Euratom Supply Agency

Annual Report

2000

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OVERVIEW

Nuclear electricity in the Community continued to be produced satisfactorily during the year, and a steady supply of nuclear fuels to the EU utilities was maintained. Nuclear plants generated about one third of the electricity produced in the Community.

Production of natural uranium worldwide continued to be far below world requirements. It increased moderately during the year but, for several years now, it has represented just over half of the estimated consumption, with the balance being supplied mainly from excess inventories. Proven mining reserves are sufficient to cover the lifetime requirements of the existing nuclear plants in the world; if, however, the current situation should continue in the longer term, this could lead to periods of instability due to lack of readily available material. The Supply Agency continues to advocate that utilities should maintain adequate levels of strategic stocks and a diversified portfolio of long term contracts to ensure security of supply.

The natural uranium market continued to be driven by the perception of plentiful inventories and supplies. The spot market prices reached historically low levels, and the price difference between NIS and non-NIS uranium became insignificant.

Taking into account market developments and after consulting with the industry and the Advisory Committee, the Agency was at the year end reviewing its policy with regard to acquisitions by EU utilities of fresh natural uranium production from some NIS countries.

Suppliers of natural uranium conversion were under serious difficulties as a result of depressed prices due to the availability of large quantities of material in the form of UF_6, such as HEU feed, re-enriched tails and other inventories.

At the end of the year USEC filed a dumping and countervailing duty petition against enriched uranium from Eurodif and Urenco. The US Department of Commerce determined that the petition meets the standard for initiation of a formal procedure. Irrespective of the outcome, this case will influence significantly the uranium enrichment market in the immediate future.

Increased competition amongst utilities continued to promote rationalisation of production and consolidation. The pressure passed also to the companies in the nuclear fuel cycle, which were equally forced to cut costs and respond in a similar fashion with mergers and acquisitions.

The European Commission adopted the Green Paper “Towards a European strategy for the security of energy supply” which is intended to open a debate on all aspects related to securing the European Union’s energy supply. The role of nuclear energy will be reviewed in that context. All interested parties are invited to contribute to the debate and are encouraged to provide their comments.

CHAPTER I

GENERAL DEVELOPMENTS

ENERGY SUPPLY

Electricity generated by nuclear power plants in the EU during 2000 amounted to 815 TWh or 34% of the total1. If fossil sources had been used instead, some 300-600 million tonnes of CO_2 (depending on the substitution mix) would have been emitted into the atmosphere for the same electricity production.

THE EU COMMISSION'S GREEN PAPER

On 29 November the European Commission adopted a Green Paper "Towards a European strategy for the security of energy supply"2 with the aim of opening a large debate on the geopolitical, economic and environmental aspects involved in securing the European Union's energy supply. The discussion concerns the role of each energy source, including nuclear energy. Commission Vice-President Loyola de Palacio stated that: "*Confronted with both increasing external dependence and the urgency of the fight against climate change, the European Union cannot be complacent" and "…we have to be aware of the efforts needed and try and define a real European strategy, more coherent and responsible".*

She further stated with regard to nuclear energy that it "should be examined in relation to its contribution to our prime concerns of security of supply and reduction in CO_2 emissions" and that with "the current state of the art, giving up the nuclear option would make it impossible to achieve the objectives of combating climate change. Paradoxically, the contribution of nuclear energy to the stabilisation of CO_2 emissions is often underestimated. It is important that research efforts be stepped up, mainly concerning radioactive waste management."

The Green Paper starts from the observation that currently domestic sources cover only half of the primary energy requirements. If nothing is done ("business as usual" scenario) the Union will, within 20 to 30 years, have to meet 70% of its energy needs from imported sources against 50% at present. Current primary energy consumption is covered for 41% by oil, 22% by natural gas, 16% by solid fuels (coal, lignite, peat), 15% by nuclear power and 6% by renewables (mainly hydro). Under the "business as usual" scenario, the energy balance would by 2030, continue to rely predominantly on fossil fuels: 38% oil, 29% natural gas, 19% solid fuels, 6% nuclear power and barely 8% renewables.

In the years to come, electricity demand is estimated to increase by almost 2% per year; in the countries that are candidates to join the EU, the increase is expected to be 3% at least. At present, electricity production depends mainly on fossil fuels (coal, lignite, natural gas) and nuclear power (35%). In future, the dependence on natural gas may increase up to almost 50%. Without a slowdown of the growth in consumption in the principal sectors of expansion, i.e. transport, electricity

1 Data source for 815 TWh: Eurostat; 34% is a provisional figure based on OECD data.

2 Commission document COM(2000) 769 final, of 29 November 2000, website: http://europa.eu.int/comm/energy_transport/en/lpi_lv_en.html

production and households, the increasing energy dependence of the Union gives cause for serious concern.

Energy policy, the Green Paper points out, has progressively taken a new Community dimension. Member States provide different solutions for common problems, yet they are becoming more and more interdependent as a consequence of the realisation of the internal energy market. The fight against climate change turns out to be more difficult because reversing the trends of increasing emissions is harder to achieve than it appeared to be three years ago. Thus, while the Union stabilised in 2000 its emissions of greenhouse gases as compared to 1990, the forecasts of the European Environment Agency are that they will increase by 5.2% between now and 2010. This situation requires more radical solutions.

The Green Paper outlines the plan of a long-term energy strategy, in several main fields, including the ambition to double the share of renewable energy sources from 6 to 12% in the primary energy balance (from 14 to 22% for electricity production) between now and 2010, and the need to maintain a relative self-sufficiency. In this respect the contribution of nuclear power will have to be the subject of an analysis, without omitting any element of the debate, e.g. the decision of some Member States to opt out, issues of waste management, global warming, the security of supplies as well as sustainable development. Notwithstanding the conclusions of this reflection, the Green Paper stresses that research on the technologies of waste management and their practical implementation under stringent safety conditions must be continued actively.

Interested parties are invited to make their comments known to the Commission, by the 30th November 2001 on the basis of 14 questions (see Annex 3). The Agency's Advisory Committee is participating in the debate and envisages to issue an opinion on the matter.

NUCLEAR GENERATION

In 2000, 143 nuclear power reactors with a total net capacity of 123 GWe were in operation in the European Union. In Finland, TVO submitted to the Finnish Council of State an application in principle for the construction of a new nuclear power plant of 1000 to 1600 MWe at an existing nuclear power plant site. It would be Finland's fifth nuclear unit, and the estimated cost of the new plant, to be financed by TVO, would be around 1500 to 2300 million euro, depending on its size. TVO stated that it was making the submission because nuclear power, together with renewable energy sources, would help Finland to meet its commitments under the Kyoto protocol to reduce greenhouse gas emissions in 2008-2012 to the 1990 level.

The upcoming decisions on the new nuclear power plant in Finland are linked to the Finnish government's climate strategy; they can also be seen in the context of the debate opened by the Green Paper. Commissioner de Palacio has expressed the hope that the Green Paper could enlighten the decision.

Outside the EU, the construction of the Rostov nuclear power plant in Russia (1000 MWe) was reported to have been completed. Final tests were completed at the Temelin nuclear power plant in the Czech Republic. Resumption of work with the aim of completing the construction of several nuclear plants around the world was announced. Further nuclear plants were planned in Russia and in Asia. In addition, operating licence extensions to up to 60 years are being granted in the USA.

The performance of nuclear plants worldwide continued to improve in terms of availability and load factors. Operators continued also to upgrade nuclear plants to increase their nominal power. In this way, over the years, nuclear power generation has increased by amounts equivalent to many new plants.

In Germany RWE AG announced that it is preparing the Mülheim-Kärlich reactor (1300 MWe) for decommissioning by 2004, and E.ON AG is considering the shut down of the Stade reactor (640 MWe) by 2003.

MAIN POLICY DEVELOPMENTS IN THE MEMBER STATES[3]

The future role of nuclear energy is under discussion in several Member States. In Belgium, the independent Ampère-commission issued an advice on the future electricity production sources. Notwithstanding the political agreement to envisage phasing out of nuclear plants after 40 years lifetime, the Ampère-commission recommended to the government to keep open the nuclear option for the long term, in view of fossil fuel prices and the green house gases emission reduction targets[4].

The French government had a study undertaken on the comparative cost of different electricity production scenarios, which concluded that nuclear energy with or without reprocessing is the most economic and environmentally suitable option[5].

In Sweden it was decided to postpone the closure of Barsebäck 2 because the conditions for replacement of the nuclear production by an increase in electricity supply from other energy sources and a reduction in electricity use, can, at this stage, not be met.

In Germany, the Federal Government has decided to terminate progressively the utilisation of nuclear energy. However, there is consensus that it will be impossible in the short run to find other energy sources or achieve energy savings sufficient to replace the share of nuclear energy in electricity production, which presently exceeds 30%.

3 Developments are described in more detail in the Member States' contributions in Chapter III.

4 Rapport de la Commission pour l'Analyse des Modes de Production de l'Electricité et le Redéploiement des Energies (AMPERE) au Secrétaire d'Etat à l'Energie et au Développement durable, website (not yet available in English): http://www.mineco.fgov.be//energy/ampere_commission/Rapport_fr.htm

5 Rapport au Premier ministre "Etude économique prospective de la filière électrique nucléaire" by J.M. Charpin, B. Dessus, R. Pellat. website (available in French and in English): http://www.plan.gouv.fr/organisation/seeat/nucleaire/accueilnucleaire.html

NUCLEAR FUEL SUPPLY

NATURAL URANIUM

In 2000, total worldwide natural uranium production amounted to some 35,000 tU, a moderate increase compared with 32,000 tU in 1999. Production increased in particular in Australia due mainly to expansion at WMC's Olympic Dam project and to a lesser extent in Canada where MacArthur River and McClean Lake production facilities were formally opened. EU production continued to decrease; domestic supply to Community utilities - which represented some 20-25% in 1990-1991 - was less than 1% in 2000 (see Chapter II). In other parts of the world production is understood to have remained stable.

Compared with total worldwide needs of some 60,000 tU/year, primary production remains well below consumption. Current production covers only just over half of requirements, the balance being made up from stockpiles and recycling. The main secondary sources were stocks from utilities, suppliers and governments, re-enrichment of depleted uranium (tails) in Russia, and a reduction in requirements due to the use of uranium from reprocessing and plutonium in mixed oxide fuels (MOX).

This situation is not sustainable in the long run. Excessive reliance on secondary sources runs the risk of instability and temporary shortages of uranium if these sources dry up before new production becomes available to meet world demand. Due to the lead times needed for prospecting, licensing and mine development, several years might be needed to adjust production levels to meet requirements. Therefore the Agency continues to recommend EU users to cover most of their needs with diversified primary production sources at equitable prices and to keep a sufficient level of strategic stockpiles.

During 2000, the market continued to be driven by the perception of plentiful supplies which caused downward pressure on prices, particularly on the "restricted" (non-NIS origin) market. Published spot prices dropped by more than US$ 2 from January to December to some US$ 7/lbU_3O_8 for "restricted" material, while the price of "unrestricted" (NIS) material dropped about US$ 1 to some US$ 6.5/lb U_3O_8 over the same period. The difference between both categories of material has become less relevant as, most likely, in future, it will apply essentially to Russian material, and Russian suppliers do not appear to be marketing large quantities of natural uranium.

While the spot market represents only a small fraction of the total purchases, it influences the much larger medium and long-term market ("multiannual contracts") on which suppliers depend for their operation and utilities for their security of supply. Spot prices may be volatile, changing rapidly in response to circumstances. However, in recent years there has been a development of "off market" transactions, i.e. transactions concerning unsolicited offers, extensions or options under existing contracts, or offers requested from a small number of selected suppliers.

The markets were influenced by fluctuations in the exchange rates. The US dollar appreciated significantly against the euro over the last two years (see Annex 2); as a

result the average ESA price for multiannual contracts increased in euro while decreasing in US dollars (see Chapter II).

The depression of natural uranium prices over the last two years was attributed to a great extent to the disposal of USEC's inventories. It was reported that a substantial proportion of these inventories may be contaminated and out of specification. If this is true and the material is not replaced by other US inventories, the impact on the market may be significant.

CONVERSION

The price of conversion started declining at the beginning of 1998. The trend accentuated in 1999 as a result of the availability of UF_6 from inventory supplies containing the conversion component, particularly the EUP feed derived from the military HEU. This continued to create serious difficulties for the converter in the USA, which at one time requested government intervention. The prices in the USA recovered significantly during 2000 but were still well below those seen up to 1997. The industry remained under pressure and with an uncertain future, raising cause for concern in view of the small number of operators world-wide.

[Editors note: In early 2001 BNFL announced its decision to cease all uranium hexafluoride (UF_6) production in 2006. The withdrawal of BNFL represents a decrease of some 6,000 tU as UF_6/year in nominal conversion capacity.]

ENRICHMENT

Supply of enrichment (separative work) to utilities worldwide continued steadily. The prices expressed in US dollars remained stable throughout the year. Most of the supply continued to take place under long term contracts. Spot purchases in the EU concerned essentially inventories of enriched uranium product (EUP).

The strength of the US dollar against the euro influenced also the economics of enrichment in favour of the EU enrichers when compared to their US competitor.

Most of the developments concerning the enrichment industry took place in the USA. Questions were raised on the way USEC was privatised, its poor financial performance and its viability. In November some of USEC’s investors filed a class action lawsuit, alleging securities fraud, against the company, some of its officers and investment securities firms that took part in the public offer.

USEC decided to close down its plant at Portsmouth, Ohio, and to concentrate the production at the Paducah, Kentucky plant. This is not expected to have a substantial impact on the market as the plant to be closed represented surplus capacity. After having abandoned the AVLIS laser enrichment programme, USEC sought replacement technology, continued its investment into another laser enrichment programme (SILEX) and, at the same time, was looking into the possibility of using US, Russian and Urenco centrifuge technology. According to reports, the purchase of an interest in Urenco was considered.

At the end of the year, USEC filed a petition with the US government for alleged dumping and subsidies against Eurodif and Urenco (see below under Legal Developments). The action will unfold during 2001. Irrespective of the merit of the case a trade chilling effect is likely to occur with adverse effects for the EU enrichers and the US users. In any event, the case will impact the market and affect commercial relations. The EU Member States directly involved in the investigation and the Commission raised their deep concern about this initiative with the US authorities and are following the case very closely.

In contrast the action happened at a time when USEC was reported to be negotiating lower prices for the blended HEU enrichment component and the purchase of several million Russian commercial SWU at below (discounted) market prices.

FABRICATION

Fabrication facilities continued also to provide adequate coverage of the utilities' needs. The market remained very competitive and further large-scale mergers again took place to profit from consolidation, rationalisation and possible synergies.

In the UK, BNFL's MOX Demonstration Facility (MDF) remained shut down following quality control problems reported last year. In December the UK's Health and Safety Executive announced that BNFL had completed all the recommendations in its key report on the facility which had been published in February. Subject to regulatory approval MDF will reopen as a development facility rather than a production plant.

