COMMISSION OF THE EUROPEAN COMMUNITIES

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MEMORANDUM

concerning a Community coal research programme in the field of mining engineering with a view to obtaining financial aid under the terms of article 55 § 2 c) of the ECSC treaty
(Budgetary year 1981)

MEMORANDUM

concerning a Community coal research programme in the field of product beneficiation with a view to obtaning financial aid under the terms of article 55 § 2 c) of the ECSC treaty
(Budgetary year 1981)

M E M O R A N D U M

CONCERNING A COMMUNITY COAL RESEARCH PROGRAMME IN THE FIELD OF MINING ENGINEERING WITH A VIEW TO OBTAINING FINANCIAL AID UNDER THE TERMS OF ARTICLE 55 § 2 c) OF THE E.C.S.C. TREATY

(Budgetary year 1981)

I. INTRODUCTION

In the future the Community's energy supply will have to depend more and more strongly on the use of coal. This will require considerable efforts to maintain or increase production capacity either by the enlargement of existing mines or by the development of new ones. The Community's mining undertakings will, particularly as a result of the necessary extension to increased depths, consequently be faced with scientific and technical problems that can not be solved without further intensive research and development.

On these grounds the Commission proposes the approval of a Community research programme in the field of mining engineering that will be carried out in close cooperation by the following institutions and undertakings:

- The National Coal Board, London, (NCB)
- The Steinkohlenbergbauverein, Essen (StBV)
- The Centre d'Etudes et Recherches des Charbonnages de France, Paris (CERCHAR)
- The Westfälische Berggewerksschaftskasse, Bochum, (WBK)

and for which financial aid under the terms of Art. 55 § 2 c) of the E.C.S.C. Treaty has been requested.

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II. AIMS AND OBJECTIVES OF THE PROGRAMME

The aims of this new programme may be summarized as follows:

Working environment and safety

Problems are caused particularly in this area by extension to greater depths for whose solution suitable means must be found. Only the increased rate of methane emission, the increasing temperature and the higher rock pressure need be mentioned here. In addition, attention must be given to further mechanization and automation in all underground operations in order to make work places more attractive.

Techniques

In preparatory work, the aim should be to increase the application of mechanized roadway drivage, with all its advantages. In the field of coal winning, it is desirable to develop efficient systems for extreme seam conditions and to optimise further the existing high performance methods.

Further developments are essential in connection with transport and supply systems since there is room here for still more rationalization.

The same is true for the field of management of operations, where trouble-free working with maximum safety and reduced costs can be assured only by the application of modern techniques of communication and data collection and evaluation.

III. PROGRAMME OF WORK ENVISAGED

The proposed new research programme takes the above requirements into account and is concentrated on the fields:

- Development work in coal and stone
- Methane studies, ventilation control and mine climate
- Rock pressure and supports
- Methods of working and techniques of coal getting
- Outbye operations underground
- Modern management techniques

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The overall programme will be carried out with close collaboration between the research institutes and the Community's mines. It comprises the following 19 projects.

Development work in coal and stone

A two-part Community project on the optimisation of heading machines is proposed here:

1. Optimisation of heading machines II (StBV)

   Part of the joint German/French proposal "Improvement of heading- and winning machines by further development of cutting techniques and optimisation of systems". Continuation of current studies of the further improvement of cutting methods for full-face machines and boom rippers, and of the improvement of operating procedures in roadway drivage.

   Total cost: DM 4 800 000

2. Use of high-pressure water jets in mining machinery (CERCHAR)

   Part of the joint German/French proposal "Improvement of heading- and winning machines by further development of cutting techniques and optimisation of systems". Continuation of current work on the integration of a high-pressure water jet as a supplementary cutting device in tunnelling- and winning machines.

   Total cost: FF 2 150 000

Methane studies, ventilation control and mine climate

This field contains a two-part Community project on the control of methane emission and two further projects concerning ventilation and mine climate.

3. Control of severe gas emission (StBV)

   Part of the joint German/French proposal "Estimation and control of methane emission". Improvement of mine safety and avoidance of interruption of operations by improved methods of estimation and control of degassing.

