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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 ART. 55 § 2 c) OF THE E.C.S.C. TREATY

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 1980)

MEMORANDUM

CONCERNING THE ABSTRACTING AND TRANSLATION OF THE TECHNICAL LITERATURE
ON COAL OF EASTERN EUROPE, SCANDINAVIA, THE MIDDLE EAST AND THE FAR EAST,
WITH A VIEW TO OBTAINING FINANCIAL AID UNDER THE TERMS
OF ARTICLE 55 § 2 c) OF THE E.C.S.C. TREATY

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 ART. 55 § 2 c) of the E.C.S.C. TREATY

I. Introduction

The increasing importance of coal in relation to the energy supply of the Community presents the latter's mining industry with scientific and technical problems that can only be overcome by intensive research and development. This is particularly the case with regard to the extension of existing mines or the creation of new ones that is necessary for the maintenance or augmentation of production capacity, where new problems arise with increasing depth.

On these grounds the Commission proposes the approval of a Community research programme in the field of mining engineering 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 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 Westfälische Berggewerkschaftskasse Bochum (WBK)

II. AIMS AND OBJECTIVES OF THE PROGRAMME

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

Working environment and safety

Special attention must be given to the accentuated problems of rock pressure and mine climate that are associated with increasing depth. New solutions in these fields have a direct influence on mine safety and the working environment. In this respect the attractiveness of workplaces must be improved by increased mechanisation and automation, as well as by the installation of modern methods of communication and data processing.

Technology

In the field of development work, most roadways are still driven by shotfiring, and the further development of this technique is particularly important.

In the area of supports, available automatic equipment must be developed further so that it can be used in all circumstances.

Moreover, the field of underground infrastructure, where there is still considerable scope for rationalisation, is of the greatest importance. This is particularly the case for the conveying of products and the transport of men and equipment.

Conduct of operations and organization

With increasing mechanisation and automation, the interdependence between the various fields of mining operations becomes greater and increasingly difficult to manage. On these grounds, use must be made of the latest methods of communication, data processing and information technology in order to ensure smooth operation with maximum safety.

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III. PROGRAMME OF WORK ENVISAGED

The proposed research programme takes into account the above-mentioned requirement and concentrates on the four fields

- Development work
- Mine climate and rock pressure
- Coal winning
- Infrastructure and modern management techniques

The overall programme will be carried out with close collaboration between the Community's research institutions and coal mines. It comprises the following 16 projects.

Development work

This involves a project on the further development of conventional techniques.

1. Mechanisation of preparatory work for shotfiring (StBV)

Simplification of work, increased productivity and improved safety in preparations for shotfiring by further mechanisation and integration of the individual steps, especially drilling and support.

Total cost: DM 4.300.000

Mine climate and rock pressure

In this field a two-part joint project on the improvement of mine climate and four projects on strata control are proposed.

2. Air cooling in coal winning and roadway drivage (StBV)

Part of a joint German-French project on the improvement of mine climate.

Tests on air cooling systems and air conditioned work places to increase the efficiency and safety of conventional or new cooling installations.

Total cost: DM 2.400.000

3. Studies of climatic conditons at great depths (CERCHAR)

Part of a joint German-French project on the improvement of mine climate.

Study of the solution of climatic problems that become more severe with increasing depth (temperature, humidity, etc) in faces and roadways.

Total cost: FF 2.110.000

4. Study of yield zones around gateroads (NCB)

Extension of tests on yield zones around gateroads with the aim of making possible the reuse of roadways in retreat mining even under difficult geological conditions.

Total cost: UKL 58.250

5. Study of closure of main drivages (NCB)

Detailed study of closure and stability problems in main drivages under various geological conditions with the aim of optimising roadway support for greater depths and under changing working conditions.

Total cost: UKL 58.250

6. Instrumentation of Selby shaft insets (NCB)

In-situ measurement to develop a calculation method for designing support for shafts in plastic or weak rocks in order to improve the stability of such excavations.

Total cost: UKL 58.250

7. Simpler and lighter shield supports (StBV)

Weight reduction and simplification of construction of shield supports in order to reduce costs, simplify transport/placement/removal, and to cut down repair work while maintaining or improving the characteristics required for safety and the control of rock pressure.

Total cost: DM 1.980.000

Coal winning

In this field there is a proposal concerning the operational testing of a previously-developed technique for horizon control of ranging drum shearers.

