1990

CONTRACT TERMINATION DATE

August 31, 1991

<p><u>APPLICANT</u></p> <p>Penn State University 114 Kern Building University Park, PA 16802</p> <p>R. Killoren 814/865-1372</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>883-4030</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>General Coal 88-89</p>
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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 certain Modules of the Pennsylvania Department of Environmental Resources' permit application package.

PROJECT STATUS

The applicant has recently secured the necessary 10% matching funds for the project. DER, however, has indicated that the original focus of the work tasks are not necessary given other work currently proceeding. PEDAs staff will be working with the applicant and DER to develop work tasks that reflect the current needs of the DER.

<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$122,046 Applicant Share: \$ 52,500 PEDAs Share: \$ 69,546</p> <p><u>REMAINING PEDAs BALANCE</u></p> <p>\$69,546</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>
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<p><u>APPLICANT</u></p> <p>Drexel University 32nd & Chestnut Streets Philadelphia, PA 19104</p> <p>Nicholas Cernansky 215/895-2284</p> <p>Philadelphia County</p>	<p><u>PROJECT NUMBER</u></p> <p>883-4034</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Non-Coal 88-89</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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 combustor. The goal of this project is to develop technology for the implementation of processed municipal solid waste as an energy producing fuel (RDF).</p>	
<p><u>PROJECT STATUS</u></p> <p>Drexel has completed a series of experiments performing thermogravimetric and kinetic analysis on RDF derived from municipal solid waste and simulated RDF created from cellulose and plastic materials. Drexel has also developed a preliminary database of kinetic parameters which describe the overall devolatilization of RDF. Currently, they are working with Tampella Power to secure a temporary burn permit from DER for the pilot plant testing phase of the RDF combustion.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$147,392 Applicant Share: \$ 40,338 PEDA Share: \$107,054</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$65,835.11</p>	<p><u>PROJECT START DATE</u></p> <p>January 5, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>June 30, 1992</p>

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

Clean Coal

FISCAL YEAR

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 was executed in May 1991. Construction is currently underway. A project dedication of this project is scheduled for July 17, 1991.

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

May 20, 1991

CONTRACT TERMINATION DATE

July 1, 1993

<p><u>APPLICANT</u></p> <p>University of Pittsburgh 350 Thackeray Hall Pittsburgh, PA 15260</p> <p>Dr. S. H. Chiang 412/624-9658</p> <p>Allegheny County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4004</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Venture Capital</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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 CO₂ 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.</p>	
<p><u>PROJECT STATUS</u></p> <p>To date, experimental work was initiated to conduct a parametric study in the Continuous Research Unit (CRU) using Upper Freeport coal. Several process variables, including interface position, mixing speeds and CO₂ flowrates were examined as they relate to BTU recovery, ash and pyritic sulfur reduction, and solid content. Early conclusions indicate the use of a pre-mixing tank improves overall test results.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$91,000 Applicant Share: \$32,320 PEDA Share: \$58,680</p> <p><u>REMAINING PED A BALANCE</u></p> <p>\$58,680</p>	<p><u>PROJECT START DATE</u></p> <p>September 13, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>December 31, 1991</p>

<p><u>APPLICANT</u></p> <p>GE Transportation Systems 2901 East Lake Road Erie, PA 16531</p> <p>Dr. Bertrend D. Hsu 814/875-2110</p> <p>Erie County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-3005</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Venture Capital</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contract is currently being circulated for signatures. Staff, as requested by the Board, is also performing an assessment of the progress of the project up to this point. The Board has conditioned funding for the fourth year of the project on a successful staff review. The assessment will be completed in the Summer of '91.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$4,245.186 Applicant Share: \$4,045.186 PEDA Share: \$ 200,000</p> <p><u>REMAINING PEDAL BALANCE</u></p> <p>\$200,000</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>Penn State University 114 Kern Building University Park, PA 16802</p> <p>Robert Killoren 814/865-3396</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4013</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Anthracite 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The Anthracite Institute's Industry Advisory Committee conducted its initial meeting to establish the Institute's agenda. Institute personnel continue to provide technical assistance for anthracite development projects. Several research projects were formulated as a result of Institute interaction.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$121,000 Applicant Share: \$ 12,100 PEDA Share: \$108,900</p> <p><u>REMAINING PEDAL BALANCE</u></p> <p>\$108,900</p>	<p><u>PROJECT START DATE</u></p> <p>January 9, 1991</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>December 31, 1991</p>

<p><u>APPLICANT</u></p> <p>Penn State University 114 Kern Building University Park, PA 16802</p> <p>Robert Killoren 814/865-3397</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4014</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
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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

Soil and water samples taken. Overburden characterization data being collected from bore holes. DER surface mine permit submitted. Awaiting issuance of permit from DER.