   Total cost: DM 3 300 000

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4. Computer-based control of methane drainage performance below ground by means of remotely-powered control valves (NCB)

Improved safety below ground, more efficient methane drainage and more stable purity level of methane extracted through computer-based control of the drainage system.

Total cost: £230 000

5. Assessment by scale modelling of aerodynamic losses in colliery shafts and surface fan drifts (NCB)

Improvement of ventilation and reduction of energy costs by systematic study of the configuration of ventilation shafts, the air velocity in upcast shafts, and modern fan designs.

Total cost: £58 000

6. Investigation of factors contributing to mine climate (NCB)

Improvement of working environment underground by continuation and extension of current studies on the prediction and control of mine climate at higher drivage rates and greater depth.

Total cost: £600 000

Rock pressure and supports

Two projects on strata control and one on the improvement of supports are proposed.

7. Prediction and control of dynamic phenomena (rock bursts)(CERCHAR)

Improvement of mine safety and avoidance of interruption of operations by prediction and control of rock bursts and associated gas outbursts.

Total cost: FF 3 500 000

8. Planning, installation, instrumentation and monitoring of circular roadway supports (NCB)

Improved safety and greater stability for new roadways in difficult

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geological conditions and at increased depths by the use of circular supports in conjunction with either full-face tunnelling machines or conventional drivage methods. Testing of various concrete sections and combinations of concrete sections and steel arches.

Total cost: £855 400

Methods of working and techniques of coal getting

In this field a project on winning in steep seams and a two-part Community project on the optimisation of winning techniques are proposed.

9. Development of a new coal winning technique for steep seams (CERCHAR)

Substitution of rising shortwall working, with its disadvantages (roof stability, low utilisation of the winning machine, etc.) in steep seams (60 - 90°), by working on the strike (vertically) with shield supports and hydraulic back filling.

Total cost: FF 5 000 000

10. Further development of winning machines to improve the quality of the raw coal (StBV)

Part of the joint German/British proposal "Further development of mechanised winning techniques to improve the quality of the raw coal with respect to size distribution, water content and dirt content", by adaptation of available winning methods or the development of new ones (e.g., combined cutting and hydraulic winning).

Total cost: DM 3 000 000

11. Application of natural gamma detectors for horizon indication on ranging drum shearers (NCB)

Part of the joint German/British proposal "Further development of mechanised winning techniques to improve the quality of the raw coal with respect to size distribution, water content and dirt content". Better roof control and lower dirt content in the raw coal by means of precise horizon control of the machine (uniform thickness of the roof coal) with the aid of a new detector for natural gamma radiation.

Total cost: £200 000

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Outbye operations underground

Two projects on the improvement of belt transport and shaft winding are proposed.

12. Direct measurement of stresses in operating conveyor belts with fabric reinforcement (StBV)

Development of a method for recording directly the stresses in conveyor belts to avoid breakdowns in conveying.

Total cost: DM 770 000

13. Tests on maintaining high-capacity shaft winding as depth increases (WBK)

Constructive adaptation of high-capacity shaft winding equipment to increased depths (greater than 1 200 m) by increasing the number of ropes and modification of winding machinery.

Total cost: DM 936 100

Modern management techniques

Six projects, including a two-part Community project, are proposed. These deal with the use of modern methods for seam reconnaissance, communication and data processing.

14. Seismic fault location : operational transition (NCB)

Part of the joint German/British proposal "Predicting geological faults to improve mine planning", with the aim of avoiding interruption of operations. Development of an operational apparatus for routine in-seam measurements on the basis of earlier work which laid the basis for a method of detecting faults at distances of up to 500 m.

Total cost: £250 000

15. Reconnaissance of geological faults with the aid of analysis of survey maps (StBV)

Part of the joint German/British proposal "Predicting geological faults to improve mine planning" with the aim of avoiding interruption of operations.

Total cost: DM 1 533 500

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16. Practical implementation of a radio highway system (NCB)

On the basis of current work the "Ariadne" system will be developed to the fully operational stage as a pit-wide system for signal transmission and speech communication, with particular regard to "sectionalisation" (avoidance of misdirected information) and a personal communication system.