8. Field evaluation of automatic horizon control of ranging drum shearers (NCB)

Continuation of work on the development of an automatic, digital system for automatic horizon control and monitoring (from the surface) of ranging drum shearers aimed at increasing face output and improving control of the roof. Underground tests with single- and double-ended ranging drum shearers under a variety of geological conditions.

Total cost: UKL 1.695.000

Infrastructure and modern management techniques

Eight projects are proposed in this field of which three (including a two-part joint project) are concerned with the transport problem in underground operations, while the other five (including a three-part joint project) deal with the application of modern methods of communication or computer control.

9. Trackless transport II (StBV)

Part of the joint German-French project on "Improving the efficiency of underground material transport".

Continuation of work on the development of a fully-developed vehicle for field of coal winning including the solution of problems of safety and ergonomics.

Total cost: DM 2.600.000

10. Improvement of material handling and transport from the surface to the work place (CERCHAR)

Part of a joint German-French proposal on "Improving the efficiency of underground material transport". Tests on improvement of transport and handling techniques for increasingly heavy loads to reduce costs and improve safety. Determination of existing weaknesses and danger points as a guide for future work.

Total cost: FF 3.166.000

11. Characteristics of pre-stretched stranded cables in shaft haulage (WBK)
Reduction of the cost of shaft haulage through the use of stranded cables that are stretched by a continuous, dynamic process before installation (simplification of "running in", avoidance of interruptions in operation, increased lifetime of cables).

Total cost: DM 2.426.000

12. Extended application of radio underground (INIEX)

Further experiments on the influence of rock and roadway walls on the propagation of radio waves to improve transmission of speech and data by the use of new frequencies, and short range communication (100m) in faces and roadways.

Total cost: FB 42.500.000

13. Components for digital data networks (StBV)

Part of a joint German-British project on improving the reliability of monitoring of operations.

Development of suitable components for the construction of high-capacity data networks for the monitoring and control of major mining operations.

Total cost: DM 1.500.000

14. Computer-assisted management of operations (StBV)

Part of a joint German-British project on improving the reliability of monitoring of operations.

Introduction of a hierarchy of computers (Dialogue with the computer and coordination with a downstream microcomputer) and new techniques of automation to improve monitoring, control and information.

15. Computer-based coal clearance for mutli-mine complex (NCB)

Part of a joint German-British project on "Improving the reliability of mining operations".

Development of a linked computer system for seven mines with central supervision of the overall coal clearance system (integration of individual MINOS systems into an overall complex).

Total cost: UKL 3.240.000

16. Reliability prediction techniques (NCB)

Testing of the practicability of techniques for predicting the reliability of equipment groups, systems and complexes in mining. It is intended to apply techniques based on probability theory that have already been tested in other high technology industries.

Total cost: UKL 693.000

IV. ESTIMATED COST AND DURATION OF THE PROGRAMME

The total estimated cost of the programme is

17.545.000 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 24.10.1979

Project	Proposer	Total cost ECU
<u>Development work</u>		
1. Mechanisation of preparatory work for shotfiring	StBV	1.728.500
<u>Mine climate and rock pressure</u>		
2. Air cooling in coal winning and roadway drivage	StBV	965.000
3. Studies of climatic conditions at great depths	CERCHAR	362.000
4. Study of yield zones around gateroads	NCB	89.000
5. Study of closure of main drivages	NCB	89.000
6. Instrumentation of Selby shaft insets	NCB	89.000
7. Simpler and lighter shield supports	StBV	796.000
		2.390.000
<u>Coal winning</u>		
8. Field evaluation of automatic horizon control of ranging drum shearers	NCB	2.588.500
<u>Infrastructure and modern management techniques</u>		
9. Trackless transport II	StBV	1.045.500
10. Improvement of material handling and transport from the surface to the workplace	CERCHAR	543.000
11. Characteristics of pre-stretched stranded cables in shaft haulage	WBK	975.500
12. Extended application of radio underground	INIEX	1.062.500
13. Components for digital data networks	StBV	603.000
14. Computer-assisted management of operations	StBV	603.000
15. Computer-based coal clearance for multi-mine complex	NCB	4.947.000
16. Reliability prediction techniques	NCB	1.058.500
		10.838.000
TOTAL		17.545.000

V. Expected repercussions of the new programme

The main consequences that can be expected to ensue from the research proposed in the new programme may be summarised as follows.