FINANCIAL SUMMARY

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

REMAINING PED A BALANCE

\$250,000

PROJECT START DATE

August 27, 1990

CONTRACT TERMINATION DATE

June 30, 1993

<p><u>APPLICANT</u></p> <p>Penn State University 114 Kern Building University Park, PA 16802</p> <p>Robert Killoren 814/865-3396</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4016</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contractor began performing sorbent testing. Field samples from several sorbent suppliers were collected and processed into various size fractions.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$246,926 Applicant Share: \$ 27,116 PEDA Share: \$219,810</p> <p><u>REMAINING PED A BALANCE</u></p> <p>\$219,810</p>	<p><u>PROJECT START DATE</u></p> <p>September 13, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>June 30, 1993</p>

<p><u>APPLICANT</u></p> <p>Penn State University 114 Kern Building University Park, PA 16802</p> <p>Robert Killoren 814/865-3396</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4018</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Non-Coal 89-90</p>
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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

The contractor has begun laboratory work on the development of a benchscale model of brine treatment equipment. They have also begun field testing of the process at the Franklin Oil Brine Treatment facility. PEDAs staff is expecting a first progress report in June.

<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$160,000 Applicant Share: \$ 16,000 PEDAs Share: \$144,000</p> <p><u>REMAINING PEDAs BALANCE</u></p> <p>\$144,000</p>	<p><u>PROJECT START DATE</u></p> <p>August 27, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>January 30, 1993</p>
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<p><u>APPLICANT</u></p> <p>Lehigh University 526 Brodhead Avenue Bethlehem, PA 18015</p> <p>John Cheezum 215/758-3024</p> <p>Northampton County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4021</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Anthracite 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>To date, Task 1 - Bed Inventories, has been completed. Currently, work is beginning on construction of the test equipment for the project.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$193,796 Applicant Share: \$ 40,000 PEDA Share: \$153,796</p> <p><u>REMAINING PEDAL BALANCE</u></p> <p>\$146,035.07</p>	<p><u>PROJECT START DATE</u></p> <p>July 1, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>June 30, 1993</p>

<p><u>APPLICANT</u></p> <p>Lehigh University 526 Brodhead Avenue Bethlehem, PA 18015</p> <p>Mary Jo Hill 215/758-3023</p> <p>Northampton County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4022</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>Characterization studies and absorption testing continue. The use of mordenite as a sorbent shows promise in flue gas clean up treatments. A contract amendment extending the termination date to September 30, 1991 is currently being negotiated between the Authority and the Contractor.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$61,205 Applicant Share: \$20,000 PEDA Share: \$41,205</p> <p><u>REMAINING PEDAL BALANCE</u></p> <p>\$27,011.31</p>	<p><u>PROJECT START DATE</u></p> <p>July 1, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>June 30, 1991</p>

<p><u>APPLICANT</u></p> <p>Production Techniques, Inc. P.O. Box 896 Hallstead, PA 18822</p> <p>Roberta D. Turner 717/879-5373</p> <p>Susquehanna County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-3023</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Venture Capital</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Non-Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>PTI has begun the design, fabrication, and installation of the prototype conveyORIZED bottle handling and coating system, that will include sample chucks (used to grip the bottles and carry them through the line), a propane gas thermal cure system (for drying the bottles after coating), and an air exhaust system. A successful bench simulation of the thermal cure system was conducted on a sample batch of bottles. These bottles were provided to potential buyers of the coating process.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$198,427 Applicant Share: \$124,214 PEDA Share: \$ 74,213</p> <p><u>REMAINING PEDAL BALANCE</u></p> <p>\$10,381</p>	<p><u>PROJECT START DATE</u></p> <p>July 1, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>December 31, 1991</p>

