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\*\* The Commission of the European Communities unreservedly welcomes the signing on 25 February of a protocol concerning the foundation in Europe of a Study Association for the CREATION OF A PLANT FOR URANIUM ENRICHMENT BY THE GASEOUS DIFFUSION METHOD. This project, which has attracted much comment in the press, brings together groups from five Member States and the United Kingdom; in the field of gaseous diffusion it supplements the decision taken in the spring of 1970 by West Germany, the Netherlands and the United Kingdom jointly to construct experimental plants operating on the gas centrifuge principle. These two uranium enrichment processes may provide a basis for a solution of the problem of the Community's long-term supplies of enriched uranium, concerning which the Commission had already presented proposals to the Council in 1969 and will shortly submit fresh proposals.

It is of interest on this occasion to quote extracts from a study on the present problems of the Community's nuclear policy, which was recently approved by the Economic and Social Committee; these extracts, relating to the COMMUNITY'S LONG-TERM SUPPLIES OF ENRICHED URANIUM, will be found in ANNEX 1.

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*The information and articles published in this Bulletin concern European scientific cooperation and industrial development in Europe. Hence they are not simply confined to reports on the decisions or views of the Commission of the European Communities, but cover the whole field of questions discussed in the different circles concerned.*

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\*\* In the IRON AND STEEL INDUSTRY about three million units of account were spent in 1958-67 on technical research on the REDUCTION OF ATMOSPHERIC POLLUTION, and in particular the elimination of brown fumes. This is recalled by the Commission of the European Communities in a reply to a written question from Mr Oele, Netherlands Member of the European Parliament, concerning the place allotted to environmental protection in the Memorandum on the General Objectives of the Community Iron and Steel Industry for the years 1975-80. Extracts from the Commission's reply are given in ANNEX 2.

\*\* A MINORITY OF NUCLEAR FIRMS ARE APPLICANTS FOR PATENTS OF NUCLEAR FUEL ELEMENTS: about 30% in the fuel-fabrication sector, about 25% in the fuel-reprocessing sector and about 40% in the reactor-technology sector. These data emerge from studies carried out by experts of the Commission of the European Communities on patents in force in the Community in various technological sectors. ANNEX 3 contains a short survey of the patent portfolio in the NUCLEAR FUEL ELEMENTS sector.

\*\* In 1971 there was a considerably greater overall INCREASE IN THE COMMUNITY'S ELECTRICITY GENERATING CAPACITY than in 1970 - indeed, one of the greatest increases in the last decade. Allowing for the down-gradings and modifications known to date, the construction of new units has made the following contributions to the overall grid system:

1. An increase of 8.4% (+ 7.1% in 1970) in the net capacity of conventional thermal plants, bringing this up to 102,000 MW at the end of 1971.
2. A net increase of 515 MWe in the capacity of nuclear thermal plants due to the commissioning of Saint-Laurent 2 (France). This modest increase in the Community's nuclear generating resources, raising the net capacity thereof to 3,620 MWe at the end of 1971, should not be allowed to obscure the fact that in 1972 this capacity will be further increased by about 2,000 MWe as a result of the commissioning of three large units; Würgassen (640 MWe) and Stade (630 MWe) in West Germany, and Bugey 1 (540 MWe) in France.

3. A relatively modest increase (+ 1.4%), progressively restricted by the growing scarcity of economically exploitable sites, in the capacity of hydro-electric stations using natural resources. The average annual increase during the past ten years was slightly over 2%.

Thermal plants commissioned in the Community in 1971

a) Overall characteristics MW (thousands of kW)

	Total installed capacity	Unit power ranges (MW)			
		200-499	100-199	50-99	<50
Total commissionings	9,396	7,459	1,060	167	710
	100%	79%	11%	2%	8%

b) According to type of fuel Installed capacity in MW

<u>Single-fuel</u>	7,700	82%
Pit coal	3,202	34%
Recent lignite	300	3%
Oil products	3,473	37%
Gas	165	2%
Natural uranium	560	6%
<u>Dual-fuel</u>	1,696	18%
Pit coal/oil products	344	4%
Oil products/natural gas or derivatives	1,352	14%

\*\* MORE THAN 56 MILLION UNITS OF ACCOUNT: THIS IS THE TOTAL AMOUNT OF AID ALLOCATED FROM THE EUROPEAN SOCIAL FUND IN 1971 to projects for the occupational retraining and resettlement of unemployed workers in the Member States. The renewal of the European Social Fund was approved by the Council in 1971, and by means of the renewed Fund will begin to function as soon as the Council has also approved the financial regulations; the Commission of the European Communities hopes to be able to contribute more effectively than in the past to the improvement of living and working conditions in the Community (see "Industry, Research and Technology" No. 122).

