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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 E.C.S.C. TREATY

(Budgetary year 1982)

MEMORANDUM

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 1982)

(submitted to the Council by the Commission)

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MEMORANDUMCONCERNING A COMMUNITY COAL RESEARCH PROGRAMME IN THE FIELD OF MINING
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I. INTRODUCTION

The expected increase in coal use presents the Community's mines with the problem of meeting the necessary requirements with regard to safety, technology, organization and economy. Since, for the existing reserves, this is not possible without a further intensive R&D effort, 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, and for which financial aid under the terms of Art. 55 § 2 c) of the ECSC Treaty has been requested.

- The National Coal Board, London (NCB)
- The Steinkohlenbergbauverein, Essen (StBV)
- The Centre d'Etudes et Recherches des Charbonnages de France, Paris (CERCHAR)
- The Institut National des Industries Extractives, Liège (INIEX)
- The Institut d'Hygiène des Mines, Hasselt (IHM)

II. AIMS AND OBJECTIVES OF THE PROGRAMME

The aims of the new programme may be summarised as follows:

Working environment and safety

The increased intensity of operation and extension to greater depths have a major influence in this field. The negative influences of these

unavoidable developments, namely the increased rate of methane release, the increasing temperatures and the increasing rock pressure make urgently necessary the development of suitable solutions for such problems. In parallel, care must be taken in all areas of underground operations to make working conditions as attractive as possible.

Technology

In preparatory work, the desired increase in the use of heading machines is strongly dependent on the development of new cutting techniques. In coal winning the face end region still presents a major hindrance to highly mechanised or even automated operation. Finally, in the field of transport and supply, it is absolutely necessary to make use of the most up-to-date means of rationalisation.

Organization and economics

The avoidance of long or short interruptions in operations is an important prerequisite for obtaining better technical and economic results. To achieve this aim, thorough reconnaissance of reserves as a basis for sound planning, and the use of the most modern techniques for communication and the monitoring and control of operations are necessary.

III. PROGRAMME OF WORK ENVISAGED

The new programme proposed takes the above requirements into account and concentrates on the following 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

The overall programme will be carried out with close collaboration between the research institutes and the Community's mines. It comprises the following 21 projects.

Development work in coal and stone

A two-part joint project, "Improvement of performance in roadway drivage by increased effectiveness of cutting" is proposed here.

1. Actuated boring II (StBV)

Continuation of work begun under the project "Actuated boring I" on the development or improvement of new actuated boring tools of various types and sizes.

Total cost: DM 1 446 000

2. Effect of high-pressure water jets on the performance of boom-type tunnelling machines (NCB)

Increase in drivage rates, reduced cutting forces, cooling and dust suppression by the combination of high-pressure water jets and mechanical cutting tools on tunnelling machines.

Total cost: UK£ 203 000

Methane studies, ventilation control and mine climate

A three-part joint project on "Prediction and control of gas emission" (Nos. 3-5) and two projects on gas drainage and ventilation control are proposed.

3. Investigation and application of new methods for observing, evaluating and controlling the emission and flow of methane (CERCHAR)

Improvement of models for the prediction and control of methane emission, taking into account the dynamics of emission, the interaction of methane flows between neighbouring workings and methane outbursts in workings in permeable seams.

Total cost: FF 2 100 000

4. Investigation of firedamp and its emission in coal seams (NCB)

Continuation of the development of a method for prediction of emission to improve planning and increase safety.

Total cost: UK£ 851 500

5. Automated management of methane drainage (INIEX)

Automation of drainage (variable dampers, microprocessors, etc.) in order to ensure the prompt and sufficient supply of gas of the required quality to consumers.

Total cost: FB 9 320 000

6. Development of telemetry of ventilation and climate for the control of main and secondary ventilation (IHM)

Development of an improved system for remote monitoring of methane and climate with a view to improving the distribution of ventilation (remote monitoring of air flow, and a new type of remote hygrometer).

Total cost: FB 4 000 000

7. Mine fan monitoring (NCB)

Improved safety through the development of a packaged system (part of the MINOS system) for continuous monitoring of main, booster and auxiliary fans.