REPROCESSING

Reprocessing of irradiated fuel continued at the plants at La Hague in France and Sellafield in the United Kingdom.

The industry welcomed the decision by the German authorities to allow the resumption of shipments of spent fuel and high level waste between Germany and both France and the United Kingdom.

The Russian Ministry of Atomic Energy (Minatom) proposed legislation to allow the import of foreign spent nuclear fuel for storage and reprocessing. The case was argued on the basis that profits from the operation would go in part towards resolving Russia's own fuel disposal and clean up of nuclear sites. The Russian Parliament ("Duma") gave initial approval to the relevant legislation, but further readings will be required before it can be submitted to the President for final approval.

MOX FROM MILITARY PLUTONIUM

On 1 September 2000, an agreement was signed between the United States and Russia on the disposition of 34 tons each of weapon plutonium. The agreement specifies that the 34 tonnes to be disposed of by the Russian Federation will be irradiated as MOX fuel in existing nuclear reactors in the Russian Federation, and in any other reactor agreed by the USA and the Russian Federation in writing. On the

Russian side the key factor of success of the operation is the availability of funding. The utilisation of equipment from the mothballed Siemens MOX fabrication plant at Hanau in Germany, if exported to Russia, could shorten the planning of the operation.

In collaboration with other services of the Commission, the Supply Agency prepared contributions to the work of the G-8 Working Party. Proposals for financing schemes, are expected to be discussed at the G-8 summit to take place in mid-2001.

The matter was also extensively debated at the Belgium Nuclear Society's Plutonium 2000 conference in October.

SUPPLY OF MATERIAL FROM THE NEW INDEPENDENT STATES (NIS)

NATURAL URANIUM DELIVERIES

The NIS countries remained the largest source of supply of natural uranium to the EU. From this source, in the year 2000, EU utilities took delivery of 5,500 tU under purchasing contracts as natural uranium or feed contained in EUP (excluding re-enriched tails). A further 300 tU were delivered as a result of exchanges. Total acquisitions of natural uranium from the NIS were therefore some 5,800 tU, representing about 37% of the total deliveries to the EU utilities under purchasing contracts in 2000 (34% in 1999) or 33% of the total amount of fuel loaded in EU reactors during the year. 4,200 tU were acquired from Russia under purchasing contracts, representing 27% of total deliveries to EU utilities under purchasing contracts in 2000 (24% in 1999), or 24% of the total amount of fuel loaded in EU reactors during the year (18% in 1999)6.

The Supply Agency concluded 4 new supply contracts for NIS uranium during the year, for about 1,100 tU (including natural uranium feed equivalent contained in EUP) to be delivered over the period 2000-2006.

Re-enrichment in Russia for EU enrichers of western origin tails continued in 2000. Deliveries of re-enriched tails to EU utilities represented some 400 tU under purchasing contracts plus 700 tU acquired through exchanges. The Agency concluded 4 new supply contracts for the delivery of about 600 tU as re-enriched tails over the period 2001-2005.

PHYSICAL IMPORTS OF NIS ORIGIN MATERIAL

Total physical imports from the NIS of natural uranium and feed contained in EUP amounted to some 8,700 tU in 2000. This figure compares with 7,000 tU delivered to the EU users during the year (both including re-enriched tails). As in 1999, Russian physical exports to the EU were essentially in the form of feed contained in EUP or re-enriched tails (natural UF_6 equivalent) for western enrichers.

6 Due to additional information communicated to the Agency after the publication of the Annual Report for 1999, the figures for that year had to be revised.

For the period 1992-2000, imports of natural uranium and feed contained in the EUP from the NIS as well as western tails re-enriched in Russia amounted to a cumulative total of 105,400 tU. From these, 43,100 tU were delivered to EU end users during the same period (see table 1).

The physical imports from NIS countries, particularly from Russia, continued to decrease, a trend observed since 1996. Excluding re-enriched tails it is clear that physical imports are getting in line with the deliveries to the utilities.

Partly as a result of the imports referred to above, the total inventories of natural uranium in the EU have increased significantly during the period 1992-97 but started decreasing slightly in 1998-99; this trend continued in 2000.

Table 1 - Physical imports by EU operators, and acquisitions by EU utilities of natural uranium or feed contained in EUP from the NIS (tU)

Year	Physical imports	Acquisitions(1)	Acquisitions as % of supply(2)	Acquisitions incl. RET(3)	Acquisitions incl. RET as % of supply(2)
1992	9,500	2,700	23		
1993	12,100	2,700	22		
1994	12,200	4,500	32		
1995	12,100	5,200	32		
1996	17,600	6,800	43		
1997	12,200	5,000	32		
1998	11,600	5,300	34		
1999(4)	9,400	5,100	34	6,200	42
2000	8,700	5,800	37	7,000	44
Total	105,400	43,100	33		

Notes:
(1) Acquisitions cover deliveries to EU utilities including exchanges but excluding re-enriched tails.
(2) Supply to EU utilities covers total deliveries to EU utilities under purchasing contracts during the respective year.
(3) Deliveries of re-enriched tails (RET) to EU utilities started in 1997 but were negligible (<1% of total supply) during the first two years. The figures for 1999 and 2000 include RET acquired as a result of exchanges.
(4) Due to additional information communicated to the Agency after the publication of the Annual Report for 1999, the figures for that year were slightly changed.

It should be noted that the studies and analysis of NIS imports mentioned here relate strictly to the commercial use and destination of the material. All such imports are subject to Euratom and, as applicable, IAEA safeguards while on the territory of the Member States.

SUPPLIES DERIVED FROM DISARMAMENT OF NUCLEAR WEAPONS

USEC continued its role as executive agent for the disposal of the enrichment component under the USA-Russia HEU Agreement. 858 t LEU derived from 30 t HEU were reported to be delivered in the USA in 2000, in line with the quantities foreseen under the Agreement bringing the total deliveries since the beginning of the

programme in 1994 to 3,243 t LEU derived from 111 t HEU (out of the 500 t HEU foreseen).

The sale of the natural uranium feed corresponding to the LEU delivered to USEC, in accordance with the contract concluded in 1999 between Cameco, Cogéma and Nukem on one side and Minatom and Tenex on the other, progressed at slow pace. Due to the relatively low quota for deliveries to the US market permitted under US legislation during the first few years and the high floor price in comparison with current spot market prices the quantities sold so far have been limited7. It is recalled that in the EU there are no restrictions on this material but, due to the price situation and costs of transportation, no sales have been recorded. Given the current deficit between world production and requirements for natural uranium, it is believed that the HEU feed will play a very important role in future. Its orderly disposal will be essential to avoid market disturbances.

THE POLICY OF DIVERSIFICATION OF SOURCES OF SUPPLY

The Community has the duty to ensure a "regular and equitable supply" of nuclear materials (Art. 2 of the Euratom Treaty), and to this end the Supply Agency is implementing a policy of diversification of sources of supply, trying to ensure that the EU does not become over-dependent on any single source of supply. For clarification it is recalled that the policy does not involve a system of quantitative import limits (as would be the case with quotas), but rather the exercise by the Agency of its exclusive right under the Treaty to conclude contracts in such a way as to assure long term security of supply.

The Agency has a large discretionary margin of judgement in order to avoid the adverse consequences of possible supply disruptions in the long term. Rather than limiting imports at Community level through a quota system, the policy requires each utility, in a pragmatic and flexible manner, to ensure that it maintains a diversified portfolio of contracts. Furthermore the users, while contracting with the suppliers of their choice, are advised to choose primary producers for the majority of their requirements and to enter into long term contracts at equitable prices. Spot contracts are mainly intended to cover requirements that were not anticipated or to build up inventory taking advantage of particularly favourable opportunities.

The legality of the Supply Agency's policy and the setting of a maximum level of dependence on a country or group of supplier countries was confirmed in the case brought before the court by Kernkraft Lippe Ems (KLE)8. The Court of Justice judged that "*no provision of the Treaty prevents the Agency or the Commission from taking into account in the management of the common supply policy, in particular when the* '*place of origin' of supplies has to be determined, a geographical territory which is more or less extensive than a State considered in isolation".*

7 Although the LEU resulting from the blending of 30t of HEU contains the equivalent of some 9,000 tU as natural uranium feed, Russia is allowed to take back part of that material for blending purposes, and out of the amount remaining only 2,300 tU were allowed for sale in the USA in the year 2000. In accordance with the USEC privatisation act, this quota is to increase progressively up to about 7,700 tU in 2009 and stabilise thereafter.

8 Case C-161/97P, KLE/Commission, European Court Reports, 1999, I, pg. 2057 (see Annual Report 1999, pg. 10). The Court of Justice rejected the appeal of KLE against the judgement of the Court of

After consulting with the industry and its Advisory Committee the Agency was contemplating at the year end an amendment of the policy in the sense of allowing further purchases of fresh production of natural uranium from Kazakhstan and Uzbekistan by the EU utilities. The Agency took into account that the amounts of uranium being mined in these countries are relatively small, and that the lifting of restrictions in the United States eliminated market distortions.

The other elements of the policy announced in last year's Annual Report remain unchanged. The Agency will continue to monitor all sources of supply and, in particular, the total supply from NIS countries, which are, as a group, by far the largest source of supply. It will reconsider the policy if the global quantity for the group is considered to be too high with regard to the long-term security of supply.

DEVELOPMENTS IN THE USA

Trade restrictions with regard to the NIS changed substantially in 2000. As a result of the "sunset reviews" initiated in 1999, the US International Trade Commission determined that there would not be a threat of injury to the US industry from imports of natural uranium from Uzbekistan and Ukraine. This finding effectively terminated the restrictions on imports of uranium from Uzbekistan and Ukraine. However, the restrictions on Russia were maintained. As a consequence, provided that these decisions are not changed by court reviews, of the six original trade actions against republics from the former Soviet Union, only the suspension agreement for Russian origin uranium and enrichment remains in place.9

Proposals from USEC to amend the Russian suspension agreement in order to allow the import of additional "commercial enrichment (SWU)" at substantially discounted market prices to compensate for higher price for SWU in the blended Russian HEU have not been confirmed by the new US administration. The Supply Agency would view such a development with concern, as it would give USEC an undue competitive advantage. Other USEC initiatives to allow additional amounts of Russian natural uranium at higher matching ratios (i.e., higher amounts of Russian materials to be combined with newly produced US uranium) did not materialise.

First Instance: Joined cases T-149/94 and T-181/94, KLE/Commission, European Court Reports, 1997, II, pg. 161, see Annual Report 1997, pg. 11-13.

9 It is recalled that the suspension agreement with Kazakhstan was terminated unilaterally in 1998 by Kazakhstan. The anti-dumping procedure resumed for a short period but, after a negative determination of injury by the ITC, natural uranium from this origin was allowed to enter freely in the USA (see 1999 Annual Report). However the situation with the Kazakh inventories of EUP enriched in the former Soviet Union remained under review. The Court review confirmed the ITC decision in early 2001. The Kyrgyz suspension agreement lapsed automatically with the "sunset reviews", as interested parties did not request its continuation. Tajikistan terminated its suspension agreement in 1993, the ITC determined that imports did not pose a threat to the US industry, therefore no duty was imposed.

LEGAL DEVELOPMENTS

DUAL USE REGULATION

On 22 June 2000 the Council of the European Union adopted a revision to the Dual Use Regulation10 which modified the Community regime on the control of exports of dual-use items and technology to third countries. The new regulation introduced an intra-community licensing system for all nuclear items, including non-sensitive materials. The new system was intended to comply with the new information obligations under the Additional Protocols to Agreements with the IAEA on the strengthening of safeguards.

However it was found that this was not only unnecessary, but also contrary to the principle of free circulation of nuclear goods11. Following an intensive campaign by the interested parties, a proposal to amend the revised regulation was adopted on 22 December 2000 and entered into force on 4 January 200112, whereby the status quo before 22 June 2000 has been maintained for non-sensitive materials.

USEC ANTI-DUMPING PETITION AGAINST EURODIF AND URENCO

On 7 December 2000 USEC filed an antidumping and countervailing duty petition on low-enriched uranium (LEU) from France, Germany, the Netherlands and the United Kingdom. It was joined by the Paper, Allied-Industry Chemical and Energy Workers International Union (PACE), the union representing USEC workers. The EU respondents (Eurodif and Urenco), the governments of the four Member States concerned, the EU Commission, and the Ad Hoc Utilities Group (a group of 14 US utilities that produce energy using nuclear fuel) opposed the petition.

The Commission and the Member States consulted with the US Department of Commerce (DOC) in December to present the EU position concerning the petition, its receivability and the initiation of an investigation. The DOC did not accept the EU arguments, determined that the petition met the standard for initiation and announced on 27 December the opening of antidumping and countervailing duty investigations. Further to a determination of possibility of injury by the US International Trade Commission (ITC) early 2001, the case was started.

Following an extension of delays, preliminary determinations by the DOC are due in May 2001. If the DOC makes affirmative final antidumping or countervailing duty determinations, the ITC must make a final injury determination within 45 days. If

10 Official Journal Nr. 159 of 30 June 2000, p. 1, website: http://europa.eu.int/eur-lex/en/lif/reg/en_register_02401030.html

11 Commission Document COM(2000) 766 final of 28 November 2000. This fundamental principle has been recalled on several occasions in Member State declarations to the IAEA (see IAEA Documents INFCIRC 322, website: http://www.iaea.org/worldatom/Documents/Infcircs/Others/inf322.shtml and INFCIRC/254/Rev.4/part1, website: http://www.iaea.org/worldatom/Documents/Infcircs/2000/infcirc254r4p1.pdf

12 Official Journal Nr. L 336 of 30 December 2000, p. 14, website: http://europa.eu.int/eur-lex/en/lif/dat/2000/en_300R2889.html

that is affirmative, the DOC will issue a duty order. Final determinations by the ITC are due in July 2001 (on countervailing) and September 2001 (on antidumping) 13.

The Commission and the Supply Agency are following the case very closely in order to assist the companies and the respective Member States. The Agency is concerned that the initiative by USEC will hamper the access of the EU enrichers to the US market and therefore distort competition. It is widely believed that USEC's problems are mostly of its own making due to its commercial and industrial decisions as well as the unfavourable strength of the US dollar relative to the euro.

MERGERS AND ACQUISITIONS

Strong competition in the electricity and nuclear fuels market continued to put pressure on companies to improve their cost structure. As a result, further mergers and acquisitions of major companies took place during the year.

After the acquisition of part of Westinghouse's nuclear business and ABB's nuclear division by BNFL over the previous two years, it was the turn of Framatome and Siemens to merge their nuclear activities. The European Commission reviewed in depth this concentration, and authorised the operation subject to the parties' agreement that Cogéma would not participate in the joint venture, and subject to the condition that EDF would withdraw from Framatome and diversify its supply structure so as to ensure access for competitors of the new joint venture. The transaction was closed in January 2001. The new company Framatome ANP SAS is owned 66% by Framatome SA and 34% by Siemens AG.

