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Annual Report of the Euratom Supply Agency  
for the Calendar Year 1975

General

The Supply Agency's activity in the fuel cycle sectors for which it is responsible was affected in 1975 by the contraction of natural uranium supplies, the repercussions of the dissolution of the USAEC and its replacement by the U S Energy Research and Development Administration (ERDA) and the Nuclear Regulatory Commission (NRC), and the continuing lack of progress towards organizing a genuine plutonium market.

The Advisory Committee of the Supply Agency met on 21 January, 29 April, 3 June and 6 November 1975. At the first meeting, Mr. William Butler (Department of Energy) was appointed Chairman. The outgoing Vice-Chairmen, Mr. Michel Houdaille (URANEX) and Mr. Manfred Stephany (NUKEM), were re-elected.

The Advisory Committee focused most of its discussions in 1975 on the situation in the natural uranium sector. As in 1974, a Working Party was set up in 1975 to prepare a report on the foreseeable development of the natural uranium market in the years 1975 - 1985 and to study the possibility of measures at Community level.

A group of experts comprising geologists from the Member States was given the task of investigating, under the guidance of Directorate-General XVII for Energy, the potential for prospecting for uranium and developing deposits within the Community, with Commission support under Article 70 of the Euratom Treaty.

The Working Party on Natural Uranium met a number of times and prepared a report which was approved, after careful deliberation, at the Advisory Committee's meeting on 6 November 1975.

The report concludes that from about 1979/80 until 1985 there will be a steady increase in demand, for which there is, as yet, no coverage either by long-term supply contracts or from the known uranium reserves to which Community producers still have access. It is the opinion of the Working Party that an impending shortfall in supplies can be made good by a marked speeding-up of the programmes for the exploration and development and/or exploitation of uranium reserves by private industry and the Member States, and that the Community should support and encourage such programmes.

Among the measures proposed by the report to support and encourage such activity by private industry and the Member States is the launching of a research programme to improve current prospecting and extraction techniques and to develop new ones.

Since about 90% of the Community's uranium requirements must be covered from non-member countries, the report considers that one of the Community's main tasks should be to protect Community companies operating in non-member countries against political risks, and in making it possible or easier - if necessary by signing appropriate agreements with the non-member countries - for such companies to undertake uranium prospecting and development either individually or in cooperation with companies in the non-member countries concerned.

The report also regards the building-up of emergency stocks and storage in the Community as a desirable measure to safeguard supplies, without expressing any opinion as to whether such stocks should be accumulated by users at national or Community level. This question was left unanswered because it was unanimously agreed that the present market difficulties could be further aggravated by additional uranium purchases.

Finally, the report attaches particular importance to security of supply on long-term supply contracts, but arrives at the conclusion that in the present market situation, where high prices are caused mainly by spot purchases for short-term supplies, there is hardly any possibility of entering into such long-term contracts, with the result that serious difficulties impede the establishment of a realistic price which is acceptable to sellers and purchasers alike.

The report was forwarded to the Commission by the Chairman of the Advisory Committee, in a letter dated 25 November 1975, with an

appended note saying that the Advisory Committee would continue this work through its Working Party during 1976.

#### I. Natural uranium and other source materials

The natural uranium market was clearly a sellers' market in 1975, with prices rising rapidly and continuously. Signs of price stabilization are not yet detectable.

The reasons for this trend were many:

- the principal decisive and determining factor was the American market, where demand was heavy and supplies were non-existent or inadequate;
- American electricity suppliers were still dependent on this market, because the present embargo on uranium imports will not be lifted until 1977, beginning with a 10% allowance;
- one major American company declared its inability to meet its existing contractual obligations;
- that company's declared inability to meet its supply commitment led numerous American users to buy covering supplies without heed for the upward effect on the price caused by their decision, partly in order to be able to justify high claims for compensation in cases pending against the defaulting supplier;
- the vast majority of purchasers were involved in spot purchases and not in supply contracts which create long-term ties between seller/producer and purchaser/user and ensure a balance between the interests of both sides;
- although the greatly inflated prices\* should not have been regarded as a suitable basis for setting a fair market price, they were constantly quoted by sellers as indicative in talks and sales negotiations;
- in view of the Canadian Government's uranium policy (coverage of requirements for the Canadian reactor programme for thirty years, government control over prices, few incentives to mining companies to undertake further prospecting, reduced potential for investment by foreign companies) there was little likelihood of any major

