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COMMITTEE PRINT

A STUDY OF THE RELATIONSHIPS BETWEEN THE GOVERNMENT AND THE PETROLEUM INDUSTRY IN SELECTED FOREIGN COUNTRIES

THE FEDERAL REPUBLIC OF GERMANY

PREPARED BY THE

CONGRESSIONAL RESEARCH SERVICE

AT THE REQUEST OF

HENRY M. JACKSON, Chairman

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

UNITED STATES SENATE

PURSUANT TO

S. Res. 45

THE NATIONAL FUELS AND ENERGY POLICY STUDY

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SENATE RESOLUTION 45

National Fuels and Energy Policy Study

This publication is printed for the use of Senators participating in the National Fuels and Energy Policy Study, authorized by Senate Resolution 45 of the 92d Congress.

Senate Resolution 45, introduced by Senators Jennings Randolph and Henry M. Jackson, was amended and agreed to by the Senate on May 3, 1971. The resolution authorized the Senate Committee on Interior and Insular Affairs and ex-officio members of the Committees on Commerce and Public Works and the Joint Committee on Atomic Energy to make a comprehensive study of programs and policies required to meet national energy needs.

Subsequently, the Senate approved the addition of ex-officio members from the Committees on Aeronautical and Space Sciences, on Finance, on Foreign Relations, on Government Operations, and on Labor and Public Welfare.

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MEMORANDUM OF THE CHAIRMAN

To Members and Ex Officio Members of the National Fuels and Energy Policy Study (S. Res. 45, 92d Congress), Committee on Interior and Insular Affairs:

The advent of the energy crisis has brought a vastly expanded Federal role in energy policy. The creation of the Federal Energy Administration and the Energy Research and Development Administration by the 93d Congress symbolize this fact. The close relationship between energy, economic and foreign policy and the predominant Federal ownership of energy resources are among the factors which assure a greater Federal role in energy matters in the future.

As a new Federal role emerges it is inevitable that the traditional role of private industry must also change in response to new requirements and objectives of national energy policy. Dissatisfaction with the past performance of both industry and government in meeting national energy needs has led to a number of proposals that would change the relationship between public and private sectors on energy matters. These include Federal chartering of energy corporations and the creation of a Federal Oil and Gas Corporation to develop federally owned energy resources.

As Congress considers these and other proposals, it should be useful to consider the experience of other countries. With this in mind, the Congressional Research Service of the Library of Congress was asked to examine the relationships between Government and the petroleum industry in selected foreign countries. In each case, these studies will attempt to describe the extent to which Government has assumed traditional industry functions; the degree of regulation when such functions are still performed by the industry; the institutional mechanisms used by Government to regulate or control industry operations and the statutory basis for Government action.

I have directed that the fifth study in the series, dealing with the Federal Republic of Germany, be published as a committee print for the use of Senators participating in the National Fuels and Energy Policy Study.* The study, completed May 7, 1975, was prepared by Edward Lampson, Analyst in European Affairs of the Congressional Research Service.

HENRY M. JACKSON, *Chairman.*

*The other reports in the series are: United Kingdom, Italy, The Netherlands, and Japan.

PREFACE

This study on the Federal Republic of Germany is the fifth in a projected series of country monographs intended to provide a brief narrative account of the relationships between Government and the petroleum industry in several industrialized oil consuming countries.

While there are, of course, wide variations in the practices and experiences of the various countries, each study will cover the following general topics:

Overall energy position.—As the framework for the more specific relationships with the petroleum industry, there is a brief summary of the country's energy posture, including a description of overall energy policy, energy use patterns, and the degree of dependence on petroleum, particularly on imports.

General industry-Government relationships.—The extent to which the government has assumed traditional industry functions is briefly described, including nationalization and/or special Government-industry relationships to the energy industries or to some of the energy industries.

Government relationships with the petroleum industry by sector.—With adjustments to allow for adaptation of each country's individual patterns, the relationships are described in terms of policies and practices applied at each of the steps in the oil development process: Exploration; the production of crude oil; its transportation, both within country and importing arrangements; refining; marketing; and export-import policies.

As appropriate to each activity, the measures described may include regulations, tax policies, price controls, ownership or other forms of Government participation, and normal stockpiling practices. Where there are special legislative or other innovations that seem to provide interesting illustrative precedent for the United States, these may be described at somewhat greater length.

While every attempt is made to provide as up-to-date information as possible, the studies are not intended to cover recent developments in joint consumer country planning for emergency pooling of supplies, emergency stockpiling or financial balance of payments burden sharing arrangements. The focus is intended to be on those aspects of foreign country experience which might prove useful in examining our own longer term national policies vis-a-vis domestic oil production and domestic petroleum needs.

Similarly, although environmental policies and practices clearly are affected by problems of pollution from petroleum in many forms at many levels of activities in the production cycle, none of the studies will attempt to cover this aspect of government policy in so brief a review.

The appendix contains an official translation of The First Revision of the Energy Policy Programme for the Federal Republic of Germany issued by the Federal Minister of Economics in November 1974.

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GERMANY AND PETROLEUM—GOVERNMENT-INDUSTRY RELATIONS

By Edward Lampson, Analyst in European Affairs, Library of Congress

I. Introduction

The Federal Republic of Germany is in a unique position. Although heavily dependent on petroleum imports, it has consistently maintained a substantial balance of payments surplus. Even after the oil producing countries quadrupled their prices, Germany continued to operate in the black. It achieved a current account surplus of almost DM 24 billion ($10.1 billion) in 1974 despite oil imports costing DM 29.7 billion ($12.5 billion) as compared to DM 14.1 billion ($5.9 billion) in 1973.[1] Late in 1974 the Federal Ministry of Economics stated: "* * * the Federal Republic is not likely to suffer from balance of payments problems in the forseeable future that result from higher oil prices."[2]

But despite this position German officials are keenly aware of the problems which reliance on foreign oil from a restricted market creates and are trying to reduce this dependence. They are planning to cut down on consumption, shift to other energy suppliers, encourage prospecting for oil both in German territory and abroad, increase their information about the operations of private national and international companies, expand the role of the Government in the industry through the establishment of a large German national oil company partly owned by the Federal Government, cooperate in international efforts to better the energy situation as it affects the Federal Republic, and develop old and new substitute sources, such as coal and atomic energy.

II. The Setting

Although some oil has been discovered in Germany, the highest annual domestic production, reached in 1968, amounted to only 8.0 million metric tons.[3] Since that time German demand has been rising and domestic production falling. In 1970 domestic production supplied 7.1 percent of total German consumption, but this percentage dropped to 5 percent in 1973. In 1974 the Federal Republic was dependent on imports for 57 percent of its total energy requirements.[4]

Imports of crude oil in 1973 came to 110.5 million metric tons of which 84.8 percent came from Arab countries in the Middle East and Africa. (The largest suppliers were Saudi Arabia and Libya.) In addition the Federal Republic imported 41.8 million metric tons of mineral oil products of which 34.7 million metric tons came from West European refineries.[5]

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[1] Monthly Report of the Deutsche Bundesbank, March 1975, p. 23.
[2] The Federal Minister for Economics. First revision of the energy programme for the Federal Government of Germany, Bonn, Germany, November, 1974, p. 8.
[3] OECD Oil Committee. Oil: the present situation and future prospect. Paris, Organization for Economic Co-operation and Development, 1973, p. 207.
[4] Energy programme, op. cit., p. 11.
[5] Ibid., pp. 74–75.

In the last decade the domestic consumption of oil products increased rapidly. From 1966 to 1970 consumption of oil products, including military consumption and refineries' own consumption as well as bunkers, increased by 44.5 percent, amounting to 127.5 million tons in 1970.[6]

A similar growth of demand was occurring in the field of natural gas. In 1966, the share of natural gas in total primary energy consumption amounted to 1.2 percent. This figure rose to 5.4 percent in 1970,[7] and 10.2 percent in 1973.[8]

The situation of the German Federal Republic as of 1970 in regard to petroleum and natural gas is set forth statistically in the following tables.

FEDERAL REPUBLIC OF GERMANY [1]
PRINCIPAL OIL STATISTICS

[In millions of metric tons]

	1966	1967	1968	1969	1970
Crude and process oils:					
Indigenous production	7.9	7.9	8.0	7.9	7.5
Imports	67.7	72.0	84.1	89.6	98.8
Total supply	75.6	79.9	92.1	97.5	106.3
Refinery intake	75.3	79.6	90.8	97.4	107.1
Exports					
Total disposals	75.3	79.6	90.8	97.4	107.1
Petroleum products:					
Refinery output	69.8	73.7	83.7	89.7	98.5
Output from other sources	.7	.5	.6	.6	.5
Imports [2]	18.5	19.3	20.6	25.1	30.4
Total supply	89.0	93.5	104.9	115.4	129.4
Deliveries to inland:					
Consumption [3]	79.7	82.7	92.1	103.7	116.2
Bunkers	3.9	3.4	3.7	4.1	3.8
Exports	5.5	6.4	7.8	7.5	8.4
Total disposals	89.1	92.5	103.6	115.3	128.4
Refinery capacity: Crude distillation capacity at end year	88.7	109.3	113.1	115.1	120.3

[1] Oil, op. cit. p. 206.
[2] Including supplies from the German Democratic Republic.
[3] Including refineries' own consumption and military consumption.

GERMANY [1]

PRINCIPAL NATURAL GAS STATISTICS

[In billion [2] cubic metres at 15°C and 760 mm Hg.]

	1966	1967	1968	1969	1970
Indigenous production [3]	3.18	4.03	6.13	8.58	12.32
Imports	.05	.34	1.54	2.67	3.74
Total supply	3.23	4.37	7.67	11.25	16.06
Inland consumption	3.23	4.37	7.67	11.25	16.05
Exports					.01
Total disposals	3.23	4.37	7.67	11.25	16.06

[1] Ibid., p. 209.
[2] Billion as used in this Report is 10^9.
[3] Excluding waste and flared gas, processing plant fuel, losses and return to formation.

[6] Oil, op. cit., p. 207.
[7] Ibid., p. 206.
[8] Energy programme, op. cit., p. 72.

III. Industry-Government Relationship: General

Throughout its postwar history the West German Government has shown a strong preference for a market economy operating under a private enterprise system. Both Christian Democratic and Social Democratic governments have based programs for expanding workingmen's stake in the economy upon profit sharing and participation in management whereby the labor force elects representatives to serve on managing boards of industrial firms. The Social Democrats have chosen to expand programs begun by their CDU predecessors rather than press for nationalization of industries along the lines pursued by the British Labour Party.

Despite its free market philosophy, however, the German Government plays an important role in business affairs. Government influence has been exerted by means of subsidies, cheap loans, special tax allowances, and other means in support of a variety of favored economic activities. Moreover, the structure of the German economy (in which a few large banks are represented on many company boards and in which industrial associations are strong) encourages coordinated planning. The Government is in close touch with German industry. It is also a stockholder in a number of important firms. In his book "German Business After the Economic Miracle" Frank Vogl wrote as follows:

> The Federal Government has major shareholdings in a considerable number of assorted types of companies. The State owns, for example, 40 percent of Veba AG, which in turn owns a range of different companies, including Veba Chemie AG, Chemische Werke Huls AG, 36 percent of Chemie Verwaltung AG, 14.1 percent of Ruhrkohle, which produces over 80 percent of Germany's coal and coke, 86 percent of Preussische Elektrizitäts AG and substantial holdings in other companies. The State also owns, among other things, 16 percent of Volkswagenwerk AG, 74.3 percent of Deutsche Lufthansa which itself owns West Germany's largest charter airline, Condor. The fifth largest steel company in Germany, Salzgitter AG, is fully State owned and owns in turn a wide range of companies in the engineering and metal industries and is a majority shareholder in the country's largest shipbuilding company, Howaldswerke-Deutsche-Werft AG. The regional States own vast industrial holdings * * *[9]

When the Government believes that private initiative and business management fail to meet economic problems satisfactorily, it is prepared to exert its influence through economic levers available to it or to seek additional powers. Thus in 1967, as a result of the recession of that year, the German Bundestag enacted a Stability and Growth Law which gave the Government special powers to raise and lower taxes and adjust other economic incentives and disincentives to meet emergency situations.[10] At the beginning of the energy crisis the German Parliament on November 11, 1973, passed a Law to Secure the Energy Supply, which expired on December 31, 1974. Meanwhile the Federal Government submitted the draft of a new law to succeed it "which provides it with a better margin for action in the event of a crisis." [11]

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[9] Vogl, Frank. German business after the economic miracle. New York, John Wiley & Sons, 1973, p. 51.

[10] The law enables the Government by simple decree to raise or lower personal and corporate income taxes by 10 percent for up to 1 year, to exercise budgetary restraint and reduced public borrowing or deficit spending, and to suspend the declining-balance method of depreciation for tax purposes for up to 1 year.

[11] Energy programme, op. cit., p. 25.

IV. Industry-Government Relationship in the Field of Energy

The Federal Government is responsible for the general aspects of energy policy. It prepares an annual energy balance sheet, makes energy forecasts and keeps the Bundestag abreast of developments. A complex system of consultation between the Federal and state governments has been developed. The state governments are responsible for the detailed administration of energy matters. Although the Federal Government plays an important role in the energy economy, it prefers to keep state interference to a minimum, believing that the state should intervene only when private industry fails.

In the following paragraphs the major energy-producing industries will be discussed briefly with major emphasis being placed upon the petroleum industry.

A. THE PETROLEUM INDUSTRY

Three-fourths of the petroleum consumed in West Germany is sold by foreign companies. Of these the most important are the German subsidiaries of the major international companies Exxon, Shell, Texaco, British Petroleum, and Mobil Oil.[12] The remainder of the market is divided between German companies, some of which are partially or wholly owned by the Federal Government.

The German Government does not take an active part in administering the operations of private oil companies, but it follows petroleum developments closely. Despite the oil crisis it continues to subscribe to a free market philosophy in its overall approach to the industry. In its recent state paper on energy policy the Federal Government advocated "* * * freedom for the companies active in the German market to develop themselves, regarding this as the best precondition for a healthy structured market and sufficient supply at reasonable prices * * * The Government continues to favour a large number of efficient small and medium scale businesses."[13]

Up to the late 1950's West German energy requirements were met largely from domestic coal and petroleum production. In 1957, the country imported only 6 percent of its primary energy requirements as compared to 57 percent in 1973.[14] Because of the high cost of domestic production of crude oil, German petroleum companies in the early 1960's were protected by a tariff which encouraged them to concentrate on domestic exploitation and not to engage in foreign exploration ventures. However, in 1964 the rules of the European Economic Community dismantled the protective tariff. In its place the German Government instituted State subsidies for crude oil production in the Federal Republic. "However, these schemes were first reduced in scale and then discontinued altogether, owing to the economic recession * * * of 1966–1967."[15]

In the 1950's the German Government owned three companies which had a stake in oil (Preussag, Scholven Chemie AG, and Schachtbau und Tiefbohr AG). Preussag was denationalized in 1959 through the issue of low denomination shares, and the Government also reduced its interest in Scholven Chemie.

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[12] Vogl, op. cit. p. 196.
[13] Energy programme, op. cit., p. 27.
[14] U.S. Federal Energy Administration. The relation of oil companies and foreign governments, Feb. 15, 1975, section on the Federal Republic of Germany, p. 2.
[15] Ibid., pp. 2–3.

Since the energy crisis of 1973, the Federal Government has played a more active role in petroleum affairs. It has developed a three-pronged policy aiming at:

(1) preserving the 75/25 ratio between the share of the international oil companies in the German market and that of the local German companies;

(2) bringing about a fusion of leading German domestic companies in order to create a strong national German oil company capable of competing with the international majors on more equal terms and of dealing with the oil producing countries directly; and

(3) developing a German exploration company to search for oil abroad.