In the mining sector, Rio Tinto purchased North Limited, the majority shareholder of Energy Resources of Australia (ERA). The international mining company Billiton acquired Rio Algom's mining assets, including their uranium interests.

Uranit GmbH and Ultra-Centrifuge Nederland, the German and Dutch shareholders of Urenco, continued to evaluate the sale of their shares in the company. Some companies were reported as being interested in acquiring Urenco's shares. However no deal materialised during the year.

On the utilities side, VEBA (owner of Preussenelektra AG) and VIAG (owner of Bayernwerk AG) merged to form the new group E.ON AG, while RWE acquired VEW AG in Germany. Vattenfall of Sweden became the majority shareholder of German utility HEW. The Commission authorised EDF to acquire joint control with existing owners over German EnBW subject to sale of a certain generating capacity by EDF.

The impact on the market of these developments is still undetermined. However, consolidation of the industry is reducing the number of buyers and suppliers; and even though the volume of the transactions remains unchanged, the diversification between market participants is becoming more limited.

13 Information on determination dates, the alleged dumping margins and subsidy rates may be found on http//www.itadoc.gov/media/uranium1228fact.htm.

RESEARCH REACTORS FUEL CYCLE

Research reactors continued to be supplied regularly with fresh fuel during the year. However long term supply of HEU for the few reactors still using this material, as well as for targets used in isotope production, remains difficult due to political pressure associated with non-proliferation considerations. LEU supply (uranium enriched up to 19.75%) does not pose a problem for the foreseeable future.

Following the exchange of diplomatic notes between the Commission and the US Government last year, shipments of HEU for the High Flux Reactor (HFR) of the Commission's Joint Research Centre (JRC) in Petten resumed in 2000. Shipments of HEU from the USA had been suspended since 1991 as a result of the revision to the US Energy Policy Act, which imposed severe conditions on the export of HEU.

Russia remains as an alternative HEU supplier to research reactors in the Community, but stringent legislation and administrative difficulties have impeded shipments.

Extensive international co-operation continued in order to find new processes which would allow the fabrication of fuels and targets with LEU to replace HEU without major penalties to the operators. However it will take several years before the research will be completed and the new fuels will be licensed and deployed.

Return of irradiated spent fuel to the United States for ultimate disposal continued without major difficulties. Alternatively, reprocessing of HEU would, in principle, be possible at Cogéma, La Hague, by dilution with commercial LEU fuels, but France would require the return of the resulting waste to the country of origin.

It is recalled that the US policy which allows the return of spent research reactor fuels to the US Department of Energy is due to expire in 2006 and not expected to be renewed. Due to the long lead times required to implement solutions for the disposal of spent fuel it is becoming increasingly urgent to establish alternatives. In addition further problems may arise in the future due to the fact that LEU silicide fuels currently used in research reactors cannot be reprocessed at present.

OTHER DEVELOPMENTS

The Sixth Conference of Parties (COP-6) of the United Nations Framework Conference on Climate Change (UNFCCC) failed to agree in The Hague on the principles and procedures to implement the "Kyoto Protocol" on greenhouse gas emission levels. A compromise proposal by the Chairman, Dutch Minister Pronk, suggested a declaration stating that developed countries would refrain from using nuclear energy for projects eligible for the "Clean Development Mechanism"14. The conference is due to be resumed, possibly in Bonn, in the summer of 2001.

14 The Clean Development Mechanism concerns emission reduction developing countries, resulting in credits for a developed country co-operating in the project). http://www.unfccc.de/resource/docs/cop6/dec1-cp6.pdf

CHAPTER II

SUPPLY AND DEMAND FOR NUCLEAR MATERIALS AND ENRICHMENT SERVICES IN THE EU

REACTOR NEEDS/NET REQUIREMENTS

During 2000, about 2,500 tU of fresh fuel were loaded in EU reactors containing the equivalent of 17,400 tU as natural uranium and 9,800 tSW; most tails assays were in the range of 0.25 – 0.35 %.

Future EU reactor needs and net requirements for uranium and separative work, based on data supplied by EU utilities, are estimated as shown in table 2.

Table 2 - Reactor needs and net requirements for uranium and separative work

A) From 2001 until 2010

Year	Natural Uranium		Separative Work	
	Reactor needs	Net requirements	Reactor needs	Net requirements
2001	21,400	16,700	12,100	10,700
2002	20,600	16,600	11,600	10,300
2003	21,100	18,300	12,100	10,700
2004	21,300	18,800	12,300	11,100
2005	20,200	18,400	11,800	10,900
2006	21,200	19,400	12,500	11,500
2007	20,900	19,000	12,400	11,400
2008	20,200	18,800	12,000	11,200
2009	20,600	19,300	12,300	11,600
2010	21,000	20,000	12,400	11,900
Total	208,500	185,300	121,500	111,300
Average	20,900	18,500	12,200	11,100

B) Extended forecast from 2011 until 2020

Year	Natural Uranium		Separative Work	
	Reactor needs	Net requirements	Reactor needs	Net requirements
2011	19,400	18,600	11,700	11,200
2012	19,800	18,900	11,900	11,500
2013	19,400	18,600	11,800	11,300
2014	18,000	17,100	10,900	10,500
2015	17,900	17,100	10,900	10,400
2016	17,700	16,900	10,700	10,300
2017	17,100	16,200	10,300	9,900
2018	17,400	16,500	10,500	10,100
2019	17,200	16,300	10,400	10,000
2020	16,800	15,900	10,100	9,700
Total	180,700	172,100	109,200	104,900
Average	18,100	17,200	10,900	10,500

Net requirements are calculated on the basis of reactor needs less the contributions from currently planned uranium/plutonium recycling, and taking account of inventory management as communicated to the Agency by utilities.

Average reactor needs for natural uranium over the next 10 years will be 20,900 tU/year, while average net requirements will be about 18,500 tU/year. Relative to 1999, average future reactor requirements decreased by some 600 tU/year on average.

Average reactor needs for enrichment over the next 10 years will be 12,200 tSW/year, while average net requirements will be in the order of 11,100 tSW/year. Relative to 1999, future enrichment needs remained stable.

NATURAL URANIUM

CONCLUSION OF CONTRACTS

The number of contracts and amendments relating to ores and source materials (essentially natural uranium) which were dealt with in accordance with the Agency's procedures during 2000 is shown in table 3.

Table 3 - Natural uranium contracts concluded by or notified to the Supply Agency (including feed contained in EUP purchases)

Contract Type	Number	Quantity (tU)[1]
Purchase (by a EU utility/user)		
- multiannual [2]	10	4,800
- spot [2]	8	1,500
Sale (by a EU utility/user)		
- multiannual	0	0
- spot	1	-
Purchase-sale (between two EU utilities/users)		
- multiannual	0	0
- spot	0	0
Purchase-sale (intermediaries) [3]		1,200
- multiannual	1	-
- spot	7	-
Exchanges [4]	19	3,000
Loans	0	0
TOTAL [5]	46	10,500
Contract Amendments [6]	6	-100

Notes
(1) In order to maintain confidentiality the quantity has been indicated only when there were at least 3 contracts of each type, but all quantities have been included in the total.
(2) Multiannual contracts are defined as those providing for deliveries extending over more than 12 months, whereas spot contracts are those providing for either only one delivery or deliveries extending over a period of a maximum of 12 months, whatever the time between the conclusion of the contract and the first delivery.
(3) Purchases/sales contracts between intermediaries - both buyer and seller are not EU utilities/end users. In order not to disclose the single multiannual contract quantity, one total for multiannual and spot contracts is presented.
(4) This category includes exchanges of ownership and U_3O_8 against UF_6. Exchanges of safeguards obligation codes and international exchanges of safeguards obligations are not included.
(5) The total includes 6 contracts of less than 10 tU each.
(6) Concerning purchasing contracts only. The quantity represents the net increase (or decrease).

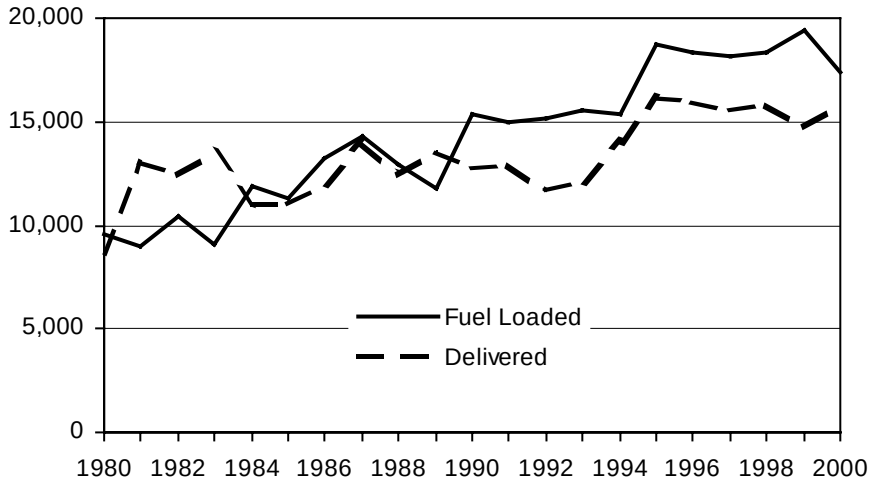
Transactions involving natural uranium totalled approximately 10,500 tU, some 6,300 tU of which were the subject of new purchase contracts by EU utilities (spot and multiannual). Amendments to existing contracts resulted in a slight reduction by 100 tU of the total quantities contracted. Some 4,200 tU transacted related to purchases by producers or intermediaries, as well as exchanges, loans, etc. In comparison with last year, the total amounts contracted have decreased, but the activity for new purchases by utilities remained fairly stable.

VOLUME OF DELIVERIES

During 2000, natural uranium deliveries under existing purchasing contracts amounted to approximately 15,800 tU compared with 14,80015 tU in 1999. Deliveries under spot contracts represented about 12% of the total (8% in 1999).

The deliveries taken into account are those made under purchasing contracts to the EU electricity utilities or their procurement organisations; they include also the natural uranium equivalent contained in enriched uranium purchases. Deliveries under purchasing contracts and fuel loaded into reactors by EU utilities since 1980 are shown in graph 1. The corresponding table is in Annex 1. The difference between deliveries and the amount of fuel loaded can be explained by the use of reprocessed uranium and drawing down of inventories.

Graph 1 - Natural uranium feed contained in fuel loaded into EU reactors and natural uranium delivered to utilities under purchasing contracts (tU)



AVERAGE PRICES OF MULTIANNUAL AND SPOT CONTRACTS

Prices for deliveries under multiannual contracts were expressed in 7 different currencies. To calculate the average price, the original contract prices were converted into euro16 (€) and then weighted by quantity. For the conversion into euro, the Agency used the average annual exchange rate of the respective currency as published by Eurostat. A very small number of contracts where it was not possible to establish reliably the price of the natural uranium component (e.g. in some cases of enriched uranium deliveries priced per kg of EUP) were excluded from the price calculation.

15 Due to late reporting by some utilities, the figure for 1999 has been corrected from 14,700 (as shown in last year's Report) to 14,800.

16 The ECU was replaced by the euro on 1 January 1999 with a conversion rate of 1:1. However, historical references (pre-1999) to the ECU continue to be labelled as ECU.

The average price for deliveries in 2000 for multiannual contracts notified to the Agency (including those agreed in earlier years) rounded to the nearest ¼ euro was as follows:

€ 37.00/kgU contained in U_3O_8 (€ 34.75/kgU in 1999).

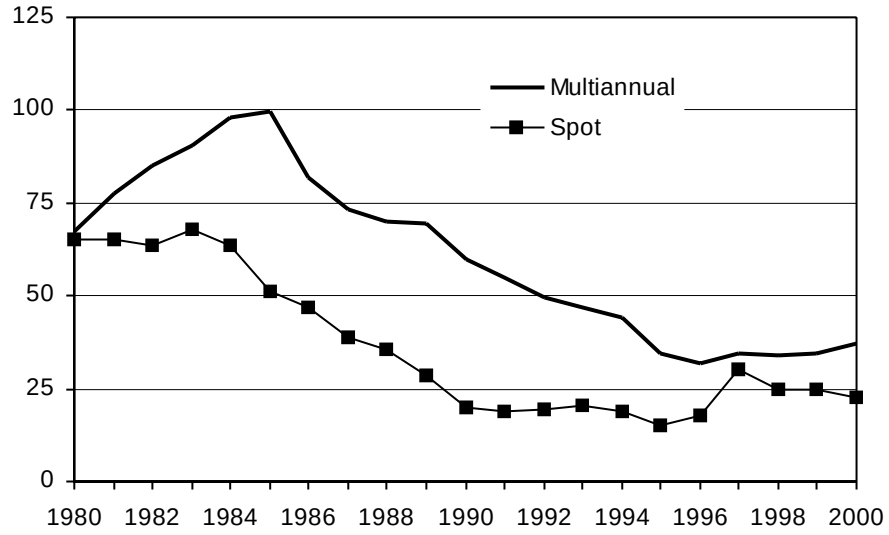
The average price of material delivered in 2000 under spot contracts, calculated according to the same principles, was as follows:

€ 22.75/kgU contained in U_3O_8 (€ 24.75/kgU in 1999).

PRICE HISTORY

Graph 2 shows prices for deliveries under multiannual and spot contracts since 1980, expressed in ECU/euro. For ease of reference, historical data on prices published in previous Annual Reports and the US dollar/euro exchange rate are presented in Annex 2.