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\*) At the end of the year the American specialist press reported one transaction worth \$ 35 lb/U<sub>3</sub>O<sub>8</sub>.

deals with Canadian producers, either from stocks or from current production;

- there was also no indication of the date when Australia, with her large reserves, would make an appearance on the market;
- most of the production of the African States was already under contract.

It merely remains to be hoped that during 1976 the situation will become clearer and the market stable.

Given this market situation, the Agency feels there is no point in giving exact details of the prices in supply contracts submitted to it. It will confine itself to saying that at the beginning of 1975 contracts could still be signed at prices around \$ 12/lb U<sup>308 \*</sup> and that towards the year's end the price already stood at \$ 25 lb U<sup>308</sup>. Thus, in the course of 1975 the price of uranium doubled and there is every sign that the trend will continue in the immediate future.

In view of this market trend, some energy supply companies are examining whether, in the interests of supply stability and security, they should not invest in prospecting campaigns with mining companies either individually or in groups.

In 1975, with the Supply Agency's concurrence, a total of 32 contracts for supplies of natural uranium, 2 contracts for the supply of monazite and 1 contract for the supply of thorium were signed. Sixteen of the contracts for natural uranium related to spot purchases for short-term coverage of the requirements of fuel element fabricators or research reactors. Nuclear power plants were supplied under 12 contracts representing a total of 6 976 metric tons. Of these contracts, only 3 can be regarded as long or medium term.

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\* ) At the time of signing a contract no indication is given of the time at which the price was agreed.

In addition, 4 contracts, involving 1 221 tons of natural uranium, were signed by fuel element fabricators for export orders. One leasing contract for 5.5 tons was signed between two reactor operators. On the supply side, of the total 32 contracts for natural uranium, the sellers involved were as follows:

- in 21 cases German undertakings	2,302 tons
- in 4 cases South African undertakings	1,879 tons
- in 4 cases American undertakings	334 tons
- in 2 cases Canadian undertakings	3,792 tons
- in 1 case a Belgian undertaking	8 tons
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	8,315 tons

In the case of undertakings from Community countries, the nationality of the seller provides no insight into the country of origin of the uranium delivered or to be delivered because these undertakings have access to supply sources in various producing countries.

As regards the formal side of the procedure for concluding supply contracts, it must be pointed out that in the present market situation the Commission and the Agency do not feel that there is any justification for complying with the Advisory Committee's wish to prolong the "simplified procedure" under Article 5 of the Agency rules of 5 May 1960. On the other hand, it was the endeavour of the Commission and the Agency to maintain the relations between users and producers and to facilitate their further development. Consequently, intervention by the Agency by virtue of its exclusive right to conclude supply contracts, as laid down in Chapter VI of the Euratom Treaty, was reduced to a minimum. Users in the Community can now freely negotiate and sign supply contracts with the producers of their choice. The signed contracts must, however, be submitted to the Agency for countersignature in order to be legally valid. Further details are obtainable from the Agency Regulations of 15 July 1975, published in Official Journal of the European Communities No L 193 of 25 July 1975, page 37.

## II. Enriched uranium

The first point to make is that the major reactor-building programmes, which were adopted in the Member States of the Community following the oil crisis in the winter of 1973, and which provided for the construction of a total of 110 nuclear power plants producing 118 200 MWe from their fuelling charge up to 30 June 1982 (see Annual Report 1974), will in all probability fall short of their target. Even if official statements on these programmes have not been made by the Member States, it became apparent to the Agency in the course of 1975 that some construction schemes had been abandoned and fairly substantial delays had occurred in the execution of others. However, the cutbacks and delays are far less marked than in the United States.