Since 1967 a number of developments have occurred. The period from 1966 to the early 1970's was difficult for the oil companies. It "was characterized by a struggle between the established companies and the cutprice independent dealers. The lucrativeness of the German gasoline market was eroded through a series of sharp price reductions, and the established companies registered significant losses."[16] An indication of the instability of the market was the decision of Gulf Oil to sell its Frisia refinery and retail outlets to the German firm Vereinigte Elektrizitäts-und Bergwerke Aktiengesellschaft (VEBA) of which the Federal Government owned 40 percent. Another indication was the pressure which the Federal Government put upon the Rheinische-Westfälisches Elektrizitätswerk (RWE) to prevent the takeover of Gelsenberg AG, the largest German independent company, by the Companie Française de Petrole (CEP). (RWE bought up 53 percent of Gelsenberg stock but later reduced its share to 48 percent.)

After the energy crisis of 1973 the Federal Government stated as its objective the creation of "a strong German mineral oil group which can join in international cooperation, especially with the oil producing countries, as an equal partner * * *"[17] It acquired the majority of the shares in Gelsenberg AG including the 48 percent belonging to RWE,[18] and thus "initiated the process of reorganization" of the domestic German petroleum industry by bringing the operations of VEBA and Gelsenberg, the two biggest local firms in Germany, under the "common leadership of VEBA AG."[19] The merger produced the largest business enterprise in the Federal Republic with a total refining capacity of close to 30 million tons a year and an electrical power generating capacity of more than 10,000MW. An example of the role of this enlarged and invigorated firm could play was the 3-year contract which VEBA signed in November 1974 "under which Saudi Arabia will supply the company with 12 million tons of crude."[20] Other companies, such as the production and drilling company Deutsche Schachtbau (wholly owned by the Government), are likely to become associated with the VEBA group. The Government has "promised a grant of up to $56 million to assist VEBA in merging with Gelsenberg."[21]

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[16] Ibid., p. 2.
[17] Energy programme, op. cit. p. 28.
[18] American Consulate, Dusseldorf, Airgram No. A–142, Dec. 18, 1974.
[19] Energy programme, op. cit., p. 28.
[20] American Embassy, Bonn, Airgram No. A–528, Aug. 13, 1973, pp. 1–2.
[21] FEA Report, op. cit., p. 5.

The Federal Government has also developed a new oil exploration company under Government sponsorship. With Government support and participation, the main West German independents in 1968 pooled some of the their resources for the procurement of crude and formed a joint exploration company, Deutsche Erdölversorgungsgesellschaft mbH (DEMINEX).[22] The German revised energy program stresses that "as the largest consumer in Europe, the Federal Republic has a special interest in joining in the worldwide search for the required quantities of oil." The program states that the Federal Government "will be fitting out DEMINEX accordingly as its instrument in this field."[23]

DEMINEX's main test drilling is taking place in the British North Sea, Nigeria, North Africa, the Caribbean, Peru, Canada, and the Middle and Far East. About DM 240 million ($101 million) had been disbursed out of an initial Government support program of DM 575 million ($242 million) which had already been committed to ongoing projects. The Federal budget and the German medium-term financing plan are providing additional funds of DM 800 million ($336 million) through 1975–78. DEMINEX has recently obtained an award of a concession in Iran. The Government is planning to restrict participation in DEMINEX to the four large refinery companies in the German group. (The shares of the companies being separated from DEMINEX will be taken over by VEBA.)[24]

B. COAL MINING

Coal and lignite provide West Germany with its most abundant source of energy, but coal mining in recent years has been uneconomical.

In 1968 a consolidated coal company, Rurhkohle AG, was established. The mines of the new company now account for 80 percent of German annual coal and coke production. The Federal Government owns 14.1 percent of Ruhrkohle stock.

Since its foundation Rurhkohle has been suffering heavy losses. Steep increases in costs and wages and the small size and outdated character of many of its mines have contributed to its difficulties. As a result German prices have been considerably above those of foreign competitors and the German Government has had to come to the assistance of the industry. Competition from coal coming from countries not in the Common Market has been reduced by limiting imports to a quota of 6 million tons per year. Heavy and light fuel oil have been taxed DM 25 ($10.5) and DM 10 ($4.2) a ton respectively, and coal companies have enjoyed other tax concessions. Power companies which undertake to use coal from the European Community over a given period receive tax concessions and grants. The Government has given coal companies advances for reorganization and modernization.

The 1973–74 energy crisis, however, "provides new possibilities for developing hard coal".[25] The Government is counting on coal to reduce German dependence on oil and is promoting the maintenance of a

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[22] Ibid., p. 4.
[23] Energy programme, op. cit., p. 29.
[24] Ibid., p. 29.
[25] Ibid., p. 10.

10 million ton reserve stockpile of coal. But German officials recognize the problems involved. The German energy program states them as follows:

> In comparison with its international competitors, the German coal industry continues to labour under structural cost disadvantages resulting from the unfortunate geological conditions and the high wage costs this entails. Although current prices more or less cover the production costs of German producers, they are considerably higher than the production costs prevailing in important coal fields abroad.
>
> A policy for coal cannot therefore leave out of account a possible widening of the difference between earning and costs which would burden domestic hard coal production. The aim must be to strike a sensible balance between the need to secure energy supplies, the dimensions of the German coal industry and the related advantages and disadvantages in financial terms and in terms of the economy as a whole.[26]

C. NATURAL GAS

Natural gas is the third most important source of energy in Germany, ranking after petroleum and coal and accounting for 10.2 percent of total energy consumption. Some natural gas companies are under private management; some of them are public utilities. Contracts for the import of natural gas are subject to Government license. Foreign gas supplying countries have been the Netherlands and the Soviet Union (since 1973). Norwegian natural gas will flow into the Federal Republic as of 1976. By 1980, it is estimated that Soviet gas deliveries may reach 10 billion cubic meters annually and Norwegian supplies about 6 million cubic meters. About half of Germany's natural gas supply is now covered by domestic production. The German Government's revised energy program report states that the territory of the Federal Republic will be intensively explored for additional natural gas deposits within the framework of the deep drilling program already announced. "Drilling has begun in Miesbach (Bavaria) and Velpke/Asse (Lower Saxony)." [27]

D. ATOMIC ENERGY

The present nuclear powerplant capacity in West Germany is 2,300 MW, which contributes only 4 percent at present to electric power generation. The plants are run by private companies of which the Rheinische-Westfälisches Elektrizitätswerke is the largest. The Federal Government in 1974 recommended a program of raising the share of nuclear powerplants in the generation of electric power to 25 percent of the total. Construction and operation of nuclear installations are under strict governmental regulation and inspection.

V. Government Relationship With the Petroleum Industry: By Sector

A. EXPLORATION AND PRODUCTION

West Germany is the largest oil producer in Western Europe, but, as noted above, production has never exceeded an annual level of 8 million metric tons. The major producing areas are in northern Germany, primarily between the Weser and the Ems Rivers and the

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[26] Ibid., p. 35.
[27] Ibid., p. 32.

Hamburg-Holstein region. Oil is also available in the Upper Rhine area, and exploration is being carried on in the lower Alpine region. However, up to 1973 operations in Germany have been by and large uneconomical.

In the early 1960's exploration was extended to the German portion of the North Sea. Legislation was enacted in 1964 for the control of mining and allied activities and later amended in 1969. Both pieces of legislation are aimed primarily at giving the German Government means to control the search and recovery of minerals from the Continental Shelf. They are also applicable to any research activities connected with or carried out in Continental Shelf water. During the sixties 11 companies of the German North Sea Consortium had exclusive rights of exploration and drilled 11 wells between 1964 and 1967 without success. Drilling was suspended in 1967. Then in 1967 the International Court of Justice ruled on the basis of a German claim that the Continental Shelf demarcation lines recognized by both Denmark and the Netherlands were not in accordance with Common Law practice. After long negotiations between the three countries new lines were drawn so as to give West Germany an additional 12,000 square kilometers. The new area was considered promising and blocks and partial blocks were awarded to 16 companies,. No discoveries have yet been announced.

1. Government Control[28]

In West Germany the supervision of mining operations, including exploration and production of oil and natural gas, come within the competence of the individual Länder (states). North Sea exploration is the responsibility of the regional office of Clausthal-Zellerfeld, which covers the Länder of Lower Saxony, Schleswig-Holstein, Bremen, and Hamburg (all of which border the North Sea). The regional office and the German Hydrographic Institute in Hamburg are jointly responsible for issuing exploration and production permits for the Continental Shelf. The basic provisions for the exploration and exploitation of oil and natural gas are contained in the Mining Act of May 12, 1934, the orders of December 13, 1934, and September 24, 1937, and the legislation of July 24, 1964, and June 25, 1969.

There are no restrictions on transfer of capital and profits to foreign companies exploring for or producing oil. In principle they are subject to the same regulations as German companies.

a. Licensing.—Permission to explore for oil on German soil is granted by the Regional Mining Office of the Land in question. In the case of exploration on the Continental Shelf the permit is issued jointly by the Clausthal-Zellerfeld Regional Office and the German Hydrographic Institute.

Onshore exploration rights are granted for an initial period of 5 years and may be renewed for additional periods of 3 years without limit. Minium operation is required. Permits for offshore exploration

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[28] The material in sec. V–A–I is based on the OECD study. The Exploration and Exploitation of Crude Oil and Natural Gas Including the Continental Shelf: Mining and Fiscal Legislation. Paris, Organization for Economic Co-operation and Development, 1973, pp. 18–66.

are granted on similar terms except that the conditions required are discretionary. The boundaries of the area covered by the exploration permit are determined in each case by the competent authorities in agreement with the applicant.

Holders of exploration licenses have production rights. Production permits are granted by the Regional Mining Office of the Land concerned or in the case of offshore areas by the Regional Mining Office of Clausthal-Zellerfeld and the German Hydrographic Institute. The duration of both onshore and offshore production rights is for an initial period of 30 years and may be renewed automatically for 10-year periods without limit. The size of the area differs according to the Land concerned. It varies from 2 square kilometers in Baden-Württemberg to 3.4 square kilometers in Bavaria and 4.4 square kilometers elsewhere. Unless specified otherwise, the area must lie within the area covered by the grant of exploration rights. If the deposit extends over the area covered by several such permits, the production concession is granted to a single company which may be associated with others to set up a consortium for the purpose of exploration and exploitation. Conditions for offshore production permits are similar.

b. Financial arrangements.—A registration fee for onshore and offshore exploration activities is charged, but the exact amount depends on the regulations applicable in each Land in the Federal Republic. The maximum fee is DM 1,000 ($420). Generally speaking, an annual tax on surface is not levied except in Bavaria, where the annual charge is DM 10 ($4.2) per square kilometer but may be waived to take account of exploration costs. Onshore and offshore production is taxed at 5 percent of the value of the oil produced. The amount of the tax on production is calculated on the basis of market prices. A registration fee on onshore and offshore production activities depends on the regulations applicable in each Land. Oil produced from the Continental Shelf is treated as being of German origin. (German tax and custom regulations do not cover the Continental Shelf and Outer Continental Shelf.)

B. REFINING

Of the total German demand for petroleum products, which amounted to 150.8 million metric tons in 1973, 71.3 percent is processed in refineries on German soil. About one quarter of this amount is refined by plants owned wholly or in part by VEBA or its German associates. The specific refineries, with an indication of their capacities in million of metric tons as of 1973, are as follows:[29]

Gelsenkirchen Buer	7.4
Oberreinische Mineralöwerke	7.0
Erdölraffinerie Ingolstadt	3.2
Gelsenkirchen-Horst	7.4
Endöl Raffinerie Neustadt	5.0
Wesseling	6.0
Frisia Emden	2.4
Total	38.4

[29] Bonn's A–528, op. cit., p. 7.

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C. TRANSPORTATION

There are 15 petroleum pipelines in West Germany of which 5 are operated from one central German administration—namely the VEBA organization.[30] They are:

Nordwest Oelleitung Wilhelmshaven-Wesseling.
Rotterdam-Rhein Pipeline.
Rohölleitung Wesel-Gelsenkirchen-Hirst.
Süd-Europäische Pipeline Lavero-Karlsruhe.
Transalpine Pipeline Triest-Ingolstadt-Karlsruhe.

The VEBA organization also controls three of the six products pipelines.[31] They are:

VEBA Raffinerie Leitungen Gelsenkirchen.
Aethylenleitung Scholven-Antwerpen.
RMR Fertigprodukten Leitung Rotterdam-Ludwigshafen.

D. MARKETING

The largest West German fuel marketing company ARAL AG, founded in 1898 for the marketing of petroleum products, is also under the control of the enlarged VEBA, which owns 56 percent of the stock. (Mobil Oil owns another 28 percent.) The VEBA company controls (as of 1973) 9,055 of the 42,038 filling stations in the Federal Republic.[32] With other smaller filling station holdings VEBA controls 24.8 percent of the gasoline distribution network. The international majors' holdings in the German marketing distribution network were as follows as of 1973:[33]

Exxon, 5,560 filling stations.
Shell, 5,270 filling stations.
British Petroleum, 4,360 filling stations.
Texaco, 4,201 filling stations.

Traditionally the German Government has not attempted to regulate the price of petroleum products. But the high profits made by oil companies in 1973–74 aroused the consternation of the general public, and the Government took steps to control prices. In April 1974 "the German Cartel Office under the supervision of the Economics Ministry blocked gasoline price increases of up to 3 cents a gallon by Shell, Esso, BP, and Texaco."[34] It also ordered the same companies "to reduce the price of fuel by 7 cents a gallon until they could produce evidence to justify maintenance of the price at the current level."[35] However, in August the proceedings were dropped because charges of price abuse could no longer be upheld in view of lower gasoline prices in Rotterdam and West Germany.

The German Government is now pressing the international oil companies for greater "transparency" in their operations. Although it prefers to leave the private companies free to fix prices (with the exception of electricity rates which are subject to supervision by the

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[30] Ibid., p. 7.
[31] Ibid., p. 7.
[32] Ibid., p. 6.
[33] Ibid., p. 6.
[34] Federal Energy Administration memorandum, German Cartel Office's action against the oil companies in Germany, May 21, 1974.
[35] Oilgram News, Aug. 7, 1974.

Länder governments) the Government wants more information from the international companies so that it can ascertain whether the distributors and producers are abusing their monopoly position.[36]

During the height of the oil shortage the Federal Government instituted speed limits and a month-long ban on Sunday driving but it did not ration gasoline. Wherever possible it encouraged the substitution of coal for oil.

E. IMPORTS

As noted above, the German Federal Republic is highly dependent on the importation of both crude and refined petroleum for the operation of its industrial system.

West German imports of crude petroleum and petroleum products, broken down by country of origin, are shown in the following tables.

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[36] Energy programme, op. cit., pp. 30–31.