<p><u>APPLICANT</u></p> <p>University of Pittsburgh 350 Thackeray Hall Pittsburgh, PA 15260</p> <p>Josephine Hatley 412/624-7400</p> <p>Allegheny County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4029</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>Contract executed in November 1990. Work is currently underway. The contractor has not yet reported on the project's status to the Authority.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$234,405 Applicant Share: \$ 76,772 PEDA Share: \$157,633</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$157,633</p>	<p><u>PROJECT START DATE</u></p> <p>November 26, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>December 31, 1992</p>

<p><u>APPLICANT</u></p> <p>Zurn Industries, Inc. 1422 East Avenue Erie, PA 16503</p> <p>Robert Seibel 814/452-6421</p> <p>Erie County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4030</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contract has been signed by the contractor and is currently being circulated for final approval. Contract execution is expected in early Summer of 1991.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$304,017 Applicant Share: \$174,017 PEDA Share: \$130,000</p> <p><u>REMAINING PEDAL BALANCE</u></p> <p>\$130,000</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>GRASP 3500 Lancaster Avenue Philadelphia, PA 19104</p> <p>Mary Mikus 215/222-0318</p> <p>Philadelphia County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4032</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Non-Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The Contractor has identified a total of 85 flat-roof rowhouses for inclusion in the study; approximately half received standard weatherization and half received optimized treatment. Energy monitors were installed in all houses and GRASP had been collecting energy usage and consumption data from the two sample groups. Preliminary results have shown that the houses receiving the optimal approach showed a 17% average savings, while the houses receiving the standard weatherization achieved a 10% savings. The contractor will continue to compile the usage data and analyze the results. A contract amendment extending the termination date to December 31, 1991 is currently being negotiated between the Authority and the Contractor.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$106,290 Applicant Share: \$ 41,290 PEDA Share: \$ 65,000</p> <p><u>REMAINING PED A BALANCE</u></p> <p>\$14,029.83</p>	<p><u>PROJECT START DATE</u></p> <p>August 20, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>June 30, 1991</p>

<p><u>APPLICANT</u></p> <p>DONLEE Technologies 693 North Hills Road York, PA 17402</p> <p>E. J. Coulthard 717/755-1081</p> <p>York County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4033</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Anthracite 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contractor has completed the design, purchase, and installation of the hospital waste shredding and feeding system at their pilot plant testing facility in York. They are currently waiting for approval from the Department of Energy for an Environmental Impact Assessment for the last phase of the project, equipment testing. Responsibility for the Impact Assessment is with DOE.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$223,396 Applicant Share: \$191,227 PEDA Share: \$ 32,169</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$4,677.24</p>	<p><u>PROJECT START DATE</u></p> <p>October 17, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>December 31, 1991</p>

<p><u>APPLICANT</u></p> <p>B. Datta Research 617 Tampico Court Pittsburgh, PA 15239</p> <p>Rabinder Datta 412/795-3693</p> <p>Allegheny County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4034</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Anthracite 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contract was executed in February 1991. No activity has been reported to date.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$167,787 Applicant Share: \$ 17,000 PEDA Share: \$150,787</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$150,787</p>	<p><u>PROJECT START DATE</u></p> <p>February 13, 1991</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>December 31, 1991</p>

<p><u>APPLICANT</u></p> <p>BCR National Laboratory 500 William Pitt Way Pittsburgh, PA 15238</p> <p>Joseph Yerushalmi 412/826-3030</p> <p>Allegheny County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4038</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contract was executed in February 1991. Activities to date focused on the preparation of equipment for the upcoming six month test period. Several utilities and coal companies were contacted regarding input and guidance into the selection of the coal blends for the project.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$238,338 Applicant Share: \$ 25,000 PEDA Share: \$213,338</p> <p><u>REMAINING PEDAL BALANCE</u></p> <p>\$206,550.53</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>Miltech Energy Services P.O. Box 501 Ligonier, PA 15658</p> <p>Francis Miller 412/238-3255</p> <p>Westmoreland County</p>	<p><u>PROJECT NUMBER</u></p> <p>893-4043</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 89-90</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>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.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contractor has completed task 2 of the project which entailed performing 30 flotation tests to establish general flotation conditions and to observe magnetite and coal recovery rates. Task 3 experiments continue using 2 central Pennsylvania coals. Task 3 is expected to be completed by mid-summer 1991.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$77,034 Applicant Share: \$ 7,704 PEDA Share: \$69,330</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$9,386</p>	<p><u>PROJECT START DATE</u></p> <p>September 21, 1990</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>December 31, 1991</p>