Total cost: UK£ 245 000

Rock pressure and supports

Two three-part joint projects on "Studies of the parameters influencing the construction and lifetime of shield supports with a view to improving roof control and achieving better functional control" (Nos. 8-10) and "Investigation of strata properties and strata behaviour with a view to early detection of changing conditions and to improve the design of roadway support systems" (Nos. 11-13) are proposed under this heading.

8. An investigation of yield zone development around longwall coal faces (NCB)

Greater safety, more effective roof control and better design of face supports through systematic measurement of the development of yield and fracture zones in the face region.

Total cost: UK£ 109 000

9. Measuring installations for recording and evaluation of rock properties (StBV)

Improved prediction of the effect of coal winning on roadways by the testing of newly-developed measuring installations and preparation of the relevant data base.

Total cost: DM 1 365 000

10. Shield support - simpler, lighter, more effective (StBV)

Continuation of work begun under the project "A lighter and simpler shield support" on the further development and reduction in weight of shield supports.

Total cost: DM 2 020 000

11. Strata loading of mine roadway supports (NCB)

Improved roof control and safety through development of a basis for selecting roadway supports as a function of their loading.

Total cost: UK£ 105 500

12. Improvement of roadway supports (INIEX)

Control of high rock pressure by the use of circular supports constructed from prefabricated concrete elements in main roadways and adaptation of these supports to operations with full-face tunnelling machines.

Total cost: FB 10 550 000

13. Planning, installation and monitoring of circular roadway supports - Phase II (NCB)

Second phase of a current project under the same title. Increased safety and greater stability of new main roadways under difficult strata conditions

and at greater depths by application of circular supports in combination with full-face tunnelling machines or conventional roadway drivage. Testing of various concrete segments or combinations of concrete segments and steel.

Total cost: UK£ 284 000

Methods of working and techniques of coal getting

In this section there are two projects on the solution of problems at the face/roadway intersection.

14. Face end fundamentals; application to coal deposits (StBV)

Continuation of work under the project "Improvement of face ends" on the systematic study of all factors and criteria related to the optimal layout of face/roadway intersections, especially through the development of a suitable measurement technique and measurement of important factors on the basis of the "Face end system" already available.

Total cost: DM 1 157 000

15. Development of face end machines II (StBV)

Continuation of the project "Development of face end machines" on the improvement of the conduct of operations at face/roadway intersections, principally by the development of special cutting machines for this area.

Total cost: DM 3 400 000

Outbye operations underground

Here, two projects deal with the further development of new and conventional conveying and transport techniques.

16. Improvement of hydraulic and pneumatic transport (StBV)

Further development of both hydraulic transport in shafts (increase in capacity), in roadways (coal, debris, waste rock) and on the surface (washery discard) and pneumatic transport of backfilling material with the aim of improving safety and reducing cost.

Total cost: DM 2 000 000

17. Improvement of conveying and transport techniques II (StBV)

Continuation of the project "Improvement of conveying and transport techniques" in order to achieve further optimisation and increased throughput of underground conveying, material transport and transfer equipment (increased quantities of material, increasing weights, flexibility, safety in the workplace, etc.).

Total cost: DM 2 309 000

Modern Management techniques

A project on reconnaissance of deposits, together with three others on the improvement of communications, remote control and the application of computers are proposed.

18. Guided longhole drilling (NCB)

Development of a longhole drilling technique and of the guidance mechanism as an alternative for reconnaissance ahead of the face in both coal seams (winning) and adjacent rocks (roadway drivage).

Total cost: UK£ 440 500

19. Underground data communications (NCB)

Development of an efficient data transmission system as a prerequisite for the use of the latest computer technology (microprocessors) for extended and comprehensive control and monitoring of operations.

Total cost: UK£ 930 000

20. New remote control systems for winning and tunnelling machines, loaders and transport equipment (CERCHAR)

Increased efficiency and wider field of application of remote control of machines by the application of the most up-to-date technology (multiple proportional control, microprocessors, line-of-sight control devices, control via power cables, etc.).

Total cost: FF 2 100 000

21. Development of MINOS 2 (NCB)

Further development and wider application of the MINOS system for the monitoring and control of operations by the use of the latest developments in computer technology.

