

EUROPEAN PARLIAMENT

# Working Documents

1977 - 1978

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17 March 1978

DOCUMENT 577/77

## Report

drawn up on behalf of the Committee on Energy and Research

on the prospects for and requirements of a Community oil supply and processing policy

Rapporteur: Mr T. NORMANTON



By letter of 24 January 1977 the Committee on Energy and Research requested authorization to draw up a report on the prospects for and requirements of a Community oil supply and processing policy.

Authorization was given by the President of the European Parliament in his letter of 2 February 1977. The Committee on Economic and Monetary Affairs and the Committee on the Environment, Public Health and Consumer Protection were asked for their opinions.

On 17 February 1977 the Committee on Energy and Research appointed Mr Normanton rapporteur.

It considered the draft report at its meetings of 28 March 1977, 26 April 1977, 19 October 1977, 2 November 1977, 22 November 1977 and 1 March 1978 and unanimously adopted the motion for a resolution and the explanatory statement with one abstention on 1 March 1978.

Present: Mrs Walz, chairman; Mr Flämig, vice-chairman; Mr Normanton, vice-chairman and rapporteur; Mr Veronesi, vice-chairman; Lord Bessborough, Mr Brown, Mr Edwards, Mr Ellis, Mr Fuchs, Mr Houdet, Mr Jensen, Mr Noè, Mr Osborn, Mr Verhaegen and Mr Zywietz.

The opinion of the Committee on Economic and Monetary Affairs is attached. The Committee on the Environment, Public Health and Consumer Protection decided not to present an opinion.

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A

The Committee on Energy and Research hereby submits to the European Parliament the following motion for a resolution, together with explanatory statement:

MOTION FOR A RESOLUTION

on the prospects for and requirements of a Community oil supply and processing policy

The European Parliament

- having regard to the report from the Committee on Energy and Research and the opinion of the Committee on Economic and Monetary Affairs (Doc. 577/77),
  - having regard to the communication from the Commission of the European Communities to the Council on a Community approach to the refining problems of the Community (Com. (77) 71 final),
1. Calls on the Commission to intensify its efforts to achieve
    - a common market in the field of oil and petroleum products, without distortion of competition;
    - transparency in the market for oil and petroleum products;
    - a common policy on the importation of oil and refined products;
  2. Believes that overcapacity in the European refining industry is a structural problem which can best be solved through cooperation between the industry and the Community, which would have a role to play in creating the most favourable administrative, fiscal and social environment so that the industry could adapt itself to the requirements of the market;
  3. Feels that a solution to the problem could be found if the industry, in cooperation with the competent Community authorities and representatives of those employed in the industry, were to
    - withdraw less efficient refining plants from service, in accordance with market requirements, without neglecting the social problems that could result therefrom;
    - adapt refining structure to market needs by reducing the proportion of heavy petroleum products produced in the Community while increasing output of lighter products;

- restrict the construction of new refineries in the Community over the next ten years, exceptions being made for an appropriate number of conversion plants for the production of gasoline and other lighter products;
4. Urges the Council and Commission of the European Communities to give further consideration to imports of refined products in the future, and, in particular, to
- draw up indicative medium-term forecasts of imports;
  - collect more detailed and complete information and statistics on prices of petroleum products;
  - develop the consultation system within the Community;
  - organise consultations, should the need arise, with the third countries concerned, on the problems relating to trade in refined products;
  - continue a dialogue with petroleum producers, including perhaps the Organisation of Petroleum Exporting Countries.
  - ensure that measures taken in the refining sector in no way endanger the security of Europe's energy supplies for which the OECD/IEA has a role to play.
5. Recognises the need for a strong institution covering all sectors of the refining industry which would represent the views of the industry, after consultation with the relevant trade unions, to the Commission;
6. Instructs its President to forward this resolution, and the report of its Committee, to the Council and Commission of the European Communities.