<p><u>APPLICANT</u></p> <p>NOXSO Corporation P.O. Box 469 Library, PA 15129</p> <p>Dr. L.G. Neal 412/854-1200</p> <p>Allegheny County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4002</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This project involves laboratory-scale experiments using the applicant's NOXSO process in a dilute phase transport reactor to remove SO₂ and NO_x emissions from the flue gas stream of coal-fired boilers. If successful, the dilute phase transport reactor may offer both operational and economic advantages currently used fluidized bed reactors.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contract for this project has been signed by the contractor and is being circulated for final Commonwealth approval. The contract is currently at the Comptroller's Office.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$282,125 Applicant Share: \$ 32,125 PEDA Share: \$250,000</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$250,000</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>Penn State University 248 Calder Way #300 University, Park, PA 16802</p> <p>William D. Moir 814/865-6277</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4003</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>General Coal 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This project is a continuation of research into the feasibility of a short (200 foot wide) longwall mining scheme. This project will investigate development cost, productivity estimates, ventilation procedures, and direct evaluation for subsidence magnitudes and specific groundwater effects. The results of this project may allow longwall mining in areas of Pennsylvania which are currently not minable.</p>	
<p><u>PROJECT STATUS</u></p> <p>The applicant is currently coordinating efforts with DER and MSHA to review the safety aspects of the project.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$70,749 Applicant Share: \$25,000 PEDA Share: \$45,749</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$45,749</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>GE Transportation Systems 2901 East Lake Road Erie, PA 16531</p> <p>J.J Grisik 814/875-2110</p> <p>Erie County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-3004</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Venture Capital</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This is the fourth year for this project to develop a coal-water slurry fueled diesel electric locomotive. This is a six year, \$22 million venture co-funded by the U.S. Department of Energy, New York State Energy Research and Development Authority, and Norfolk Southern Railroad.</p>	
<p><u>PROJECT STATUS</u></p> <p>The contract for this fourth year of the project will follow the expiration of Year Three which will expire on December 31, 1991.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$2,084,043 Applicant Share: \$1,884,043 PEDA Share: \$ 200,000</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$200,000</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>Miltech Energy Services, Inc. P.O. Box 501 Ligonier, PA 15658</p> <p>Francis G. Miller 412/238-3255</p> <p>Westmoreland County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4005</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This is the second year funding for this project to study a patented fine coal cleaning process involving heavy medium cyclonic separation and froth flotation. This year's research will include detailed studies and laboratory testing of the process using samples of Upper Freeport, Lower Freeport and Lower Kittanning coal.</p>	
<p><u>PROJECT STATUS</u></p> <p>This project, which is for tasks 4 & 5, will follow completion of the first year's project, tasks 2 & 3.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$76,925 Applicant Share: \$ 7,693 PEDA Share: \$69,232</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$69,232</p>	<p><u>PROJECT START DATE</u></p> <p>April 24, 1991</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>June 30, 1992</p>

<p><u>APPLICANT</u></p> <p>Pennsylvania Electric Company 1001 Broad Street Johnstown, PA 15907</p> <p>Robert D. Stoessner 814/533-8666</p> <p>Cambria County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4008</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This project involves the construction of a three ton per hour fine coal cleaning and coal water slurry (CWS) pilot plant at Pennsylvania Electric's Homer City Coal Preparation Plant. The pilot plant will enable the applicant to conduct tests to determine the optimum CWS which can be produced from fine coals at the Homer City Plant.</p>	
<p><u>PROJECT STATUS</u></p> <p>Currently, the contract is being prepared and the work statement is being finalized.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$376,880 Applicant Share: \$127,500 PEDA Share: \$249,380</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$249,380</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>Tampella Power Corporation 2600 Reach Road Williamsport, PA 17701</p> <p>Brian G. Martin 717/326-3361</p> <p>Lycoming County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4011</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This project involves research and testing sorbents to improve sulfur capture and limestone utilization in a circulating fluidized bed (CFB) boilers. The applicant is a Pennsylvania-based manufacturer of CFB equipment and maintains their own pilot testing facility.</p>	
<p><u>PROJECT STATUS</u></p> <p>Currently, the contract is being prepared and the work statement is being finalized.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$306,108 Applicant Share: \$131,108 PEDA Share: \$175,000</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$175,000</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>Rodale Research Center 611 Siegfriedale Road Kutztown, PA 19530</p> <p>Maria van Hekken 215/683-6383</p> <p>Berks County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4013</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Non-Coal 90-91</p>
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PROJECT DESCRIPTION

This project will investigate energy efficient cropping techniques that will potentially reduce oil consumption in farming. An energy and economic analysis will be performed on six new cropping techniques.