Reasons for these restrictions and postponements are many and have already been mentioned in the Annual Report for 1974, e.g. in the United Kingdom the changeover in the construction programme to the British SGHWR reactor type. Action by anti-nuclear pressure groups and advocates of environmental protection have also had some influence. Even though spectacular action like the occupation of the site for the Wyhl power plant has not had any counterpart in the Community, demonstrations and petitions from the local populations in the vicinity of proposed sites, together with pending legal action, have influenced the authorities in the granting of the various authorizations, because questions of environmental protection and reactor safety have been reexamined and have given rise to additional administrative requirements.

But economic factors might also have been of decisive importance. Mention must be made of the steeply rising construction costs for nuclear power plants and the prices within the fuel cycle, which could throw into question the economics of nuclear energy if the rapid price escalation continues. In addition, the economic recession of 1974/75 and energy conservation measures undoubtedly brought a significant decline in electricity consumption, whereas the programmes had been based on a yearly increase in consumption of 7%. It is therefore understandable that the electricity supply undertakings are reconsidering their construction schedules, adapting them where possible to the estimated scaled-down of energy consumption and biding their time before placing new orders.

This economic situation became apparent to the Agency in the relations between the users and the various operators of enrichment facilities, in particular with the American AEC, now ERDA, as will be explained below.

A. Toll enrichment

In the United States, the Atomic Energy Commission was dissolved and transformed, with effect from 20 January 1975, into the newly founded authorities called "Energy Research and Development Administration" (ERDA) and "Nuclear Regulatory Commission" (NRC). This division of the old AEC involved transfers of staff in the reorganization process and substantial teething troubles in the two new organizations. For the Agency and Community users, the reorganization caused fairly considerable delays in the handling of applications and requests already submitted, particularly with the NRC, which now bore sole responsibility for the granting of transport authorizations and export licences, but was obliged first, in this connection, to prepare administrative instructions and directives for the granting of the necessary authorizations. Despite the persistent efforts of the Agency and in particular the Delegation of the Commission of the European Communities in Washington to speed up the handling of supply transactions for Community users and despite intervention at the highest levels, delays in the established delivery deadlines could not be avoided. These teething troubles, which in the course of 1975 were gradually ironed out, fortunately did not seriously impede the activities of the nuclear industry in the Community.

Other difficulties arose because of the increasing concern of the American public about questions of safety, environmental protection, protection against sabotage, terrorism and theft of materials and setbacks in connection with the non-proliferation of strategically sensitive materials, particularly highly enriched uranium and plutonium. The US Congress devoted increasing attention to these questions, under the pressure of public opinion, and obliged the Administration, in particular ERDA and NRC, to adopt more stringent administrative measures and assessment criteria when deciding on supply and export applications which had been submitted. This new situation obviously persists in 1976. Effects of this new policy on the development of the Community nuclear industry are not yet foreseeable.

The reorganization of the American administration also had the result that the enrichment situation was still not clear. As stated in the Annual Report for 1974, the power granted by Congress to the then AEC for the contractual commitment of available enrichment capacities was exhausted more quickly than expected, with the result that further applications for the conclusion of long-term toll enrichment contracts were no longer accepted and for some of the applications submitted by the Agency and other foreign users before the deadline of 30 June 1974 the AEC offered only "conditional" toll enrichment contracts.

The condition provided for was the issue by the American Administration of a decision on the authorization of plutonium recycling in American nuclear power plants (the GESMO-Statement - Generic Statement on Plutonium Recycle) since such recycling would bring about a drop in the demand for separative work and thereby some liberation of the enrichment capacity for further supplies. The deadline for the application of this condition was first set for 30 June 1975. In March 1975 it was postponed to 30 June, 1976. Meanwhile it is certain that the NRC will be unable to maintain even this date, although it has given priority to the matter, and the issue of the GESMO Statement cannot be counted on before 1977.