Total cost: UK£ 397 500

IV. ESTIMATED COST AND DURATION OF THE PROGRAMME

The total estimated cost for the programme is

13 155 000 ECU*

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

*Rates of conversion from national currencies are those of 30 November 1981

No.	Project	Proposer	Total cost ECU*
	<u>DEVELOPMENT WORK IN COAL AND STONE</u>		
1.	Actuated boring II	StBV	590 000
2.	Effect of high-pressure water jets on the performance of boom-type tunnelling machines	NCB	359 500
		Total	949 500
	<u>METHANE STUDIES, VENTILATION CONTROL AND MINE CLIMATE</u>		
3.	Investigation and application of new methods for observing, evaluating and controlling the emission and flow of methane	CERCHAR	339 500
4.	Investigation of firedamp and its emission in coal seams	NCB	1 506 000
5.	Automated management of methane drainage	INIEX	226 000
6.	Development of telemetry of ventilation and climate for the control of main and secondary ventilation	IHM	97 000
7.	Mine fan monitoring	NCB	433 500
		Total	2 602 000
	<u>ROCK PRESSURE AND SUPPORTS</u>		
8.	An investigation of yield zone development around longwall coal faces	NCB	193 000
9.	Measuring installations for recording and evaluation of rock properties	StBV	557 000
10.	Shield support - simpler, lighter, more effective	StBV	824 000
11.	Strata loading of mine roadway supports	NCB	187 000
12.	Improvement of roadway supports	INIEX	256 000
13.	Planning, installation and monitoring of circular roadway supports - Phase II	NCB	502 500
		Total	2 519 500
	<u>METHODS OF WORKING AND TECHNIQUES OF COAL GETTING</u>		
14.	Face end fundamentals; application to coal deposits	StBV	472 000
15.	Development of face end machines II	StBV	1 387 000
		Total	1 859 000

*Rates of conversion from national currencies are those of 30 November 1981

No.	Project	Proposer	Total cost ECU*
	<u>OUTBYE OPERATIONS UNDERGROUND</u>		
16.	Improvement of hydraulic and pneumatic transport	StBV	816 000
17.	Improvement of conveying and transport techniques II	StBV	942 000
		Total	1 758 000
	<u>MODERN MANAGEMENT TECHNIQUES</u>		
18.	Guided longhole drilling	NCB	779 500
19.	Underground data communications	NCB	1 645 000
20.	New remote control systems for winning and tunnelling machines, loaders and transport equipment	CERCHAR	339 500
21.	Development of MINOS 2	NCB	703 000
		Total	3 467 000
		Grand total	13 155 000

*Rates of conversion from national currencies are those of 20 November 1981

V. EXPECTED REPERCUSSIONS OF THE NEW PROGRAMME

The most important results to be expected from the new programme may be summarised as follows:

Mine safety and working environment

In the field of methane studies and ventilation control, the work on prediction and control of gas emission in particular (Nos. 3 and 4) will have a direct effect on safety as a consequence of improved planning and the avoidance of accumulations of methane. The control of methane drainage (No. 5) will, apart from its economic advantages, also lead indirectly to improved safety. Of the projects on ventilation surveillance, the one on mine fan monitoring (No. 7) will very quickly have an influence on safety, while the preliminary work on automatic control of ventilation (No. 6) will give long-term benefits for mine climate.

With regard to rock pressure and supports, the theoretical studies and work on measurement techniques (Nos. 8, 9 and 11) will lay the foundation for further developments, while the projects on the improvement of supports themselves (Nos. 10, 12 and 13) will facilitate the transfer of previous results into practice, thus rapidly leading to developments in roof control.

Favourable consequences for coal winning are expected to follow from the projects on the improved management of the dangerous face end region.

The conditions in the work place will be directly improved, particularly through the projects on improved transport and conveying (Nos. 16 and 17), communications (No. 19) and remote control (No. 20), while the studies on seam reconnaissance (No. 18) and monitoring of operations (No. 21) should have an indirect influence.

Technology

In the field of outbye services the studies on the improvement of drilling techniques (No. 1) and the development of new cutting processes (No. 2), will, in addition to making the work easier, give rise to increased rates of advance and hence to a reduction in costs.

In coal winning, work on the optimum layout of face ends and the development of appropriate machines (Nos. 14 and 15) is expected to lead to the elimination of operational problems, and hence to increased winning rates.