Total cost: £450 000

17. Research into fibre optic data transmission (NCB)

Improvement of data transmission from a face machine (higher data rates, reliable transmission in areas of high electrical noise, safe non-electrical connection) by fibre optic transmission through the trailing cable to the gate end and hence to the surface. Data processing by micro-computer.

Total cost: £250 000

18. Scheme for computer based face monitoring with secondary computer management information systems (NCB)

Demonstration of a computer-based combination of face monitoring and information systems at four sites to achieve improved utilisation of face equipment and better organization of operations.

Total cost: £895 000

19. Machine health monitoring (NCB)

Reduction of lost operational time, improvement of machine availability and elimination of sources of accidents by continuous monitoring of the condition and operational safety of mining machinery with the help of appropriate sensors and data transmission systems.

Total cost: £760 000

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IV. ESTIMATED COST AND DURATION OF THE PROGRAMME

The total cost foreseen for the programme is

15 495 000 ECU*)

The costs of the individual projects are given in the following table. The duration of the projects varies between two and five years.

*) Rates of conversion from national currencies are those of 22 October 1980.

No.	Project	Proposer	Total cost ECU*)
	DEVELOPMENT WORK IN COAL AND STONE		
1.	Optimisation of heading machines II	StBV	1 874 500
2.	Use of high-pressure water jets in mining machinery	CERCHAR	364 000
	TOTAL		2 238 500
	METHANE STUDIES, VENTILATION CONTROL AND MINE CLIMATE		
3.	Control of severe gas emission	StBV	1 289 000
4.	Computer-based control of methane drainage performance below ground by means of remotely-powered control valves	NCB	409 000
5.	Assessment by scale modelling of aerodynamic losses in colliery shafts and surface fan drifts	NCB	103 500
6.	Investigation of factors contributing to mine climate	NCB	1 067 000
	TOTAL		2 868 500
	ROCK PRESSURE AND SUPPORTS		
7.	Prediction and control of dynamic phenomena (rock bursts)	CERCHAR	593 000
8.	Planning, installation, instrumentation and monitoring of circular roadway supports	NCB	1 521 000
	TOTAL		2 114 000

*) Rates of conversion from national currencies are those of 22 October 1980

No.	Project	Proposer	Total cost ECU*)
	METHODS OF WORKING AND TECHNIQUES OF COAL GETTING		
9.	Development of a new coal winning technique for steep seams	CERCHAR	846 500
10.	Further development of winning machines to improve the quality of raw coal	StBV	1 172 000
11.	Application of natural gamma detectors for horizon indication on ranging drum shearers	NCB	356 000
	TOTAL		2 374 500
	OUTBYE OPERATIONS UNDERGROUND		
12.	Direct measurement of stresses in operating conveyor belts with fabric reinforcement	StBV	301 000
13.	Tests on maintaining high-capacity shaft winding as depth increases	WBK	366 000
	TOTAL		667 000
	MODERN MANAGEMENT TECHNIQUES		
14.	Seismic fault location : operational transition	NCB	445 000
15.	Reconnaissance of geological faults with the aid of analysis of survey maps	StBV	599 000
16.	Practical implementation of a radio highway system	NCB	800 500
17.	Research into fibre optic data transmission	NCB	445 000
18.	Scheme for computer-based face monitoring with secondary computer management information systems	NCB	1 591 500
19.	Machine health monitoring	NCB	1 351 500
	TOTAL		5 232 500
	GRAND TOTAL		14 495 000

*) Rates of conversion from national currencies those of 22 October 1980

V. EXPECTED REPERCUSSIONS OF THE NEW PROGRAMME

The most important results to be expected from the research programme may be summarized as follows:

Mine safety and working environment

In the field of methane and ventilation the studies will lead, by improved control of methane at greater depths (No. 3) and better gas drainage (No. 4), not only to improved safety but, in addition, to trouble-free operation and improved operational results. The latter is also true for the work on aerodynamic losses (No. 5), while the studies of mine climate (No. 6) will also lead to an improvement in the working environment.

The research on rock pressure and supports is expected to lead to better control of rock bursts (No. 7) and greater stability of roadways (No. 8) and will thus make a significant contribution to safety.