Mine safety and working environment

The main outcome of the work on mine climate should be to provide a sound basis for the prediction of climate at increased depths which will, in turn, facilitate the improvement of the climate and, consequently, of the working environment (Projects 2 and 3).

The research on rock pressure and supports (Projects 4 to 7) should have both a direct effect on mine safety through better roof control and an indirect influence on the conduct and results of operations.

Further favourable effects on mine safety, especially with regard to conditions in the workplace should arise from the projects on improved shotfiring (Project 1), on further automation of the face (Project 8), on equipment transport and manriding (Projects 9 and 10), and on the application of communications and computer techniques (Projects 11 to 16).

Technology

In the field of development work the improvement of drivage by shotfiring, which is still used to drive the major proportion of roadways, should lead to further increases in efficiency and to a lightening of the work (Project 1).

In coal winning, the automatic horizon control of shearers should provide a further step towards the complete automation of operations (Project 8).

With regard to conveying and transport, increased efficiency and a simplification of operations are to be expected, particularly through the further development of trackless transport and the rationalisation of material conveying (Projects 9 and 10). The work on the improvement of shaft transport (Project 11) promises to give significant cost savings.

Organisation and management of operations

In this field the research on communications technology (Project 12) and on the application of modern techniques for the processing of information and data (Projects 13 to 16) are expected to lead to stricter monitoring of operations and to the avoidance of breakdowns. This should have significant advantages for the organization and results of operations.

VI. RESEARCH RESULTS

The E.C.S.C. Experts' Committee which are already concerned with all research work in the fields covered by the new programme 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 interested parties 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 technology, the safety, the working environment and the economics of underground and surface operations in the Community's coal mining industry, the provision of E.C.S.C. financial aid for the execution of the individual projects is deemed to be appropriate and justified.

The total cost of the research programme will be 17.545.000 ECU and the Commission proposes to grant financial aid of 10.195.980 ECU to cover its share of the cost.

Distribution of aid

CERCHAR (France)	543.000	ECU
INIEX (Belgium)	637.500	ECU
NCB (United Kingdom)	4.985.580	ECU
StBV (Germany)	3.444.600	ECU
WBK (Germany)	585.300	ECU
	<u>10.195.980</u>	ECU

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 1980)

I. GENERAL REMARKS

Continuing research efforts are needed in the field of product beneficiation to ensure that the Community's coal industry can achieve its aims and fulfil the rôle allotted to it in the framework of the Community's energy policy.

Research must be aimed at maintaining and improving the market for coal. This can be achieved by activities in three main areas: in the first place, through improvements in coal preparation that will increase the coal industry's ability to meet its customers' quality requirements; secondly, through developments in coal processing and utilisation, particularly in the important fields of metallurgical coke production and electricity generation; and thirdly through longer term developments to ensure that coal can be used as a source of new, high value products, particularly organic chemicals and liquid and gaseous fuels.

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 (CERCH)
- The Centro Sperimentale Metallurgico, Rome (CSM)
- The Deutscher Braunkohlen-Industrie-Verein, Cologne (DEBRIV)
- The Electricity Supply Board, Dublin (ESB)
- Fusion et Volatilisation, St.-Etienne (FUVO)
- The National Coal Board, London (NCB)
- 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 three main topics and thus form three programmes

- Mechanical coal preparation
- Coking and briquetting of coal, and
- New chemical and physical processes and products from coal.

Advances in mining technology have led to the occurrence of increasing quantities of fine material in run-of-mine coal. In consequence, there is a need for developments and improvements in coal preparation technology to enable such material to be handled and treated satisfactorily.

The programme on mechanical coal preparation therefore comprises projects aimed at improving treatment of fines, increasing the throughput of treatment installations, and developing methods for measuring the properties of slimes with a view to improving process control and automation.

The aims of the programme on coking and briquetting of coal are as follows:

- to investigate the effects of coal blend composition and preparation, charging technique and carbonization conditions on coke quality with the object of extending further the range of coals that can be carbonized;
- to improve the assessment of metallurgical coke quality by studying the behaviour of coke under ambient conditions and under conditions of temperature and chemical attack encountered in the blast furnace;
- to improve the production, treatment and utilization of carbonization by-products.

These aims are clearly in line with the general objectives of Community research in the coking sector.