TABLE 3.—SOURCES OF IMPORTED CRUDE OIL

	Total imports	Midde East	Among others from—					Africa	Among others from—			Venezuela	Soviet Union
			Saudi Arabia	Iraq	Kuwait	Iran	Abu Dhabi, Dubai/Oman		Algeria	Libya	Nigeria		
In thousands of tons:													
1961	29, 657	22, 175	3, 761	4, 378	2, 271	10, 000	----------	1, 722	1, 598	44	80	2, 941	1, 622
1962	33, 260	22, 958	2, 662	5, 214	2, 573	11, 203	----------	4, 145	2, 500	876	769	3, 913	1, 822
1963	40, 438	23, 526	4, 451	5, 348	2, 733	9, 709	----------	10, 139	2, 604	6, 595	908	4, 278	2, 195
1964	51, 740	25, 516	7, 578	5, 409	2, 752	7, 384	1, 453	19, 086	2, 973	14, 662	1, 451	4, 045	3, 030
1965	59, 068	24, 875	8, 104	5, 189	2, 570	6, 117	2, 878	28, 121	2, 554	23, 131	2, 405	3, 487	2, 585
1966	67, 687	26, 283	9, 073	3, 959	2, 035	7, 275	3, 842	34, 473	4, 568	26, 330	3, 052	3, 646	3, 285
1967	72, 032	30, 034	11, 754	1, 568	3, 499	6, 435	5, 306	33, 895	6, 708	22, 559	3, 250	3, 714	4, 064
1968	84, 091	32, 418	13, 438	2, 743	2, 685	6, 535	5, 735	44, 714	7, 108	36, 336	150	2, 949	3, 954
1969	89, 551	29, 699	11, 993	2, 340	2, 986	5, 866	6, 128	52, 429	8, 485	40, 483	1, 800	3, 883	3, 493
1970	98, 786	33, 830	12, 058	3, 478	3, 953	8, 269	5, 764	58, 118	7, 984	40, 922	6, 945	3, 402	3, 437
1971	100, 230	40, 943	16, 845	4, 168	4, 299	8, 517	5, 86–	53, 053	11, 327	29, 940	9, 511	2, 838	3, 318
1972	102, 600	43, 033	18, 998	1, 896	4, 344	9, 808	6, 47–	52, 511	11, 430	28, 482	10, 890	3, 727	2, 845
1973	110, 493	54, 455	25, 283	1, 613	4, 286	14, 122	7, 89–	50, 774	13, 557	25, 649	10, 249	2, 163	2, 735
In percent of total imports:													
1961	100	74. 8	12. 7	14. 8	7. 7	33. 7	----------	5. 8	5. 4	0. 1	. 3	9. 9	5. 5
1962	100	69. 0	8. 0	15. 7	7. 7	33. 7	----------	12. 5	7. 5	2. 6	2. 3	11. 8	5. 5
1963	100	58. 2	11. 0	13. 2	6. 8	24. 0	----------	25. 1	6. 4	16. 3	2. 2	10. 6	5. 4
1964	100	49. 3	14. 6	10. 5	5. 3	14. 3	2. 3	36. 9	5. 7	28. 3	2. 8	7. 8	5. 9
1965	100	42. 1	13. 7	8. 8	4. 4	10. 4	4. 0	47. 6	4. 3	39. 2	4. 1	5. 9	4. 4
1966	100	38. 8	13. 4	5. 8	3. 0	10. 7	5. 7	50. 9	6. 7	38. 9	4. 5	5. 4	4. 9
1967	100	41. 7	16. 3	2. 2	4. 9	8. 9	7. 4	47. 1	9. 3	31. 3	4. 5	5. 2	5. 6
1968	100	38. 6	16. 0	3. 3	3. 2	7. 8	6. 8	53. 2	8. 5	43. 2	. 2	3. 5	4. 7
1969	100	33. 2	13. 4	2. 6	3. 3	6. 6	6. 8	58. 5	9. 5	45. 2	2. 0	4. 3	3. 9
1970	100	34. 2	12. 2	3. 5	4. 0	8. 4	5. 8	58. 8	8. 1	41. 4	7. 0	3. 4	3. 5
1971	100	40. 8	16. 8	4. 2	4. 3	8. 5	5. 8	52. 9	11. 3	29. 9	9. 5	2. 8	3. 3
1972	100	41. 9	18. 5	1. 8	4. 2	9. 6	6. 3	51. 2	11. 1	27. 8	10. 7	3. 6	2. 8
1973	100	49. 3	22. 9	1. 5	3. 9	12. 8	7. 1	46. 0	12. 3	23. 2	9. 3	2. 0	2. 5

[1] Energy programme, p. 74.

TABLE 4.—SOURCES OF IMPORTS OF MINERAL OIL PRODUCTS [1]

	1970		1971		1972		1973	
	1,000/t	Percent	1,000/t	Percent	1,000/t	Percent	1,000/t	Percent
France	2,765	8.9	2,957	8.7	3,195	8.4	3,225	7.7
Belgium/Luxembourg	2,512	8.1	3,169	9.3	2,589	6.8	2,286	5.5
Netherlands	14,471	46.6	16,988	50.0	18,797	49.7	22,353	53.5
Italy	4,098	13.2	3,834	11.3	3,102	8.2	3,622	8.7
Great Britain	954	3.1	1,250	3.7	1,877	5.0	1,349	3.2
Denmark	80	.33	57	.2	66	.2	150	.3
(EEC)	(24,880)	(80.2)	(28,255)	(83.2)	(29,626)	(78.3)	(32,985)	(78.9)
Other Countries	916	2.9	981	2.9	1,474	3.9	1,706	4.1
(Western Europe)	(25,796)	(83.1)	(29,236)	(86.1)	(31,100)	(82.2)	(34,691)	(83.0)
East Bloc	3,407	11.0	3,515	10.3	4,241	11.2	3,887	9.3
Africa	27	.1	100	.3	137	.4	379	.9
America	1,224	3.9	844	2.5	2,145	5.6	2,428	5.8
Middle East	569	1.8	263	.8	222	.6	399	1.0
Far East	18	.06	14	.04	3	----------	5	----------
Total	31,041	100.0	33,972	100.0	37,848	100.0	41,789	100.0
Purchases from GDR	804	----------	769	----------	1,283	----------	1,482	----------

[1] Energy programme, p. 75.

F. TAXATION

German officials have stated that in general German fiscal policy is not an instrument of energy policy. German energy industries are subject to the same direct and indirect taxation as other enterprises and firms. When the Federal Government intervenes, it is mainly for social reasons. For example, certain incentives are granted in order to keep prices at reasonable levels and to protect national or community energy industries. Thus tax benefits are given to facilitate the production and distribution of gas, electricity, or heat for the use of the general public. Tax benefits are also given for the building of hydroelectric power stations and for the exploration activities of DEMINEX. The German coal industry receives tax relief as well as financial assistance to help with rationalization schemes and pit closures and to promote the use of coal in new power stations. Conversely, special taxes are levied on motor fuels and fuel oil to provide revenue which goes to support the coal industry.

The latest Germany energy program, which contains provisions for stockpiling petroleum stocks, includes special tax features. The program will require independent importers to increase their mandatory stocks for refineries from 65 to 90 days and for importers of petroleum products from 45 to 70 days. The Ministry of Economics has explained the tax features of this plan as follows:

> In view of the drastic rise in crude oil prices the Federal Government intends to propose tax relief for all those under minimum reserve regulations and additional special arrangements for independent importers, so as to make it possible to include this group in the minimum reserve regulation.
>
> So far the amendment merely provides for exempting from the taxes that depend on rated value (property and trading capital tax) payable on the additional stocks for another 25 days—as a result of higher minimum reserve requirements—and on the necessary storage tanks. This tax regulation is to be supplemented as follows:
>
> Granting of a tax-free reserve, which must be written back after ten years within another five years, to avoid profit tax being imposed on book profits which result exclusively from a nonrecurrent sudden rise in prices in the mineral oil sector in 1973–74 and from the need to replace minimum reserves on mechanical grounds; this is however limited to stocks equivalent to 25 days' supply.

Extension of exemption from rated value linked taxes already provided for in the amendment to the law on mineral oil stockpiling from stocks equal to 25 days' supply to stocks equal to 40 days' supply to include the group of independent importers.[37]

VI. Government Plans

The German Ministry of Economics has been developing a comprehensive energy program since 1973. The first revision of the program was released in October 1974 thus reflecting the impact of the energy crisis of 1973–74. It set forth a broad-gauged, well-organized, and sweeping program stated in general terms. It set as targets the following:

Higher priority for securing mineral oil supplies and reducing the share of mineral oil in energy supply;
Accelerated use of nuclear energy, natural gas, and lignite;
A new position for hard coal;
Improved long-term site reservation for energy industry installations;
Greater saving on energy;
Higher priority for research in the field of energy; and
Improved contingency planning.[38]

The Government's statement of energy policy emphasized the importance of international cooperation in the solution of energy problems, including obligations for building up minimum stocks and restricting demand in times of crisis. It called for long-range collaboration in energy research and development together with the establishment of a comprehensive information system.

The Government is planning to store crude petroleum reserves in underground salt caverns up to a level of 4 million tons and to finance the maintenance of a 10-million-ton coal stockpile. Companies exploring for natural gas will receive Government support. The Government has already provided DM 40 million ($16.8 million) for natural gas deep drilling.

In the field of energy conservation the Government expects "that the increased energy prices will lead to a considerable intensification of effort toward a more rational energy use, especially by industry." However, the Government is prepared to "resort to supplementary measures," if necessary.[39] It plans to launch a program "to inform consumers about the possibilities of using energy more rationally in the home, in transportation, and at work."[40] It will introduce a law "which will create in particular the legal bases for the mandatory introduction of better heating insulation in new buildings."[41] It places particular importance on the expansion of long distance heat installations, especially in connection with heating powerplants.

The report also stressed research. The Government is backing research projects on energy flows and energy consumption. In considering the costs of various energy projects, the report recognizes that the accelerated buildup of secure energy sources, including conversion, transportation, and processing capacities requires increasingly large

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[37] Ibid., pp. 22–23. For additional proposals, see app. A, p. 23.
[38] Ibid., p. 12.
[39] Ibid., p. 54.
[40] Ibid., p. 55.
[41] Ibid., p. 56.

investment. But it sees no reason to create governmental special conditions on the capital market for the financing of energy investments—with the one exception of the development of nuclear power because of the long construction timetable involved.

Finally the paper stressed strongly that energy and environmental policies "must not be contradictory in character." [42] (For the text of the report see the appendix.)

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[43] Ibid., p. 62.

APPENDIX

First Revision, Energy Programme of the Federal Republic of Germany

THE FEDERAL MINISTER
OF ECONOMICS

FIRST REVISION OF THE ENERGY POLICY PROGRAMME FOR THE FEDERAL REPUBLIC OF GERMANY

THE FEDERAL MINISTER OF ECONOMICS

First Revision of the Energy Policy Programme

for the

Federal Republic of Germany

November 1974

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THE FEDERAL MINISTER OF ECONOMICS

First revision of the Energy Policy Programme of the Federal Government

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In its energy policy programme of 26 September 1973 the Federal Government worked out for the first time a long-term strategy to secure the energy supply. At the time, the Government emphasised that it will be a constant task in economic policy to carry the programme forward and adapt it to changing conditions.

The oil crisis and the resulting radical changes in world energy markets made such a revision necessary within a short period of time.

The first revision of the energy policy programme follows.

A. The Crisis and its Lessons

I. Coping with the Crisis

Warning in the energy programme

1. In its energy programme the Federal Government stated that the risks to the energy supply are not abstract possibilities but real threats. In connection with oil this risk became a reality during the Arab-Israeli conflict. In fact, the cuts in production of up to 25 per cent decided on by the Arab producer countries on 17 October and 28 November 1973 and the embargo on deliveries from November onwards led to a substantial reduction in oil supplies to the consumer countries. The overall boycott, affecting inter alia the port of Rotterdam which is important in supplying our country, had particularly adverse effects on the Federal Republic.

Substantial shortages of crude oil and mineral oil products

2. The shortfall in crude oil supplies to the Federal Republic increased, compared with October 1973, from 7 per cent in November to 12 per cent in December and 13 per cent in January 1974. Imports of finished products decreased during the same period by 8 per cent, 21 per cent and 32 per cent, respectively. The considerable dependence of the Federal Republic on imported mineral oil products (about 30 per cent) caused disproportionately large shortages mainly in the case of light heating oil and fuels.

Law to Secure the Energy Supply forms the basis for government action

3. After only two days of discussion Parliament adopted the Law to Secure the Energy Supply on 9 November, thus creating the legal basis for the necessary government measures.

Energy saving measures taken by the Federal Government

4. On 19 November 1973 the Federal Government decreed speed limits and a driving ban on four successive Sundays. In the case of light heating oil the Federal Government was able to confine itself to advising consumers to save on heating oil because their stocks were comparatively large. In order to support this voluntary saving, the Federal Minister of Economics requested the mineral oil industry and the trade associations to cut deliveries to consumers correspondingly. Difficulties in the supply of heavy heating oil were made up for by substituting coal for oil. Substitution mainly in the electricity and steel industries saved 300,000 to 500,000 tonnes per month.

Setting up of clearing agencies to overcome acute disruptions of supply

5. For the purpose of coping with acute disruptions of supply in some cases - often caused through insufficient stockpiling by individual consumers - the mineral oil industry set up clearing agencies for fuels, light heating oil, heavy heating oil, bunkering oil, naphtha and liquified gas as suggested by the Federal Ministry of Economics. The clearing agencies, authorised in accordance with Section 12 of the Law to Secure the Energy Supply, were subject to supervision by the Economics Ministry.

The good co-operation between the Economics Ministry and industry made it possible to refrain from rationing measures.

No administration of prices

6. The cuts in supplies caused drastic price increases, particularly in the case of imported petroleum products, whereas the movement of prices for products manufactured at home was considerably more restrained. Particularly large price

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fluctuations and price differences occurred in the case of light heating oil where a share of 39 per cent has to be imported. In the interest of securing sufficiently large quantities of supply the Federal Government did not wish to control the formation of prices for mineral oil products administratively. With the help of the law on the provision of a non-recurrent grant towards heating oil costs dated 21.12.1973, the Federal Government assisted the lower income brackets in coping with the drastic cost increases that occurred in the middle of the heating period. Apart from that, government assistance was only needed in agriculture and fishing.

Grant towards heating oil costs for lower income brackets

7. During the crisis it became obvious that the data available to the Federal Government on changes in quantity and price did not suffice. The Federal Ministry of Economics and the mineral oil industry therefore agreed in November 1973 on the systematic establishment of a comprehensive system of information and notification at national level. But it soon became evident that the results to be obtained within a national framework would not be sufficient. The worldwide integration of international companies calls for supplementary international data.

Establishment of a system of information and notification in the mineral oil sector

As a whole the Federal Republic has mastered the crisis better than others

8. Due to this strategy and the responsible co-operation on the part of the population it was possible to overcome the crisis without the German economy being seriously harmed. On the whole the Federal Republic was able to meet this challenge better than most of the industrialised countries.

II. Price Policy of the Producer Countries

Tripling of crude oil prices

9. On 1 January 1974 the producer countries introduced a new price policy by raising the posted price of crude oil by an amount which so far had hardly been conceivable. Meanwhile the world prices of crude oil have tripled compared to the level before the crisis.

In the Federal Republic crude oil prices rose to about 230 D-Mark/tonne free border in March 1974 compared to 76 D-Mark/tonne in September 1973.

Consequence: extreme price increases for mineral oil products

The rise in crude oil prices - fed by the shortages in supply - resulted in extremely strong price increases for mineral oil products throughout the world. In the Federal Republic the price of light heating oil rose in the above mentioned period from 20 Pfennigs per litre to about 32 Pfennigs per litre; the price of petrol increased from 74 Pf/l to 84 Pf/l and that of heavy heating oil from 80 DM/t to 200 DM/t. In Rotterdam, the rise in prices of petrol, light and heavy heating oil was even larger.