Nevertheless, ERDA adhered to the previously fixed deadline of 17 March 1975 for users to make their final decision concerning their acceptance of the "conditional" contract offered by ERDA as the AEC's successor. In the Report for 1974 it was stated that a total of 18 users in the Community had been offered such "conditional" contracts, namely

- 1 Italian power plant
- 6 German power plants
- 6 French power plants (reloads only)
- 1 Irish power plant
- 1 Luxembourg power plant
- 1 Dutch power plant
- 2 British power plants

Only 5 such contracts were signed with ERDA at 17 March 1975. Three nuclear power plant projects forwent the possibility of concluding a contract with the USAEC as a result of the economic circumstances described above and the delay in construction schedules.

Instead of conditional contracts with ERDA, firm enrichment contracts were signed with URENCO in the case of 4 projects, and with the Soviet

Techsnabexport in the case of 2 projects. Six nuclear plants signed take-over contracts with nuclear plant operators in the United States who had abandoned their projects and had been put in touch with the power plants in question by the Agency or American broker organisations. In exchange for the acquisition of firm contracts with 6 American electricity supply undertakings, 4 Community users definitely renounced their entitlement to the conclusion of conditional contracts with ERDA; for 2 contracts, the users reserved their decision on whether to renounce until 30 June 1976.

In conclusion, it must be stated that one power plant which had been completed ahead of time also covered its separative work requirements by acquiring a contract from an American supply undertaking, while another Community user renounced the conclusion of a conditional contract on account of the abandonment of his project\*.

Consequently, there remain 3 conditional contracts with ERDA and 2 for the replacement contracts, which have been signed, for which a final decision on whether to renounce has not yet been taken. In all these cases the user is entitled, up to 30 June 1976, to cancel the contracts without penalty. If there is no cancellation, he remains bound to the contract, which will be transformed into a firm contract if a positive GESMO Statement is issued.

In view of the present capacity problem besetting enrichment facilities, ERDA also decided to modify the tails policy which it had been applying hitherto, in order to safeguard supplies to domestic and foreign users and also to be able to build up security stocks by pre-production.

On 19 June 1975 ERDA announced that its tails Assay of 0.2% U<sup>235</sup> would be maintained until 30 September 1977. Then, from 1 October 1977, it would be increased to 0.25% U<sup>235</sup>, and on 1 October 1979 to 0.275% U<sup>235</sup>, and finally on 1 October 1981 to 0.3% U<sup>235</sup>. The Agency drew attention, in a letter to ERDA, to the particular difficulties which would be created, in view of the restricted situation in the natural uranium market during the period 1977-81, by the increase of approximately 20% in natural uranium requirements which would result from the increase in the U<sup>235</sup> assay of the tails. It also requested that users be granted the right to reclaim the tails material with its corresponding high U<sup>235</sup> assay.

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\* A total of 4 nuclear power plant projects were therefore abandoned in/

(Hitherto ERDA has determined the U 235 assay of the tails material, which could be recovered by customers). In view of the numerous protests made by American and foreign users in response to this announcement, ERDA postponed its final decision (probably until April 1976).

However, Community users are advised to provide for a gradual upward adjustment of the U<sup>235</sup> tails content in their planning. In the meantime it has emerged that since 1 July 1975 the American enrichment plants have been working with a U<sup>235</sup> tails content of 0.25%, instead of the 0.3% applied hitherto, and that old stocks with a 0.3% content are already being fed back into the enrichment process.

It must also be reported that as a result of the numerous cancellations of reactor construction orders and the current very substantial delays in the construction and scheduled commissioning of nuclear power plants in the United States, ERDA offered all users a single opportunity on 19 June 1975 to adapt the supply arrangements which they had agreed contractually with ERDA to the actual circumstances in which they found themselves (called "slippage policy" or "open-season option"). This open-season option, which expired on 18 August 1975, opened up the following main possibilities for users:

1. Penalty-free cancellations of an existing contract with refund of the deposit paid;
2. Modification of the quantities and terms of established delivery schedules;
3. Some easing of the obligations to deliver natural uranium as feed to meet previously agreed deadlines.

Community users have availed themselves of these possibilities as follows:

2 contracts were cancelled (they were "conditional" contracts), and the following slippage in the delivery schedules was applied for:

for 3 nuclear power plants	3 months
for 1 nuclear power plant	5 months
for 1 " " "	6 months
for 1 " " "	9 months
for 1 " " "	14 months
for 1 " " "	21 months

The corresponding amendments to the contracts have not yet been signed in all cases.