An important aim of Community coal research is to reduce dependence on external energy sources. To this end, the programme on new chemical and physical processes and products from coal includes projects related to the production of gas for clean, efficient electricity generation in combined cycles, to the hydrogenation of coal to provide organic chemicals and liquid hydrocarbons, and to coal combustion where the aims of the research are to make possible the direct substitution of coal for oil, to improve the convenience and efficiency of small-to-medium sized coal-burning equipment, and to make possible the environmentally acceptable utilisation of indigenous high sulphur anthracite for electricity generation. Other projects in this programme are aimed at the use of a material manufactured from lignite as a substitute for more expensive types of activated carbon, and at developing a new coal-based fuel for the electrometallurgical industry.

III. PROGRAMME OF WORK ENVISAGED

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

Programme "Mechanical Coal Preparation"

1. Application of heat to the preparation of very fine material (StBV)
Increased throughput in flotation installations without loss of product quality, together with improved dewatering and ease of handling of the concentrate and the tailings.

Total cost: DM 500.000

2. Development of measuring devices to monitor the preparation of very fine material (StBV)

Development of techniques for the direct measurement or indirect deduction of indices of the degree of dispersion and the ash content of slimes in order to improve the preparation of very fine material by continuously adapting the operating conditions to the quality of the feed.

Total cost: DM 1.500.000

Programme "Coking and Briquetting of Coal"

3. Determination of coke strength after reaction with carbon dioxide (StBV)

More realistic assessment of the quality of blast furnace coke by the development and application of a technique for subjecting large samples of coke to reaction with carbon dioxide and mechanical testing at high temperatures.

Total cost: DM 340.000

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

Widening of the coking coal basis by combining processes (preheating, stamp charging and addition of pitch) that will have additive effects on coke quality. Laboratory, semi-technical and full-scale tests.
Total cost: FF 2.586.600

5. Characterisation of blast furnace cokes (conventional and formed cokes) (CERCHAR)

Continuation of research into the development of physico-chemical and mechanical tests, related to blast furnace conditions, for more precise and realistic characterisation of cokes. The investigation involves both theoretical and practical studies, with emphasis on the latter.
Total cost: FF 2.630.000

6. Study of the optimum conditions for the manufacture of coke in conventional ovens (CERCHAR)

The aim of the research is to establish a rational scheme for the economic production of coke from given coal blends using various oven charging techniques (wet and preheated charging, charging of mixtures of coal fines and briquettes) and to determine the optimum production conditions in terms of coke yield and quality, oven productivity, etc.
Total cost: FF 1.500.000

7. Bulk reactivity of coke (NCB)

Establishment of more realistic criteria of coke quality, related to temperature and reaction conditions encountered in the blast furnace, by means of a bulk reactivity test. (This study complements an existing project in which the effect of high temperatures on coke stability is being investigated).
Total cost: £ 485.300

8. The selection and control of the properties of the coal charge in formulating blends (NCB)

Study of the control of factors that influence the caking and coking properties of coal blends in order to optimise their effect in extending the range of coals that can be carbonized to produce high-quality metallurgical coke.

Total cost: £ 522.600

9. Studies of the mechanical and chemical properties of coke at high temperature (BCRA)

Study of the influence of high temperature and chemical attack on the behaviour of metallurgical coke aimed at obtaining improved understanding of relationships between parameters of carbonization and coke quality, and the degradation of coke under operational conditions. A range of blast furnace cokes and specially prepared cokes will be examined.

Total cost: £ 241.100

10. Conversion of hot, raw coke oven gas in a pulsating combustor (StBV)

Technical-scale study of the conversion, in a single step, of raw coke oven gas into a clean reducing or synthesis gas by means of a pulsating combustor. Testing is to be carried out under operational conditions in a coking plant.

Total cost: DM 5.300.000

11. Treatment of carry-over material in modern coking plants (CERCHAR)

The purpose of the study is to develop uses for the wet mixture of tar and partially carbonized coal fines that is carried into the gas main during coke oven charging.

Total cost: FF 1.545.000

12. Pelletization of part of the charge mix as a technique to increase the content of poorly coking coals in coking blends (CSM)

Extension of the range of coals used to make coke by pelletizing (in contrast to the more expensive technique of briquetting) poorly coking coal with a binder (pitch or tar) before addition to a coking blend to increase the charge density, thus enabling larger amounts of inferior coal to be used.

Total cost: Lit. 770.000.000

13. Studies of the constitution and quality of coal tar binder pitch and refined tar in relation to commercial usage (BCRA)

Basic study of the properties of tar and pitch for use in road surfacing and as binders for electrode manufacture.