EXPLANATORY STATEMENTI Introduction

1. Before the Second World War oil was quantitatively of much less importance for the economies of Western Europe than in the period after 1945. In 1938 oil accounted for only 8% of the total consumption of primary energy in Western Europe, while coal accounted for some 90%. Up to 1939 and in the years immediately following the Second World War the oil industry built refineries near the sources of crude oil, and exported refined products to Europe, demand in Europe at that time was scarcely sufficient to permit the economies of scale that were technically possible in the refining of oil, and so it was more convenient to transport oil products than crude. The exception to this general pattern was France, which imported most of its oil as crude, to be refined in France, much of it by the state-controlled Compagnie Française de Raffinage. In the late 1940s, in order to reduce the foreign exchange cost of oil, other European governments encouraged the oil companies to build refineries in Europe, often offering financial inducements. At the same time the economic structure of the oil industry and of oil consumption was changing in the immediate post-war years, and economically it became advantageous for the oil companies to refine their oil in Europe. By 1950 large oil refineries were in operation at Marseille in France, Fawley in the United Kingdom and Pernis in the Netherlands. The changing pattern is clearly illustrated by Annex XII.

2. The growth of the oil refining industry in Europe was extraordinarily rapid after the Second World War; in 1948 the throughput of crude oil in refineries in OEEC countries was 19.5 million tonnes, by 1955 it amounted to 103 million tonnes. At first oil refineries were built at points on the European coastline where oil could be imported conveniently. Subsequently it became more usual to build refineries near highly industrialised regions, these refineries being supplied by pipelines from the coast. Nevertheless most refineries are still to be found near suitable ports.

A more recent factor affecting refinery location has been the attempts by some Member State governments to bring industry to economically less advantaged regions by either constructing or favouring the construction of oil refineries in the hope that other industries would be created around new refining complexes in development regions.

3. By far the greatest proportion of crude oil for European refineries has to be imported from third countries. In 1975 the Community's biggest supplier of crude oil was Saudi Arabia, with 129.5 million tonnes exported to the Community, followed by Iran (87.6m tonnes), Iraq (43.4m tonnes). The most important oil suppliers apart from Middle Eastern countries are Nigeria (34.9 m tonnes in 1975), Libya (34.2 m tonnes) and Algeria (22.8 m

tonnes). From the American continent Venezuela exported 7.8 m tonnes of crude oil to the Community, while 10.1 m tonnes were imported from Eastern Europe, principally from the Soviet Union, (see Annex III). As can be seen from the above figures and from the tables in Annex III, the Middle East/Persian Gulf occupies a pre-eminent position as far as oil exports to Europe are concerned. This reflects the balance of production, as the Middle East produced some 19.7 m barrels per day of oil in 1975, while Africa produced 5.1 million and the Caribbean and South America 3.6 m barrels per day. North America produced 12.5 million barrels per day in 1975, almost all of which was for internal consumption. The pattern has changed considerably over the preceding 25 years. In 1950 the Middle Eastern region produced only 1.8 m barrels/day and African production was negligible, while the Caribbean/South America with 1.8 m barrels/day produced as much oil as the Middle East, and North America produced 6.2 m barrels/day. At the same time, so that a realistic comparison can be made, it should be noted that, in the world, excluding the USSR, Eastern Europe and China, the 10 million barrels of oil per day produced in 1950 had increased to some 44 million barrels of oil per day in 1975. Corresponding changes naturally had taken place in the capacity, as well as in the geographical location of oil refineries.

## II. Basic refining techniques

4. The processing of crude oil can be divided into the basic distillation process and a variety of other processing stages known as conversion. Conversion processes include reforming, catalytic cracking, hydrocracking and alkylation which, together with the distillation process, are described in detail in Annex XIV.

5. The distillation process separates the crude oil into various distillates, the lightest being gas and naphtha, followed by heavier products such as kerosene, light and heavy gas oil and finally a heavy distillation residue that can be used as a mixing agent in heavy fuel oil or directly as an asphalt product.

6. The conversion units can be used to further refine the distillates for two purposes: firstly, to produce raw materials such as aromatics for the chemical industry; secondly, and particularly important from the point of view of general use of capacity, to convert distillates for which there is not enough demand (such as heavy fuel oil) into products in greater demand (such as petrol). In recent years therefore there has been a general drop in utilization of capacity at European refineries and an increased utilization and often some expansion of conversion capacity.