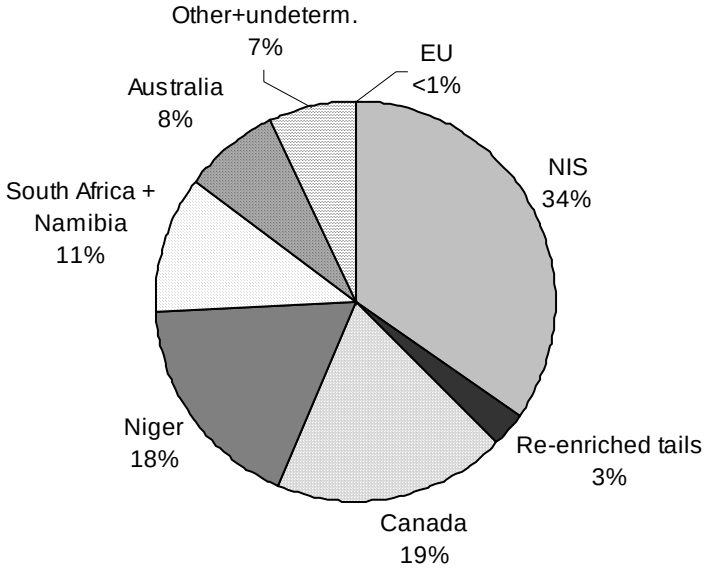
Graph 2 - Average price for natural uranium delivered under spot and multiannual contracts (€/kgU)



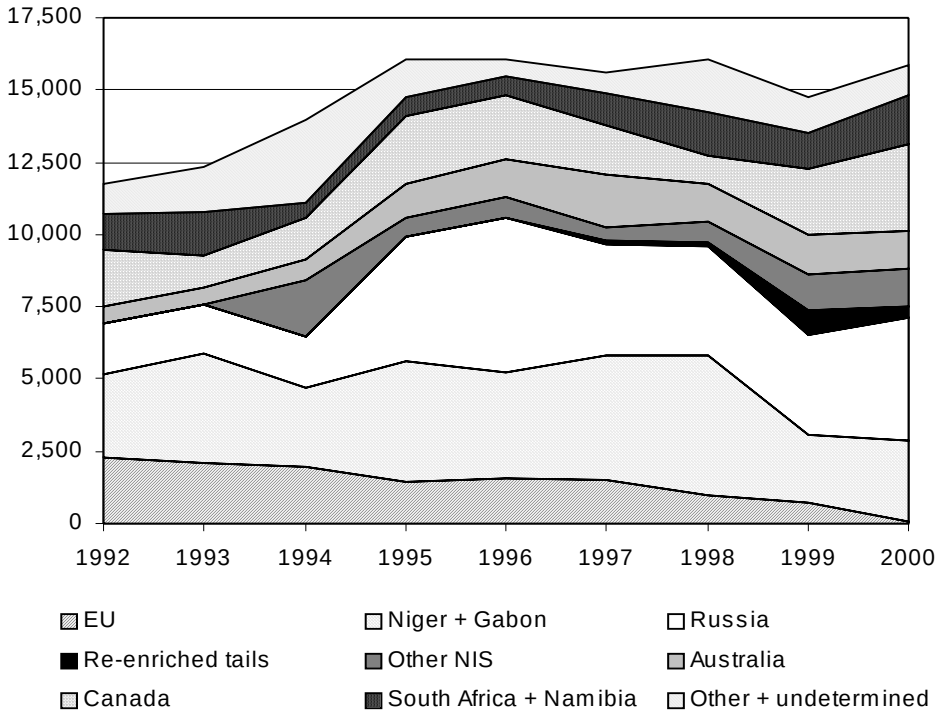
ORIGINS

EU utilities or their procurement organisations obtained in 2000 virtually all of their supplies from 12 countries outside the EU. The largest supplier was Russia, which provided some 27% of supply under purchasing contracts (29% including re-enriched tails), followed by Canada with 19% (graph 3). Purchases of natural uranium by origin since 1992 are shown in graph 4.

Graph 3 - Origin of the natural uranium delivered to EU utilities under purchasing contracts

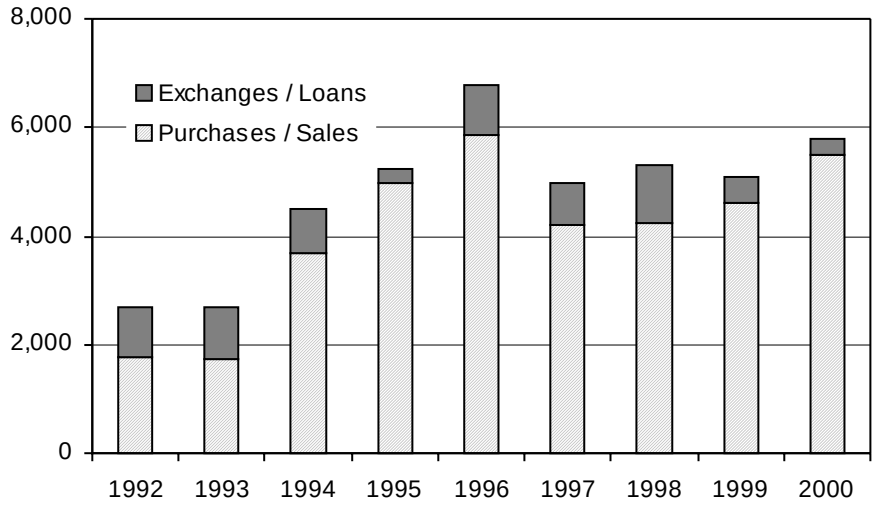


Graph 4 - Purchases of natural uranium by EU utilities by origin (tU)



The details for acquisitions of NIS origin natural uranium (excluding re-enriched tails) by EU utilities since 1992 are shown in graph 5.

Graph 5 - Acquisitions of NIS origin natural uranium by EU utilities (tU)



SPECIAL FISSILE MATERIALS

CONCLUSION OF CONTRACTS

The number of contracts and amendments relating to special fissile materials (enrichment, enriched uranium and plutonium for power and research reactors) which were dealt with during 2000 in accordance with the Agency's procedures is shown in table 4.

Table 4 - Special fissile material contracts concluded by or notified to the Supply Agency

Contract Type [1]	Number
A. Special Fissile Materials	
Purchase (by a EU utility/user)	
- multiannual	2
- spot	13
Sale (by a EU utility/user)	
- multiannual	2
- spot	38
Purchase-sale (between two EU utilities/users)	
- multiannual	0
- spot	14
Purchase-sale (intermediaries)	
- multiannual	3
- spot	25
Exchanges	9
Loans	7
TOTAL, including [2]	113
- Low enriched uranium	57
- High enriched uranium	23
- Plutonium	35
Contract Amendments	2
B. Enrichment contracts [3]	
Multiannual	10
Spot	1
Contract Amendments	19

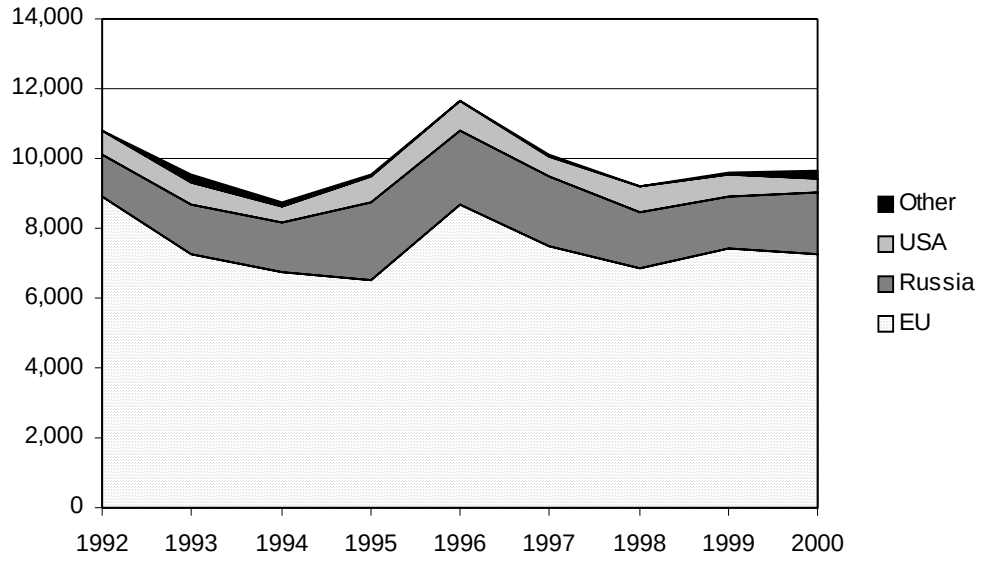
Notes
(1) See explanations under table 3, as appropriate.
(2) Some contracts may involve both LEU and plutonium or HEU and plutonium.
(3) Contracts with primary enrichers only.

DELIVERIES OF LOW ENRICHED URANIUM (LEU)

In 2000, supply of enrichment services to EU utilities totalled approximately 9,700 tSW, delivered in 1,800 tLEU which contained the equivalent of some 15,200 tonnes of natural uranium feed. Some 75% of this separative work was provided by EU companies (Eurodif and Urenco). Deliveries of separative work under spot contracts were in the order of 3%.

Deliveries of Russian separative work under purchasing contracts represented 18% of the total; including exchanges, this figure increases to 22%. Supplies from the USA accounted for some 4%. Supply of enrichment (separative work) to EU utilities by origin since 1992 is shown in graph 6.

Graph 6 - Supply of enrichment (separative work) to EU utilities by origin



ENRICHED URANIUM FOR RESEARCH REACTORS

Enriched uranium for research reactors is normally supplied in two enrichment assays: just under 20% (LEU) and about 90% (HEU). Although the quantities involved represent a minor amount in terms of EU needs for enriched uranium, HEU supply is very important to the scientific community and for the production of isotopes for medical and industrial applications.

Supply of LEU to research reactors continued unhindered. Reactor requirements for HEU were met, but the source of future supplies continued to be the object of considerable attention (see also Chapter I). The Supply Agency continued to provide support to reactor operators in the procurement of fuels.

PLUTONIUM AND MIXED-OXIDE FUEL

In 2000, transactions involving plutonium were again mainly related to its use for MOX fuel fabrication, and the Agency concluded 35 such contracts.

The use of MOX has contributed to a significant reduction in requirements for natural uranium and separative work in recent years. However, reprocessing and the use of MOX fuels continue to face increased difficulties because of the political decisions in some countries to postpone or to abandon this solution for the management of irradiated fuels.

The quantities loaded into EU reactors and the estimated savings from the use of MOX fuel are shown in table 5. It should be noted that published figures on natural uranium and separative work savings vary considerably; here, it was assumed that 1 tPu saves the equivalent of 120 tU as natural uranium and 80 tSW.

Table 5 - Utilisation of plutonium in MOX in the EU and estimated natural uranium and separative work savings

Year	kg Pu	savings	
		t NatU	t SW
1996	4,050	490	320
1997	5,770	690	460
1998	9,210	1,110	740
1999	7,230	870	580
2000	9,130	1,100	730
Total	35,390	4,260	2,830

COMMISSION AUTHORISATIONS FOR EXPORT

The authorisation of the Commission is required for the export of nuclear materials produced in the Community, according to the provisions of Article 59(b) of the Euratom Treaty (and Article 62.1 (c) in the case of special fissile materials). Requests for these authorisations are submitted to the Commission by the Supply Agency.

During 2000, 3 authorisations were granted by the Commission for the export of 251 tLEU with enrichments below 5%, containing the equivalent to 1,336 tSW of EU origin over the period 2000-2003.

CHAPTER III

NUCLEAR ENERGY DEVELOPMENTS IN THE MEMBER STATES OF THE EUROPEAN UNION17

BELGIË/BELGIQUE - BELGIUM

ENERGY POLICY

The law of 29 April 1999 concerning the organisation of the electricity market was further put into effect. The steering committee of the regulator (Regulatory Commission of Electricity and Gas) was appointed, and the composition and working of its General Council was determined.

The clients consuming more than 20 GWh a year per site have been made eligible. Negotiations are on-going for the appointment of the transport grid manager. For the construction of electricity production facilities and direct lines, specific authorisation regimes have been established as required by the law.

The committee of experts charged with the examination of the future choices for electricity production (Ampère-Commission)18 has presented its report. With respect to nuclear energy some of its recommendations are:

- It is necessary to maintain a scientific and technological potential in order to assure an efficient production capability in optimal safety conditions. This includes the continuation of research and development in the nuclear field, as well as the existence of education programmes.

- The nuclear option should be kept open for the future, which means maintaining national know-how in the nuclear sector as well as participating in the research and development of future process. These should be evaluated on their merits.

The report will be submitted to the peer review of a group of 5 international experts.

NUCLEAR ELECTRICITY GENERATION

In 2000 Belgium's nuclear power plants (including the French share of Tihange 1) generated about 45.4 TWh. This is 2.7% lower than in 1999 due to the higher number of reloads in 2000 than in 1999. The nuclear share represents 56.8% of the country's total electricity production in 2000. The load factor of Belgium's nuclear power plants reached 90.7%.

FUEL CYCLE DEVELOPMENTS

The production of MOX fuel by BELGONUCLEAIRE in its Dessel plant amounted to 37 tonnes in 2000, to be used in Belgian, German and Swiss plants.

17 This chapter comprises contributions made by the Member States.

18 See footnote 4; website: http://www.mineco.fgov.be//energy/ampere_commission/Rapport_fr.htm.

8 fresh MOX fuel elements were loaded in 2000 in the Doel 3 unit and 8 fresh MOX fuel elements in the Tihange 2 unit. This brings the cumulated total to 96 fresh MOX elements loaded for the whole of Belgium.

In the course of 2000 two shipments of vitrified high level waste took place from La Hague to the temporary storage building of the BELGOPROCESS site at Dessel. The waste results from the reprocessing of Belgian spent fuel in France.

Work on the optimisation of the conditioning process of spent fuel continued.

With regard to R&D on the geological disposal of conditioned spent fuel and high level, medium level and long-lived waste, as already mentioned in previous reports, Belgium is extending its underground laboratory in order to demonstrate the feasibility of the underground disposal of high-level waste. The construction 'of a second access shaft was already completed in 1999. At the end of 2000, construction of the connecting gallery between this new shaft and the already existing underground laboratory was ready to go ahead.

The SAFIR 2 report, giving an overview of the results obtained so far and indicating future R&D orientations is in its final stage. At the year end it was undergoing a thorough examination by a national reading committee. After this it will be submitted to an international peer review.

During 2000, 342 spent elements were placed in 12 dry storage containers in the interim storage building at Doel. This brings the total to 834 spent fuel elements placed in 31 containers. At Tihange, 60 spent fuel elements were placed in the wet storage building, which brings their total to 635.

The work programme with respect to the disposal of low-level and short-lived waste has progressed well. Apart from several technical studies, two local partnerships have been formed, one at Dessel and one at Mol. At Fleurus-Farciennes an accompaniment committee has been set up pending the creation of a local partnership. The local partnerships are charged with preparing integrated projects, in which the disposal facility forms part of a more global development scheme of the region from the economic and social points of view.

RESEARCH

The BR2 research reactor at the Nuclear Research Centre at Mol continued its operation according to a schedule of 105 equivalent full power days. The BR2 was involved in the irradiation of LWR fuels (increased burn-up), LWR pressure vessel materials and LWR structural materials (irradiation assisted stress corrosion cracking) and fusion materials. Irradiations of advanced nuclear fuels were in preparation. The BR2 has continued with the production of radio-elements and silicon doping.

The work on the pre-design of an accelerator driven system (ADS), called MYRRHA, for multiple purposes has continued. The feasibility study has advanced well but will only be finished in the course of 2001.

DANMARK - DENMARK

Denmark has no nuclear power plants. The existing relatively small amount of Danish radioactive waste arises mainly from the operation of research reactors and from post-irradiation characterisation of experimentally produced fuel elements in the period 1970 to 1990 at Risø National Laboratory. In 1999 there were two reactors in operation at Risø National Laboratory: a 10 MW heavy water moderated reactor, DR3, used for basic research, silicon doping, and isotope production, and a small homogenous reactor, DR1, used for educational purposes. Another research reactor, DR2, has been decommissioned to stage 2, as were the Risø hot cells used in the post irradiation studies.