These different movements of prices affected in particular the import-dependent trade. In this sector, too, it was possible through the services of the clearing agencies to guarantee supplies to the consumers and avoid structural shifts in the market. Since then import prices have dropped to a level where imported mineral oil products can compete again with home-produced goods.

Even during the crisis, prices in the Federal Republic kept within the middle range compared with the other Western European consumer countries, both countries with free prices and those with government-controlled prices.

Reliable, long-term price forecasts cannot be made at present

10. At the present time nobody can predict with any degree of certainty how worldwide movements of mineral oil prices will be influenced in the future by political and economic events.

Consumer behaviour and energy policy measures may help to limit the movement of prices. Of decisive importance however will be the outcome of the dialogue between the oil-producing countries and the rest of the world about this price policy and its serious repercussions on the balances of payments of many countries and on the entire world economy.

The dimensions of the problems call for a high degree of insight and responsibility on the part of all those concerned - producer and consumer countries. The prosperity of the world economy depends on the reconciliation of interests.

III. Overall Economic Effects

Additional heavy burden on world economy

11. The sudden massive rise in oil prices hits the world economy when it is anyway passing through a phase of instability. Therefore an extraordinary responsibility rests with the oil-producing countries for the future development. Should they misjudge the situation, this could have unforeseeable consequences for the world economy. This statement does not contradict the oil-producing countries' interest in adequate prices which is recognised also by the Federal Republic. The rise in oil prices has put an additional heavy burden on the balances of payments of almost all countries dependent on oil imports. The oil-induced surpluses in the balances on current account of the OPEC countries in 1974 are estimated at about

Balance-of-payments problems

60 billion US $. According to estimates by the OECD this means that the OECD countries in 1974 will have to put up with an overall deficit on current account of the order of 40 billion US $. The developing countries must expect that the deficits in their balances on current account will increase as a result of higher oil prices by an estimated 10 billion US $, an amount which is larger than the total of capital aid granted to these countries by other nations.

If oil prices do not fall substantially there is a danger that the balances on current account of the oil-consuming countries will also be heavily in deficit in the years to come because the oil-producing countries' import capacity will remain limited, at least in the foreseeable future. Major oil-exporting countries will not be in a position, even in the medium term and in spite of improvements in economic co-operation with the industrialised countries, to absorb additional purchasing power fully within their own economies. Initially it is therefore necessary to channel the flow of capital from the countries with surpluses arising from oil revenues to the deficit countries. This would also be in the interests of the oil-producing countries themselves.

For this reason the Federal Government supports the efforts encouraged inter alia by the International Monetary Fund and the World Bank to pass the surpluses of the oil countries directly on to the countries in need, taking special account of the situation of the developing countries.

Relapse into bilateralism and protectionism is no way out

Even under the changed circumstances the Federal Government is convinced that a relaps into bilateralism and protectionist trade policies cannot be the solution to the difficulties that are presently facing the world economy. Steps in that direction would only endanger employment and monetary stability even more and result in negative chain reactions in world economic relations. The Federal Government therefore energetically supports the standstill agreement which the Council of Ministers of the OECD has meanwhile adopted.

Effects on the economy of the Federal Republic

12. The effects of the drastic rise in oil prices are most clearly reflected in the fact that the Federal Republic in the first seven months of this year had to pay 19.4 billion D-Mark for its oil imports whereas only 7.2 billion D-Mark would have bought the same quantity at last year's prices. Nevertheless, the Federal Republic is not likely to suffer from balance-of-payments problems in the foreseeable future that result from higher oil prices. In the period from January to July 1974 the German current balance was actually in surplus by nearly 16 billion D-Mark.

The German economy has reacted with great flexibility to the changes in the world energy market. Structural adjustment processes which were already under way in some sectors have been intensified and accelerated.

In cyclical terms the German economy had already been in a phase of slowdown before the oil crisis started. This trend was initially accentuated by the crisis. The economic policy measures taken by the Federal Government of 19 December 1973

contributed their share towards avoiding drops in activity resulting from the crisis. The decisions made by the Federal Government on 6 February and on 25 September 1974 led to the adoption of special programmes in favour of areas suffering from particular structural and employment problems; through these programmes activity was secured at local and regional level.

The substantial increases in the price of oil and oil products have directly and indirectly affected the level and structure of prices. Those sectors especially which make extensive use of mineral oil and mineral oil products have experienced cost increases. The direct effects of higher prices for petrol and light heating oil on the cost-of-living index of all private households stood at 1.1 per cent in February 1974 and fell to 0.5 per cent after a decline of prices in the mineral oil market in August 1974.

B. Consequences for Energy Policy

I. Changes in Basic Data

13. The basic data and the pre-requisites for the Federal Republic's energy policy have changed considerably.

Only an interim assessment can be made at the present time

In this context, it is only possible at the present time to make an interim assessment. New reliable structures in the world energy market and stable relationships between the prices of the various forms of energy have not emerged as yet. Experience from the past can only be used to a limited extent since the energy markets have at no time before seen such far-reaching and rapid changes.

14. The world mineral oil market is increasingly being influenced by non-economic factors. Oil has for the first time been used by the producing countries as a political instrument.

Shift of predominance in the mineral oil market

The producing countries are more and more taking over the management of oil production; their involvement in down-stream operations is increasing. At the same time a process of fundamental changes in the distribution of wealth has been launched in favour of the oil-producing countries and at the expense of the industrialised countries as well as the non-oil-producing developing countries.

15. The relative competitiveness of oil and other forms of energy has changed radically; the position of the latter has improved. This is true of nuclear energy, a low-cost form of energy already, natural gas and lignite. The changes in the world energy market also provide new possibilities of development for hard coal.

New trends 16. Important new trends are:

- The increase in energy demand has become slower throughout the world.
- The overall level of energy prices has gone up.
- Exploration for new reserves of energy is increasingly being encouraged. Energy resources which have been unprofitable so far because of excessively high costs may become profitable or come near it.
- New technologies in the production, transport and use of energy are becoming more promising worldwide. Possibilities of rational use of energy and recycling of energy are increasingly coming to the fore. Research projects are being intensified in all parts of the world.

These reactions are important and lead to some easing of pressure; however they cannot alter the crucial point, namely that we will be dependent on oil up to the middle of the eighties.

Structure of the German energy industry

17. These major changes meet with the following structure of the energy industry in our country:

- The supply of energy covers a wide range, dependence on imports however amounts to 57 per cent.
- The supply of energy is assured by numerous efficient enterprises which up to now have, for the most part, been capable of fulfilling their functions.
- The Federal Republic of Germany possesses considerable hard coal deposits.
- We produce the largest volume of lignite in the Western world.
- The enormous efforts made in the Federal Republic of Germany to develop nuclear energy have put it technologically among the leading countries in this field. Nevertheless, the share of nuclear energy in primary energy consumption is only 1 per cent at present.
- About half of the natural gas supply is presently being met from domestic production; whether the share of this form of energy will be increased depends on future supplies from abroad.
- Oil from domestic sources covers only 5 per cent of the supply of mineral oil whose share in primary consumption stood at 55 per cent in 1973.

II. Conclusions Regarding Energy Policy Objectives

Undisturbed energy supply no longer a matter of course

18. It can no longer be taken for granted that energy supply will be undisturbed. The statements by many producing countries that they will tend to restrict oil supplies in order to conserve their own reserves and to make optimum use of them, must be taken seriously. There is a persisting risk of temporary crises and disruptions of supply. On the other hand, there is only some leeway for energy policy measures because of the heavy dependence on imports and the limited possibilities of substituting large quantities of oil within a short period of time. The German economy will have to live with this risk in the medium term.

Given this situation, higher priority than ever before is being given in German economic policy to securing energy supply. The crisis has taught us that new impulses and additional measures are required:

- Higher priority for securing mineral oil supplies and reducing the share of mineral oil in energy supply.
- Accelerated use of nuclear energy, natural gas and lignite.
- A new position for hard coal.
- Improved long-term site reservation for energy industry installations.
- Greater saving on energy.
- Higher priority for research in the field of energy.
- Improved contingency planning.

No change in basic aims in energy policy

19. The basic aims of the Federal Government's energy policy remain unchanged:

- Sufficient and low-price energy supplies to consumers in all parts of the Federal Republic.
- Securing the supply in the medium and the long term.
- Providing energy at favourable total costs to the economy in the long term.
- Adequate and early consideration of the requirements of environmental protection in order to bring energy and environmental policy needs into line.

III. Developments in the German Energy Market up to 1980 and 1985

Levelling off of energy

20. The Federal Government expects energy consumption in the Federal Republic to rise more slowly than forecast in the energy programme published in September 1973. Consumption in 1980 is now estimated at 475 million t.c.e. and in 1985 at 555 million t.c.e.. This would mean that in 1980 consumption would be 35 million t.c.e. or 7 per cent lower than assumed in the 1973 energy programme and in 1985 55 million t.c.e. or 9 per cent lower. The decisive factor in this context is mainly that overall economic growth will probably be smaller and that consumers will use energy more economically and rationally as a reaction to higher prices and government measures.

In addition, the Federal Government will make an effort - in particular by developing new technologies - to reduce actual energy consumption compared with the forecasts to the extent that this is possible without jeopardizing economic growth.

Quantitative framework of energy policy

21. In carrying its programme forward the Federal Government goes beyond a mere estimate of probabilities and presents a qualified forecast which reflects the results that it expects from its energy policy. This estimate serves as guidepost in the energy policy of the Federal Republic and for the decisions taken by industry. In view of the above uncertainties as to how the international energy markets will develop in the future this quantitative framework will be adapted to changing circumstances in each case; there is a clear difference therefore between this frame and rigid quantitative targets.

In working out this framework the Federal Government has based itself on scientific studies, forecasts and information available at both the national and the international level.

Initially the Federal Government examined which share domestic sources of energy can and ought to contribute in view of the changed situation. It was then ascertained which contribution could be made and should be made by other comparatively secure forms of energy, such as natural gas and nuclear power. It has become evident that up to the mid-eighties a considerable part of energy demand will stillhave to be met by mineral oil.

The figure given by the Federal Government for coal up to 1980 goes beyond a qualified forecast.

22. The following picture results:

	1973 mill. t.c.e.	%	1980 mill. t.c.e.	%	1985 mill. t.c.e.	%
Mineral oil	209	55	221	47	245	44
Hard coal	84.2	22	82[x)]	17	79	14
Natural gas	38.6	10	87	18	101	18
Lignite	33.1	9	35	7	38	7
Nuclear energy	4	1	40	9	81	15
Others	9.7	3	10	2	11	2
Primary energy consumption	378.6	100	475	100	555	100

x) Taking account of expected sales; see para. 51

23. It becomes evident

Visibly smaller share of mineral oil

- that the degree of dependence on mineral oil in our energy supplies will be reduced from 55 per cent to about 47 per cent in 1980 and about 44 per cent in 1985. Nevertheless, mineral oil will remain the most important form of energy up to the mid-eighties. There are limits to the amount which can be attributed by secure forms of energy. Additional supplies through new technologies can only produce a real effect in the longer term. Furthermore, in a number of fields of use such as the petrochemical sector and the transport sector mineral oil can for the time being not be substituted for technical reasons;

High growth rates of natural gas and nuclear energy

- that natural gas and nuclear energy are recording high growth rates. Together with lignite they will reach a share in primary energy supply of

roughly 40 per cent in the middle of the eighties. In the 1973 energy programme the share of these three forms of energy was estimated at one third;

Stabilisation of the share of hard coal

- that the share of coal in primary energy supply will have been stabilised by 1980 at spproximately the present level.

The regional aspects of energy market trends should be examined in collaboration with the Laender.

Uncertainties in the forecast

24. As any estimate this forecast is subject to uncertainties. The general lack of certainty about the future development of world markets is accompanied vy the specific doubts about individual forms of energy. The desired growth rates of nuclear energy and natural gas call for great efforts on the part of all those involved. Delays in obtaining or constructing production and transport facilities as well as in the authorisation procedures cannot be ruled out.

No figures for the period after 1985

25. In rolling forward the programme this time the Federal Government has refrained from giving forecasts of long-term developments after 1985. The development from the mid-eighties onwards can in practice not be quantified from the information available today because it is influenced by very uncertain factors from outside the energy sector. These include the development of the economy as a whole and of the world economy as well as consumer behaviour. A major rôle will also be played by the outcome of efforts made by energy policy makers worldwide to develop alternative forms of energy and new energy technologies.

As however considerable importance must be attached in energy policy terms to the long-term development, the Federal Government has commissioned studies on the perspectives in the energy market up to the year 2000.

C. International and European Co-operation

National solutions are insufficient

26. The problems in the world energy market can only be solved with the help of international co-operation. The largely national context in which energy policy has so far been implemented will in future not be broad enough.

Only if tensions in the world oil market are reduced can a stable supply situation in terms of price and quantity be obtained. International co-operation in energy policy should in particular concentrate on the following aspects:

- The industrialised countries of the West must find a common way of securing supplies on the changed economic policy scene.
- They must make a common attempt to reduce dependence on oil as a source of energy.
- Their relations to the producer countries must be brought into a new equilibrium.
- In the face of the enormous demand for energy in the future, international co-operation will provide the key to the realisation of projects which surpass the capabilities of any individual economy. This applies mainly to the development of new sources of energy and the relevant technologies.
- Bilateral co-operation with the producer countries must be adequately supplemented on the multilateral side so that in the wider international frame the necessary equitable reconciliation of interests becomes possible.

In order to avoid confrontation, new forms of communication must be found for the discussions

among all countries concerned, the industrialised consumer countries, the non-oil-producing developing countries and the oil-producing countries. Therefore, the Federal Government invites all governments to join forces in solving the problems in the energy field.

Energy policy efforts by the EC are necessary

27. A common energy policy of the European Community is indispensable. The Federal Government welcomes the proposal made by the Commission regarding an energy policy strategy. It is a suitable starting point for the necessary steps.

The resolution adopted by the Council of Ministers on 17 September 1974 confirms the political will to persue a common energy policy. The Federal Government will adhere to this basis for a Community energy policy condept and will most actively contribute to developing one. In the German view the most important tasks are:
strengthening the security of energy supply, particularly by making better use of the forms of energy available within the Community, and common, co-ordinated efforts to obtain additional energy as well as promoting research and technology.

International energy programme worked out by major industrialised countries

28. The efforts made in connection with far-reaching co-operation between the consumer countries have produced concrete results in the past few weeks. The twelve industrialised countries participating in the follow-up work to the Washington Energy Conference of February 1974 - Belgium, Canada, Denmark, Great Britain, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, USA and the Federal Republic of Germany - have prepared the

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text of a comprehensive international energy programme based on the principle of solidarity. The Federal Government welcomes this Agreement and approves it. It hopes that it will become effective within a short period of time after all governments concerned have given their approval.

The programme aims at mobilising the consumer countries' own forces in the field of energy. This does not imply confrontation with the producer countries, because it is also an essential element of the Agreement to enter into a dialogue with the oil-producing countries which will lead to an equitable reconciliation of interests and to the stabilisation of international energy markets.

29. The programme contains the following points of emphasis:

- A system of solidarity to overcome supply difficulties which includes in particular the obligation to build up minimum reserves and to introduce minimum demand restrictions in a crisis, and provides for a balanced distribution of the available quantities of oil among all participating countries;
- common long-term programmes for the rational utilisation of energy, the development of alternative sources of energy, for research and development in the energy sector and for uranium enrichment;
- a comprehensive information system - supplemented by consultations with the international oil companies - which will collect regularly and centrally all important data about events on the

oil market and the activities of the oil companies. Only with this system will it be possible to make assessments covering the international nature of the market;

- preparation of the dialogue with the producing countries.