### III. Structure of the Refining Industry in the Community.

7. Total theoretical refining capacity<sup>1</sup> in the Community was about 855 million tons at 1 January 1976. Italy with 221 million tons has the largest share of this capacity. Then comes France with 169 million tons, the Federal Republic of Germany with 154 million tons, the United Kingdom with 147 million tons, the Netherlands with 102 million tons and Belgium with 49 million tons. Denmark and Ireland with 11 and 3 million tons respectively account for a very small proportion of the Community's refining capacity. Luxembourg is the only Member State with no refining industry at all (see Annex XVI). It should be noted that refining rights are granted by concessions in Italy and France.

8. By far the majority of the European refineries are owned by multinational companies; most of them are American but some are British or Dutch. In Denmark and Ireland all refineries are owned by multinationals. In Belgium, the Federal Republic of Germany, the United Kingdom and the Netherlands, multinational companies with headquarters elsewhere account for between 2/3 and 3/4 of the total capacity whereas multinational companies with headquarters in those countries and independent national companies account for the remainder. There are no state-controlled companies in the refining industry in any of these countries but there is in individual cases capital participation by the state.

9. The situation is somewhat different in France and Italy: in France half of the existing capacity is owned by multinational companies with headquarters elsewhere and the other half by state-controlled national companies. In Italy one state-owned company accounts for about 18% of capacity, multinationals with headquarters outside Italy about 29% and the remainder is owned by other companies.

### IV. The present situation with regard to supplies of crude oil and petroleum products

10. As can be seen from Annex VI, (Sources of crude oil supply 1973-1975), the Middle East region, particularly Saudi Arabia, followed by Iran, is Europe's most important source of crude oil, other important suppliers being Nigeria in West Africa, Libya and Algeria in North Africa, and Venezuela. In 1975 Saudi Arabia was the most important supplier of Belgium, France, Germany Italy and the United Kingdom, while Iran supplied most of the crude oil for Denmark and the Netherlands. Kuwait was Ireland's main supplier.

<sup>1</sup> When a refining plant is designed it has a 'theoretical' or 'design' capacity. When it goes into operation the owner finds out just what it will do by test runs. The 'strategic' capacity thus discovered may turn out to be 95 to 120% of 'theoretical' or 'design' capacity. Most owners never reveal this figure. At a later date a plant may be 'debottlenecked' to increase capacity, without ever releasing this figure. In addition, all plants have to be shut down at intervals for 4 to 6 weeks; in addition breakdowns, fires, etc. can occur. Therefore 'effective' capacity in the Community is probably 90% of 'strategic' capacity

11. As far as petroleum products are concerned, the situation is quite different. The biggest supplier of petroleum products is the USSR while, in 1975, Saudi Arabia processed only 1% and Iran 1.8% of the petroleum products imported into the Community. For fuller details of imports of petroleum products, broken down by source, see Annex VII (Petroleum Products - Imports into the Community). It should also be noted that, while imports of crude oil amounted to 477.2 million tonnes in 1975, imports of petroleum products came to only 39.3 million tonnes in that year. This is evidence of the importance of the Community's oil refining and processing industry, and of the growth in refining away from sources of oil production that has taken place since the Second World War (see Annex XII).

V. Possible future developments in the demand for crude oil and petroleum products

12. A vital element in any assessment of refining policy must be the development of demand for crude oil and petroleum products, considered together with pressure from oil producing countries to process crude near the sources of production. Annex IX (Energy Production, Consumption and Imports for the EEC in 1974, 1980 and 1985) gives estimates, as prepared by the OECD, of oil production, consumption and imports for 1980 and 1985, and assumes a modest increase in consumption from 10.6 m barrels/day in 1974 to 11.0 m barrels/day in 1980 and 13.2 m barrels/day in 1985. Such estimates can be taken as no more than approximations. As well as this, consideration must be given to the break-down of demand by products - gasolines, petro-chemical feedstocks, jet fuels and kerosenes, gasoils (diesel oil and domestic heating oils), heavy fuel oils, etc.

13. As far as overall supplies are concerned the position is even more uncertain. This would be affected by, for example, the availability and cost of oil supplies, the structure of demand as modified by conservation measures, the success, or lack of success, in the development of alternative sources of energy and the general prosperity of the Community economy in the future. The OECD, in its 'World Energy Outlook' has estimated that, by 1985, total OPEC oil production could be around 39.3 million barrels/day, while EEC oil production (mainly North Sea) would amount to some 3.3 million barrels/day. Estimates of exports of crude oil and petroleum products from Eastern Europe and China are much more hypothetical. While it is generally held that China will not become a major exporter of energy, the Soviet Union, which already supplies about a third of the Community's present imports of petroleum products, could affect the supply situation.