PROJECT STATUS

Currently, the contract is being prepared and the work statement is being finalized.

FINANCIAL SUMMARY

Total Project Cost: \$101,992
Applicant Share: \$ 91,992
PEDA Share: \$ 10,000

REMAINING PEDA BALANCE

\$10,000

PROJECT START DATE

N/A

CONTRACT TERMINATION DATE

N/A

<p><u>APPLICANT</u></p> <p>Lehigh University 526 Brodhead Avenue Bethlehem, PA 18015</p> <p>Lorraine Schroeder 215/758-3023</p> <p>Northampton County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4022</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This project is a continuing investigation into the use of mordenite, a zeolite, as a sorbent for controlling SO₂ and NO_x emissions. This project will set out to establish the optimum operating conditions and limits of a mordenite regeneration process.</p>	
<p><u>PROJECT STATUS</u></p> <p>This project was approved by the Board of Directors on June 13, 1991.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$81,795 Applicant Share: \$10,000 PEDA Share: \$71,795</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$71,795</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>Washington Energy Processing, Inc. 420 Rouser Road Coraopolis, PA 15108</p> <p>Edward H. Greenwald 412/796-8771</p> <p>Allegheny County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4025</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Clean Coal 90-91</p>
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PROJECT DESCRIPTION

This project will test the use of an innovative coal cleaning process to remove impurities from waste streams of coal preparation plants and slurry ponds to produce a usable fuel for cogeneration facilities. The cleaned product from this project will be burned in the Piney Creek Cogeneration Plant.

PROJECT STATUS

This project was approved by the Board of Directors on June 13, 1991.

<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$194,060 Applicant Share: \$ 38,812 PEDA Share: \$155,248</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$155,248</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>
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APPLICANT

Lehigh University
 526 Brodhead Avenue
 Bethlehem, PA 18015

Ruth L. Tallman
 215/758-3024

Northampton County

PROJECT NUMBER

9003-4027

TYPE OF ASSISTANCE

Grant

FUNDING CATEGORY

Clean Coal

FISCAL YEAR

90-91

PROJECT DESCRIPTION

This project is for the construction of a pilot scale coal cleaning facility utilizing Lehigh University's Dry Coal Purifier (D-CoP) process. This process uses a low temperature fluidized bed particle separator to remove impurities from coal. The Authority has supported this project since its inception.

PROJECT STATUS

This project was approved by the Board of Directors on June 13, 1991.

FINANCIAL SUMMARY

Total Project Cost: \$1,725,906
 Applicant Share: \$1,475,906
 PEDA Share: \$ 250,000

REMAINING PEDA BALANCE

\$250,000

PROJECT START DATE

N/A

CONTRACT TERMINATION DATE

N/A

<p><u>APPLICANT</u></p> <p>Penn State University 248 Calder Way, #300 University Park, PA 16802</p> <p>Robert Killoren 814/865-3396</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4029</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Anthracite 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This project will focus on recovering and marketing tailings from existing anthracite coal preparation plants for use in the carbon market. These tailings have the potential, if recovered, to yield a very low ash (less than 3%) anthracite product.</p>	
<p><u>PROJECT STATUS</u></p> <p>This project was approved by the Board of Directors on June 13, 1991.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$94,727 Applicant Share: \$ 9,500 PEDA Share: \$85,227</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$85,227</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