Following a year with uncertainties about leak tightness of the reactor tank, it was decided in September 2000 to close down the DR3 reactor permanently. DR1 is expected also to be permanently closed in the near future. Responsibility for the closed facilities and the remaining operating nuclear facilities, e.g. the waste management plant, will be transferred to a new organization: Danish Decommissioning, established under the Ministry of Information, Technology and Research. The organization will take care of planning and practical work in connection with future removal of the nuclear plants. A Danish repository for low- and intermediate level waste will be needed in this context, but at the end of 2000 there were no concrete plans for such a facility.

The remaining spent fuel from DR3 will be sent by ship to the United States according to the US policy for research reactor fuel of US origin. There are no plans for disposal of high-level waste in Denmark.

Low-level waste (LLW) and intermediate-level-waste (ILW) are collected, treated and stored in two intermediate storage facilities situated at Risø.

Solid LLW is compacted in drums and liquid ILW is treated in an evaporator and a bituminization plant. Between 1/2 and 2/3 of the LLW is produced by Risø National Laboratory, the rest comes from hospitals, industry, laboratories and other users of radioactive isotopes in Denmark. At the end of 2000 about 4,700 drums were stored in the facility for LLW. The facility has a capacity of about 5,000 drums. Decommissioning waste is expected to dominate future waste generation.

The storage facility for ILW is also used for long-lived LLW. At the end of 2000 about 130 m^3 long-lived ILW and LLW are stored in the facility. A small capacity extension was carried out in 2000.

DEUTSCHLAND - GERMANY

NUCLEAR ENERGY PRODUCTION.

In 2000, the 19 commercial power plants connected to the grid produced about 168.4 TWh of electricity (gross) in Germany. To this should be added 1.2 TWh of electricity destined for the railway system and 0.05 TWh of steam supply from the Stade nuclear power plant. This represents the second-best result since the utilisation of nuclear energy started in Germany; it has been achieved through a further increased availability of the German nuclear power plants and the fact that longer outages did not occur. Nuclear power's share in public electricity supply amounted to about 34%.

ENERGY POLICY

In a reaction to the growing resistance against nuclear energy in public opinion since the accidents of Three Mile Island and Chernobyl, the Federal Government has decided to terminate progressively the utilisation of nuclear energy. As an alternative, the Federal Government is at present preparing a sustainable energy policy with greater emphasis on renewable energy sources, on economising energy consumption and on improving the efficiency of non-nuclear plants.

There is a consensus that it is impossible to replace immediately or to save the share of nuclear energy in the electricity production, which amounts to more than 30%. This is reflected in the arrangement of 14 June between the Federal Government and the four largest electricity producers, whose conclusion can be considered to be the most important event in the area of nuclear energy policy in the year 2000. Accordingly the future exploitation of the existing nuclear power plants is to be limited in time; in exchange, it is envisaged to guarantee, for the remaining exploitation period, the undisturbed functioning of the nuclear power plants and the disposal of their waste while maintaining a high level of safety and respecting the requirements of the nuclear legislation.

The cornerstones of the arrangement are as follows:

- Based upon a calculated total lifetime of the installations of 32 calendar years, every nuclear power plant has had determined for it the quantities of electricity which it is allowed to continue to produce; the total is 2623 TWh. This figure includes 107 TWh for the Mülheim-Kärlich nuclear power plant, which will not be reconnected to the grid, and whose production allowance will be transferred to other plants. As a matter of principle, the attributed electricity production allowances can be transferred to other plants.

- Starting in mid-2005, direct storage will become the only means allowed of disposal of spent fuel elements. Until then, transport of spent fuel elements for reprocessing in France and the UK as well as to the central interim storage facilities Gorleben and Ahaus are permissible.

- The utilities will construct, at the nuclear power plants or in their vicinity, interim storage facilities for fuel element containers – applications for most of which have already been made since the end of 1999/beginning of 2000.

- For the final disposal project Konrad, the « Planfeststellungsbescheid » is to be given. The exploration work on the suitability of the saliferous rock at Gorleben as a final disposal site for all kinds of radioactive waste is to be interrupted for 3-10 years.

- The obligatory insurance for nuclear power plants will be increased to 5000 million German mark.

- The construction of new nuclear power plants will be forbidden ; research, especially on safety questions, remains free. The Atomic Law will be amended to eliminate the promotional aspects.

The participants agree to the arrangement provided that the new Atomic Law, including the reasons given for its adoption, translate the content of the consensus.

DEVELOPMENT OF NEW REACTORS

Work continued for the development of a European Pressurized Water Reactor (EPR) between the French and German partners, and for an innovative boiling water reactor with passively working components to control failures, financed by industry.

TRANSPORT

Transport of spent fuel elements from nuclear power plants, which had been interrupted in May 1998, still could not be undertaken in 2000. The reactor operators endeavoured to fulfil the measures imposed by the authorities relating to transports to the central interim storage facilities within Germany and to reprocessing facilities in Europe. In the Autumn of 2000, authorisations for transports were granted which will be effected during 2001. These include return transports of radioactive waste resulting from reprocessing in France, which has to be taken back in accordance with contractual obligations.

The extent of use of the central interim storage facilities in Ahaus and Gorleben remained unchanged. In 2000, no transports of spent fuel elements or of vitrified ingots of high-level waste (HLW) took place. The necessary reconstruction of a bridge made heavy duty transport by rail to Gorleben impossible. The construction was completed in January 2001. Since early 1998 six CASTOR containers with 28 vitrified ingots in each stand ready for transport in La Hague.

FUEL CYCLE

In the course of 2000, the URENCO enrichment plant in Gronau reached a capacity of almost 1300 tSW/year. The installation operates at nearly 100% capacity. The enlargement of the plant to 1800 tSW/year continues according to plans. The construction of two additional enrichment halls has been completed.

In the context of the envisaged co-operation between Siemens AG and Framatome the ANF fuel fabrication plant in Lingen has been transferred as a 100% holding company to Siemens Nuclear Power GmbH (SNP). The annual capacity for the production of powder and pellets remained unchanged at 400 t U/a. For the first time it is planned to handle Enriched Reprocessed Uranium (ERU); an authorisation

for 50 t U/y has been applied for. Following recent events in the fuel cycle sector in third countries, the ANF fuel fabrication plant has been, on several occasions, examined by authorities and expert organisations; as a result, the impeccable observance of all requirements concerning the safety of the installation and the protection of data has been confirmed.

The treatment of leaching resulting from the reclamation of the closed Wismut mining site yielded in 2000 27.9 t of natural uranium.

DISPOSAL

The pilot conditioning installation (PKA) at Gorleben obtained its operating licence on 20 December 2000. The activities remain limited to the repair of damaged containers for spent fuel elements or radioactive waste.

The exploration of the saliferous rock at Gorleben has been suspended. Since 1 October 2000 the mining operations are exclusively restricted to keeping the mine open and in safe conditions. The infrastructure sector on the 840m floor which includes workshop, storage and working rooms had been completed and partly installed prior to the moratorium. The argument that essential criteria had not been considered in the concept followed up to now, but which have been under discussion in scientific circles for several years, and which are additionally relevant, is used as the reason for the moratorium. The questions resulting from these discussions concerning the possibly improved suitability of alternative geological structures will be examined in the near future.

WASTE

At the final waste disposal facility at Morsleben, activities related to the maintaining of safe operation and work in the framework of the planning procedures for the shut-down of the facility. Among other things, the operator started the premature filling-in of one storage chamber in order to prevent the risk of falling-in of so-called «Lösern».

The status of the Konrad project for the final storage of radioactive waste with negligible development of heat did not change in 2000. With the intention of completing the procedure in 2001, the competent authorities arranged a reassessment of the expert opinions available in 2000 from the latest scientific and technical viewpoint. Even when the planning procedure will have been completed the realisation of the final storage facility can only be expected after the termination of the law suits which are likely to be introduced against the decision.

SHUT DOWN AND DECOMMISSIONING

The decommissioning of the «uranium treatment» section of the former fuel element installation in Hanau continued according to plan. The emptying of the MOX processing facility – a prerequisite for the decommissioning – continued to proceed without disturbance. 85% of the remaining plutonium inventory has been transformed into so-called storage elements to be transported to La Hague for reprocessing.

The remote handling installation for the decommissioning of highly radioactive components in the Karlsruhe reprocessing plant continued in an efficient manner and without noteworthy problems. The construction of the Karlsruhe vitrification installation (VEK) at the site of the plant, which should allow the solidification of highly radioactive fluid waste material resulting from the reprocessing, progressed according to plan.

ELLAS - GREECE

Greece has no nuclear power plants. Electricity is produced by plants fuelled with lignite or oil and by hydroelectric plants. At the National Center for Scientific Research (NCSR) “Demokritos”, GRR-1, a 5 MW Research Reactor is in operation for basic and applied research, radioisotope production and other applications.

Two subcritical assemblies are used for education at the Athens Polytechnic University and at Thessaloniki University. Spent nuclear fuel is sent by sea to the USA according to the policy of acceptance of research reactor fuel of US origin for permanent disposal.

Low-Level and Intermediate-Level Waste are treated and stored at NCSR-"Demokritos" site. Greece's nuclear policy objectives place a strong emphasis on radiation protection and emergency preparedness.

ESPAÑA - SPAIN

Gross nuclear power production in Spain in the year 2000 was 62 094 GWh, about 28% of total national production. Operation of the nuclear park has been satisfactory, as in previous years, reaching average load factor values of 90.9% and an availability factor of 93.1%. The main points to be noted for the year 2000 in the various nuclear power sectors are as follows.

NUCLEAR INSTALLATIONS

During the year, an increase in power of 48.95 MWe was authorised for Unit II of the Ascó nuclear plant, this being an increase in thermal power. The nominal power of the national nuclear park therefore now stands at 7 798 MWe.

In 2000, the companies owning the Almaraz and Trillo nuclear power plants reached an agreement to restructure the management divisions of the two plants by combining their operation, management and administration, but leaving the ownership of the two plants unaffected.

FRONT END OF THE NUCLEAR FUEL CYCLE

In 2000, Planta Quercus, the manufacturer of uranium concentrates owned by ENUSA Industrias Avanzadas, S.A. previously Empresa Nacional del Uranio, S.A. (ENUSA), continued operating at below design capacity, in the year 2000 producing 251 tU in U_3O_8, using mineral previously extracted from the mine, located on the same site. At the end of the year, all production at the mine stopped because of the shortage, at current market prices, of economically exploitable mineral resources. The Juzbado (Salamanca) nuclear fuel plant, which is owned by ENUSA Industrias

Avanzadas, S.A., continued in 2000 with the production of PWR and BWR fuel elements for Spanish and other European nuclear power plants. During the year, it produced 635 elements containing 198.6 tonnes of uranium: 305 for PWRs and 330 for BWRs.

210 fuel elements were exported to Finland, Belgium, Germany and Sweden.

BACK END OF THE NUCLEAR FUEL CYCLE

The storage facility for intermediate and low-level radioactive waste at Sierra Albarrana (El Cabril) owned by Empresa Nacional de Residuos Radioactivos, S.A. (ENRESA) continues to operate satisfactorily. During the year, 213 consignments of waste were received, filling 367 containers on the site. On 31 December 2000, 3 244 containers were in storage; 36% of storage capacity is in use, and saturation is expected to occur around 2016.

In the Trillo nuclear power plant, work continues on the construction of the special temporary storage facility, which will accommodate the plant's spent fuel in metal containers after the full storage capacity will be in use in 2002. This work began in December 1999. At the end of 2000 the project was 53% of the way towards its target and is expected to be completed in July 2001.

In 2000, the first two dual-purpose metal containers for the storage and transport of waste fuel elements for use in the storage facility of the Trillo nuclear power plant were manufactured by Equipos Nucleares, S.A., in Santander. Each is capable of holding 21 of the plant's spent fuel elements. Six further containers are expected to be delivered in 2002 and 2003. The two units will be delivered to the power plant at the end of the first half of 2001.

DECOMMISSIONING

The work authorised at the beginning of 1998 on the decommissioning of the Vandellos I power plant continues. On 31 December 2000 the project was 59% complete, slightly ahead of schedule. The activities authorised, leading to "level 2", are expected to be completed by the end of 2002, after which the expected waiting period of 30 years will begin. During the year 2000, the main tasks carried out were: dismantling of active parts, the isolation of the reactor openings, the decontamination of walls and the dismantling of conventional components.

With regard to the decommissioning of the ARGUS experimental reactor at Universidad Politécnica de Cataluña in Barcelona, no decommissioning as such was carried out in 2000 since administrative procedures still have to be completed. Decommissioning is expected to take one year.

REGULATORY DEVELOPMENT

In 2000, Nuclear Power Plant Information Committees were set up under the Regulation on Nuclear and Radioactive Installations approved at the end of 1999. These committees, which will be operational during the construction, operation and decommissioning of the nuclear power plants, consist of representatives of the public administrations involved and the chief official from each facility.

FRANCE

HIGHLIGHTS

At 31 December 2000, the French nuclear facilities numbered 58 pressurised water reactors in operation (thirty-four of 900 MW, twenty of 1300 MW and four of 1450 MW), and one fast reactor (Phénix).

Nuclear industry organisation underwent two main developments. First, the European Commission declared compatible with the common market the decision of Framatome and Siemens to merge their respective nuclear businesses in a joint venture. This operation will create the world leader for the engineering, construction, services and the supply of fuel assemblies for light water reactors.

Secondly, the French Government announced a reorganisation plan of the French nuclear industry. This operation will create a single industry holding, divided in two main parts: on the one side the nuclear business with Cogéma, on the other side Framatome activities and electronics and information technology business with Framatome connectics, as well as CEA parts in ST-Microelectronics. Structured business units will be created for each line of activity.

Research on nuclear waste management continued in 2000. As far as geological disposal research is concerned, the drilling of an underground laboratory shaft began in a clay formation in Eastern France, where this installation was licensed in 1999. The consultation organised for finding sites in order to install in addition a granite-located waste laboratory did not succeed because of strong opposition. Yet the French Government held firm to its intention to proceed with a second laboratory in granite and to continue with the consultation.

Finally, the three eminent persons, Messrs Charpin, Dessus and Pellat, who were commissioned to propose a report on nuclear electricity production costs, gave an account to the French Prime Minister of their work. Their report confirmed the firm competitiveness of nuclear kWh and the strong benefit of nuclear energy vis-à-vis fossil fuel price fluctuations. 19

NUCLEAR POWER AND ELECTRICITY GENERATION IN 2000

Gross national consumption of electricity rose to 441 TWh, an increase of 2.4% compared with 1999. The export balance increased compared with 1999 and amounted to 72.7 TWh.

Total net production of electricity rose to 517 TWh, i.e. 3.3% more than in 1999. Nuclear power stations produced 395 TWh, representing approximately 76% of domestic production. Thermal production from fossil fuels was 50 TWh, an increase of 2.7% compared with 1999. Hydroelectric production decreased by 6.1% compared with 1999 and amounted to 72 TWh.