14. Within the next ten years it is almost certain that Community refiners will be affected by the large number of export refineries planned in oil producing countries, particularly in the Middle East and North Africa. At present, capacity in those two regions is about 160 m tonnes/year. For the future, estimates of from 260 to 373 m tonnes/year, and possibly up to 7,096,500 barrels per day - (See Annex XIX) have been put forward by oil producing states; current estimates, though more moderate, are still considerable. Up to now, imports of oil products by the Community have not been sufficient in volume to cause serious problems for Community refineries. Although the domestic requirements of producer countries are growing and imports by the USA and Japan may rise, nevertheless it seems likely that increasing quantities of product exports will be directed towards the Community market. Thus the Community's oil industry will have to cope with intense competition from producer countries. The Community has traditionally been a net exporter of petroleum products. This situation has changed somewhat, and in 1976 the Community became a net importer by some 6 million tonnes, or around 1% of its internal requirements.

15. This trend could reasonably continue in the future, and the Community must be aware of its dependence on imports of crude oil from the Middle East and North Africa, while the producer countries, before investing heavily in refineries, will no doubt study the real possibilities offered by the Community market.

#### VI. The long distance transport by sea of crude oil

16. By far the greater part of crude oil is at present transported by sea and control of large sectors of the tanker fleet thus automatically entails control of supplies for the oil-importing countries.

17. At the end of 1976 the tanker and combination-carrier fleet throughout the world comprised 4,092 ships of 10,000 tons dead-weight or over. The oil companies owned 24% of the fleet (calculated in tons deadweight) and independent owners 67%. The rest were state-owned.

18. In 1975 and 1976 these ships sailed under the following flags:

Tankers and combination carriers - Breakdown by flag

Million tons deadweight	1976	%	1975	%
Liberia	116.9	31	103.4	30
Japan	38.4	10	37.7	11
Norway	36.8	10	33.2	10
United Kingdom	36.2	10	38.2	11
Greece	19.7	5	18.3	6
France	15.9	4	14.2	4
United States	11.9	3	11.0	3
Italy	11.7	3	10.7	3
Panama	11.7	3	10.8	3
USSR	5.9	2	5.2	2
Other countries	68.8	19	58.1	17
Total world	373.9	100	340.8	100

19. This breakdown does not at present give rise to major concern on the part of the Member States about their dependence on politically unstable areas for transport. It is, however, important to realise the danger of becoming dependent on such areas for transport and, if necessary, to take measures to prevent it.

20. This situation varies according to whether it is the oil-producing countries or other third countries that provide the transport: the provision by the oil-producing countries of additional transport to carry their own products will scarcely reduce security of supplies since consumer countries are already wholly dependent on them. On the other hand it could be dangerous to become too dependent on those countries for transport in the context of competition in the field of transport prices.

21. Any major dependence for transport on politically unstable third countries other than oil-exporting countries would lead to further uncertainty about the Community's oil supplies and would, therefore, be quite unacceptable from the security angle.

#### VII. Present refinery capacity and utilization in the Community

22. As can be seen from Annex II (Refinery Capacity and its geographical distribution in the European Communities 1975) and Annex V (Oil refineries - capacity, throughput and utilization 1974-76) Italy, with 220.7 m tonnes in 1976, has the highest refinery capacity in the Community, followed by France, Germany and the United Kingdom. In 1976, however, Italy did not have the greatest volume throughput, France handling 118.2 m tonnes (capacity 169.5 m tonnes) as opposed to Italy's 104.0 m tonnes throughput. Capacity utilisation in 1976 varied from 73% for Denmark, 71% for Ireland and 70% for France, to 47% for Italy. Capacity utilisation for other Member States was as follows: Belgium and Germany (Federal Republic) 67%, United Kingdom 66%, the Netherlands 62%. For the Community as a whole the average rate of capacity utilisation for 1976 was 62%. Thus while the situation is unsatisfactory throughout the Community, it is most critical in Italy where less than half the total available capacity was used. It should, however, be noted that, for the Community as a whole, the 1976 utilisation figures showed a slight improvement on the figures for 1975, when only 59% of capacity was used.