\*\* The Commission of the European Communities recently submitted to the Council two proposed directives concerning the approximation of the laws of the Member States on the PRETREATMENT OF CERTAIN PREPACKED LIQUIDS and on BOTTLES used as receptacles of a given capacity. These proposals define the filling tolerances and the volumes to be complied with in order that these beverages (wine, milk and beer) may be able to circulate freely throughout the Community. The Commission is continuing its work in this field and intends to prepare other proposals concerning prepacked liquids, other than beverages, and solids.

In each of the coming months the Commission intends to present to the Council one proposed directive concerning SAFETY GLASS FOR MOTOR VEHICLES.

\*\* Almost three million tons of lubricants were consumed in the Community in 1970; this gives an indication of the resulting quantity of WASTE OILS, which can give rise to disposal problems. Quoting this figure in a recent reply to a written question from Mr Oele, a Netherlands Member of the European Parliament, concerning the processing of waste oils for purposes of ENVIRONMENTAL PROTECTION, the Commission stated that the quantity of such oils regenerated in the Community totalled 242,000 tons in 1965 (the most recent available statistics), although the measures taken by the Member States for the collection of waste oils and their disposal by combustion or regeneration varied.

\*\* In connection with the FIVE-YEAR COMMUNITY RESEARCH PROGRAMME ON THERMONUCLEAR FUSION AND PLASMA PHYSICS, the Commission of the European Communities recently signed a contract of association with the Belgian State (for the Royal Military School). Other contracts will shortly be concluded with the CEA (France), the MPIP and the KFA (West Germany), the CNEN and the CNR (Italy), the FOM (Netherlands) and the ULB (Belgium).

This five-year research programme in the field of thermonuclear fusion and plasma physics, adopted last year by the Council on a proposal from the Commission (see "Industry, Research and Technology" Nos. 71 and 104), covers all the work done in this field by the specialized institutions of the Member States. The programme is carried out through contracts of association between the Commission of the European Communities and these specialized institutions. The Commission has at its disposal a sum of 46.5 million units of account to cover its participation in these contracts.

\*\* The origins and quantities of HEAVY-METAL WASTES AND EFFLUENTS discharged into the environment in the Member States will be the subject of a study to be carried out on behalf of the Commission of the European Communities. It is now clear that among the numerous existing pollutants the heavy metals, and in particular mercury, cadmium, chromium and their compounds, call for urgent anti-pollution measures because of their extreme noxiousness, their wide dissemination in the environment and their effects on man and nature.

\*\* The situation, problems and prospects of the Community's AGRICULTURAL AND FOOD INDUSTRIES were extensively discussed during a recent conversation between Mr Spinelli, Member of the Commission of the European Communities with special responsibility for industrial affairs and research, and representatives of these industries (Commission of the Agricultural and Food Industries).

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\*\* A MEDICAL ATLAS OF RADIONUCLIDES used in medicine, biology, industry and agriculture has just been published by the Commission of the European Communities. It is intended for small and medium-sized users of radioactive substances and provides the documentation necessary for the use of the various radioisotopes currently employed, under conditions ensuring adequate protection of workers. It is obtainable from the Sales Office for Official Publications of the European Communities (Case postale 1003, Luxembourg 1) under reference number EUR 4606 f (374 pp. - 300 B.frs).