With this unprecedented effort in the energy policies of the industrialised countries, the participating nations can create the foundation for the solution of the urgent international problems in the energy sector.

D. Improved Contingency Planning

Importance of optimum contingency planning

30. The past months have shown how important optimum contingency measures are, such as building up energy reserves, the capability to substitute some forms of energy with others and an efficient crisis management. Such measures are particularly important in the crucial initial phase of critical developments.

The Federal Government is aiming at a combination of these measures which produces the most favourable effect in economic terms.

The Federal Government will intensify national contingency planning and adapt it to the European and to the new international requirements.

I. Stockpiling

Speedy adoption of amendment to law on mineral oil stockpiling

31. Since the most serious risk exists in the mineral oil sector for the time being, the Federal Government attaches importance to the following points:

Speedy adoption of the amendment to the law on mineral oil stockpiling which has been submitted to Parliament. The amendment provides for an increase in minimum reserves held by refineries from 65 to 90 days' supply and for those held by importers from 45 to 70 days' supply.

In view of the drastic rise in crude oil prices the Federal Government intends to propose tax relief for all those under minimum reserve requirements and additional special arrangements for independent importers, so as to make it possible to include this group in the minimum reserve regulation.

Extension of tax relief

So far the amendment merely provides for exemption from the taxes that depend on rated value (property and trading capital tax) payable on the additional stocks for another 25 days - as a result of higher minimum reserve requirements - and on the necessary storage tanks. This tax regulation is to be supplemented as follows:

- Granting of a tax-free reserve, which must be written back after ten years within another five years, to avoid profit tax being imposed on book profits which result exclusively from a non-= recurrent sudden rise in prices in the mineral oil sector in 1973/74 and from the need to replace minimum reserves on technical grounds; this is however limited to stocks equivalent to 25 days' supply.
- Extension of exemption from rated value linked taxes already provided for in the amendment to the law on mineral oil stockpiling from stocks equal to 25 days' supply to stocks equal to 40 days' supply to include the group of independent importers.

As regards the independent importers, the Federal Government furthermore proposes:

New regulation relating to minimum reserves of independent importers

- Minimum reserves for this group will be limited to 44 days in order to offset the difference in the cost of new stocks in relation to old stocks.
- The Federal Government will make available the necessary space for storing crude oil in underground caverns on a rented basis.
- The government-owned Industrieverwaltungsgesellschaft (industrial managing company - IVG) in Bonn will purchase the crude oil; if necessary, these purchases will be guaranteed by the Federal Government. Current costs will have to be borne by importers.
- Where the minimum requirement is met through mineral oil products instead of crude oil, the Federal Government is willing - under conditions still to be set up - to guarantee the financing of storage tanks and the purchasing of stocks.

Federal Crude Oil Reserve

32. The Federal Government will begin to store a federal crude oil reserve of 4 million tonnes before the end of 1974. The funds for the financing of this measure have been appropriated in the 1974 Budget, in the draft budget for 1975 and in medium-term financial planning. The crude oil will be stored in underground salt caverns. By the end of 1974 about 400,000 tonnes will have been stored; the remaining amounts will be deposited in annual lots of 1.2 million tonnes, 1.4 million tonnes and 1 million tonnes by the end of 1977.

33. Furthermore, the Federal Government is aiming at expanding the crude oil reserve. The Federal Government's programme for the building of caverns provided for 10 million tonnes of stocks; this will be reduced by about 2 million tonnes for which the Federal Government will make available storage space to the independent importers. It will then be possible to expand the Federal crude oil reserve to amount to a total of 8 million tonnes.

The timing for the increase in stocks will depend on the possibilities offered by the Federal Budget.

Target: Total reserves to last more than 90 days

34. Through the above measures, the Federal Republic will be raising total mineral oil stocks so as to last more than 90 days and thus meet international long-term supply targets.

Obligatory reserve stocks to be held by oil-fired power stations

35. The Commission of the EC has proposed to introduce obligatory reserve stocks to be held by oil-fired power stations operating in the public as well as in the private industrial sectors. The Federal Government welcomes this initiative which is to invite power stations to hold heavy heating oil stocks equivalent to the consumption of 50 days. The German public electric power industry already holds such stocks.

Voluntary reserve stocks to be held by consumers

36. The Federal Government leaves it to the responsibility of consumers whether they want to store even larger quantities; for the time being, it does not plan to introduce obligatory reserve stocks in this area.

Nevertheless, the Federal Government requests all consumers urgently to hold sufficient stocks on a voluntary basis or to arrange for the necessary

precautionary measures. This applies also to the local gas works operating on liquified gas where critical bottle-necks occurred during the latest disruptions in supply. The Federal Government recommends that consumers in trade and industry and the public authorities hold minimum reserves equivalent to 14 days' supply.

Consumers holding insufficient stocks must be aware that in a crisis they have to bear the consequences, The Federal Government has entered into talks with the relevant associations and organisations so as to encourage consumers to improve their stock-piling.

37. The risks to other imported forms of energy are comparatively limited so far. The same applies to natural gas. It is not necessary at the present time to make reserve stocks obligatory. In view of the fact, however, that dependence on imported natural gas is growing the Federal Government will closely observe the development of natural gas storage.

Building up of coal reserves

38. The Federal Government believes that it is necessary to build up hard coal reserves from domestic production of the order of about 10 million tonnes with the mining companies. Such reserves have been taken into account in calculating the figures for coal.

As regards the additional burden on the mining companies the Federal Government is willing to bear the cost of such coal reserves to the extent that they exceed the stocks usually kept by the companies. Approval by the Federal Minister of Economics is required if these reserves are to be used. The upper limit of stocks financed from

public funds is to be 10 million tonnes. As from 1977 the Federal Government will make provision for such funds. In view of the importance of these hard coal stocks in connection with the mining industry's level of activity and stabilising the employment situation, the Federal Government assumes that the Laender where mining prevails will bear one third of the costs.

The advantages of coal reserves became evident during the oil crisis. Substitution is possible particularly in the case of heating oil. Furthermore, such hard coal stocks may serve to cope with other threats to the energy supply such as delays in the construction of nuclear power plants.

II. Crisis Management

Draft of a new Law to Secure the Energy Supply

39. The powers granted to the Federal Government by Parliament during the crisis will expire on 31.12. 1974. Therefore the Federal Government has submitted to the legislative bodies the draft of a law to succeed the Law to Secure the Energy Supply dated 9.11.1973 which provides it with a better margin for action in the event of a crisis.

E. Policies for Individual Energy Forms

I. Mineral Oil

Basic thrust of policy

40. As one of the most important trading countries and one of the largest importers of oil, the Federal Republic has a vital interest in a free and properly functioning international oil market.

Position of the international companies

The balance of forces in this market has changed radically. The international oil companies now find themselves in a position where their traditional concession rights are being reduced and their control over crude oil is lessened. By virtue of their extensive processing and marketing capacities and their technical and economic potential, however, these companies will continue to play an important role in the world energy market.

Greater transparency necessary

Events during the oil crisis and the expansion of international oil company profits have given rise to considerable criticism in the consumer countries, coupled with the demand for greater transparency in the activities of these companies. The Federal Government also takes the view that disclosure of their market policies is necessary and would be in the companies' own interest.

Support for cooperation with national companies in the producer states

As the control of national companies in the producer countries over the production of crude has rapidly increased, their influence in the international oil market has also grown significantly.

The Federal Government regards the companies in the producer countries as important trading partners. It therefore supports the efforts of the oil groups active in the Federal Republic to enter into closer cooperation with them. The Government will encourage this cooperation to the best of its ability, especially with financial guarantees. It remains the responsibility of private enterprise to agree on and implement specific projects on economic terms.

National companies in the consumer countries

Current structural changes are having a special impact on national oil companies in the consumer countries; they were previously supplied by the international companies but now have to switch to other sources. In addition to this, their position in the market has been impaired by the differences between the price of equity oil and the free world market price. On the other hand, the contribution these companies make to supplying the country is essential.

A balanced market structure in the Federal Republic

The Federal Government advocates freedom for the companies active in the German market to develop themselves, regarding this as the best precondition for a healthily structured market and sufficient supply at reasonable prices.

Importance of small and medium businesses

The Government continues to favour a large number of efficient small and medium scale businesses. However, the constriction of the market during the crisis and the large price increases in world markets have shown how vulnerable these companies are. The Federal Government expects the financially stronger and more powerful oil groups to respect this state

of affairs, even in times of crisis, so that the present structure of the market can be upheld.

Measures to secure long-term oil supplies

Creation of a strong German oil group

41. The objective stated in the 1973 Energy Programme of creating a strong German mineral oil group which can join in international cooperation, especially with the oil-producing countries, as an equal partner has been the subject of a major effort by the Federal Government since the crisis. By purchasing a majority share participation in Gelsenberg AG it has initiated the process of reorganisation. The activities of VEBA and Gelsenberg are being brought together under the common management of VEBA AG.

In preparation for this, the Government has transferred the rights from its participation in Gelsenberg to the trusteeship of VEBA. VEBA intends before the end of this year to make an offer to all Gelsenberg shareholders to exchange their holdings for VEBA shares. This calls for a valuation of the business, which is currently being conducted.

Once the steps necessary under company law have been completed, it will be the task of all those involved to work out and establish a functional company structure within the VEBA concern.

42. The crisis has induced the Federal Government to step up its efforts to broaden the country's own crude oil base. As the largest consumer in Europe, the Federal Republic has a special interest in joining in the worldwide search for

the required quantities of oil. The Government will be fitting out DEMINEX accordingly as its instrument in this field.

International activities of DEMINEX

The activities of DEMINEX have gained wide international recognition, so that it is now accepted by both the oil companies of the producer countries and the international companies as a valuable partner.

DEMINEX has had to recast completely its role in the producer countries. In its relatively short period of existence it has been able to establish a good starting position for itself in geologically promising areas. In collaboration with other oil companies it is currently exploring a total area of about 220,000 square kilometres. DEMINEX's main test drilling is being carried out in the following regions: the British North Sea, Nigeria, North Africa, the Caribbean, Peru, Canada, the Middle and Far East. The current projects will absorb the whole of the 575 million D-Mark made available under the springboard programme. About 240 million D-Mark have already been spent.

Follow-up programme worth 800 mill. DM

The Federal Government is providing a follow-up to the DEMINEX programme for the years 1975 - 78, worth 800 million D-Mark. Funds in this amount have already been planned into the national budget and financial dispositions. As its first major project under the new programme, DEMINEX has bid successfully for a concession in Iran.

Re-grouping within DEMINEX

43. In order to streamline managerial decision-making within DEMINEX, the Federal Government plans to restrict participation in DEMINEX to the four large refining companies in the German group.

This has already been done in the case of the Iran project.

The holdings of the companies dropping out of DEMINEX are to be taken over by VEBA. In order to prevent the technical and economic potential of these companies from being lost to the German group, they will be allowed to participate in individual projects of interest to them via VEBA.

Adjustment of refinery structure necessary

44. The particularly acute vulnerability of petroleum products imports during the crisis has underlined the importance in energy policy terms of further developing domestic refining capacity. In this context, the Federal Government continues to attach importance to a regionally balanced refinery structure.

Within the context of new forms of cooperation with the oil-producing countries new opportunities will arise for securing long-term supplies of petroleum products for the German market; these opportunities should be taken.

The Federal Government has already called on the oil industry in its 1973 Energy Programme to give due weight in planning the size and structure of refinery capacity to the Government's desire to see the use of heavy fuel oil in electricity generation kept within narrow limits. This adjustment of refinery structure has become more urgent than ever.

Transparency of the mineral oil market

45. The Federal Government will be continuing with the existing national system of information, which covers

- supply quantities (production, imports, sales, exports and movement of stocks)

- costs, earnings and prices within the oil industry.

The Government will extend the system to include distribution and marketing channels, in order to make the flow of supply from producer to consumer more transparent. This additional information will be treated, like that before it, as confidential so that the competitiveness of independent oil dealers is not impaired.

II. Natural Gas

46. After mineral oil and hard coal, natural gas is the third largest source of primary energy with a share of 10.2 per cent in total supplies. The natural gas available in recent years has been made up of domestic production and imports from the Netherlands.

New sources of supply

Since 1973, the Netherlands have been joined as a supplier by the USSR. A further natural gas supply contract with the USSR was initialled in August 1974, providing for the delivery of an extra 2.5 billion cubic metres a year to the Federal Republic. This means that Soviet natural gas supplies in 1980 will be raised to about 10 billion cubic metres a year altogether.

Norwegian natural gas from the Ekofisk field will start to flow to the Federal Republic in 1976, reaching about 6 billion cubic metres a year by 1980. The subsea pipeline to Emden which is

required to transport it is currently under construction.

Negotiations are under way with Algeria for the delivery of a total of 12.5 billion cu.metres annually. In the framework of our broad-based economic cooperation with Iran, intensive negotiations are taking place with a view to drawing natural gas supplies both overland, in collaboration with the USSR, and by sea.

The Federal Government will continue in future to work energetically for an increase in the share of natural gas in overall energy supplies. As announced in the 1973 Energy Programme, the Government will support companies in the securing of new supply quantities for the German market.

Depending on the details of each case, it will provide this assistance in the form of general policy measures, international bilateral agreements or public financial guarantees. As a realistic objective it is aiming at a natural gas contribution to energy needs of roughly 87 million tce by 1980.

Stepping up of exploration in the Federal Republic

47. In the context of the deep-drilling programme announced in the 1973 Energy Programme, the exploration of the territory of the Federal Republic for further reserves of natural gas will be stepped up. Drilling has begun in Miesbach (Bavaria) and Velpke/Asse (Lower Saxony). The Government has set aside 40 million D-Mark for deep drilling for natural gas. Exploration of

the German section of the North Sea has been resumed.

Cooperation within the gas industry desirable

48. In Europe, cross-frontier cooperation between large gas companies is gaining in importance. In the Federal Republic itself the existing pattern of the gas industry is in need of improvement in view of the large risks and extraordinarily high sums of money involved in major gas projects. The Federal Government therefore considers it a matter of urgency that the operators of long-distance gas supply networks in Southern Germany should arrive in the short term at a more efficient form of close cooperation.

III. Hard Coal

The Government seeks optimum use of domestic coal reserves

49. The Federal Government is determined that the reserves of coal in this country should be optimally used in supplying the Federal Republic with energy. The 1973 Energy Programme stressed the importance of coal in meeting the country's energy needs, and this was made abundantly clear by the crisis. The higher price of energy and the continuing world steel boom have radically altered the international coal market in comparison with the situation a year ago. It is at present almost impossible to buy extra quantities of coal on the world market. World market prices for coking coal currently match the list prices for German coal.

Coal stocks have shrunk

50. The coal stocks held by mining companies in the Federal Republic were drawn down from nearly

19 million tonnes in September 1973 to 4.8 million tonnes at the end of September 1974. An important share of the additional demand is accounted for by other EC countries. Thus the German coal industry has performed an important back-up function for the rest of Europe.

Production capacity

51. In its 1973 Energy Programme, before the oil crisis began, the Federal Government stated that the German coal industry should aim in its adjustment process at a production level of 83 million tonnes in 1978.

The radical changes in the oil market and their effect on the international coal market have confronted the German coal industry with a totally new demand situation. The world boom in steel has also had an important part in this. The Federal Government has called on the German coal industry to make full use of its present production capacity and to consider the supply needs of the German market in framing its export policies. The Government expects the high level of demand to continue at least until 1975. German coal production in 1974/5 is thus likely to be in the region of 94 to 95 million tonnes.