On 20 June 1975 ERDA also announced an increase in its prices for the supply of separative work. With effect from 20 August 1975, the price for 1 unit of separative work supplied under fixed-commitment contracts was increased from \$ 42.10 to \$ 53.35. For separative work under former requirements-type contracts, the price increased on 18 December 1975 from \$ 47.80 to \$ 59.20 and on 1 January 1976 to \$ 60.95. This price is, in addition, limited by the contractually agreed ceiling charge. The automatic increase (1% / 2%) has been abolished; in future, ERDA will adapt its prices at regular intervals in line with the increase in the cost of operating its plants, having due regard to the terms established for advance notice.

Furthermore, ERDA lodged an application with Congress for the amendment of the Atomic Energy Act. In its present form, Section 161-v lays down that ERDA may only charge prices which cover costs. ERDA intends to introduce a commercial price, which, among other things, provides for a reasonable return on capital outlay. ERDA experts quote a price of about US \$ 76 for one separative work unit, at 1975 prices.

On 26 June 1975, the President of the United States made an announcement concerning the US Government's plan to expand the enrichment capacity of the United States, to reinforce the leading role of the United States as an export power in the free world, to abolish the Government monopoly of uranium enrichment and to create and encourage an efficient and competitive private industry in this sector. The draft of an appropriate law (Nuclear Fuel Assurance Act) was laid before Congress. The President's announcement and the draft law have been given a mixed reception in Congress and by the general public. Most open to question is the intention of transferring the enrichment sector to private industry. There is an increasing volume of support for maintaining the Government monopoly and achieving the necessary expansion of capacity by enlarging the existing government-owned plants. Congress will not decide on this matter until 1976.

For Community users it is important that the statement made by former President Richard Nixon, on 6 August 1974 to the effect that the United States would in all cases honour the enrichment contracts already concluded still remains valid. The conditions under which these contracts can be fulfilled remain to be seen.

Finally, it must be pointed out that on 15 March 1975 the American Congress empowered ERDA to conclude supply contracts with the Community<sup>235</sup> for the supply of a total of 55 000 MWe; the quantities of 25 000 kg U and 1 500 kg plutonium for research remain unchanged.

Altogether, a total of 9 toll enrichment contracts\* for nuclear power plants, with an aggregate output of 3 540 MWe, were concluded with ERDA (including the takeover, with the agreement of ERDA, of enrichment contracts with American users) during the year covered by this Report. They provide for the supply of a total of 7 531 tons of separative work. The period covered ranges from 10 to 20 years; generally it covers the duration of the validity of the Euratom/USA agreement, i.e., until 31 December 1995.

Furthermore, in 1975 three short-term contracts for the supply of MTR and other research reactors in the Community, together with export orders for Community fuel element fabricators, were signed with ERDA.

A total of 10 contracts for the supply of 9 415 tons of separative work for 10 power plants were signed with the URENCO enrichment plant. Similarly, with the concurrence of the Supply Agency, 3 contracts were signed between EURODIF and three of its shareholders. These contracts provide for the supply of a total of 32 122 tons of separative work in the period 1979-1990.

It had already been mentioned in the report for 1974 that the exhaustion of the capacity of American plants had induced Community users to take up options in their contracts with the Soviet Techsnabexport or transfer their custom to this source of enrichment. Altogether, with the concurrence of the Supply Agency, this amounted to two new transactions involving 4 385 tons of separative work to be supplied between 1979 and 1991. On the basis of contracts signed, the following quantities entered the Community during 1975:

From US-ERDA:

(a) With an enrichment of 0.7-5 % U<sup>235</sup>

384 748 kg U containing 10 248 kg U<sup>235</sup>

For this the enrichment costs amounted to US \$ 63 249 849 and 1 852 563 kg feed material were delivered.

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\* Including a contract with the Federal Republic of Germany under the German-American offset agreement.