Total cost: £ 121.200

Programme "New Chemical and Physical Processes and Products from Coal"

14. To extend the application of fluidised bed gasification of coal (NCB)

Further development of a process based on the partial gasification of coal in a fluidised bed to make a fuel gas suitable for operating gas turbines for combined cycle electricity generation, or for use as an industrial fuel.

Total cost: £1.112.000

15. Upgrading of coal by hydrogenation (StBV)

Investigation of new and improved techniques for the hydrogenation of coal to obtain liquid products and for the further treatment of the primary products. The aim of the research is to develop more economic processes for manufacturing liquid hydrocarbons from coal.

Total cost: DM 1.750.000

16. The use of lignite coke as an adsorbent (DEBRIV)

Laboratory and semi-technical scale study of the use of lignite coke to replace more expensive activated carbons for the cleaning of water and gases.

Total cost: DM 1.500.000

17. Upgrading of coal fines and ores (FUVO)

Development of a technique for agglomerating coal fines with quartz or silica fines and a binder to produce composite briquettes for the manufacture of ferrosilicon in electric furnaces. The use of a more homogeneous charge in such furnaces is expected to improve their operation and reduce their energy consumption.

Total cost: FF 750.000

18. Study of problems in connection with the use of a suspension of coal in heavy fuel oil (CERCHAR)

Pilot-scale study aimed at reducing the consumption of fuel oil by investigating problems related to the combustion of a coal/oil suspension, notably those connected with the changing qualities of the components.

Total cost: FF 1.260.000

19. Development of automatic equipment for coal-fired boilers (NCB)

Improvement of the competitive position of coal for small-to-medium sized boiler plants by developing and demonstrating new and improved types of ancillary equipment, with particular emphasis on optimisation of combustion efficiency by improved automatic control, and on improving plant amenity.

Total cost: £ 369.600

20. Production of steam for electricity generation or other purposes using fluidised bed combustion techniques when applied to a high sulphur Irish anthracite (ESB)

Study of the application of fluidised bed combustion at atmospheric pressure to high sulphur (2.3 - 4.9%) indigenous anthracite with a view to exploiting the coal deposit for electricity generation.

Total cost: IR£ 147.294

IV. ESTIMATED COST AND DURATION OF THE RESEARCH WORK

The total cost foreseen for the programme is 11.389.500 ECU*. The cost of the individual projects is given in the following table. The duration of the projects varies between 2 and 4 years.

*Rates of conversion from national currencies are those of 24.10.1979

No.	Project	Proposer	Total cost* ECU
1.	<u>MECHANICAL COAL PREPARATION</u> Application of heat to the preparation of very fine material.	StBV	201 000
2.	Development of measuring devices to monitor the preparation of very fine material	StBV	603 000
	TOTAL		804 000
3.	<u>COKING AND BRIQUETTING OF COAL</u> Determination of coke strength after reaction with carbon dioxide	StBV	137 000
4.	Production of blast furnace coke in conventional ovens from blends without conventional coking properties by the combined application of preheating and stamp charging	CERCHAR	444 000
5.	Characterization of blast furnace coke (conventional and formed cokes)	CERCHAR	451 000
6.	Study of the optimum conditions for the manufacture of coke in conventional ovens	CERCHAR	257 500
7.	Bulk reactivity of coke	NCB	741 000

No.	Project	Proposer	Total cost ECU*
8.	The selection and control of the properties of the coal charge in formulating blends	NCB	798 000
9.	Studies of the mechanical and chemical properties of coke at high temperature	BCRA	368 500
10.	Conversion of hot, raw coke oven gas in a pulsating combustor	StBV	2 130 500
11.	Treatment of carry-over material in modern coking plants	CERCHAR	265 000
12.	Pelletization of part of the charge mix as a technique to increase the content of poorly coking coals in coking blends	CSM	672 000
13.	Studies of the constitution and quality of coal tar binder pitch and refined tar in relation to commercial usage	BCRA	185 500
	TOTAL		6 450 000
14.	<u>NEW CHEMICAL AND PHYSICAL PROCESSES AND PRODUCTS FROM COAL</u> To extend the application of fluidised bed gasification of coal	NCB	1 698 000