The projects on heading machines (Nos. 1 and 2), underground transmission (Nos. 16 and 17) and modern management techniques (Nos. 18 and 19) will have a favourable effect on conditions in work places.

Techniques

The investigations related to heading machines (Nos. 1 and 2) should lead to faster heading rates and reduced costs for preparatory work.

In the field of coal winning, a better utilisation of reserves in steep seams (No. 9), better results in high-output faces through improved winning (No. 10) and better guidance of winning machines (No. 11) are to be anticipated.

In conveying and transport the avoidance of breakdowns in large conveyor systems (No. 12) and significant cost savings in shaft winding (No. 13) can be expected in particular.

In the field of organization and management of operations, the work on improved reconnaissance (Nos. 14 and 15) will lead to more trouble-free working and to the avoidance of unnecessary costs for the stopping and re-starting of coal extraction. The investigations of communications and data transmission (Nos. 16 and 17), the work on improved information

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technology (No. 18) and machine health monitoring (No. 19) should have important effects in relation to the organization of operations and operational results.

VI. DISSEMINATION OF RESEARCH RESULTS

The E.C.S.C. Experts' Committees which are already concerned with all research work in these fields will also supervise and keep under review the execution of the research work that forms the subject of the proposals.

The agreements to be concluded with the beneficiaries of the aid will define the rights and obligations of the contracting parties. They will be designed primarily to ensure that the research results will be made available to all concerned in the Community, in accordance with Art. 55 of the E.C.S.C. Treaty.

VII. CONCLUSIONS

In view of the importance and interest of the proposed research programme with regard to the techniques, the safety, the working environment and the economy of underground and surface operations in the Community's coal mines, the provision of financial aid by the E.C.S.C. for the carrying out of the individual projects is judged to be appropriate and justified.

The research programme will cost 15 495 000 ECU*) and the Commission proposes to grant aid totalling

9 297 000 ECU

to cover its share of the research costs.

Distribution of aid

CERCHAR (France)	1 082 100 ECU
NCB (United Kingdom)	4 854 000 ECU
StBV (Germany)	3 141 300 ECU
WBK (Germany)	219 600 ECU

*) Rates of conversion from national currencies are those of 22 October 1980.

M E M O R A N D U M

CONCERNING A COMMUNITY COAL RESEARCH PROGRAMME IN THE FIELD OF PRODUCT BENEFICIATION WITH A VIEW TO OBTAINING FINANCIAL AID UNDER THE TERMS OF ARTICLE 55 § 2 c) OF THE E.C.S.C. TREATY

(Budgetary year 1981)

I. GENERAL REMARKS

The renewed interest in coal that has arisen as a result of difficulties and uncertainties with regard to other energy sources gives a new emphasis to the need for continued and intensified efforts in the field of coal research and development in order to ensure that coal can be mined safely and efficiently and that it can be upgraded and used as effectively as possible.

Research related to coal beneficiation must be aimed, first of all, at ensuring that coal users can be supplied with a product of high and consistent quality, suited to their requirements. Other important topics in this field include improvement of the technology and economy of metallurgical coke manufacture, a matter of vital importance to the Community steel industry, and the conversion of coal to high value products, notably liquid fuels and feedstocks for the organic chemical industry which can be used as substitutes for products derived from oil. In addition, further research is needed on the upgrading of colliery spoil in order to alleviate the Community coal mining industry's problems over the disposal of that material.

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On these grounds the Commission proposes the approval of a Community research programme in the field of product beneficiation for which financial aid under the terms of Art. 55 § 2 c) of the E.C.S.C. Treaty has been requested and which will be carried out in close cooperation by the following institutions and undertakings :

- The British Carbonization Research Association, Chesterfield (BCRA)
- The Centre d'Etudes et Recherches des Charbonnages de France, Paris (CERCHAR)
- The Centro Sperimentale Metallurgico, Rome (CSM)
- Estel Hoogovens BV, IJmuiden (Hoogovens)
- Italsider S.p.A., Genoa (Italsider)
- The National Coal Board, London (NCB)
- The Steinkohlenbergbauverein, Essen (StBV)
- The Université Libre de Bruxelles (ULB)

The allocation of tasks within the programme takes account of the facilities and expertise existing in the various Community countries and collaboration between research workers and coal producers is assured.