23. In 1976 total consumption of refined petroleum products in the Community was 468 million tons<sup>1</sup>. This is a considerable drop from 1973, when 555 million tons were consumed<sup>2</sup>. The pattern of consumption also changed: the consumption of motor spirit increased from 13% of the total in 1973 to 16% in 1976, in absolute figures the change being from 72m tonnes to 75m tonnes. For naphtha however, which is used on a large scale as a raw material in the petro-chemical industry, there was a considerable drop in absolute figures from 41 million tons in 1973 to 28 million tons in 1976, the percentage drop in total consumption being from 7.4 to 5.98. Consumption of middle distillates, chiefly kerosene and light gas oil, also dropped in absolute figures but increased slightly as a percentage of total consumption. Finally, there was a sharp drop in the consumption of residual fuel oil, from 201 million tons in 1973 to 145 million tons in 1976. Consumption of 'other products' such as lubricating oils, lubricating grease and bitumen also dropped sharply from 45 million tons in 1973 to 25 million tons in 1976.

<sup>1</sup> Source: Eurostat

<sup>2</sup> Source: Commission of the European Communities

24. The following table shows the consumption of refinery products in tons and as a percentage of total consumption in the Community in 1973 and 1975. Annex IV shows graphically how overall consumption was divided between individual Member States in 1976.

Breakdown of consumption in the Community (million tons and %)

	1973	%	1975	%
Petrol	72	13.0	72	15.2
Naphtha	41	7.4	31	6.4
Total petrol	113	20.4	103	21.6
Middle distillates	196	35.3	174	36.8
Residual fuel oil	201	36.2	163	34.4
Other products	45	8.1	33	7.2
Total refinery products	555	100.0	473	100.0

25. The main reason for this trend in consumption is the general economic recession and oil price increases which led to attempts to limit the consumption of petroleum products by means of energy-saving measures and by switching to substitutes such as coal. This trend has also been encouraged in several countries by legislation aimed at a general reduction in energy consumption and a shift away from oil-based forms of energy. Many Member States for instance have encouraged the use of coal rather than residual fuel oil in power plants and this is presumably one of the main reasons for the sharp drop in consumption of the latter product.

VIII. Present consumption and Possible future demand for refined products in the Community

26. It has been estimated that, by 1980, the total theoretical refinery capacity requirement for the European Economic Community would amount to some 695 m tonnes. Such a figure, however, is only an estimate, and must be subject to such variables as the development of the European and world economies, the success of energy-conservation measures, internal product demand, advances in research into alternative sources of energy and developments in such fields as heating, power production and transport. Nevertheless estimates must be made if refinery capacity is to be planned for the future. However, the other major variable, pressure from producing countries to refine at source, is even more difficult to assess. This problem has already been mentioned, and some figures given, in paragraph No. 14.

27. How the economy will develop in the coming years is one of the major unknowns when attempting to estimate future demand for refinery products. Most estimates therefore presuppose a certain economic growth while treating with reserve the validity of this supposition.
28. Even if the presumed economic growth on which estimated demand for refined products is based proves correct, it is far from sure that demand will develop as expected. Admittedly, developments in total energy consumption based on a specific economic growth rate can be foreseen with some certainty, but the pattern of consumption, especially of refinery products, depends on a variety of other factors whose development is today subject to considerable uncertainty.
29. The main factor of uncertainty regarding the future pattern of energy consumption, including consumption of refinery products, is the use of nuclear power. Recent discussions on the future role of this form of energy has created considerable planning difficulties for those branches of trade and industry in the Community directly or indirectly involved with energy production. The uncertainty about nuclear power also affects the uncertainty about the use of coal and natural gas, which may be expected to play a more important role if Member States reduce their nuclear power programmes.
30. Mention should also be made of the unreliability of crude oil supplies and prices, which greatly affect the demand for refinery products.
31. Other important factors are Community and national legislation. Energy saving provisions can severely limit demand for motor fuel and energy for domestic heating or industrial purposes, as can any change in the taxation of energy or in the official price of energy (gas and electricity).
32. New environmental provisions (lead content of petrol, sulphur content of fuel oil) can also affect demand for refinery products, not just by affecting the price of the product but also by changing its product structure to some extent.
33. Lastly, there are the difficulties in forecasting the effect of technological developments on the volume and type of energy and raw materials consumed. Admittedly, we are already familiar with the basic technology that could influence energy production and consumption in the next 10 to 15 years, but there is great uncertainty about the extent to which the different branches of technology will in fact be applied. An example of the difficulty of foreseeing the development of familiar techniques is the diesel engine which, after being used for decades solely in heavy transport vehicles, is now expected to be used to a much greater extent in an improved form in private cars in

the 80s. If this theory proves correct it could lead to major changes in the relationship between the production structure of refineries and the structure of demand.