THE COMMUNITY'S LONG-TERM SUPPLIES OF ENRICHED URANIUM

(extracts from a study on the present problems of the Community's nuclear policy approved by the Economic and Social Committee)

The Community's supplies of enriched uranium still derive mainly from three enrichment plants in the United States; the small quantities hitherto required were supplied under the terms of an agreement between the US Atomic Energy Commission (USAEC) and Euratom. (Owing to their special assignment, the two European plants at Pierrelatte in France and Capenhurst in the UK have not played any part in supplying the Community). This position is unlikely to change in the near future, and the Community will therefore probably remain dependent upon the US plants for the next few years. It is true that the agreement concluded between the USSR and France on the enrichment of French uranium for the Fessenheim nuclear power plant has for the first time broken the US supply monopoly, but at present it is not known whether the USSR will conclude similar treaties with other Member States, and, if so, what their scope will be.

It can be assumed that in 1980 the Community will have about 45,000 MWe of installed nuclear electricity generating capacity operating on enriched uranium. In 1985 the figure will be 100,000 MWe. In Western Europe more than 70,000 MWe will have been installed by 1980 and about 160,000 MWe by 1985. This means that in the Community - and, by extension, in the whole of Western Europe - there will be a separation requirement of about 10,000,000 SWU (separative work units) in 1980 and about 19,000,000 SWU in 1985. The USAEC, which at present is the only supplier of enriched uranium in the Western world, has a separation capacity of about 17,000,000 SWU, which will have increased to 26,000,000 SWU by 1980. Since the demand in Western Europe represents between one-third and one-quarter of the Western world's requirements it is already clear that even under the most favourable conditions it will be necessary to bring larger separation capacities on stream, towards 1980, both in Europe and, probably, in other parts of the Western world. All the parties concerned recognize the valid grounds for the proposals put forward, both by the Commission of the European Communities and by the relevant economic circles in the Community, for the creation of a



European base for the supply of enriched uranium. The urgency of the question, in view of the expected rapid growth of demand in the 1980's, has prompted the Member States to intensify or hasten their efforts to develop viable uranium enrichment process of their own. Thus France is at present trying to develop its gaseous diffusion method for use from 1973/74 onward in a large enrichment facility to be constructed in a Community context. West Germany and the Netherlands, which consider the gas centrifuge process to be very promising, have joined with the UK in a programme aimed at reaching a decision by 1974/75 at the latest as to the construction of commercial centrifugation plants. Meanwhile, a government-backed West German undertaking is working on the development of the "nozzle separation" process, which, however consumes a great deal of electricity and is accorded a cautious welcome. The European Atomic Energy Community has not taken up a position as regards the merits of the various enrichment processes in general. The Council, however, decided at the end of 1970 to set up a study group composed of representatives of the Commission of the European Communities and governmental experts for the purpose of studying the enrichment problem, and in particular to examine in detail the technical and economic data on the three processes with a view to taking up a position on the Commission's proposals of May 1969 concerning the creation of a European enrichment capacity (see "Industry, Research and Technology" No. 18). The Commission considers that the various processes being developed on an industrial scale in the Community are in different stages of maturity and that it is advisable to have various technologies capable of meeting the requirements in the immediate or more distant future.

The Economic and Social Committee thinks it desirable for the Community to coordinate the efforts now being made in Europe to develop enrichment processes, which are at present directed towards three different projects. Absence of coordination in this field would be all the more regrettable since the gaseous-diffusion and gas-centrifuge processes require, or have already absorbed, large sums of money. In principle, of course, competition between two processes may prove advantageous if the rival groups do their utmost to ensure the success of their projects. As a rule it is only in these circumstances that the most economic process has a chance of success. But in view of the considerable capital required

for the development of enrichment processes it appears necessary to concentrate on a single process once it is seen to be definitely the most economic. However, the Commission cannot confine its efforts to selecting the best process from all those under study and then advocating its use, particularly for economic measures; the Commission's aim is to ensure the security of enriched-uranium supplies to the Community countries by the creation of a European enrichment capacity. From this standpoint it is advisable in the first place to examine the possibilities of the techniques developed in Europe and to supplement them where necessary by those offered recently by the United States - insofar as the conditions are acceptable - and by participation in overseas projects.

The Economic and Social Committee thinks it important, in the context of the preliminary discussions between the United States and the Community, to determine the conditions for the construction of a European enrichment facility based on the American gaseous-diffusion technology. It would be advisable to examine in detail all the problems associated with such a project and particularly those of financing, electricity supply and Customs protection. The construction and operation of the facilities should be assigned to Community enterprises from the outset. It would therefore be helpful if interested and suitably qualified firms could participate from the earliest stages in the discussions with the United States government.