19 Rapport au Premier ministre “Etude économique prospective de la filière électrique nucléaire” by J.M. Charpin, B. Dessus, R. Pellat. website (available in French and in English): http://www.plan.gouv.fr/organisation/seeat/nucleaire/accueilnucleaire.html

As regards nuclear operation, 2000 showed an increase in availability factor, which was 80.4% compared to 79.3% in 1999. This increase was limited by the unavailability at the beginning of the year of the Blayais 1 and 2 units as a consequence of the storm that occurred in late December 1999.

The Chooz B1 and Chooz B2 units have been in commercial operation since May 2000 and September 2000, respectively.

A new record in daily peak domestic consumption was reached on January 12, 2000 and amounted to 72.4 GigaWatt (72 400 MegaWatt). The previous record was established on December 21, 1999 at 71.9 GW.

The programme of testing and replacing vessel heads has continued. Since 1994, 38 vessel heads out of the 54 in operation have been replaced. Also, 7 steam generator replacements have been achieved since 1995.

At the end of 1999, 20 reactors were operating with MOX fuel and 20 reactors with 4% U_{235} fuel elements.

URANIUM MINING

In 2000, the uranium production amounted to 319 tU in concentrates, 27.3% down as compared with 1999.

Production managed by Cogéma in Canada amounted to about 3750 tU. The Cluff Lake closure was postponed to 2001 due to the occurrence of high grade ore in 2000. McClean Mill performed at nominal capacity throughout the year. Cogéma's share of McArthur River and Key Lake production was 1197 tU.

In Niger, the production was 2898 tU, close to the 1999 figure, in spite of a three months strike at the Somaïr site.

URANIUM CONVERSION

In 2000, the two COMURHEX plants of Malvezi and Pierrelatte operated satisfactorily, reaching a good level of production. No new project is in progress. The headquarters of COMURHEX have moved from Velizy to the site of Pierrelatte.

URANIUM ENRICHMENT

In 2000, Eurodif supplied about a quarter of world-wide enrichment needs, and delivered its services to more than 30 power utilities. The ongoing regeneration programme of Georges BESSE plant, launched in 1999, allows Eurodif to look forward the next 15 years with great confidence.

REPROCESSING

The UP2 and UP3 plants operated very satisfactorily during 2000: 810 tons of oxide fuel were reprocessed in UP2 and 387 t in UP3. The cumulative quantity of spent fuel reprocessed in the La Hague plants is 16 296 tons since 1976.

IRELAND

Ireland does not have a nuclear power industry and there are no plans for such. Ireland's nuclear policy objectives place a heavy emphasis on the enhancement of nuclear safety, radiation protection and emergency preparedness world-wide. Ireland remains opposed to the operation and expansion of the nuclear industry, particularly in the UK, because of its proximity to Ireland and the scale and complexity of its nuclear activities. Ireland is also concerned about the safety of many nuclear plants in Central and Eastern Europe. In the implementation of its nuclear policy, the Irish Government is advised and assisted by the Radiological Protection Institute of Ireland.

ITALIA - ITALY

The Italian electricity supply market is now in a deep transition phase, due to the ongoing liberalisation process, related to the EU Council Directive 96/92, and to the ENEL privatisation process. The EU Directive was sanctioned in Italy by legislative Decree nº 79 of 16 March 1999.

In this context, specifically according to the above mentioned Decree, all ENEL's liabilities and assets (and all capabilities and resources) connected to nuclear power have been assigned to a newly established company SOGIN (Società Gestione Impianti Nucleari). SOGIN is operational since 1 November 1999; its shares were transferred to the Ministry of Finance from 3 November 2000; nevertheless SOGIN will act according to guidelines issued by the Ministry of Industry.

Based on governmental policies, the nuclear sector in Italy is now limited to the closure of previous ENEL activities for energy generation and decommissioning of nuclear power plants. Facilities for fabrication of nuclear fuel and for its management, which were also built in the past, are today no longer in operation.

The Ministry of Industry statement outlines three main goals:

- Treatment and conditioning within a 10 year period, of all liquid and solid radioactive waste currently in on-site storage, mostly arising from the operation of the plants, with a view to subsequent transport to a national waste repository.

- Site selection and construction of a national repository for low and intermediate level waste, also within 10 years; the same site would be used for temporary storage of high level long-lived radioactive wastes, in particular spent fuel and wastes resulting from reprocessing.

- Decommissioning of the nuclear plants in about 20 years from now, proceeding directly to the dismantling stage in order to reach the site release with no radiological constraints.

SOGIN therefore has planned the activities in view of the DECON (prompt dismantling) strategy, in order to meet the Ministry requirements; this also considering that an adequate financing procedure has been defined by the Government in order to meet the related costs.

As a matter of fact, the problem of decommissioning is linked to the availability of a repository of radioactive waste and to its utilisation. The Ministry of Industry planned the availability of the national repository as follows: selection of the site in 2001; start of construction in 2005; and availability for operation from January 2009. The national repository will be used for (i) the disposal of operational waste produced during the life of NPPs or by the other facilities; (ii) for the disposal of the decommissioning waste of all nuclear related facilities (mainly from NPPs); (iii) for the disposal of waste deriving from hospitals, research institutes and universities; (iv) for the interim storage of irradiated fuel in dry containers.

Regarding the nuclear power plant fuel, in the mid 90s ENEL has decided to cease nuclear fuel reprocessing, on the basis of an economic and technical evaluation, and to proceed with Interim Dry Storage of the remaining spent fuel of light water reactors. As a consequence of that decision, the fuel under contracts already signed will be reprocessed, and the remaining fuel will be stored in dry containers (casks) licensed for transport and storage awaiting transfer to the national interim storage mentioned above.

A comprehensive programme is under way at ENEA (the Italian Agency for New Technologies, Energy, and the Environment) for the management of liquid and solid waste, nuclear materials and irradiated fuel elements still present in its nuclear fuel cycle facilities no longer in operation (EUREX Plant, ITREC Plant, Plutonium Laboratory and Hot Cell Facility). The most urgent target is the solidification of liquid wastes stocked at the EUREX and ITREC reprocessing facilities. A first result has been obtained with the cementing of all liquid wastes stored at the ITREC plant, which was completed in November 2000. The basic design and preliminary safety report for a vitrification unit to be installed at the EUREX plant is now under review by the Italian Environmental Protection Agency (ANPA).

The company FN (Fabbricazioni Nucleari, the former industrial nuclear fuel fabrication plant) has completed all the preliminary operations and it is ready to start dismantling operations as soon as the required authorisation will be granted. As mentioned above, following specific governmental policies, all activities performed in this field by ENEA and FN will be carried out by a dedicated consortium of SOGIN, ENEA and FN, formally constituted at the end of 2000, which will act as the co-ordinating body for all decommissioning activities in Italy.

NEDERLAND - NETHERLANDS

ENERGY POLICY CONSIDERATIONS

The two principal objectives of the Netherlands government's energy policy are accelerating the pace of liberalisation and meeting its objectives in the areas of renewable energy and energy efficiency.

Originally it was decided that the liberalisation of the electricity and gas markets would take place gradually with a relatively long transitional period (from 1-1-1999 until 2007). But at the end of 1999 for a number of reasons the Government decided to open the electricity and gas markets entirely by 2004. The government further aims to deregulate the market for green power as early as 2001.

Furthermore the Netherlands has committed itself to ambitious targets in order to reduce emissions of greenhouse gases. The pace of improvement in energy efficiency is to be increased from 1.5 to 2 percent a year. The share of renewable energy is to grow to 5 percent by 2010 and 10 percent by 2020.

NUCLEAR ELECTRICITY AND CONSUMPTION

Netherlands' only nuclear power plant in operation is the Borssele NPP, which dates from 1973, and is a PWR of 450 MW. It had an excellent year in 2000. The power plant's availability (load factor) was 93.5%. In 2000, the Borssele NPP produced 3.7 TWh electricity which was consumed totally in the Netherlands itself. The share of nuclear in total electricity production (centralised and decentralised) is 4%, in central electricity production it is 6%.

The reactor has to close down at the end of 2003 since its operating licence granted by the Government is only valid until that date. Last year, this licence was declared invalid by the Council of State, following examination of a law suit brought in November 1999 by a group of individuals, mainly Borssele personnel. In reaction, the Dutch government stated that the Council had not condemned the government's intention of phasing out nuclear power in the Netherlands, but had only stated that the legal procedure being used was incorrect. Since the Dutch government strongly believes there is in fact an agreement with Borssele's owner EPZ to shut down the plant by the end of 2003 and noticing that EPZ takes the standpoint this is not the case, the government decided to bring the case to a civil court. To this end, EPZ has been summoned in December, 2000.

NUCLEAR FUEL CYCLE DEVELOPMENTS

ENRICHMENT

On 4 March 2000 the Treaty of Almelo, which covers collaboration in the development and exploitation of the gas centrifuge process for producing enriched uranium, completed 30 years of existence. To mark this anniversary, on 9 March 2000, the Minister of Economic Affairs of the Netherlands, Mrs. A. Jorritsma, officially inaugurated the fifth enrichment facility of Urenco Nederland, the SP 5. It will have a capacity of 1000 tonnes separative work per year, and will bring the total capacity of the Dutch site in Almelo to 2500 tonnes separative work per year.

On 5 December 2000 Urenco's three uranium enrichment plants - at Almelo in the Netherlands, Capenhurst in the United Kingdom and Gronau in Germany, achieved the landmark delivery of 50 million Separative Work Units (SWU). At the end of 2000 Urenco's total installed capacity approached 4.8 million SWU per annum. And it is supplying around 12% of the total world demand for enrichment.

On 7 December 2000, USEC Inc filed a petition with the United States Department of Commerce (DOC) and the International Trade Commission (ITC), alleging that Urenco has shipped enriched uranium to the USA in violation of anti-dumping and countervailing duty laws. The petition sought the imposition of anti-dumping and countervailing duties. The DOC decided to open up an investigation on 27 December 2000, and the ITC is expected to make a preliminary determination on whether USEC is threatened with material injury in early 2001.

RADIO-ACTIVE WASTE POLICY AND DEVELOPMENTS

COVRA is responsible for the treatment and storage of all kinds of radioactive waste. Some 90 per cent of COVRA's shares are held by the main waste producers, which are the nuclear facilities at Dodewaard (30 per cent), and Borssele (30 per cent), as well as the Energy Research Foundation (30 per cent) at Petten. The remaining 10 per cent are held by the State, where the Ministry of Public Housing, Spatial Planning and Environment acts as the State's representative. Decisions which are of concern to the shareholders must be agreed unanimously, which means that every shareholder, including the State, has the right to veto any decision.

Due to the future discontinuation of the use of nuclear energy for electricity production, plans to change the ownership of COVRA into a State-owned company are in an advanced stage. By the end of 2000 all the shareholders agreed in principle to implement these plans. In December 2000 the Dutch government informed Parliament about this intention to change ownership of COVRA into a State-owned company. Implementation of this intention will be completed somewhere during the year 2001.

DECOMMISSIONING

On the question of the applicable strategy for the decommissioning of the Dodewaard reactor an in-depth study was carried out by the Delft University of Technology in co-operation with the Dutch Economics Institute (NEI). Three strategies have been considered: rapid decommissioning within ten years, postponed decommissioning within 50 years and in situ decommissioning. Summarising the conclusions it appeared that essentially the financial aspects are decisive. Therefore the Government decided in favour of postponed decommissioning.

NUCLEAR RESEARCH

Medical activities are at the moment the most important pursuit of the High Flux Reactor in Petten. In recent years a centre of excellence has been created around this reactor that has transformed the Petten site into Europe's "Medical Valley". The centre is the major producer in Europe of medical radio-isotopes, several millions of patients inside and outside Europe are treated with these radiopharmaceuticals. Petten also provides for other therapeutical treatment like BNCT, the Boron Neutron Capture Therapy, which is currently applied, on a trial basis, to brain cancer patients.

ÖSTERREICH - AUSTRIA

ENERGY POLICY

The Austrian energy policy goals laid down by the Federal Government in 1996, and declared to the International Energy Agency, have remain unchanged since then. Austria's energy supply system is committed to the following four goals: security, (cost)efficiency, environmental compatibility, and social acceptability.

These energy policy goals align with those of the EU and the principles of the International Energy Agency. In order to achieve these objectives the Federal Government uses the strategies of promoting the rational use of energy (improvements in energy efficiency) and of renewable sources of energy.

These strategies are complemented by a number of activities in various energy policy action fields such as the liberalisation of energy markets, diversification of energy sources, diversification of suppliers, IEA crisis-mechanisms, mandatory oil stocks, prohibition of nuclear energy, and price monitoring.

AUSTRIA AND THE EUROPEAN UNION

For Austria, among all international fora, the EU is certainly the dominating driving force for intensified international co-operation. Due to this co-operation a large number of activities in many fields of energy policy have been carried out. Examples include:

- a directive on energy efficiency (SAVE II - programme);
- renewable sources of energy (the ALTENER II-Programme);
- minimum stocks of crude oil and/or petroleum products;
- the directive on the single market in natural gas;
- coal: the promotion of clean solid fuel technologies (the CARNOT-Programme);
- the directive on the single market in electricity;
- the Energy Programmes within the Framework-Programme for Research, technological Development and Demonstration (ENERGY),
- co-operation with non-member countries in the energy sector (the SYNERGY-programme).

NO UTILISATION OF NUCLEAR ENERGY IN AUSTRIA

Austria does not operate any nuclear power plant. The origin of this situation goes back to a law of 1978 establishing the prohibition of nuclear power plants on Austrian territory. This was the legal consequence of a referendum in November 1978 resulting in a negative vote against the nuclear power plant project Zwentendorf. The events in Chernobyl in 1986 reinforced this parliamentary

decision and further strengthened the opposition of the Austrian population against nuclear power.

RESEARCH REACTORS

Austria has no nuclear power plants. However, three research reactors are in operation in Vienna, Seibersdorf and Graz. With respect to the ASTRA Reactor in Seibersdorf it has been decided to close down the reactor and to begin with the appropriate steps to put the reactor definitely out of operation. The shipment of ASTRA spent fuel from Seibersdorf to Savannah River Site in the USA will take place in May 2001. The overall situation for the remaining other two reactors, as already reported in the annual report 1999, remains unchanged.

RADIOACTIVE WASTE

Since Austria does not operate nuclear power plants, there is no major production of high level radioactive waste (HLW). Consequently, there is no need for intermediate or final storage capacities in Austria for HLW. The relatively small quantities of HLW resulting from the Austrian research reactors are covered by a framework contract for “US-origin nuclear fuel” and will be returned to the USA.

Low and medium level waste (L/MLW) from hospitals, industry and research laboratories (30-40 tons/year) is being collected and treated by and at the Austrian Research Centre Seibersdorf. The research centre is equipped with suitable facilities to process and condition low and medium level waste, e.g. incinerator, supercompactor and waste water evaporator. As a conditioning process, cementing is predominantly used.