No.	Project	Proposer	Total cost ECU.*
15.	Upgrading of coal by hydrogenation	StBV	703 500
16.	The use of lignite coke as an adsorbent	DEBRIV	603 000
17.	Upgrading of coal fines and ores	FUVO	129 000
18.	Study of problems in connection with the use of a suspension of coal in heavy fuel oil	CERCHAR	216 500
19.	Development of automatic equipment for coal-fired boilers	NCB	564 500
20.	Production of steam for electricity generation or other purposes using fluidised bed combustion techniques when applied to a high sulphur Irish anthracite	ESB	221 000
TOTAL			4 135 500
GRAND TOTAL			11 389 500

*Rates of conversion from national currencies are those of 24.10.1979

V. 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.

VI. EXPECTED REPERCUSSIONS OF THE RESEARCH PROGRAMME

In the field of coal preparation, the research programme will assist the adaptation of coal preparation technology to changing conditions and will help the coal industry to achieve improved control of product quality, and to continue to meet the requirements of its customers in that respect.

The studies related to the coking of coal will lead to a widening of the coking coal range and will thus make it possible to use cheaper and more abundant coals for coke manufacture. At the same time, research into the properties of coke will lead to a better understanding of coke behaviour and therefore to a greater ability to supply the steel industry with a high quality product. Research related to carbonization by-products will make a contribution to the economy of coke oven operation, and will also have a favourable effect on the environment.

The programme in the field of new chemical and physical processes and products from coal will contribute towards the objectives of reinforcing existing uses for coal, finding new uses, and substituting coal for other raw materials either directly by combustion or indirectly by conversion to gases and liquids. In addition, the research concerning combustion and gasification will lead to techniques for the cleaner and more efficient generation of electricity. Finally, the programme will aid the development of new solid products in the form of a cheap adsorbent for gas and water purification and an improved fuel for the electrometallurgical industry.

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, coking and briquetting of coal, and new chemical and physical processes and products from coal is judged to be appropriate and justified.

The research programme will cost 11 389 500 ECU* and the Commission proposes to grant aid totalling 6 576 400 ECU.

Distribution of aid

BCRA (United Kingdom)	332 400 ECU
CERCHAR (France)	980 400 ECU
CSM (Italy)	403 200 ECU
DEBRIV (Germany)	361 800 ECU
ESB (Ireland)	132 600 ECU
FUVO (France)	77 400 ECU
NCB (United Kingdom)	2 280 900 ECU
StBV (Germany)	2 007 700 ECU

*Rates of conversion from national currencies are those of 24.10.1979

M E M O R A N D U M

CONCERNING THE ABSTRACTING AND TRANSLATION OF THE TECHNICAL LITERATURE ON COAL OF EASTERN EUROPE, SCANDINAVIA, THE MIDDLE EAST AND THE FAR EAST, WITH A VIEW TO OBTAINING FINANCIAL AID UNDER THE TERMS OF ARTICLE 55 § 2 c) OF THE E.C.S.C. TREATY

In three occasions, in 1962, 1970 and 1975, the E.C.S.C. has granted credits of 100 000 ECU to research centres and institutes in the Community's coal-producing countries in order to aid financially the abstracting, translation and dissemination within the Community of technical publications on coal from countries with "difficult" languages (Eastern Europe, Scandinavia, the Middle East and the Far East).

The system is as follows: the research organizations carry out the abstracting of technical literature selected as a function of the interest of the subjects. Translations of summaries and important articles are generally made at the request of the technical services of the mines concerned, sometimes as a consequence of specific preliminary research.

In order to avoid duplication of effort a constant exchange of the texts translated takes place between the documentation services of the research organizations of the Community's coal-producing countries. The Centre d'Etudes et Recherches des Charbonnages de France (CERCHAR) is the organization mandated to arrange the exchange and to assure collaboration between the institutions, the latter being the Steinkohlenbergbauverein (Essen), the Institut National des Industries Extractives (Liège), the Mining Research and Development Establishment (Bretby) and the Safety in Mines Research Establishment (Sheffield).

Since 1978 an analytical bibliographical bulletin has appeared, in the form of a supplement to the journal EURO ABSTRACTS, which lists, at half-yearly intervals, the titles of the articles and monographs translated or summarized. For the coal research institutions this type of documentary research is, at one and the same time, a working tool and an obligation, making it possible to save both time and money in carrying out research.

Moreover, the translation and abstracting of the literature enables research workers in the Community to keep completely up to date with the development of technology in the countries concerned.

For these reasons, the granting of financial aid of 100 000 ECU by the Community for this action of abstracting and translation is deemed to be justified.