POLLUTION CONTROL IN THE COMMUNITY'S IRON AND STEEL INDUSTRY

(extracts from a reply by the Commission of the European Communities to a written question from Mr Oele, a Netherlands Member of the European Parliament, concerning the Memorandum on the General Objectives of the Community Iron and Steel Industry for the years 1975-80 and the place assigned to environmental protection in these objectives).

In the iron and steel industry, about 3 million u.a. was allocated during the period 1958-67 to technical research on the reduction of atmospheric pollution and, among other things the elimination of brown fumes. The results obtained have been utilized by many firms who have installed dust separating plants in their steelworks. They also prompted the European Coal and Steel Community to launch in 1967 a second five-year research programme including several major projects of a practical nature on techniques for combating dusts and waste gases in the iron and steel industry. This programme is now under way and will involve the expenditure of about 4 million u.a.

In the medical field, a sum of about 15 million u.a. has been earmarked for studies on the effects of pollutants on groups of workers, with the twofold aim of effective medical prevention and of defining the relationship between pollution on the one hand and the nature and frequency of respiratory diseases in the coal and steel industries on the other.

The Commission also intends to back certain investment projects of the coal and steel industries aimed at nuisance abatement and pollution control, by granting industrial loans at reduced interest rates. The pollutant aspects of coal and steel industry plants will henceforth receive special attention during the scrutiny of the advance declarations of investments.

When the Memorandum on the General Objectives of the Community's Iron and Steel Industry for the years 1975-80 was drawn up (see "Industry, Research and Technology No. 93), the Commission had not yet undertaken an overall study of the problems of environmental protection and improvement. However, the general objectives of the iron and steel industry are periodically revised in the light of problems encountered in its development. The accession of the applicant countries will provide an opportunity for such a revision and for the incorporation in the General Objectives of the results of the studies and work meanwhile accomplished on environmental protection in the vicinity of iron and steel plants, together with indications of the projects to be undertaken.

PATENTS IN FORCE IN THE COMMUNITY IN THE FIELD OF NUCLEAR FUEL ELEMENTS

A minority of nuclear firms are applicants for patents on nuclear fuel elements: about 30% in the fuel-element fabrication sector, about 25% in the fuel-reprocessing sector and about 40% in the sector of reactor technology.

These data emerge from studies carried out by experts of the Commission of the European Communities concerning patents in force in the Community in various technological sectors.

As regards patents on nuclear fuel elements, the following table shows the situation as at 31 December 1968.

	Belgium	West Germany	France	Luxem- bourg	Nether- lands	TOTAL
Belgian Applicants	9	1	4	-	1	15
German "	10	40	24	4	-	78
French "	57	31	85	64	2	239
Italian "	-	1	-	-	-	1
Luxembourg "	-	-	-	-	-	-
Netherlands "	3	1	1	-	-	5
EURATOM	13	4	10	12	-	39
TOTAL EEC	92	78	124	80	3	377
US applicants	56	29	62	-	5	152
UK "	44	21	77	-	2	144
EFTA " (excl. UK)	4	5	14	-	1	24
TOTAL	104	55	153	-	8	320
GRAND TOTAL	196	133	277	80	11	697

Remarks concerning the table:

1. Owing to the great difficulty of ascertaining the relevant data, no responsibility can be assumed for the complete accuracy of the figures.
2. In view of these difficulties no patent search was made in Italy.
3. The vertical total gives the number of patents in force on 31 December 1968 in the technological sector concerned.

The horizontal total does not correspond to the number of inventions, since a given invention may be protected in several countries.

As regards West Germany the following points should be noted:

About 30% of the patents in Community hands and 70% of those in British and American hands are less than 10 years old.

Between 1968 and 1970 the number of patents in the sector under consideration remained fairly constant (new patents compensating for lapsed patents); however, the number of patents applied for by British nationals decreased considerably (50%), whereas the number of patents the applicants for which are nationals of the Community countries or of the USA increased.