Safety will be improved in development work by the improvement of transport and conveying (Nos. 16 and 17). These projects will also give increases in capacity and reductions in cost in winding and material transport.

Organisation and economy

Rational planning and the avoidance of interruptions can be expected to result from the research into improved seam reconnaissance (No. 18), and this will have important economic consequences.

The project on underground communications, remote control and up-to-date monitoring techniques (Nos. 19-21) will lay the basis for a further improvement in organization and thus for interruption-free operation.

VI. DISSEMINATION OF RESEARCH RESULTS

The ECSC Experts' Committees which are concerned with research work in the various fields of the new programme 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 ECSC Treaty.

VII. CONCLUSIONS

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

The research programme will cost 13 155 000 ECU* and the Commission proposes to grant aid totalling

7 893 000 ECU

to cover its share of research costs.

*Rates of conversion from national currencies are those of 30 Nov. 1981/..

Distribution of aid

CERCHAR (France)	407 400 ECU
NCB (United Kingdom)	3 785 400 ECU
StBV (Germany)	3 352 800 ECU
INLEX (Belgium)	289 200 ECU
IHM (Belgium)	58 200

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

(Budgetary year 1982)

I. INTRODUCTION

The events of recent years have served to emphasise the vulnerability of the European Community with regard to energy supplies. It is generally acknowledged that the Community's dependence on imported hydrocarbons should be reduced and that increased coal use has an important rôle to play in achieving greater security of supply. However, new and traditional uses for coal must be developed and improved if this objective is to be achieved.

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 § 2c) 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)
- The Deutscher Braunkohlen-Industrie-Verein, Cologne (DEBRIV)
- The National Coal Board, London (NCB)
- NEI International Combustion Limited, Derby (NEI)
- The Steinkohlenbergbauverein, Essen (StBV)

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 problem of handling and treating the increased quantity of fine material that results from the introduction of more powerful coal-winning machinery is a major preoccupation among coal preparation engineers, and is the theme of the four projects that form the research programme in the field of mechanical coal preparation and coal transport. The projects are aimed at improving the preparation of fines and the control of the processes involved.

The research programme on the coking of coal covers the Community's principal aims in that field. Two fundamental studies of coke texture and the mechanism of formation of coke are aimed at providing a basis for the optimum use of available coals and the improvement of coke quality; the purpose of continuing research on the use of stamp charging in combination with charge preheating is to widen the range of coals that can be carbonized successfully; further work on the control of coke oven heating is intended to improve the economy and efficiency of coking plant operation; finally, two projects on the treatment of gaseous and liquid by-products are aimed at reducing, or even eliminating problems related to liquid effluents as well as at upgrading the gases produced during carbonization.

The projects in the field of combustion of coal and new technologies for coal utilization are concerned, in the first place, with the substitution of coal for oil and natural gas in general industry, electricity generation and the blast furnace. Other projects deal with the improvement of coal distribution and handling in small-to-medium industrial applications and

with environmental problems related to the ash resulting from coal combustion or processing and to the trace elements present in coal.

The three projects in the field of coal chemistry and physics and development of processes are aimed at widening the range of organic chemicals and liquid fuels that can be manufactured by liquefaction of coal to provide substitutes for products made from oil and natural gas, and at improving the economy and efficiency of coal liquefaction.

III. PROGRAMME OF WORK ENVISAGED

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

Mechanical coal preparation and coal transport

1. Improved dewatering of small coal and fines (StBV)

Continuation of research aimed at improving the dewatering of fine material to obtain products with the desired moisture content without resorting to costly thermal drying.

Total cost: DM 843 000

2. The interaction of processes in fines treatment plants (NCB)

Pilot-scale tests to improve the quality and consistency of coal produced by increasing machine capacity. The project will lead to the development and testing of a method of control for the total fines treatment system.

Total cost: UK£ 247 300

3. Investigation to improve the handlability of wet fine coal (NCB)

The purpose of the project is to find a solution to the problem of the deterioration that occurs in coal handlability and flow properties as the fines content increases, so that fine coal can be prepared and sold competitively.

Total cost: UK£ 265 000

4. Influence of the quality of washery water on grading and flocculation (StBV)

The aim of the project is to study the influence of, and the interactions between the chemicals (salts, flocculants, etc) present in washery water with a view to improving the preparation of coal fines.