INTERIM STORAGE FACILITY

On the basis of a Joint Agreement between the Republic of Austria, the community of Seibersdorf and the Austrian Research Centre Seibersdorf, the intermediate storage facility is scheduled to be operated until 2012 on the site of the research centre with a capacity of 15000 drums of conditioned waste. After that, the waste would be transferred to a final storage facility which is planned to be built on a site which is to be selected at the beginning of the next decade.

PORTUGAL

ENERGY POLICY CONSIDERATIONS

Portugal's energy policy objectives are to reduce its dependence on imported energy and oil in particular, and to develop and diversify domestic energy sources and suppliers; to reduce the environmental impact of energy production and use; to reduce the energy bill; and to increase efficiency of energy supply and conservation.

These objectives have been pursued mainly through the introduction of natural gas, the increase in the use of renewable sources, and the promotion of energy efficiency and conservation.

Domestic energy production was somewhat less than 11% of total energy supply. All domestic energy production is from renewable sources, mainly from hydro which can vary dramatically by up to 50%. The energy supply per capita of some 2 toe is in spite of strong growth still substantially below the EU average of 3.8 toe.

Oil continues to be the dominant fuel, while coal contributes with some 15% and natural gas with 3% of total primary energy supply.

Coal is almost entirely used in the coal fired power plants of Sines (1200 MWe) and Pego (615 MWe). Natural gas supply amounted to 2.1 bcm in 1999, most of which (1.04 bcm) was used in the Tapada do Outeiro Combined Cycle Gas Turbine Power Plant. Provisional figures for 2000 point out to a gas supply in the order of 2.3 bcm.

Natural gas is imported mostly from Algeria through a pipeline; a small portion comes from Nigeria in the form of liquefied gas which is delivered via the Spanish Huelva terminal. A Liquefied Natural Gas (LNG) terminal is expected to start operation at Sines, south of Lisbon, by the year 2003 with a capacity of 2.4 bcm per year, which can be extended to 4.8 bcm/year.

As far as electricity supply is concerned, total installed capacity in 2000 was 10 Gwe (hydro 4.4 GW_e, oil 2.6 GW_e, coal 1.8 GW_e, natural gas 0.9 GW_e, renewable 0.3 GW_e). Gross electricity generation in 2000 was 39.0 TWh (33% hydro), which represents a 14% increase over 1999. However, electricity consumption in 2000 was 38 TWh, 5.6% higher than in the previous year.

NUCLEAR ELECTRICITY GENERATION

Portugal has no plans for the time being to use this source of energy.

FUEL CYCLE DEVELOPMENTS

Uranium (yellow cake) production remains at a very low level and amounted to 15 tU_3O_8 (13.3 tU) in 2000.

RESEARCH REACTORS

The RPI (Reactor Português de Investigação), a 1 MWe swimming pool reactor and the only one in operation in the Iberian Peninsula, still has a stock of fuel sufficient for its operation until May 2006, at the current regime. All the fuel stored will be returned to the USA under the "US Foreign Research Reactor Spent Nuclear Fuel Receipt Programme".

Negotiations concerning the purchase of fresh fuel will also include discussions on the final disposal of the irradiated fuel, have not yet been formally initiated. The utilisation of the reactor has been increasing in the past years with the demands from both Portuguese and foreign institutions.

SUOMI - FINLAND

ENERGY POLICY CONSIDERATIONS

In order to fulfil the obligations of the Kyoto Protocol, work on a national climate strategy was started in 1999. This work has taken place under the guidance of six ministers (chairperson: Minister of Trade and Industry). The year 2000 was devoted to preparation of a number of scenarios in order to study different means to influence the energy consumption, as well as to accelerate the transformation of the energy production into a less greenhouse gas intensive direction. The effectiveness and costs of these means were included in the calculations. Also the role of nuclear power was studied during the work and especially a scenario including a new nuclear power unit starting in 2010. The strategy itself is expected to be ready for a parliamentary debate during the first half of 2001.

In November 2000, Teollisuuden Voima Oy (TVO) filed an application requesting the Government to state formally, in accordance with the Nuclear Energy Act, that a project to build a new nuclear power unit is in line with the overall good of the society. According to the application, the 1000-1600 MWe LWR unit will be built on either one of the existing nuclear power plant sites. According to the Finnish nuclear legislation, such a decision in principle is a necessary prerequisite for obtaining later a construction licence. The Government's decision is expected during 2001. To be effective, a positive statement must then be endorsed by the Parliament.

NUCLEAR ELECTRICITY GENERATION AND ELECTRICITY CONSUMPTION

The total amount of electricity produced by the four nuclear power units in 2000 was 21.5 TWh. This corresponded to 30.3% of the electricity generation and 27.3% of the electricity supply in Finland. The capacity factors of the units varied between 84.8 and 95.7%.

RADIOACTIVE WASTE POLICY AND DEVELOPMENTS

In December 2000, the Government made a formal statement that the project developed by Posiva Oy for a final disposal facility of spent nuclear fuel is in line with the overall good of the society, as far as it refers to the spent fuel used in the existing nuclear power plants. Posiva Oy, a company jointly owned by the two nuclear power companies in Finland, submitted in May 1999 an application for this kind of a statement. The location specified in the application is near the Olkiluoto nuclear power plant site. The project consists of an encapsulation plant and a repository. To be effective, this statement still must be endorsed by the Parliament. The Parliament's decision is expected during the first half of 2001.

RESEARCH REACTOR

The only research reactor in Finland, a 250 kW Triga Mark II reactor, was, as before, used for boron neutron capture therapy (at the reactor site), research, education and isotope production.

SVERIGE - SWEDEN

ENERGY POLICY CONSIDERATIONS

The closure of one reactor in the Barsebäck plant in 1999, which initiated the nuclear power phase-out in Sweden, shall - according to an earlier decision by Parliament - be followed by the closing down of the plant's second reactor not later than 1 July 2001. In its decision, however, Parliament made it a condition that the loss of electricity production must be compensated by an increase in electricity supply from other energy sources and a reduction in electricity use. When discussing the matter in December 2000, Parliament shared the Government's view that these conditions are not yet fulfilled, but they are expected to be so before the end of 2003. The conditions will be examined again during the autumn of 2001.

NUCLEAR ELECTRICITY GENERATION AND CONSUMPTION

The total production of electricity in Sweden in 2000 was 140.4 TWh and consumption 145.1 TWh. The eleven nuclear power reactors generated 54.8 TWh, compared with 70.1 TWh in 1999. Following the unusually high water flow to the reservoirs, hydro electricity production was at record level 76.4 TWh, about 15 TWh higher than a normal year. Consequently the nuclear power capacity was not fully utilised and the production was somewhat cut back for commercial reasons by approximately 11.7 TWh.

The average availability of the power stations was high, but varied considerably between individual reactors (from 57% for Ringhals 1 – closed down during the autumn for repair work on the core spray - up to 95% for Forsmark 3).

All supplies of nuclear fuel materials and services were made in time and without any problems, as were all transports of radioactive waste and spent fuel.

NUCLEAR FUEL CYCLE DEVELOPMENTS

In April 2000 ABB's sale of its entire nuclear operations to BNFL was finalized. At the Westinghouse Atom fuel fabrication plant 317 tons of uranium dioxide powder were converted and 180 tons of fresh fuel were produced during 2000. More than half of the production was for the export market.

RADIOACTIVE WASTE POLICY AND DEVELOPMENTS

Work has commenced to expand the Swedish central interim storage facility for spent nuclear fuel (CLAB). A new rock cavern has been excavated, which will be ready to accommodate an additional 3.000 tons of spent fuel by the end of 2003.

The major safety assessment of the complete deep repository system which SKB, the Swedish Nuclear Fuel and Waste Management Co., submitted to the Government in 1999 has been circulated for consideration and to an international peer review. In the autumn the Swedish safety authorities submitted their recommendation, based on the review process, to the Government. Their conclusion was that the safety assessment provides a comprehensive illustration of most safety

and radiation issues and that there remain questions that have to be clarified in the future stages of the siting process.

In September 2000 the international EC-supported Prototype Repository Project was started. The project objective is to investigate, on a full scale, the integrated performance of engineered barriers and near-field rock of a simulated deep repository in crystalline rock.

During 2000 feasibility studies for the siting of a deep repository were completed in the six municipalities that have participated in the siting process on a voluntary basis. The feasibility reports indicate several potential locations.

In December 2000 SKB submitted the supplementary accounts which the Government requested in its decision on the RD&D-Programme 98, including basis material for site selection, and a programme for the site investigations. Of the siting alternatives SKB also suggested three sites for further investigations including geoscientific studies with test drilling and environmental impact assessments.

The Studsvik centre provides different types of nuclear services to power plants and other nuclear installations. The European operations focus on the treatment of low level waste in its incineration and melting facilities. The rebuilt and extended melting facility was taken into operation at the beginning of 2000, and the services were extended with a steel shot blasting plant for mechanical decontamination of metal scrap.

The fee during 2001 for the waste management activities and future decommissioning of all Swedish reactors was lowered in December 2000 to an average of 0,010 SEK per KWh.

RESEARCH REACTORS

At Studsvik both the R2 (a 50 MW MTR used for fuel testing, fuel investigations, silicon doping and isotope production) and the R2-0 (1 MW) reactors have operated at full capacity. Both reactors provided neutrons for basic research for the Neutron Research Laboratory in Sweden. The new Boron Neutron Capture Therapy facility at the R2-0 reactor was taken into operation. The aim is to treat patients suffering from brain tumours with neutron radiation. The new facility for production of iodine-125, used for treatment of prostate cancer, was also in operation.

UNITED KINGDOM

ENERGY POLICY CONSIDERATIONS

The Government's broad energy policy objective is to ensure secure, diverse and sustainable supplies of energy at competitive prices. The Government believes that existing nuclear stations should continue to contribute both to electricity supply and reduction of CO_2 emissions as long as they can do so to the high safety and environmental standards which are currently observed. As with other forms of generation in the UK, it is for the market to take the initiative for proposals for new generating capacity. There are no plans to build new nuclear plants at this point in time.

Early in 2000, the Government announced that the decision to introduce a public private partnership (PPP) into BNFL is unlikely to take place before the latter part of 2002, following two reports issued by the UK regulator, which were critical of BNFL's management and safety culture. The introduction of any PPP remains subject to the company's progress towards achieving a range of health, safety and environmental targets.

In May 2000, BNFL announced a lifetime strategy for its fleet of magnox stations. The strategy provides a phased programme for the cessation of electricity generation and has been announced ahead of time in order to bring clarity to BNFL's business plan and certainty about the future for those concerned. This will also mean that the magnox reprocessing plant (B205) at Sellafield will close once all the fuel has been processed, thought to be around 2012.

NUCLEAR ELECTRICITY GENERATION AND CONSUMPTION

The UK's nuclear power stations supplied 78.3 TWh in 2000, compared with 87.7 TWh in 1999. This represented 22% of total electricity supplied in 2000 (compared with 25.5% in 1999).

INTERNATIONAL ACQUISITIONS

In July 2000, British Energy plc (BE) announced that it will lease Ontario Power Generation's (OPG) Bruce A and B power units until 2018 (with an option to extend until 2043). Liability for decommissioning the stations remains with OPG. Under the commercial arrangements they will also be responsible for disposal of spent fuel and waste arising from generation during the lease period. BE have applied to the Canadian Regulators for a licence to operate the two units and if issued, the agreement is expected to be finalised in summer 2001.

In June 2000, BNFL announced that it had taken a 20% stake in Eskom's Pebble Bed Modular Reactor (PBMR) feasibility study to develop a 114 MW reactor. If the necessary regulatory considerations are met, construction of a demonstration module is expected to begin in 2001 and commercial operations commence in 2005.

BNFL also announced the completion of the purchase of ABB's nuclear business, which will be operated as part of BNFL's subsidiary Westinghouse. The integration of the companies is expected to be completed by the end of 2001.

FUEL CYCLE DEVELOPMENTS

Urenco has continued to expand its enrichment capacity in line with increased business commitments reaching a total capacity across its three sites of 4800 tonnes of separative work (tSW) at the end of 2000. Meanwhile, discussions are ongoing with other companies who had expressed an interest in purchasing shares in Urenco currently held by German utilities and the Dutch Government.

In December 2000 the US Enrichment Corporation (USEC) filed a petition in the United States under anti-dumping legislation making allegations that Urenco had traded unfairly in the US market. Urenco has strongly refuted such allegations.

In February 2000, the Health and Safety Executive (HSE) published a report surrounding the falsification of secondary quality control data at BNFL's MOX Demonstration Facility at Sellafield. The report concluded that safety culture had to be improved but that the affected MOX fuel would be safe in use. An agreement was reached with the Japanese government whereby the fuel at the centre of this falsification report would be returned from Japan to the UK.

Following an earlier decision not to accept any new reprocessing contracts at Dounreay, in April 2000 the Government launched a public consultation on the options being proposed for the future management of the Dounreay Prototype Fast Reactor (PFR) fuels. A decision on the three possible options is expected early in 2001. In October 2000, UKAEA published its decommissioning plan for the Dounreay fast reactor and reprocessing site. The operation is expected to take 50-60 years.

The Government's policy is that radioactive wastes should be managed in ways that protect the safety of the public, the workforce and the environment, now and in the future. This is a complex issue and the UK Government and the Devolved Administrations will publish a consultation paper setting out detailed proposals as soon as they are ready. This paper will begin the process that will lead to the implementation of a radioactive waste management policy capable of commanding widespread support across the UK.

RESEARCH REACTORS

The UK currently has one operating civil nuclear research reactor, belonging to Imperial College, part of London University. Others await decommissioning, are in the process of being decommissioned, or have been fully decommissioned.

CHAPTER IV

INTERNATIONAL RELATIONS

INTRODUCTION

European Union (EU) operators acquire nuclear materials and services from a number of external supplying countries. Moreover, some EU operators also process materials on behalf of foreign clients. While in the European Union, nuclear materials in the civil fuel cycle are subject to the safeguard provisions of the Treaty establishing the European Atomic Energy Community (Euratom or the Community) and, as appropriate, also to the agreements entered into by the Community, its Member States and the International Atomic Energy Agency (IAEA). In addition, nuclear materials transferred between the Community and three non-Community countries - Australia, Canada and the USA - are subject to international agreements concluded between the Community and the country concerned. These agreements provide for some additional conditions which apply to such materials. Furthermore, transfers of nuclear materials with some other countries are or may become covered under agreements with the European Community and Euratom of a more general nature.

The Agency has compiled a compendium of agreements to which the European Atomic Energy Community is a party and which relate to nuclear fuel supply20.

Under the provisions of the Euratom Treaty, international agreements are negotiated on behalf of the Community by the European Commission in accordance with directives issued by the Council of Ministers. Where these agreements relate to the supply of nuclear materials or services, the Euratom Supply Agency takes part in the Commission's negotiating team and in any ongoing consultations with the authorities of the countries concerned. Developments in relation to these agreements during the year relevant to nuclear fuel supplies are reported below.

BILATERAL NUCLEAR CO-OPERATION AGREEMENTS

EURATOM/AUSTRALIA

There were no developments concerning this Agreement during the year. Trade in Australian uranium continued normally.