II. AIMS AND OBJECTIVES OF THE PROGRAMME

The research projects in the field of product beneficiation for which aid is requested are related to four main topics and thus form four programmes :

- Mechanical coal preparation and coal transport
- Coking of coal
- Combustion of coal and new technologies for coal utilization, and
- Coal chemistry and physics and development of processes

The quantity of fine material in raw coal increases as more powerful coal winning machines are brought into operation. The programme on mechanical coal preparation and coal transport therefore includes projects aimed at improving the cleaning, sizing and filtration of fines. As new technologies, such as

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gasification and liquefaction, are introduced in the future, coal quality requirements will change, and there is likely to be a need for improved consistency of coal quality. The programme takes these needs into consideration and also includes work aimed at making the most efficient use of available equipment by means of tests on full-size units.

In the field of coking of coal the general aims of Community research include increasing the capacity and profitability of coke ovens, widening the coking coal range, maintaining and improving coke quality and solving problems of pollution. There is a strong interest in improving the assessment of metallurgical coke quality and, with this end in view, a project on the testing of coke under simulated blast furnace conditions is included in the research programme. The programme also includes projects directed towards the automation of coke oven operation, the reduction of energy consumption, increasing the yield of saleable coke, using larger proportions of poorly-coking coal, and improving the specification of oven refractories to reduce the risk of expensive damage.

The programme on combustion of coal and new technologies for coal utilization comprises a single project whose aim is to find new uses for colliery spoil with a view to reducing the environmental and other problems associated with spoil dumping.

The programme on coal chemistry and physics and development of processes includes a project related to the manufacture of high value materials from carbonization by-products, and a series of projects covering a wide range of fundamental research related to the upgrading of coal products and by-products, liquefaction, combustion and carbonization, whose purpose is to serve as a foundation for the improvement of existing processes and the development of new ones.

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III. PROGRAMME OF WORK ENVISAGED

The proposed research programme in the field of product beneficiation may be summarised as follows :

Mechanical coal preparation and coal transport

1. Development and testing of optimum processes and equipment for the preparation of coal in a form adapted to new technologies (StBV)

   Development and testing of methods and equipment for the preparation of coal with the most suitable size distribution and water content for use in new technologies such as gasification and liquefaction.

   Total cost : DM 1 750 000

2. Full performance testing of proprietary coal cleaning equipment (NCB)

   Provision of basic information about the performance of dense medium separation equipment, obtained from tests on full-scale units, to facilitate correct process selection and hence to achieve maximum product yield at minimum cost in new coal cleaning installations.

   Total cost : £ 150 000

3. Membrane pressure plate filtration (NCB)

   Examination and assessment of the application of membrane pressure plate filtration to the treatment of slimes and very fine washery tailings in order to improve filter press output, and to reduce the moisture content and the cost of filtration.

   Total cost : £ 350 000

4. Study of means of improving the wet sizing of coal fines (CERCHAR)

   Improvement in the size grading of coal fines, prior to their final preparation, in order to achieve reduced ash and sulphur contents.

   Total cost : FF 1 600 000

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5. The accuracy of sampling product streams (NCB)

Reassessment of the accuracy and bias of current techniques for sampling in coal preparation plants in the light of the increasing size of plants and product streams and the more stringent coal quality requirements of new technologies such as gasification and liquefaction.

Total cost : £ 400 000

Coking of coal

6. Evaluation of the characteristics and behaviour of coke at high temperature with reference to its use in the blast furnace (CSM)

Improved understanding of the characteristics and behaviour of blast furnace coke by the application of tests and simulation techniques already developed for ferrous materials.

Total cost : Lit 600 000 000

7. Methods for determining the end of the coking process in the ovens of a steel works coke plant : definition of a prediction model of the thermal state of the plant (Italsider)

Development of a system for monitoring and controlling the thermal condition of coke ovens and determining the end of the carbonization period. The aim of the project is to provide the elements for automatic data collection and a mathematical model of coke oven operation that can be used to achieve partial automation of the process.