In considering the medium-term prospects for German coal, however, one must start from the assumption that the present unusual situation in the coal market will moderate. The major coal producers, especially the United States and Poland, intend to increase their output considerably. A relaxation of the steel boom will

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inevitably lead to a decline in coking coal prices.

In comparison with its international competitors, the German coal industry continues to labour under structural cost disadvantages resulting from the unfavourable geological conditions and the high wage costs this entails. Although current prices more or less cover the production costs of German producers, they are considerably higher than the production costs prevailing in important coalfields abroad.

A policy for coal cannot therefore leave out of account a possible widening of the difference between earnings and costs which would burden domestic hard coal production. The aim must be to strike a sensible balance between the need to secure energy supplies, the dimensions of the German coal industry and the related advantages and disadvantages in financial terms and in terms of the economy as a whole.

Given this position, it appears today that the following markets will be available in 1980:

35 million tonnes for the electricity industry

25 million tonnes for the domestic iron and steel industry, if its requirements are to be met entirely with German coal

11 million tonnes for consumption in the home and the remainder of industry

18 million tonnes for export. This figure is based on the expectation that previous loss-making foreign sales will be supplanted as far as possible by export transactions in which costs are recovered.

Taking into account the planned coal reserve (see para. 38) and the intended importation under certain conditions of 3 million tonnes (see para. 53), this would mean total sales of 90 million tonnes.

This assumption regarding sales in 1980 is subject to greater qualification than any previous estimate. The uncertainty arises from the instability of the international energy market as a whole, from the unknown consequences of revised energy policies in the main consumer countries as well as of the International Energy Programme, and especially from the future behaviour of the oil-producing countries, which is hard to estimate and is heavily influenced by political motivations. The political responsibility of the Federal Government for securing German energy supplies makes it imperative in this situation to uphold present production capacity until the international energy position has become clearer and more amenable to calculation. The Government thus considers it right to proceed today on the premise of 94 million tonnes of capacity in 1980.

Coal production capacity in 1980: 94 million tonnes

In making this statement, the Federal Government is not giving State guarantees with respect to

levels of production and sales. Within the scope available to it, the Government will consolidate the basis for this coal policy by means of energy policy measures, more particularly in relation to sales to the electricity industry and the domestic iron and steel industry.

52. 80 per cent of German coal sold domestically goes to the electricity and iron & steel industries.

Sales to the electricity industry

Securing of coal sales to the electricity industry at an average 33 million tonnes/year (3rd Power Generating Law)

The use of domestic coal in the electricity industry makes an important contribution to making our electric power supply as independent as possible of imported energy, particularly mineral oil. For this reason, the Federal Government takes the view that the German coal industry has a major energy policy function to perform in this field. The draft of a Third Law on the Conversion of Coal into Electric Power which has now been presented by the Federal Government is intended to ensure that the share of coal in the generation of electricity remains sufficient to secure electric power supplies. As a supporting measure to this end, the bill prescribes prior authorisation for the construction of power stations burning oil and natural gas.

On the basis of experience gained during the energy crisis and after detailled discussions with all concerned during the debate on the bill in the competent Bundestag committees, an average annual level of consumption of German coal in power stations of 33 million tonnes up to 1980 has been provided for; this implies a level of

about 35 million tonnes in 1980 itself. This means raising the average annual level given in the 1973 Energy Programme (30 million tonnes) by 3 million tonnes. In fixing this increase, attention was also paid to the threat to electric power supplies which might arise from delays in expanding nuclear power station capacity.

This higher level of hard coal consumption should not be allowed to hinder the use of other secure and low-cost forms of energy such as lignite in the basic load sector. The limits on the use of hard coal are set by technical constraints, and situations where inappropriate interference or extra costs would be involved or where the use of fuel oil is absolutely necessary to meet demand.

For the rest, the Federal Government will base itself on the undertaking made by the electricity industry at the end of 1973 to build new power stations with a combined capacity of 6,000 megawatts (10 units) by 1980. Investment for 3,400 MW has already been committed. Of the 5 units now at the planning stage, 2 are going to be built in the Ruhr, 2 in the Saarland and one in the Hanover/Brunswick area.

Sales to the steel industry

Coking coal consumption in the German iron and steel industry

53. Coking coal sales to the German iron and steel industry this year will be unusually high, probably 29 million tonnes. As in the 1973 Energy Programme, the Federal Government assumes that demand will amount on average to about 25 million tonnes a year up to 1980. A partial substitution of coke for the heavy fuel oil used in blast furnaces, potentially equivalent to up

to 2 million tonnes of coal, will depend on the relative prices of coke and heavy fuel oil. The Federal Government does not intend to prescribe or subsidise substitution of this kind.

At present the German iron and steel industry draws its supplies entirely from German producers. It is not allowed to import coking coal - with the exception of areas on the North German coast. Coking coal purchases in the Ruhr are regulated in an exclusive contract under which any demand must be met. The fact that the German steel industry is practically only supplied by the domestic coal industry has the result that the Federal Government has to subsidise coking coal when the competing price on the world market is lower than the cost price of German coal.

The Federal Government wishes to try a new approach to coal policy in this area, one capable of putting the partnership between coal and steel on a new footing and enabling the Government to reduce the volume of its subsidies.

3 million tonnes import quota

The Federal Government would in future like to see about 22 million tonnes of the domestic iron and steel industry's annual requirements covered with German coal. It proposes to allow the import of 3 million tonnes of coking coal a year for consumption by the iron and steel industry. A precondition for introducing such a quota is that the coal and steel industries should together agree on amendments to the provisions of the present supply contracts,

particularly the smelting contract with the Ruhr coal industry, in order to adapt these to the new situation.

The Government believes that any adjustment of the contract terms should include the following basic elements:

- the steel industry should in future, and over the longer term, buy a given basic quantity at cost price;

- the coal industry should supply the German steel industry with the remainder of what it needs at prices which take account of the competitive position of the steel industry. The Federal Government is prepared to cover any difference between this and the list price in the context of the European Community's coking coal subsidy system should this be necessary;

- advantage should be taken of the import quota in consultation with the German coal industry;

- any decline in demand should not have to be borne by only one of the parties.

The Government has called on the parties to the contracts to make a start with intensive talks among themselves. It expects a balance to be struck between basic quantity and remaining quantity such that the interests of those commercially involved are respected in an equitable manner and that the financial risk to the public authorities entailed by the scale of the remaining quantity should remain calculable and limited.

In taking this approach, the Federal Government is giving due attention to the fact that coking coal is not just a form of energy in the iron-producing industry but is also above all a raw material. This means that the supply of coking coal comes into the ambit of raw materials policy, which aims at an optimum supply of basic materials for German industry.

On the other hand, the coal and steel industries have made clear by their long-term exclusive contracts that they attach some value to the security and geographical proximity of German coal deposits. This assessment is shared by the Federal Government.

Coal in the home, industry and transport

54. In the other sectors of the domestic market (consumption in the home, industry and transport), the Federal Government believes it likely that sales of German coal in 1980 will amount to 11 million tonnes. This means a less steep decline than originally expected in this area. Although it would be desirable from an energy policy point of view to reduce the share of fuel oil in this area, this is almost impossible to achieve using any reasonable means at the disposal of the State. No forecast can be made today about additional sales through the introduction of new technologies - especially coal gasification and coal liquefaction. Significant sales in this field can be expected at the beginning of the eighties at the earliest.

Coal exports

More German coking coal exports to the European Community

55. The total marketed output of the German coal industry contains an important export component, especially to the smelting industries of the other EC countries. Total exports in 1974 will probably amount to about 33 million tonnes as a consequence of higher crisis-induced demand and the worldwide steel boom. The Federal Government's estimate for coal sales in 1980 on the other hand is based on exports totalling 18 million tonnes.

In recent years exports have to some extent placed a major burden on companies, the Federal Government and the mining Laender, since earnings were not enough to cover costs unless supplemented by subsidies.

The future movement of coking coal exports to the other Community countries depends crucially on what the EC's coal policy will be. German coal could continue to make a significant contribution to supplying the iron and steel industries in the other Member States of the Community, but in the long run such exports can only be maintained to the extent that consumers in these countries are prepared to pay cost prices or that the Community itself guarantees the covering of costs by means of a compensatory system borne largely by the consumer countries. Neither the mining companies nor the Federal and mining Laender governments will be able in future to support high exports through subsidies in view of their other commitments in the energy sector. The Federal

Government's sales forecast assumes only a small volume of steam coal exports to other Community States and third countries. Thus, because of the uncertainty about the future content of EC coal policy, the Federal Government currently expects a decline in German coal exports.

Depending on the evolution of the Community's energy policy and developments in the world coal market, better export prospects for German coal than those forecast by the Federal Government are possible. The mining industry is naturally free to take advantage of export opportunities if this can be done without affecting supplies to traditional customers and if these exports are economic, and thus do not entail added financial risks for the public authorities.

Law on Tariff Quotas for Coal

Pre-emptive extension of the coal quotas

56. In view of the changed situation in the coal market, the Federal Government took advantage early this year of its powers under existing legislation and increased the import quota by 20 per cent. However, the scope thus created for the importation of 6.6 million tonnes will probably not be used to the full in 1974.

In addition to the opening of a 3 million tonne quota for consumers of smelting coke, the Federal Government will be proposing to the legislature that the Tariff Quotas for Coal which are due to expire on 31.12.1976 should be extended to 1981. This is intended to enable importers to conclude longer-term contracts and

to provide consumers of imported coal with a higher degree of security of supply.

Investment aids and social measures

57. A production level of 95 million tonnes in the coming year and an output capacity of 94 million tonnes in 1980 imply that the necessary labour-force will be available and that the companies will be able to make the investment required.

Increase in investment aids

The Federal Government intends to raise investment aids from the present 160 million D-Mark to 210 million D-Mark (shared by Federal Government and Laender).

In recent years, investment in coal mining has amounted to about 1 billion D-Mark annually. In view of the adverse financial position of the mining companies, this was mainly investment in repairs and replacement. In spite of the improvement in the competitiveness of the companies, the investment backlog will present them with considerable financing problems.

The Federal Government feels that the German coal industry should exploit the scope it now has for a forward-looking investment policy as a result of the unusual state of the world coal market and the rise in energy prices. The increase in investment aids is meant to facilitate and speed up this process.

Better conditions for financing investment have also been created by the higher ceiling on the sum available to the Rationalisation Association for the Hard Coal Industry for financing rationalisation measures; this was announced in the 1973 Energy Programme and has now been approved by Parliament. The ceiling has been raised by 1.5 billion D-Mark, giving the Rationalisation Association a greater margin for lending to the coal industry.

Improvement of working conditions

58. An active labour policy must continue to make the mining industry attractive to those working in it and those considering it as a career. The proportion of foreign workers among the underground workforce, currently about 20 per cent on average, is subject to limitations, not only on safety grounds. As well as striving for an economic and financial stabilisation, the mining companies have an important responsibility as regards training and the improvement of working conditions.

Miner's premiums are another way in which an adequate underground workforce is secured; the premium was doubled in 1973 to 5,- D-Mark per shift.

Furthermore, the Federal Government supports the improvement of working conditions through the "Framework Programme for Non-nuclear Research". Under this Programme it provides funds for the following purposes:

- better ventilation systems for stopes

- improvement of safeguards against fire damp and cooling of air underground

- dust abatement in stopes and headings

- noise abatement

Retention of present welfare benefits

59. The Federal Government will continue with existing welfare benefits, even though the changed circumstances will make the position of mine employees considerably easier and redundancies, if any, are only likely to a limited extent in the next few years. If miners are to continue to have confidence in their work, it is important for them to know that the Federal Government will be retaining the benefits which affect them personally.

Contribution of mining Laender to coal aids

60. In its budget measures to help the coal sector, the Federal Government proceeds from the assumption that the mining Laender will continue to meet a one-third share themselves. As in the past, the measures are aimed at stabilising the mining companies both economically and socially, even when they are also directed towards greater security of energy supplies; they therefore also serve the specific regional interests of the mining Laender.

It is in any case expected that there will be little demand for coal aids, and this will ease the burden on the Laender budgets.

IV. Lignite (brown coal)

Long-term future of domestic lignite industry guaranteed by new workings in 'Hambacher Forst'

61. After hard coal and natural gas, lignite is the most important energy form present in the Federal Republic of Germany. Most of output (83 per cent) is used to generate electricity. In this field of use, lignite is also one of the cheapest energy forms.

Special depreciation rates to encourage opening up of new reserves

The Federal Government welcomes the fact that the companies concerned have decided to open up the 'Hambacher Forst' lignite deposit. The Tax Amendment Law 1973 introduced special depreciation allowances for investment in lignite mining, and this will help to facilitate this new project.

V. Nuclear power

Target: 50,000 MW by 1980

62. The present installed capacity of 2,300 MW means that nuclear power only provides 4 per cent of the electricity generated in this country. In its 1973 Energy Programme, the Federal Government regarded it as necessary to instal 18,000 MW by 1980 and 40,000 MW by 1985.

In view of the developments of the last few months, it will now be necessary to instal 20,000 MW by 1980 - equal to a share in electricity generation of 25 per cent - and 45,000 MW by 1985. An even more desirable figure would actually be 50,000 MW, which would mean that nuclear energy would be supplying 45 per cent of electricity generated. Other industrial countries such as France are similarly basing their plans for future power station capacity on a large element of nuclear power.

Preconditions

63. Attaining this target will call for major efforts on the part of all concerned. In particular, the following preconditions will have to be met; partial successes have already been achieved:

- In order to shorten the time required for planning and construction, standardised stations will have to be offered and built.

  At the Federal Government's suggestion, talks have already begun between constructors and operators on the standardisation of power stations. The Government expects that the first results will make themselves felt in the construction applications to be presented for approval in early 1975.

- Independent consulting organisations, manufacturers and operators, and administrative departments at Federal and Laender level should continue to take the necessary organisational and staffing measures which will allow a rapid and reliable implementation of approval and supervisory procedures.

  Organisational measures to streamline the approval procedures required by law have already been initiated, with full attention being paid to safety aspects.

- Regulations and guidelines in particular should be updated to keep pace with developments in safety techniques, taking account of the requirements imposed by the special demographic situation in the Federal Republic. Consideration should be given here to protection against

outside factors (aircraft crashes, earthquakes, explosions, sabotage etc.).

If national safety requirements for nuclear power plants are clarified, standardised and codified, the approval procedure will become more efficient and more transparent for the public as well as constructors and operators.

In addition to this, the Federal Government is encouraging the improvement of reactor safety through its reactor safety research programme, so that even an extensive use of nuclear power will continue to carry only a small risk to the population.

- Spent fuel processing, the safe transport of radioactive materials, the safe disposal of radioactive waste and of the radioactive parts of nuclear power stations which have been shut down must all be guaranteed. They are the object of intensive work by central government and industry.

- The authorities in the Laender responsible for public safety and order must, as the use of nuclear power expands, be so equipped that they can deal with unauthorised interference by outsiders in nuclear power plants and the transport of nuclear materials.

- Appropriate sites for nuclear installations must be allowed for in town and country planning on an anticiptory and long-term basis.

Efforts in this direction by central government, the Laender and the electricity industry have had the result that long-term site reservation plans are now being prepared in various Laender.

Furthermore, the Federal Government will be giving the public more information about the safety standards embodied in German nuclear power stations, which are internationally recognised as being high, about the effects on the environment and about the necessity in terms of energy policy of making use of nuclear power. These activities are intended to contribute to a better understanding for the use of nuclear energy and to help meet difficulties in approval procedures which are due to unjustified fears.