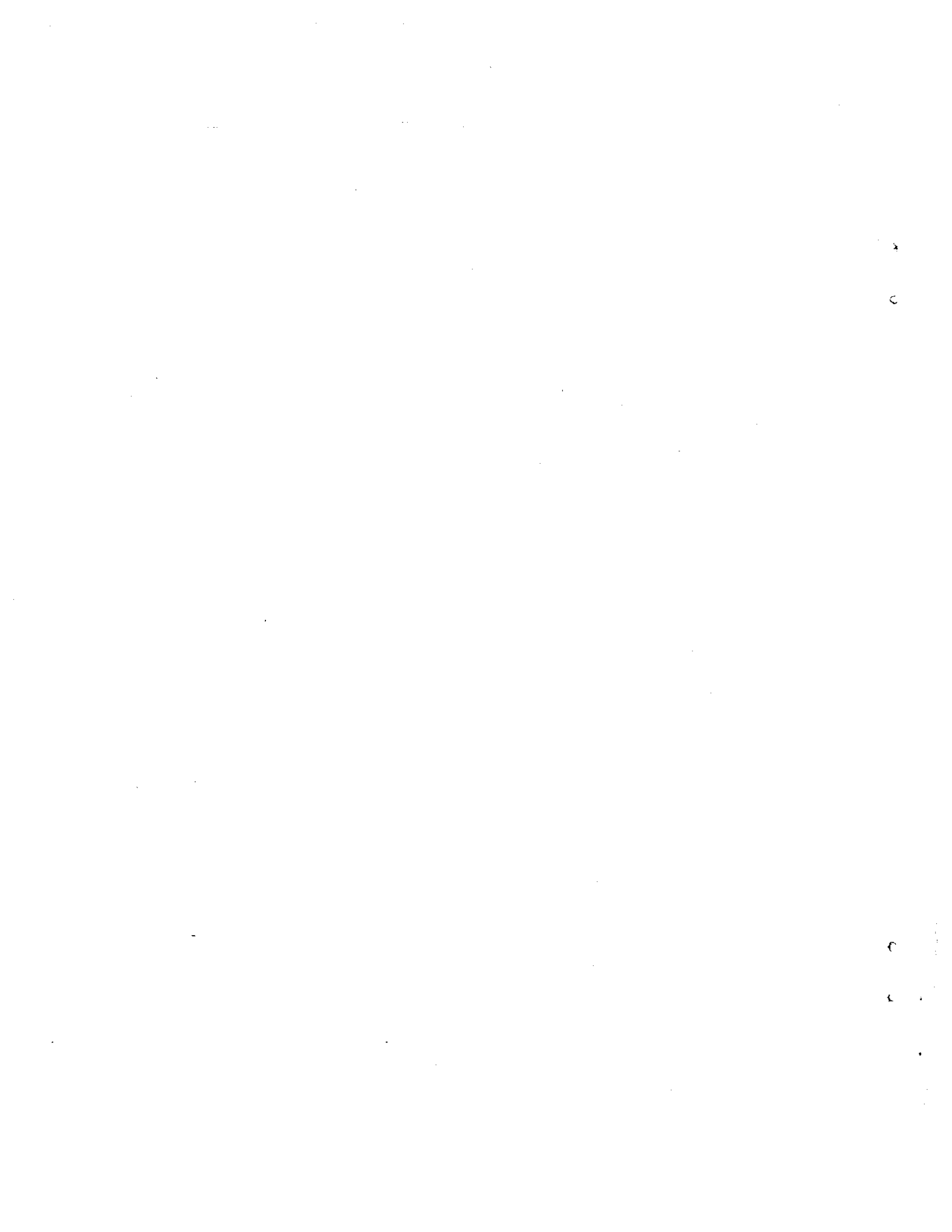
<p><u>APPLICANT</u></p> <p>Penn State University 248 Calder Way, #300 University Park, PA 16802</p> <p>Robert Killoren 814/865-3396</p> <p>Centre County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4030</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>Anthracite 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This project is for second year funding of the Anthracite Institute being conducted at Penn State University. The Anthracite Institute is 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.</p>	
<p><u>PROJECT STATUS</u></p> <p>This project was approved by the Board of Directors on June 13, 1991.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$87,191 Applicant Share: \$43,596 PEDA Share: \$43,595</p> <p><u>REMAINING PEDA BALANCE</u></p> <p>\$43,595</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