Total cost : Lit 1825 000 000

8. Mathematical model for determination of thermal spalling in refractory material on the basis of practical relationships between rupture, physical properties and physical conditions (Hoogovens)

Diminution of risks to coke oven refractories by development of a mathematical model of thermal spalling to aid selection of refractories, brick shapes and heating conditions.

Total cost : Hfl 486 500

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9. Further contributions to the process control of coking plants (StBV)

Studies related to the partial computer control of coke oven operations aimed at reducing costs, diminishing pollutant emissions and maintaining product quality.

Total cost : DM 1 750 000

10. The influence of coke oven width on throughput and coke quality (StBV)

Investigation of the possibility of increasing the yield of saleable blast furnace coke by using ovens of increased width.

Total cost : DM 2 150 000

11. The thermal technology of coke ovens (StBV)

Study aimed at reducing the energy consumption of coke ovens. Mathematical formulation of relationships between heat transfer in oven walls and flues and the progress of carbonization, taking into consideration the type of oven construction and the operating conditions.

Total cost : DM 1 377 000

12. Research into the use of briquetted coal (CERCHAR)

Widening of the coking coal range by application of the technique of partial briquetting of the coal charge to increase the charge density.

Total cost : FF 1 990 000

Combustion of coal and new techniques for coal utilization

13. Utilization of tailings in road building and as a feedstock for constructional materials (StBV)

Development and testing of methods and equipment for the manufacture of products that can be used in various branches of the construction industry. Both thermal and mechanical processing of tailings will be considered.

Total cost : DM 1 400 000

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Coal chemistry and physics and development of processes

14. Electrical, chemical and physical properties of coal tar pitch for electrode manufacture (BCRA)

Study of pitch properties in order to improve methods of assessing pitch for the manufacture of electrodes for the metallurgical industry.

Total cost : £ 160 000

15. Physical and chemical valorisation of coal and its by-products (CERCHAR)

Further development of a programme of basic studies with particular emphasis on coal hydrogenation, ignition and pyrolysis of coal, investigation of pitch properties, and upgrading of colliery spoil.

Total cost : FF 2 925 000

16. Production of hydrocarbons by pyrolysis of coals under pressure and in the presence of reactive gases during their primary devolatilization. Upgrading of the hydrocarbons and residual char (ULB)

Production of light aromatic hydrocarbons and light phenols during the primary stages of coal gasification under pressure by reaction with hydrogen or steam.

Total cost : FB 24 539 000

17. Chemical and physical valorisation of coal (StBV)

Basic research aimed at improving coal liquefaction processes. Fundamental studies of carbonization with a view to widening the coking coal range. Development of new methods of deriving high value chemicals from coal liquefaction products and coking by-products.

Total cost : DM 4 000 000

18. Optimisation studies on the liquefaction of coal (NCB)

Optimisation, in terms of hydrogen requirements and thermal efficiency, of process conditions for the extraction of coal with a recycled liquid solvent and hydrocracking of the solution to produce distillate oils suitable for the manufacture of transport fuels and chemical feedstocks.

Total cost : £ 2 243 000

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IV. ESTIMATED COST AND DURATION OF THE RESEARCH WORK

The total cost foreseen for the programme is

14 609 000 ECU.*)

The cost of the individual projects is given in the following table.

The duration of the projects varies between 2 and 4 years.

No.	Project	Proposer	Total cost ECU*)
	MECHANICAL COAL PREPARATION AND COAL TRANSPORT		
1	Development and testing of optimum processes and equipment for the preparation of coal in a form adapted to new technologies	StBV	683 500
2	Full performance testing of proprietary coal cleaning equipment	NCB	267 000
3	Membrane pressure plate filtration	NCB	622 500
4	Study of means of improving the wet sizing of coal fines	CERCHAR	271 000
5	The accuracy of sampling product streams	NCB	711 500
	TOTAL		2 555 500
	COKING OF COAL		
6	Evaluation of the characteristics of coke at high temperature with reference to its use in the blast furnace	CSM	495 500
7	Methods for determining the end of the coking process in the ovens of a steel works coke plant: definition of a prediction model of the thermal state of the plant	Italsider	1 507 000
8	Mathematical model for determination of thermal spalling in refractory material on the basis of practical relationships between the appearance of rupture, physical properties and physical conditions	Hoogovens	175 500
9	Further contributions to the process control of coking plants	StBV	683 500
10	The influence of coke oven width on throughput and coke quality	StBV	840 000
11	The thermal technology of coke ovens	StBV	538 000
12	Research into the use of briquetted coal	CERCHAR	337 000
	TOTAL		4 576 500