The target of 45,000 MW by 1985 is covered by electricity industry plans. Projects for the period up to 1980 are relatively far advanced. Construction work has already begun on 11,000 MW of new capacity. Nevertheless, in view of the large amount of building to be completed in a fairly short time and the other problems mentioned, one cannot rule out all doubts as to whether certain units will come on stream at the planned time. The Federal Government will do all it can to see that the targets are met. It calls on the Laender, industry and all concerned to lend their support. If the projected scale of nuclear capacity is not attained, it would be bound to have serious consequences for the energy supply.

The safety of the population has priority

64. Even in the changed energy situation, the Federal Government has not altered its view that the protection of the population against potentially harmful effects from the use of nuclear power has absolute priority. Appropriate regulations under the law on atomic energy and radiation protection can guarantee such a high degree of safety (see Report of the Federal Minister of the Interior to the Bundestag Home Affairs Committee on 12.9.1974) that the construction of new nuclear power stations to meet energy policy requirements is justifiable. Given the advanced state of science and technology in the field of reactor safety and protection against radiation, the Government takes the view that nuclear power has an essential contribution to make to the quality of life, even if one takes into account the uncertainties which may remain regarding the consequences of making large-scale use of nuclear energy over the longer term. The Federal Government will continue in the future to allow only the construction and operation of those nuclear installations which present no danger to the population according to the results of scientific research and relevant experience at home and abroad.

Advanced reactor types

65. The development of advanced reactor types is concentrating on the one side on high temperature reactors, which because of their high thermodynamic efficiency help render the cooling and waste heat problem less acute. It is also expected that within about a decade this type of reactor will be contributing to the better

exploitation of domestic energy resources by generating process heat for use in the gasification of coal and possibly in other chemical and metallurgical processes.

A prototype plant with a capacity of 300 MW (THTR-300) is being built near Schmehausen and is already at an advanced stage of construction.

Another line which reactor development is concentrating on is the fast breeder, which in the long term could considerably increase security of energy supply and perform a regulatory function on the uranium market.

However, fast breeders are not likely to come into service commercially until sometime in the nineties of this century. A prototype plant based on a sodium-cooled fast breeder reactor (SNR-300) is currently being constructed at Kalkar with the participation of Belgium and the Netherlands.

The high costs and economic risks involved in developing these advanced types of reactor make it increasingly necessary to look in the future for opportunities for international cooperation and division of labour.

Uranium supplies

66. In order to encourage adequate supplies of natural uranium and to guarantee stable prices and a wide diversification of supply sources, the Federal Government provides German uranium companies with grants to help in prospecting. It also engages in risk-sharing in connection with the purchase of uranium deposits.

Supplies of enriched uranium for German nuclear power stations are secured up to the end of this decade and to some extent beyond that date. The main source is the American Atomic Energy Commission. Alongside this, the enrichment installations of URENCO, the German-British-Dutch centrifuge company, will grow in importance. Enrichment contracts of relatively small volume have also been signed with the USSR and the French firm EURODIF. As a further guarantee of supplies, the Federal Government has agreed with the United States that it will buy 200 million D-Mark's worth of enriched uranium under the foreign exchange offset agreement between the two countries.

Disposal of waste from nuclear power stations

67. The installations needed to close the fuel cycle, especially a re-processing plant for the fuel elements at present in use, are to be in existence in the Federal Republic by 1985 at the latest on the basis of a joint European scheme.

The final disposal of highly radioactive waste is to take place in deep-lying natural salt structures once the present trials have been successfully completed.

The Federal Government is supporting the necessary research and development; it is proceeding on the assumption that the costs of the eventual disposal of waste will be borne by operators on the "polluter pays" principle.

F. Energy Conservation

New awareness of energy

68. Energy has become expensive and is no longer available in unlimited quantity. It is necessary for consumers to adopt a new attitude towards the use of energy.

A slower growth of energy consumption as a result of the more rational use of energy reduces indirectly the vulnerability of our economy to dislocations of supply. Moreover, in a highly industrialized and densely populated country the conservation of energy offers the important advantage of reduced environmental pollution.

Substantial impulses for the conservation of energy emanate from the movement of prices. As a result of the recent vigorous price increases, industry as well as private consumers have become much more cost-conscious. The Federal Government expects that the increased energy prices will lead to a considerable intensification of efforts towards a more rational use of energy, especially by industry. These effects alone will, however, not be sufficient. Therefore the Federal Government will resort to supplementary measures.

Losses must be avoided

69. The scope for saving energy is relatively large. In energy production and its transfer to the consumer a 20 per cent loss of energy occurs. The loss at the consumer level is estimated to come to over 50 per cent. At the present level of technology however, only part of these losses can be avoided. The

losses occur inter alia through insufficient heat insulation of buildings, insufficient heat regulation and poor servicing of heating installations as well as through the omission to re-use waste heat.

Appeal to consumers' attitudes

The rational use of energy is decisively determined by the individual consumer in industry and in households and his attitude to this subject. The levelling off of the increase in energy consumption in recent months is not least to be explained by the increased awareness of energy problems on the part of the consumers. The Federal Government calls upon all energy consumers in their own best interest to use the scope for more rational consumption of energy. The greater the sense of responsibility with which consumers act, the smaller will be the number of measures decreed by the Government. The Federal Government welcomes and supports corresponding activities of the business and science communities.

Consumer information campaign under preparation

70. At the beginning of the next winter the Federal Government will organise a campaign to inform consumers about the possibilities of using energy more rationally in the home, in transportation and at work. This education is to be continued regularly and selectively.

Such a campaign will be particularly successful if it is supported by the mass media as a topical subject of our times.

Measures to be taken by the Federal Government

71. The Federal Government will support the changeover to a more rational use of energy through selective measures. It has initiated the following measures in particular:

- Since space heating has the largest share in energy consumption (about 40 per cent) and energy losses are especially high in this area mainly because of insufficient heat insulation of buildings, the priority aim must be the improvement of thermal insulation of buildings. For the building measures of the Federal Government a considerable improvement of heat insulation was already introduced by decree in January 1974; it was suggested to the Länder governments and the other regional authorities that they proceed accordingly. Further measures to reduce the consumption of energy in public buildings are presently being prepared by a joint Federal/Länder Committee.

  The Federal Government will introduce a law which will create in particular the legal bases for the mandatory introduction of better heat insulation in new buildings.

  It is furthermore being studied how the demand for increased thermal insulation can be taken into account in already existing buildings.

Recycling

- The Federal Government has commissioned the preparation of an expert opinion on a waste recycling programme. Under this programme the possibilities of how far the recycling of energy-intensive raw materials could be used for energy conservation are being studied inter alia.

The Federal Government attaches particular importance to the increased use of district heating, especially in connexion with long-distance heating plant systems, since this would result in a substantial conservation of energy and moreover reduce on a major scale the pollution of the environment. Furthermore, extended district heating would later on provide the opportunity of obtaining energy from nuclear power plants.

Research promotion in the field of energy conservation

72. Starting points for a more rational use of energy in the future are expected to be the outcome of an exact analysis of the flow of energy and energy consumption. Under the "Framework Programme on Energy Research 1974 - 1977" the Federal Government is supporting therefore inter alia the following research projects:

- Analysis of the energy flow in the Federal Republic of Germany and of the consumption of energy by households and industry, with reference also to tax measures (the relevant data are expected to be available at the end of 1975).
- Studies of energy requirements and supply, availability of energy, energy economics, environmental pollution and adaptability of the existing supply structure.
- Preparation of "heat maps" in collaboration between industry and scientific research institutions as planning documents for heat distribution systems and the use of district heating, for instance.

- Comprehensive studies on "technologies for the conservation of energy", with a view to establishing a survey of the various possibilities of a more rational use of energy.

Demonstration projects combining heat and power

With the assistance of planning and demonstration projects supported by the Federal Government, further possibilities of application and limits to the combination of heat and power production between large and small heating plants are to be demonstrated.

The Federal Government is also supporting the development of technologies which will lead to the conservation of energy in various sectors of consumption.

G. Investment Problems encountered by the German Energy Industry

Strongly increasing volume of investment

73. The accelerated extension of secure energy resources as well as the necessary transformation, transport and processing capacities require an increasingly larger volume of investment. In constant prices the total investment requirements of the German energy industry is estimated to acquire a dimension of approximately DM 250 billion up to 1985. This would be roughly DM 21 billion on average each year. By comparison, the investment volume in 1973 amounted to approximately DM 15 billion. This calculation is based on an extrapolation of the development already visible in concrete terms at the present time.

No special capital market terms

74. The Federal Government has studied the implications for the capital market of the additional financing requirements of the energy industry. It has come to the conclusion that from today's point of view it should be possible to cope with this burden. It does not see any necessity for creating special capital market terms and conditions for the financing of investment by the energy industry. It will however, carefully observe the further development of the capital market. In adopting this view the Federal Government is also taking into consideration the fact that other areas of the German economy facing structural changes are confronted with similar financing problems without getting any special governmental assistance to cope with them.

Investment problem: construction of nuclear power plants

75. In the electric power industry, too, it has so far been possible to finance the necessary investment without major difficulty. This continues to apply to the financing of traditional investments in the conventional type of power stations and transmission lines. However, a problem may perhaps arise for those electric power distribution companies which are to build nuclear power stations. The costs per unit of installed capacity in nuclear power stations are about 70 to 80 per cent above those of conventional power stations. Moreover, the pure building time is about twice as long as that required for conventional power stations of the same order of magnitude. The financing requirements for nuclear power stations can be met within the framework of internally generated funds above all by depreciation of the stock of power plants now in service. Until larger sums become available after the entry into service of nuclear plants, a considerable gap will arise between the growth of investments and the possible depreciation allowances. The balance will have to be met by additional equity resources or borrowed capital. Therefore the Federal Government is at present studying the financing problems that may arise in connexion with the building of nuclear power stations during the transitional period until the beginning of the eighties. Thereafter the nuclear power station capacities established in the mean time will again have led to a parallel development in depreciation and investments. The information available

so far is not sufficient in the opinion of the Federal Government to justify concrete measures for the provision of financial relief.

Utilization of the guarantee ceiling

76. When the ceiling on the various types of federal guarantees was increased, due allowance was made for the energy projects to be financed. Energy projects that are in the general interest of the German economy will also in the future be included by the Federal Government in its guarantee ceiling, in as much as this is necessary for the financing of those projects and the projects are eligible according to both the principles governing guarantees and the legal provisions in force.

H. Energy Supply and the Protection of the Environment

Energy and Environmental protection remain equally important aims also in the future

77. Energy and environmental policies must not be contradictory in character.

Both serve the purpose of making provision for future and improving present living conditions in our country. Measures designed to protect the environment will in particular guard the population against dangers and adverse effects to its health and wellbeing emanating from harm to its natural surroundings as a result of the utilization of the various forms of energy (e.g. oil, coal, nuclear energy, etc.). On the other hand, measures to secure adequate supplies of energy are not only in the interests of economic stability, but serve at the same time to ward off dangers that would arise to the individual and to our society from an inadequate supply of elementary services such as heat, light and power.

In its Energy Programme of September 1973 the Federal Government explained that secure and adequate energy supplies and the protection of the environment are goals of equal importance in its policy. It is not always easy to make these two goals compatible. In order to reach optimum solutions to clashes of priorities, it is often necessary to weigh the position carefully and - in individual cases - to arrive at a frequently difficult trade-off between all relevant aspects of environmental and energy policies.

These principles have not changed; the development that has made itself felt in the

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energy sector since then does not constitute any reason for redefining the relationship between energy policy and environmental policy. On the one hand total energy consumption-with its potential effects on the environment - will according to estimates continue to rise, although at lower annual rates; on the other hand growing economic efficiency and modern technologies make it possible to make better use of domestic energy resources without the necessity of paying for the thus increased security in energy supply by making deductions from the environmental goals adopted by the Federal Government.

78. Energy and environmental policies must be made compatible if programmatic statements on energy policy are to be translated into concrete measures that ensure the protection of the environment; conversely, this also holds true for environmental measures when they become relevant in terms of energy supply. It does not serve any practical purpose merely to give a general outline of the relationship between energy and environmental policy. On the other hand it will be necessary to prepare practical criteria in accordance with the legal provisions in force as a decision-making aid in individual cases concerning the implementation of the energy and environmental programmes. The public authorities, industry and the affected public have the right to be given provisions which contain clear-cut and unambiguous criteria, e.g. safety criteria, tolerance limits, technical standards, standardization provisions, deadlines or rules of conduct in individual cases.

Federal Law on Immissions

On the basis of the Federal Law on Immissions, which entered into force on April 1, 1974, the Federal Government has adopted or is preparing:

Clean Air Regulation - The Technical Regulation on Clean Air, dated August 28, 1974, which sets new limits on the concentration of harmful substances in the air and on emissions of pollutants by polluting plants as well as processes, installations and operational methods to contain and reduce the emission of pollutants;

Limit on the sulphur dioxide content in light fuel oil - The Third Ordinance to Implement the Federal Law on Immissions, which is to limit the permissible sulphur content in light fuel oil and diesel fuel to 0.3 per cent in terms of weight on a step-by-step basis up to January 1, 1979, and to reduce drastically the considerable proportion of sulphur dioxide pollution caused especially by households and small commercial consumers;

Limit on the sulphur dioxide content in heavy fuel oil - Another Regulation concerning the implementation of the Federal Law on Immissions designed to limit also on a step-by-step basis and permanently the permissible sulphur content in heavy fuel oil, which is widely used by industry and in electric power production.

These measures will help to ensure that in 1980 the concentration of pollutants in the air will be already much lower than in 1970. These measures have been carefully harmonized with the goals of the Energy Programme and the objective possibilities of the energy

industry. In the field covered by the Clean Air Regulation, for instance, this means that large polluting installations may only be erected on sites which are unobjectionable from a biological and medical point of view. The sites selected for new hard coal fired power plants are compatible with the above requirements.

Clean water

79. The bases for all measures designed to keep water clean will be decisively reinforced by the Fourth Law to Amend the Law on Water Management and the Law on Waste Water Disposal Charges. Both draft bills, which are currently being debated by Parliament, will also become operative in the energy industry. Standards pertaining to the water economy have implications especially for the coking and mining industries where there is a need to improve water purification. Refineries and power stations on the other hand hardly emit suspended and settling substances into water any longer. The increasing use of water for cooling in thermal power plants leads to a further burden on the environment, in particular on account of waste heat. Further studies will be necessary to ascertain how far this effect is compensated for by the partial purification of used water and its enrichment with oxygen. Here, too, the Federal Government will carefully see to it that environmental and energy supply interests are brought into harmony, as may be seen from the treatment of waste heat and water pumped from mines under the intended legislation.

Early site reservation

80. As announced in the Energy Programme of September 1973, the Federal Government has initiated measures that are aimed at the reservation of suitable sites or the extension of energy supply capacities in accordance with requirements.

The studies pertaining to the early selection of industrial sites are focused on the target years 1985 and 1990. Decisive are preferences in terms of energy supply and regional industries, desired settlement patterns within the framework of urban development and country planning and the probable development of the pollution of the environment. Planning pertaining to industrial locations required until 1980 has basically been concluded, including environmental protection aspects. Whether the corresponding projects can be implemented on schedule will, however, depend on how speedily the licencing procedures can be implemented. The studies are also to be based on estimates of energy consumption broken down by regions.

J. Energy Research

Selective promotion of research

81. The events of the past year have made clear the urgend need for new technologies in energy supply and fundamental innovation in energy technology. Therefore the programmes for energy research and technology in almost all industrialized countries have been substantially increased and expanded.