<p><u>APPLICANT</u></p> <p>BCR National Laboratory 500 William Pitt Way Pittsburgh, PA 15238</p> <p>Dr. Joseph Yerushalmi 412/826-3030</p> <p>Allegheny County</p>	<p><u>PROJECT NUMBER</u></p> <p>9003-4034</p> <p><u>TYPE OF ASSISTANCE</u></p> <p>Grant</p> <p><u>FUNDING CATEGORY</u> <u>FISCAL YEAR</u></p> <p>General Coal 90-91</p>
<p><u>PROJECT DESCRIPTION</u></p> <p>This project will investigate a new technique for the drying of fine coals. The approach is based on the use of vibrated beds in which a granular solid acquires a fluid-like mobility by the applications of mechanical vibrations without the need of an aerating gas. This approach could be used in lieu of thermal dryers, thereby significantly reducing the cost of the product.</p>	
<p><u>PROJECT STATUS</u></p> <p>This project was approved by the Board of Directors on June 13, 1991.</p>	
<p><u>FINANCIAL SUMMARY</u></p> <p>Total Project Cost: \$714,961 Applicant Share: \$615,000 PEDA Share: \$ 99,961</p> <p><u>REMAINING PED A BALANCE</u></p> <p>\$99,961</p>	<p><u>PROJECT START DATE</u></p> <p>N/A</p> <p><u>CONTRACT TERMINATION DATE</u></p> <p>N/A</p>