*) Rates of conversion from national currencies are those of 22 October 1980.

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No.	Project	Proposer	Total cost ECU*)
	COMBUSTION OF COAL AND NEW TECHNIQUES FOR COAL UTILIZATION		
13	Utilization of tailings in road building and as a feedstock for constructional materials	StBV	547 000
	COAL CHEMISTRY AND PHYSICS AND DEVELOPMENT OF PROCESSES		
14	Electrical, chemical and physical properties of coal tar pitch for electrode manufacture	BCRA	284 500
15	Physical and chemical valorisation of coal and its by-products	CERCHAR	495 500
16	Production of hydrocarbons by pyrolysis of coals under pressure and in the presence of reactive gases during their primary devolatization. Upgrading of the hydrocarbons and residual char	ULB	599 000
17	Chemical and physical valorisation of coal	StBV	1 562 500
18	Optimisation studies on the liquefaction of coal	NCB	3 988 500
	TOTAL		6 930 000
	GRAND TOTAL		14 609 000

V. RESEARCH RESULTS

The E.C.S.C. Experts' Committeeswhich are already concerned with all research work in these fields will also supervise and keep under review the execution of the research work that forms the subject of the requests.

The agreements to be concluded with the beneficiaries of the aid will define the rights and obligations of the conctracting parties. They will be designed primarily to ensure that the research results will be made available to all concerned in the Community, in accordance with Art. 55 of the E.C.S.C. Treaty.

*) Rates of conversion from national currencies are those of 22 October 1980.

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VI. EXPECTED REPERCUSSIONS OF THE RESEARCH PROGRAMME

The research programme will contribute to the efficiency and economy of coal preparation by facilitating the correct selection of equipment and improving methods of treatment, especially of fine material. It will also help coal preparation plants to adapt to changes in both the quality of the raw coal and the requirements of coal users.

In the field of coking of coal the research work will lead to improvements in oven operation that will have favourable effects on the economy of the industry (through improvements in yield, reduced energy consumption, the use of cheaper coals, etc.). The studies directed towards partial automation are also expected to lead to reduced pollution and an improvement in the working environment. The development of coke quality assessment will be of value to the Community steel industry by virtue of the contribution that it will make to the improved specification of coke and the efficiency of blast furnace operation.

The project forming the programme on combustion of coal and new technologies for coal utilization will contribute towards the provision of outlets for spoil-based materials and will consequently help to reduce the need for spoil dumping with its associated cost, environmental and space problems.

The programme on coal chemistry and physics and development of processes will provide a valuable back-up for the development of new processes that can be applied industrially and the improvement of existing processes, and will contribute especially to the production of coal-based substitutes for oil and oil products.

VII. CONCLUSIONS

For the reasons outlined above, the provision of financial aid by the Community for the proposed research work in the fields of mechanical coal preparation and coal transport, coking of coal, combustion of coal and new techniques for coal utilization, and coal chemistry and physics and development of processes is judged to be appropriate and justified.

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The research programme will cost 14 609 000 ECU*) and the Commission proposes to grant aid totalling

8 765 400 ECU.

Distribution of aid

BCRA (United Kingdom)	170 700 ECU
CERCHAR (France)	662 100 ECU
CSM (Italy)	297 300 ECU
Hoogovens (Netherlands)	105 300 ECU
Italsider (Italy)	904 200 ECU
NCB (United Kingdom)	3 353 700 ECU
StBV (Germany)	2 912 700 ECU
ULB (Belgium)	359 400 ECU

*) Rates of conversion from national currencies are those of 22 October 1980.