Basing itself on the preparatory work done in 1973, the Federal Government adopted the "Framework Programme - Energy Research (1974 - 1977)" before the energy crisis ended. It creates the prerequisites for the selective promotion of research including the non-nuclear field as a supplement to the current Fourth Nuclear Programme. Under both programmes official support funds of about DM 1.75 billion per year will be made available. They serve the implementation of the Federal Government's Energy Programme and will be continually revised with regard to their economic effectiveness. They will be updated in good time, with consideration being given to energy policy needs.

Framework Programme for Energy Research

82. Under the "Framework Programme for Energy Research" the Federal Government is promoting - in coordination with the Governments of the coal mining Länder of the Federal Republic with respect to coal research - the following fields especially:

- Coal refinement

Coal gasification

The measures for promoting the refinement of coal take up the better part of the Framework Programme for Energy Research. In this area the substitution of natural gas by gasification and methanization of coal (SNG) and the substitution of petroleum products as chemical feedstocks by corresponding coal products play the main role. With regard to the gasification of coal, various processes are being examined which still need to be tested and improved in order to guarantee the economic efficiency and low-pollution character of both the production processes and the final products. By re-treatment of lower-grade coal it will be possible to produce high-grade coke with a low sulphur content and thus to broaden further the raw material supply base of the Federal Republic of Germany. Since a not insignificant share in German coal production consists of such coal, these processes are of major significance. By further developing

Liquefaction of coal

the Fischer-Tropsch synthesis it will be possible to extract valuable raw materials for the chemical industry not only from coal, but also from by-products of coal refining processes.

In view of its large lignite and hard coal deposits, the Federal Republic of Germany attaches great importance to these coal refining processes. Therefore the Federal Government is supporting the development of several processes for both coal types alike.

- Mining technology and treatment

  In this context the Federal Government is in particular promoting activities for the provisional exploration of deposits and the further development of fully mechanized and automated advance work, extraction and treatment systems with a view to increasing further the efficiency of domestic coal mining - comparatively difficult because of the prevailing mining conditions - and to improving the working conditions in mining.

- Energy transformation, transport and storage

  The Federal Government promotes in this field especially research and development work to study the potential of energy resources - so far unutilized -, particularly solar energy, with a view to using it in decentralized heat supply systems. In order to transport electric power into the conurbations via routes that are as narrow as possible, the development of sub-surface high-capacity transport systems as well as very high voltage technologies are being promoted inter alia. For a rational adjustment of energy supply to the requirements that fluctuate in the course of time and for the utilization of energy resources alternatively available, such as solar energy, the projects for the development of efficient energy storage facilities are of equal importance.

83. The Federal Government will study whether it will be possible to increase investment grants for research and development investments in terms of the tax system as an appropriate instrument in the energy sector, in order to strengthen the equity capital raising capacity which industry is expected to have. The further development of technologies for rational energy production and transportation of electric power, research and development projects in the field of energy conservation and the further development of technologies in the gas sector could be regarded as eligible for increased promotion.

Future points of emphasis in research

84. In the past, energy research has primarily been focussed on nuclear energy. This has led to a stage at which, in the field of electric power generation, we have at our disposal today a new energy source which can no longer be left out of the planning of energy supply in all industrialized countries. The research and development projects necessary for the further development of this technology and the exploitation of its large potential under the Fourth Nuclear Programme - especially advanced reactor systems and the nuclear fuel cycle - continue to be the main areas of research today. Under the Nuclear Programme they will be supplemented through the promotion of research into controlled nuclear fusion which could help to open up a new large energy potential in the more distant future.

It will be necessary for energy research in the future to take greater account of the fact that by far the better part of energy will be required in the form of heat. At present approximately 40 per cent of primary energy is used for space heating and almost another 40 per cent as industrial process heat. In order to avoid transformation losses, such energy should - as directly as possible - be made available in the form of heat. It will moreover be necessary to use new expansionary energy sources on an increased scale to meet these requirements also. This would, for instance, be conceivable in the industrial sector through the development of nuclear process heat and in the field of space heating through district heating systems, for example.

By using the waste heat emitted by power stations, a more rational use of primary energy could be ensured on the basis of such systems as well as a reduction of the thermal pollution of the environment. There will moreover, be activities for the development of new gaseous secondary forms of energy, e.g. hydrogen or hydrocarbons in closed cycles, in order to meet the requirements of a flexible, economic and low-polluting energy supply structure in the future.

Table 1

Trends in Primary Energy Consumption and Net Imports
1961 – 1973

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1961 - 65	1966 - 70
							– in million t.c.e. * –							av. annual change in %	
Hard Coal	123.4	125.2	126.9	121.8	114.4	102.2	96.6	98.0	101.7	96.8	90.3	83.7	84.2	– 2.3	– 3.3
Lignite	29.3	30.6	32.4	32.9	30.0	28.2	27.3	28.7	29.9	30.6	29.3	31.0	31.0	+ 0.5	+ 0.4
Mineral Oil	53.7	66.7	80.7	93.4	108.0	121.9	127.2	142.4	160.4	178.9	185.7	196.4	209.0	+ 19.5	+ 10.6
Natural Gas	1.0	1.3	1.7	2.5	3.5	4.2	5.7	9.3	13.1	18.3	24.0	30.6	38.6	+ 31.2	+ 39.2
Hydroelectric Power	4.8	4.5	4.3	4.2	5.2	5.6	5.4	5.4	4.5	5.7	4.2	4.1	4.7	+ 1.2	+ 1.9
Nuclear Power	.	.	.	.	.	0.1	0.4	0.6	1.7	2.1	2.0	3.1	4.0	.	.
Electric Power (net)	1.7	1.2	1.0	0.4	1.6	2.7	2.5	2.4	2.1	2.7	2.2	4.0	3.4	– 1.2	+ 11.0
Other forms	1.8	1.8	1.9	1.9	1.9	1.8	1.7	1.7	1.6	1.7	1.7	1,7	1.6	– 1.0	– 2.2
Primary energy consumption total	215.7	231.3	248.9	257.1	264.6	266.7	266.8	288.5	315.0	336.8	339.4	354.4	378.6	+ 4.6	+ 4.9
							– percentage share –								
Hard Coal	57.2	54.1	51.0	47.4	43.2	38.3	36.2	34.0	32.3	28.8	26.6	23.6	22.2		
Lignite	13.6	13.2	13.0	12.8	11.4	10.6	10.2	9.9	9.5	9.1	8.6	8.7	8.7		
Mineral Oil	24.9	28.8	32.4	36.3	40.8	45.7	47.7	49.4	50.9	53.1	54.7	55.4	55.2		
Natural Gas	0.5	0.6	0.7	1.0	1.3	1.6	2.1	3.2	4.2	5.4	7.1	8.6	10.2		
Hydroelectric Power	2.2	2.0	1.7	1.6	2.0	2.1	2.0	1.9	1.4	1.7	1.2	1.2	1.3		
Nuclear Power	.	.	.	.	.	.	0.2	0.2	0.5	0.6	0.6	0.9	1.1		
Electric Power (net)	0.8	0.5	0.4	0.2	0.6	1.0	0.9	0.8	0.7	0.8	0.7	1.1	0.9		
Other forms	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.4		
Primary energy consumption total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		
Net imports															
a) million t.c.e.	32.1	45.5	60.9	75.3	92.0	104.6	109.4	122.6	142.0	168.5	179.8	194.7	214.1		
b) percentage of primary energy consumption	14.9	19.7	24.5	29.3	34.8	39.2	41.0	42.5	45.1	50.0	53.0	55.0	56.6		

* t.c.e. = tons of (hard) coal equivalent

How Mineral Oil Demand was Met

Table 2

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Refinery Capacity at year's end in million tons	42.5	46.4	62.4	72.4	80.9	88.7	109.3	113.1	115.1	120.3	126.5	133.2	145.6
Refinery Capacity (annual average) in million tons	41.5	44.5	54.5	67.4	76.6	84.8	99.0	111.2	114.1	117.7	123.4	129.8	139.4
Refinery Output (incl. in-plant consumption and losses) in million tons	35.4	39.7	47.0	57.8	66.2	75.0	79.4	90.5	96.8	105.5	106.4	109.8	116.2
Capacity Utilisation (in % of annual) average capacity)	85.3	89.2	86.2	85.8	86.4	88.4	80.2	81.4	84.8	89.6	86.2	84.6	83.4
Domestic production (excl. in-plant consumption and losses) in million tons	32.8	36.9	43.4	53.4	60.9	69.6	73.5	83.5	89.1	96.9	97.9	100.9	106.8
Total Demand (incl. military, bunkering, exports and changes in stocks, excl. in-plant consumption and losses) in million tons	41.6	50.2	60.9	69.1	77.9	88.2	92.9	104.1	114.7	128.7	132.6	140.1	150.8
Imports of Mineral Oil Products in million tons (incl. purchases in intra-German trade)	8.8	13.3	17.5	15.7	17.0	18.6	19.4	20.6	25.6	31.8	34.7	39.2	43.3
Imports of Mineral Oil Products in % total demand	21.2	26.5	28.7	22.7	21.8	21.1	20.9	19.8	22.3	24.7	26.2	28.0	28.7

Sources of Imported Crude Oil

Table 3

	Total Imports	Middle East	among others from					Africa	among others from			Venezuela	Soviet Union
			Saudi Arabia	Irag	Kuwait	Iran	Abu Dhabi, Dubai/Oman		Algeria	Libya	Nigeria		
	– in 1,000 tons –												
1961	29 657	22 175	3 761	4 378	2 271	10 000	–	1 722	1 598	44	80	2 941	1 622
1962	33 260	22 958	2 662	5 214	2 573	11 203	–	4 145	2 500	876	769	3 913	1 822
1963	40 438	23 526	4 451	5 348	2 733	9 709	–	10 139	2 604	6 595	908	4 278	2 195
1964	51 740	25 516	7 578	5 409	2 752	7 384	1 453	19 086	2 973	14 662	1 451	4 045	3 030
1965	59 068	24 875	8 104	5 189	2 570	6 117	2 878	28 121	2 554	23 131	2 405	3 487	2 585
1966	67 687	26 283	9 073	3 959	2 035	7 275	3 842	34 473	4 568	26 330	3 052	3 646	3 285
1967	72 032	30 034	11 754	1 568	3 499	6 435	5 306	33 895	6 708	22 559	3 250	3 714	4 064
1968	84 091	32 418	13 438	2 743	2 685	6 535	5 735	44 714	7 108	36 336	150	2 949	3 954
1969	89 551	29 699	11 993	2 340	2 986	5 866	6 128	52 429	8 485	40 483	1 800	3 883	3 493
1970	98 786	33 830	12 058	3 478	3 953	8 269	5 764	58 118	7 984	40 922	6 945	3 402	3 437
1971	100 230	40 943	16 845	4 168	4 299	8 517	5 861	53 053	11 327	29 940	9 511	2 838	3 318
1972	102 600	43 033	18 998	1 896	4 344	9 808	6 472	52 511	11 430	28 482	10 890	3 727	2 845
1973	110 493	54 455	25 283	1 613	4 286	14 122	7 892	50 774	13 557	25 649	10 249	2 163	2 735
	– in % of total imports –												
1961	100	74, 8	12, 7	14, 8	7, 7	33, 7	–	5, 8	5, 4	0, 1	0, 3	9, 9	5, 5
1962	100	69, 0	8, 0	15, 7	7, 7	33, 7	–	12, 5	7, 5	2, 6	2, 3	11, 8	5, 5
1963	100	58, 2	11, 0	13, 2	6, 8	24, 0	–	25, 1	6, 4	16, 3	2, 2	10, 6	5, 4
1964	100	49, 3	14, 6	10, 5	5, 3	14, 3	2, 8	36, 9	5, 7	28, 3	2, 8	7, 8	5, 9
1965	100	42, 1	13, 7	8, 8	4, 4	10, 4	4, 9	47, 6	4, 3	39, 2	4, 1	5, 9	4, 4
1966	100	38, 8	13, 4	5, 8	3, 0	10, 7	5, 7	50, 9	6, 7	38, 9	4, 5	5, 4	4, 9
1967	100	41, 7	16, 3	2, 2	4, 9	8, 9	7, 4	47, 1	9, 3	31, 3	4, 5	5, 2	5, 6
1968	100	38, 6	16, 0	3, 3	3, 2	7, 8	6, 8	53, 2	8, 5	43, 2	0, 2	3, 5	4, 7
1969	100	33, 2	13, 4	2, 6	3, 3	6, 6	6, 8	58, 5	9, 5	45, 2	2, 0	4, 3	3, 9
1970	100	34, 2	12, 2	3, 5	4, 0	8, 4	5, 8	58, 8	8, 1	41, 4	7, 0	3, 4	3, 5
1971	100	40, 8	16, 8	4, 2	4, 3	8, 5	5, 8	52, 9	11, 3	29, 9	9, 5	2, 8	3, 3
1972	100	41, 9	18, 5	1, 8	4, 2	9, 6	6, 3	51, 2	11, 1	27, 8	10, 6	3, 6	2, 8
1973	100	49, 3	22, 9	1, 5	3, 9	12, 8	7, 1	46, 0	12, 3	23, 2	9, 3	2, 0	2, 5

Sources of Imports of Mineral Oil Products

Table 4

	1970		1971		1972		1973	
	1 000 / t	%	1 000 / t	%	1 000 / t	%	1 000 / t	%
France	2 765	8.9	2 957	8.7	3 195	8.4	3 225	7.7
Belgium / Lux.	2 512	8.1	3 169	9.3	2 589	6.8	2 286	5.5
Netherlands	14 471	46.6	16 988	50.0	18 797	49.7	22 353	53.5
Italy	4 098	13.2	3 834	11.3	3 102	8.2	3 622	8.7
Great Britain	954	3.1	1 250	3.7	1 877	5.0	1 349	3.2
Denmark	80	0.33	57	0.2	66	0.2	150	0.3
(EEC)	(24 880)	(80.2)	(28 255)	(83.2)	(29 626)	(78.3)	(32 985)	(78.9)
other Countries	916	2.9	981	2.9	1 474	3.9	1 706	4.1
(Western Europe)	(25 796)	(83.1)	(29 236)	(86.1)	(31 100)	(82.2)	(34 691)	(83.0)
East Bloc	3 407	11.0	3 515	10.3	4 241	11.2	3 887	9.3
Africa	27	0.1	100	0.3	137	0.4	379	0.9
America	1 224	3.9	844	2.5	2 145	5.6	2 428	5.8
Middle East	569	1.8	263	0.8	222	0.6	399	1.0
Far East	18	0.06	14	0.04	3	–	5	–
Total	31 041	100.0	33 972	100.0	37 848	100.0	41 789	100.0
Purchases from GDR	804		769		1 283		1 482	

Figures relating to hard coal mining

Table 5

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Hard coal output million tons	142.7	141.1	142.1	142.2	135.1	126.0	112.0	112.0	111.6	111.3	110.8	102.5	97.3
Total workforce (year-end) in 1 000	465	434	412	399	377	334	287	264	254	253	244	221	205
Output (per man/shift) underground in kg	2 207	2 372	2 521	2 614	2 705	2 926	3 264	3 526	3 665	3 755	3 828	4 015	4 068
Pithead stocks (hard coal and hard coal coke together) in million tons at year-end	11.7	9,6	3.8	7.8	15.4	20.4	17.8	9.5	2.6	1.2	9.5	16.2	14.9
Sales of hard coal, patent fuel and hard coal coke in million tons (total)	117	120	126	116	106	98	97	103	105	112	100	94	98
thereof:													
Exports to EEC and third countries	28	29	30	26	24	25	26	30	28	26	23	22	24