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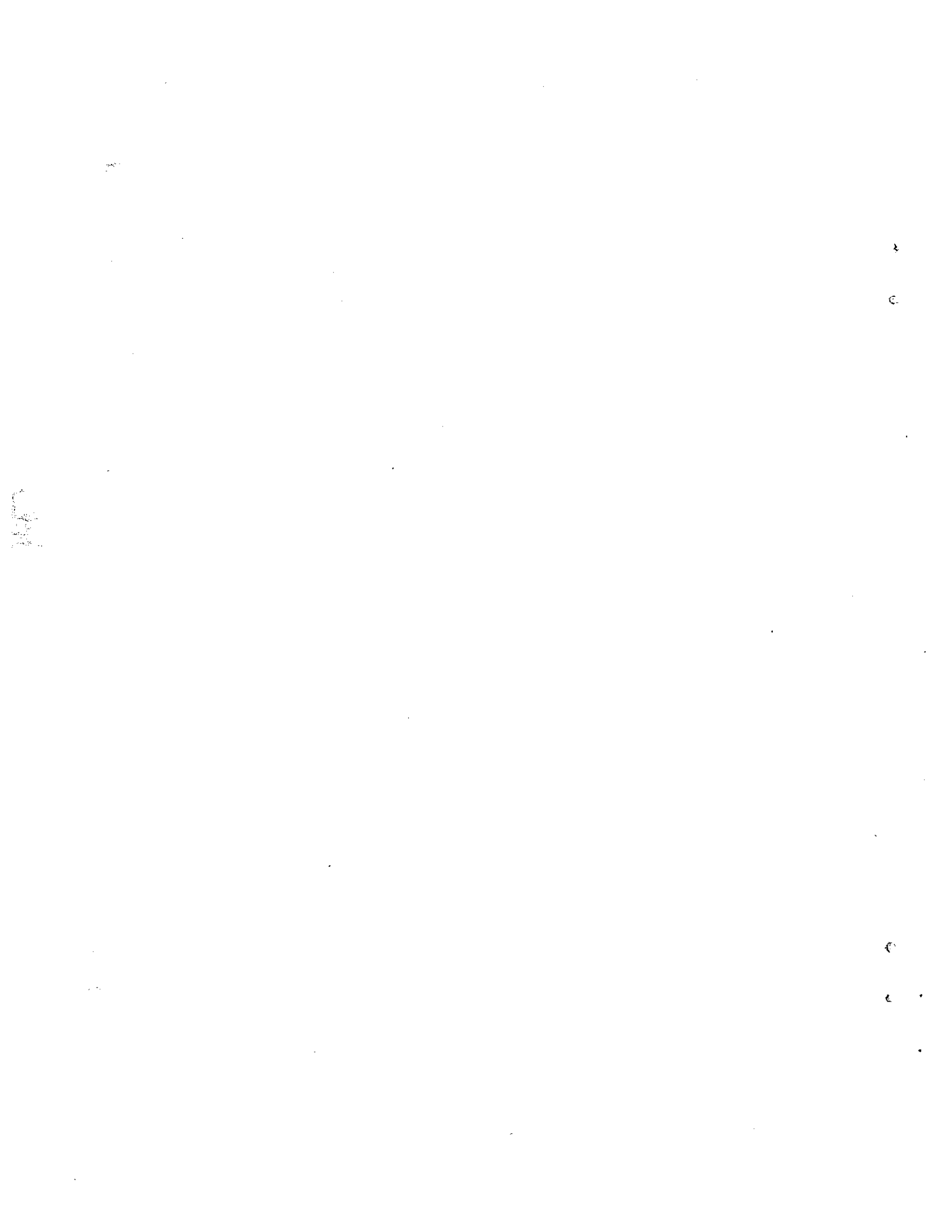
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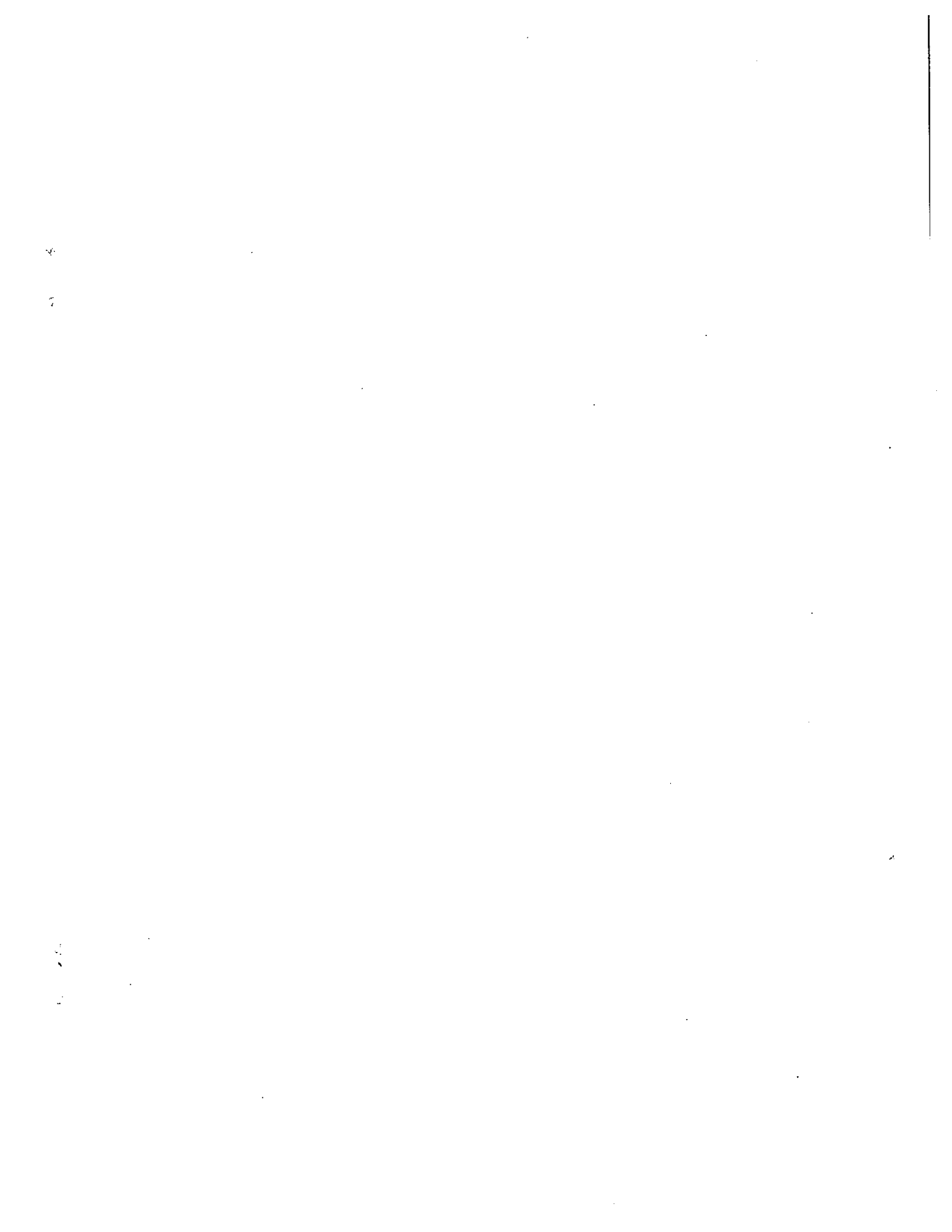


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