EURATOM/CANADA

A routine consultation as provided for by the Euratom/Canada Agreement was held in March between Commission and Canadian officials. This meeting provided an opportunity for the two sides to review the operation of the Agreement, to update each other on policy developments in the EU and Canada, and to exchange views on the uranium market.

20 This document is published by the Office for Official Publications of the European Communities, Luxembourg under reference n° ISBN 92-828-0091-1.

EURATOM/USA

In the framework of the Euratom/US agreement, the US authorities added Brazil, Kazakhstan, Romania and Ukraine to the list of destination countries for which generic prior consent is granted for re-transfers from the EU of certain non-sensitive nuclear materials.

RETRANSFERS

Under the terms of the Community's agreements with Australia, Canada and the USA, these supplier countries retain the right of consent, albeit in a long-term programmatic framework, over the retransfer from the Community of nuclear materials subject to those agreements to other countries outside the Community.

Under the Euratom/Canada agreement, simplified procedures relating to re-transfers of certain Canadian-obligated nuclear items are in place for most of the Community's nuclear trading partners. In the case of the Euratom/Australia Agreement, re-transfers from the Community of Australian obligated material can take place, subject to certain notification conditions, to countries with which Australia has a co-operation agreement in place for activities for which Australia has accepted those countries as a destination. Again, this includes most of the Community's nuclear trading partners.

Under the Euratom/US agreement, a mechanism providing for advance generic consent for re-transfers of nuclear items subject to the agreement is in place based on a list of destinations outside the EU which includes most of the Community's nuclear trading partners. Advance generic consent for re-transfers to Japan and Switzerland of plutonium, including plutonium contained in mixed oxide fuel, is maintained under this agreement.

Applications for retransfer consents falling outside the generic consents provided for under the above agreements are handled by the Supply Agency. During 2000, 3 such re-transfers were approved.

In this context, the Agency and the Commission continued to consult with Australian, Canadian and Russian authorities with the aim of trying to resolve the impediments preventing the retransfer of Australian and Canadian obligated depleted uranium to Russia for re-enrichment.

BILATERAL RELATIONS IN THE NUCLEAR FIELD WITH OTHER COUNTRIES

THE RUSSIAN FEDERATION

No major progress could be recorded towards a possible arrangement on trade in nuclear materials as envisaged in the EU/Russia Partnership and Co-operation Agreement. The matter, however, remains on the agenda of the two parties.

UKRAINE

On the basis of the directives, approved by the Council in April 1999, to negotiate a nuclear co-operation agreement with Ukraine, the Commission prepared a draft agreement which was handed over to Ukraine in March 2000. No further developments occurred.

KAZAKHSTAN AND UZBEKISTAN

The Partnership and Co-operation Agreements of the European Union with Kazakhstan and Uzbekistan include commitments to conclude nuclear trade agreements with these countries. The Council issued negotiating directives to the Commission in early 2000. On that basis, the Commission prepared draft agreement texts, which will be transmitted to Kazakhstan and Uzbekistan early in 2001. Both draft agreements are wide in scope, conceived as framework agreements that foresee the possibility of concluding implementing agreements on specific areas such as nuclear applications in medicine and agriculture. Negotiations will start whenever the countries concerned are ready.

JAPAN

Two rounds of negotiations on the planned nuclear co-operation agreement between Japan and Euratom were held, in April 2000 and June 2000. At the EU/Japan summit held in July 2000, the leaders of Japan and the EU affirmed that the parties would "*make utmost efforts with a view to concluding an agreement between the Government of Japan and the European Atomic Energy Community for co-operation in the peaceful uses of nuclear energy, to make long-term co-operative arrangements in the field of peaceful and non-explosive uses of nuclear energy in a predictable and practical manner, which take into account the needs of their respective nuclear energy programmes".* Momentum was maintained on this dossier during the autumn, and further negotiations are expected to take place early in 2001.

CHINA

Exploratory talks were held in Beijing in November 2000 between the Commission and China on a possible nuclear co-operation agreement. The talks confirmed the mutual desire to expand preparatory work on both sides and a common view on the suitable scope of such an agreement. The Commission reported to the Council, recommending that negotiating directives should now be formulated.

CHAPTER V

ADMINISTRATIVE REPORT

PERSONNEL

The staff establishment of the Agency at the end of 2000 was 19.

FINANCE

The Agency's expenditure in 2000 amounted to € 154 346. This amount was financed principally by a subvention from the budget of the Commission, as a result of a Council decision of 1960 to postpone the introduction of a charge on transactions to defray the operating expenses of the Agency as provided by the Euratom Treaty.

ADVISORY COMMITTEE

In 2000, the Advisory Committee held two meetings. During the year, the Agency consulted extensively with the industry and the Committee on the supply policy and the appropriateness of adapting its application in view of developments in NIS republics and the lifting of restrictions in the United States, in particular the separate treatment of the individual republics Kazakhstan, Uzbekistan and Ukraine. A paper setting out the potential adaptations was prepared in the Bureau, and received broad support in the Committee.

The Agency briefed the Committee on a number of other events of special interest to the nuclear community, such as the new dual use regulation and the publication of the Commission's Green Paper on Security of Energy Supply. The Committee will participate actively in the debate on the Green Paper and intends to issue an opinion on the document. At the end of 2000, the filing of an anti-dumping petition in the United States against European enrichers attracted special attention.

The Agency informed the Committee of developments in the field of nuclear fuel supply and related issues. The Committee was kept informed of developments related to the nuclear co-operation agreements with the United States, Canada and Australia. The Commission services also reported to the Committee on progress concerning potential new Euratom nuclear co-operation agreements (Japan, Ukraine, Kazakhstan and Uzbekistan), as well as on the exploratory talks held with China. Likewise, updates were provided on the Commission's work in the framework of the General Agreement on Trade and Services (GATS) 2000 negotiations.

ORGANISATIONAL CHART

(as at 31 December 2000)

Director General	M. GOPPEL
Assistant to the Director General	D. MONASSE (a.i.)
Nuclear fuels supply contracts and research	J.C. BLANQUART
	J. MOTA
	A. BOUQUET
	P. BOUCHAUD-BEULÉ
General Affairs; Secretariat of the Advisory Committee	D.S. ENNALS
	G. MUIJZERS

ADVISORY COMMITTEE OF THE SUPPLY AGENCY

Chairman	Mr. S. SANDKLEF (Vattenfall Fuel, Sweden)
Vice-Chairmen	Mr. L.-F. DURRET (Cogéma, France)
	Mr. C. GIMENO SANZ (Nuclear Safety Council, Spain)

WORKING PARTY

Chairman	Mr. M. S. TRAVIS (Rio Tinto Mineral Services, UK)
Vice-Chairmen	Mr. G. PAULUIS (Synatom, Belgium)
	Mr. J. HUBER (E-ON Kernkraft, Germany)

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WEBSITE

This report is also accessible on the Supply Agency's website:

http://europa.eu.int/comm/euratom/index_en.html

A limited number of paper copies of this report may be obtained, subject to availability, from the above address.

ANNEX 1

FUEL LOADED INTO EU REACTORS AND DELIVERIES OF FRESH FUEL UNDER PURCHASING CONTRACTS

Year	Fuel loaded			Deliveries		
	LEU (tU)	Feed eq. (tU)	Enrich. eq. (tSW)	Natural U (tU)	% spot	Enrichm. (tSW)
1980		9,600		8,600	(4)	
1981		9,000		13,000	10	
1982		10,400		12,500	<10	
1983		9,100		13,500	<10	
1984		11,900		11,000	<10	
1985		11,300		11,000	11.5	
1986		13,200		12,000	9.5	
1987		14,300		14,000	17.0	
1988		12,900		12,500	4.5	
1989		11,800		13,500	11.5	
1990		15,400		12,800	16.7	
1991		15,000	9,200	12,900	13.3	10,000
1992		15,200	9,200	11,700	13.7	10,900
1993		15,600	9,300	12,100	11.3	9,100
1994	2,520	15,400	9,100	14,000	21.0	8,800
1995	3,040	18,700	10,400	16,100	18.1	9,600
1996	2,920	18,400	11,100	15,900	4.4	11,700
1997	2,900	18,200	11,000	15,600	12	10,100
1998	2,830	18,400	10,400	16,100	6	9,200
1999	2,860	19,400	10,800	14,800	8	9,700
2000	**2,500**	**17,400**	**9,800**	**15,800**	**12**	**9,700**
Total	19,570	300,600	100,300	279,400		98,800

Note: The figures for natural uranium deliveries in 1998 and 1999 as published in the Annual Report 1999 were revised to reflect additional information provided by some utilities after the publication of that report (from 15,800 and 14,700 tU respectively).

ANNEX 2

ESA AVERAGE PRICE
FOR MULTIANNUAL AND SPOT CONTRACTS
INVOLVING NATURAL URANIUM

Year	Multiannual contracts		Spot contracts		Exch.rate
	euro/kgU	US$/lb$U_3O_8$	euro/kgU	US$/lb$U_3O_8$	US$/euro
1980	67.20	36.00	65.34	35.00	1.39
1981	77.45	33.25	65.22	28.00	1.12
1982	84.86	32.00	63.65	24.00	0.98
1983	90.51	31.00	67.89	23.25	0.89
1984	98.00	29.75	63.41	19.25	0.79
1985	99.77	29.00	51.09	15.00	0.76
1986	81.89	31.00	46.89	17.75	0.98
1987	73.50	32.50	39.00	17.25	1.15
1988	70.00	31.82	35.50	16.13	1.18
1989	69.25	29.35	28.75	12.19	1.10
1990	60.00	29.39	19.75	9.68	1.27
1991	54.75	26.09	19.00	9.05	1.24
1992	49.50	24.71	19.25	9.61	1.30
1993	47.00	21.17	20.50	9.23	1.17
1994	44.25	20.25	18.75	8.58	1.19
1995	34.75	17.48	15.25	7.67	1.31
1996	32.00	15.63	17.75	8.67	1.27
1997	34.75	15.16	30.00	13.09	1.13
1998	34.00	14.66	25.00	10.78	1.12
1999	34.75	14.25	24.75	10.15	1.07
2000	**37.00**	**13.12**	**22.75**	**8.07**	**0.92**

ANNEX 3

QUESTIONS RAISED BY THE COMMISSION GREEN PAPER "TOWARDS A EUROPEAN STRATEGY FOR THE SECURITY OF ENERGY SUPPLY"

1	Can the European Union accept an increase in its dependence on external energy sources without compromising its security of supply and European competitiveness? For which sources of energy would it be appropriate, if this were the case, to foresee a framework policy for imports? In this context, is it appropriate to favour an economic approach: energy cost; or geopolitical approach: risk of disruption?
2	Does not Europe's increasingly integrated internal market, where decisions taken in one country have an impact on the others, call for a consistent and co-ordinated policy at Community level?
3	Are tax and state aid policies in the energy sector an obstacle to competitiveness in the European Union or not? Given the failure of attempts to harmonise indirect taxation, should not the whole issue of energy taxation be re-examined taking account of energy and environmental objectives?
4	In the framework of an ongoing dialogue with producer countries, what should supply and investment promotion agreements contain? Given the importance of a partnership with Russia in particular, how can stable quantities, prices and investments be guaranteed?
5	Should more reserves be stockpiled - as already done for oil - and should other energy sources be included, such as gas or coal? Should the Community take on a greater role in stock management and, if so, what should the objectives and modalities be? Does the risk of physical disruption to energy supplies justify more onerous measures for access to resources?
6	How can we develop and ensure better operation of energy transport networks in the European Union and neighbouring countries so as to enable the internal market to function properly and guarantee security of supply?
7	The development of some renewable energy sources calls for major efforts in terms of research and technological development, investment aid and operational aid. Should co-financing of this aid include a contribution from sectors which received substantial initial development aid and which are now highly profitable (gas, oil, nuclear)?
8	Seeing that nuclear energy is one of the elements in the debate on tackling climate change and energy autonomy, how can the Community find a solution to the problem of nuclear waste, reinforcing nuclear safety and developing research into reactors of the future, in particular fusion technology ?
9	Which policies should permit the European Union to fulfil its obligations under the Kyoto Protocol? What measures could be taken in order to exploit fully potential energy savings which would help to reduce both our external dependence and CO_2 emissions?

10	Can an ambitious programme to promote biofuels and other substitute fuels, including hydrogen, geared to 20% of total fuel consumption by 2020, continue to be implemented via national initiatives, or are co-ordinated decisions required on taxation, distribution and prospects for agricultural production ?
11	Should energy saving in buildings (40% of energy consumption), whether public or private, new or under renovation, be promoted through incentives such as tax breaks, or are regulatory measures required along the lines of those adopted for major industrial installations?
12	Energy saving in the transport sector (32% of energy consumption) depends on redressing the growing imbalance between road and rail. Is this imbalance inevitable, or could corrective action be taken, however unpopular, notably to encourage lower use of cars in urban areas? How can the aims of opening up the sector to competition, investment in infrastructure to remove bottlenecks and intermodality be reconciled?
13	How can we develop more collaborative visions and integrate the long-term dimension into deliberations and actions undertaken by public authorities and other involved parties in order to evolve a sustainable system of energy supply. How are we to prepare the energy options for the future?
14	Any other questions or proposals:

The full text of the Green Paper (COM(2000) 769 final, 29 November 2000) can be found on the website of the Commission's Directorate General Energy and Transport:

http://europa.eu.int/comm/energy_transport/en/lpi_en.html

Comments can be sent to the Directorate General Energy and Transport, for the attention Mrs Nina Commeau,

- by mail to nr. 200, rue de la Loi, B-1049 Brussels
- by fax: +32 (2) 295.61.05
- by e-mail to: tren-enersupply@cec.eu.int, or
- on the above website (recommended communication mean).

LIST OF ABBREVIATIONS

ESA	Euratom Supply Agency
EU	European Union
IAEA	International Atomic Energy Authority
JRC	European Commission Joint Research Centre
NIS	New Independent States
(US-) DOC	United States Department of Commerce
(US-) DOE	United States Department of Energy
(US-) ITC	United States International Trade Commission
EUP	Enriched uranium product
LEU	Low-enriched uranium
HEU	Highly enriched uranium
MOX	Mixed oxide fuel (fuel of uranium and plutonium oxide)
RET	Re-enriched tails
SWU	Separative Work Unit
tSW	ton Separative Work (= 1000 SWU)
tU	ton U (= 1000 kg uranium)
LLW, ILW, HLW	Low-, Intermediate-, High-level waste
BWR	Boiling Water Reactor
HFR	High Flux Reactor
LWR	Light Water Reactor
NPP	Nuclear Power Plant
PBMR	Pebble Bed Modular Reactor
PFR	Prototype Fast Reactor
PWR	Pressurised Water Reactor
kWh	kilowatthour
MWh	Megawatthour = 10^3 kWh
GWh	Gigawatthour = 10^6 kWh
TWh	Terawatthour = 10^9 kWh