(b) With an enrichment of 5-93% U235

307 915 kg U containing 266.01 kg U<sup>235</sup>

For this the enrichment costs amounted to US \$ 2 764 564 and 5 171.15 kg feed material were delivered.

(From Techsnabexport 81 238.046 kg U containing 2 239.260 kg U for three users).

B. Contracts involving extended terms of payment

With regard to the existing contracts with extended terms of payment, it must be pointed out that for the Garigliano nuclear power plant the first 10 year contract period with the possibility of purchasing enriched uranium on extended terms of payment has expired and the repayment of capital and interest over the second 10 years has now started.

The Trino Vercellese nuclear power plant purchased 8 627.493 kg of enriched uranium and the SENA plant at Chooz 10 836.44 kg.

Altogether, these three nuclear power plants paid out US \$ 17 579 617 in capital, burn-up and interest.

C. Purchase contracts

A total of three transactions were carried out by the Agency under the existing Master Sales Agreement with ERDA.

D. Lease contracts

As the forerunner of ERDA, the AEC had - as already indicated - discontinued the conclusion of lease contracts on 30 June 1974. Leased material still situated in the Community, which was not purchased by the Agency under an "in-situ" arrangement, was bought as required by users.

Only in isolated cases did ERDA lease or hire out a few isotopes, which could not be procured otherwise, to laboratories and research centres for scientific purposes.

### III. Plutonium

The lack of sufficient facilities for the chemical reprocessing of irradiated fuel elements and for the extraction of the plutonium produced prevented the establishment of a market based on supply and demand in 1975. A further contributory factor was the ban issued in the United States on air shipment of plutonium, especially as a changeover to shipment by sea could not be arranged at short notice. Most affected by this measure were the research institutes which are dependent on small quantities of plutonium with particular specifications. There is reason to assume that the satisfactory testing of crash-proof containers during the first half of 1976 will lead to the removal of the ban on the shipment by air of supplies and that the corresponding export and transport licenses will be re-issued. However for larger quantities, a further negative factor is that in the United States no processing plant is in operation and activity in this sector can hardly be expected before the end of the decade. In the European plants there is also a bottleneck.

Out of 23 plutonium transactions in which the Agency was involved during 1975, 17 applications came from research institutes, universities and similar institutions for small quantities of the order of several milligrammes to a few hundred grammes. The total quantity of these sales amounted to 2 683 g.

5 transactions, totalling 342 kg were supplied to the SNR in Kalkar. The average price for these supplies was US \$ 7.95/g fissionable Pu.

For one export order there is a letter of intent from the foreign purchaser, but by the end of the year no contract had yet been signed.

IV. Transfers of American material to and from non-member countries

In 1975 the Agency obtained the authorization of the US-ERDA for a total of 62 transactions concerning material of American origin.

	<u>Imports from</u>	<u>Exports to</u>
Australia	-	3
Spain	2	-
Japan	-	1
Norway	3	6
Sweden	6	22
Switzerland	3	1
Austria	-	6
UKAEA (bilateral)	9	-
	<hr/> 23	<hr/> 39

Exports on an industrial scale for purposes of conversion or manufacture of pellets or fuel elements for MTR reactors or nuclear power plants in non-member countries were as follows:

France	1 transaction covering	1 311 kg
Italy	1 transaction "	5 267 kg
Germany	21 transactions "	45 610 kg

V. Intra-Community transfers

The Agency concurred in the conclusion of 26 agreements on the transfer of special fissionable materials inside the Community and 122 notifications of re-processing contracts under Article 75 of the Euratom Treaty were recorded.

VI. Summary of transactions

1. Natural uranium	32
monazite, thorium and depleted uranium	5
2. Toll enrichment	
- ERDA	9
- Technabexport	2
- EURODIF	3
- URENCO	10
3. Purchase contracts with ERDA	3
4. Plutonium	23
5. Transfer authorization from ERDA	
- for imports	23
- for exports	39
6. Intra-Community transfers	<u>26</u>
	<u>TOTAL</u>
	<u>175</u>

January 1976

EURATOM SUPPLY AGENCY

F. Oboussier  
Director General