34. These factors of uncertainty make it very difficult to form any precise estimates of demand for refinery products for more than three or four years in the future. Estimates for from five to ten years in the future must be treated with great reserve, having regard to possible deviations from the general development trend on which they are based. If longer-term estimates are to have any value as a basis for decisions, they must be confined to the upper and lower limits of possible developments and the situations in which they might occur.

35. Since longer-term estimates are acknowledged to be very unreliable, an attempt has merely been made to forecast the demand trends for refinery products up to 1985. The following estimate of demand for refined petroleum products in the period 1975-85 has been drawn up by the Commission of the European Communities on the basis of information available in 1976. Your rapporteur has not been in a position to confirm these forecasts.

Expected trend in demand for refined petroleum products in the  
Community in the period 1975 - 85  
(million tons)  
(Domestic consumption + reserves)

	1975	%	1980	%	1985	%	75/85 percentage increase
Petrol	72	15.2	84	15.2	93	15.5	+ 30
Naphtha	31	6.4	53	9.6	67	11.2	+ 117
Total petrol	103	21.6	137	24.8	160	26.7	+ 57
Middle distillates	174	36.8	195	35.3	206	34.3	+ 18
Residual fuel oil	163	34.4	185	33.4	193	32.2	+ 18
Other products	33	7.2	36	6.5	40	6.8	+ 17
Total refined products	473	100.0	553	100.0	599	100.0	+ 27



36. The forecast is based on the expectation that the gross national product of the Member States will increase by an average of 4.3% in the period 1976-1980 and by 4.2% in the period 1981-1985. For the individual Member States the expected increase in the gross national product is as follows:

	B	F	D	DK	I	IRL	L	NL	UK
1976-80	4.2%	5.7%	4.0%	3.8%	4.0%	4.8%	3.0%	4.2%	3.0%
1981-85	3.3%	5.2%	4.0%	3.8%	4.5%	5.5%	3.0%	3.5%	3.0%

37. It is assumed that petrol consumption will increase by 30% since there is not expected to be any appreciable increase in the number of diesel-powered cars. For the same reasons it is assumed that consumption of middle distillates (including diesel fuel) will increase by only 18%. These two figures obviously depend on the accuracy of the assumed increase in the number of diesel-powered cars. Consumption of naphtha, an important raw material in the petro-chemical industry, is expected to increase by 117% (using 1975 as base year). It should be noted that, in 1976, naphtha consumption amounted to only 28,182,000 tonnes. It is assumed that very little new petrochemical processing capacity will be created by 1985 since much of the present petrochemical capacity is already unused. However, a figure of 7% growth in demand per annum has been suggested also. The position is thus uncertain. If major new processing capacity is created, the estimated naphtha demand will probably prove wrong, since new plants will as a rule be equipped to use gas oil and fluid natural gas derivatives as raw material.

38. As regards residual fuel oil, the increase in consumption in the period 1975-85 is estimated at 17%. In view of the efforts currently being made by the Community and several Member States to reduce consumption of residual fuel oil in favour of coal, the estimate is scarcely too low. It is more likely that incentives to use coal instead of fuel oil in the future will result in the consumption of residual fuel oil remaining stable or even falling.

#### IX. The situation with regard to refining in areas other than the European Economic Community

39. It is necessary, at this stage, to consider world refining capacity. In Western Europe outside the Community, theoretical capacity in 1975 stood at some 181 million tonnes, while refining capacity requirements came to about 144 m tonnes, giving some 37 m tonnes surplus capacity. At the same time Japan's capacity came to some 267 m tonnes and requirements to 264 m tonnes, a reasonable balance. The same was true for Canada,