Total cost: DM 804 000

Coking of coal

5. Optimisation of texture of carbon in coke (BCRA)

Study of the influence of coke carbon texture on the gasification and breakage behaviour of cokes with a view to identifying the optimum texture. Investigation of means of achieving this optimum texture in cokes made from poorer quality coals.

Total cost: UK£ 211 730

6. Contribution to the study of the mechanism of formation of coke (CERCHAR)

Improvement of methods of predicting coke quality and defining the rôle of additives incorporated into coking blends, and development of new laboratory tests for quality prediction.

Total cost: FF 2 000 000

7. Production of blast furnace coke in slot-type ovens from blends without conventional coking properties by the combined application of preheating and stamp charging (CERCHAR)

The aim of the project is to develop an industrial installation for the regular charging of a battery of 43 coke ovens.

Total cost: FF 2 735 000

8. Development of systematic controls for the thermal regulation of batteries and the production of coke (CERCHAR)

Continuation of work on optimisation of the control of the heating of coke oven batteries to reduce energy consumption and to improve productivity and coke quality.

Total cost: FF 2 000 000

9. Treatment of condensates and washing water in coking plants - II (StBV)

Continuation of studies aimed at improving the removal or recovery of harmful organic and inorganic materials (phenols, ammonia, hydrogen sulphide, etc.) from coke oven effluent in order to reduce treatment costs and water consumption and to minimise pollution. The ultimate aim is to enable a coking plant to operate without producing liquid effluent.

Total cost: DM 1 034 000

10. Conversion of tar-containing coke oven gas in a pulsating combustor and treatment of the product gases (StBV)

The aim of the project is to improve the economy of coking plant operation by reducing the cost of gas cleaning and liquid effluent treatment and finding new outlets for coke oven gas.

Total cost: DM 2 763 000

Combustion of coal and new techniques for coal utilization

11. Optimisation trials on large burners firing coal-water mixtures and burners firing dense-phase, air-conveyed pulverised coal (NEI)

Investigation of coal firing systems aimed at conversion of large-scale steam-raising plant from oil and gas firing to coal firing.

Total cost: UK£ 363 847

12. Preparation and injection into the blast furnace of coal-water mixtures (CSM)

Investigation of the possibility of replacing fuel oil injection into blast furnace tuyères by injection of mixtures of water and Community coal (coking or non-coking) or available coke breeze.

Total cost: LIT 870 000 000

13. Improvements to coal transport methods (NCB)

Improvement of the acceptability of coal for industrial use, particularly for combustion equipment below 30 MW (thermal) capacity, by developing new and improved methods of coal delivery and improved reception facilities. Emphasis will be placed on automation, convenience and environmental acceptability.

Total cost: UK£ 398 600

14. Disposal and utilization of ash residues (NCB)

Assessment of the environmental impact of the disposal of ash residues produced by new coal processing technology, and investigation of methods of utilizing such residues.

Total cost: UK£ 262 000

15. Study of the conditions of formation and evolution of trace pollutants during coal combustion in industrial furnaces (CERCHAR)

Assessment of the real risks of pollution associated with the predicted increase in the number of medium-sized, coal-fired installations.

Total cost: FF 1 500 000

Coal chemistry and physics and development of processes

16. Synthesis of chemical feedstocks and intermediates (NCB)

The aim of the project is to establish technically feasible methods for manufacturing certain important organic chemicals (starting materials for plastics, resins, synthetic rubber and textiles) from coal via synthesis gas and methanol instead of from naphtha and natural gas.

Total cost: UK£ 421 000

17. Refining of coal oils to produce fuels and feedstocks (NCB)

Study of the beneficiation of coal oil distillates to produce gasoline, diesel and aviation fuels, and chemical feedstocks to meet the specifications of existing markets. Development, for coal refining, of equipment and methods based on those used in the petroleum industry.

Total cost: UK£ 753 700

18. Studies of the liquefaction of lignite by hydrogenation (DEBRIV)

Development of improved techniques for the preparation and hydrogenation of lignite to make the process of liquefaction economically more attractive as a means of replacing imported hydrocarbons.

Total cost: DM 1 850 000

IV. ESTIMATED COST AND DURATION OF THE RESEARCH WORK

The total cost foreseen for the programme is

10 139 500 ECU*

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

The duration of the projects varies between 2 and $3\frac{1}{2}$ years.

*Rates of conversion from national currencies are those of 30 November 1981

No.	Project	Proposer	Total cost ECU*
<u>MECHANICAL COAL PREPARATION AND COAL TRANSPORT</u>			
1.	Improved dewatering of small coal and fines	StBV	344 000
2.	The interaction of fines treatment processes	NCB	437 500
3.	Investigation to improve the handlability of wet fine coal	NCB	469 000
4.	Influence of the quality of washery water on grading and flocculation	StBV	328 000
		Total	1 578 500
<u>COKING OF COAL</u>			
5.	Optimization of texture of carbon in coke	BCRA	374 500
6.	Contribution to the study of the mechanism of formation of coke	CERCHAR	323 500
7.	Production of blast furnace coke in slot-type ovens from blends without conventional coking properties by the combined application of preheating and stamp charging	CERCHAR	442 000
8.	Development of systematic controls for the thermal regulation of batteries and the production of coke	CERCHAR	323 500
9.	Treatment of condensates and washing water in coking plants - II	StBV	422 000
10.	Conversion of tar-containing coke oven gas in a pulsating combustor and treatment of the product gases	StBV	1 127 000
		Total	3 012 500
<u>COMBUSTION OF COAL AND NEW TECHNIQUES FOR COAL UTILIZATION</u>			
11.	Optimisation trials on large burners firing coal-water mixtures and burners firing dense-phase, air-conveyed pulverised coal	NEI	643 500
12.	Preparation and injection into the blast furnace of coal-water mixtures	CSM	661 000
13.	Improvements to coal transport methods	NCB	705 000
14.	Disposal and utilization of ash residues	NCB	463 500
15.	Study of the conditions of formation and evolution of trace pollutants during coal combustion in industrial furnaces	CERCHAR	242 500
		Total	2 715 500

*Rates of conversion from national currencies are those of 30 November 1981

No.	Project	Proposer	Total cost ECU*
	<u>COAL CHEMISTRY AND PHYSICS AND DEVELOPMENT OF PROCESSES</u>		
16.	Synthesis of chemical feedstocks and intermediates	NCB	745 000
17.	Refining of coal oils to produce fuels and feedstocks	NCB	1 333 000
18.	Studies of the liquefaction of lignite by hydrogenation	DEBRIV	755 000
		Total	2 833 000
		Grand total	10 139 500

V. EXPECTED REPERCUSSIONS OF THE RESEARCH PROGRAMME

The research programme will contribute to the efficiency and economy of coal preparation by improving the effectiveness of fines treatment and will, through the development of techniques for agglomerating fine coal, help to provide a product that is more easily manageable and, therefore, more attractive to coal users.

Work in the field of coking of coal will give rise to improvements in coking plant operation, particularly with respect to throughput, energy saving, product quality and the treatment of by-products. It will also lead to a widening of the range of usable coals and improvements in the quality of metallurgical coke which will, in turn, give improvements in blast furnace performance.

In the field of combustion of coal and new technologies for coal utilization, the programme will make contributions to the design of large burners for coal/water mixtures and dense phase coal/air suspensions as well as to the preparation and use in the blast furnace of coal/water mixtures. It will also increase the attractiveness of coal as a fuel in smaller-scale applications. Finally, the research should lead to improvements in the disposal or utilization of coal ash and will provide a basis for solutions to the problem of dealing with trace elements in ash and combustion gases.

*Rates of conversion from national currencies are those of 30 November 1981

The studies on coal chemistry and physics and development of processes will help to reduce the Community's dependence on imported hydrocarbons by making it possible to produce a wide range of substitute products from coal.

VI. 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 requests.

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

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.

The research programme will cost 10 139 500 ECU* and the Commission proposes to grant aid totalling

6 083 700 ECU*

Distribution of aid

BCRA (United Kingdom)	224 700 ECU
CERCHAR (France)	798 900 ECU
CSM (Italy)	396 600 ECU
DEBRIV (Germany)	453 000 ECU
NCB (United Kingdom)	2 491 800 ECU
NEI (United Kingdom)	386 100 ECU
StBV (Germany)	1 332 600 ECU

*Rates of conversion from national currencies are those of 30 November 1981