

WHAT FUTURE FOR BRITISH  
COAL POLICY?

Colin Robinson

and

Eileen Marshall

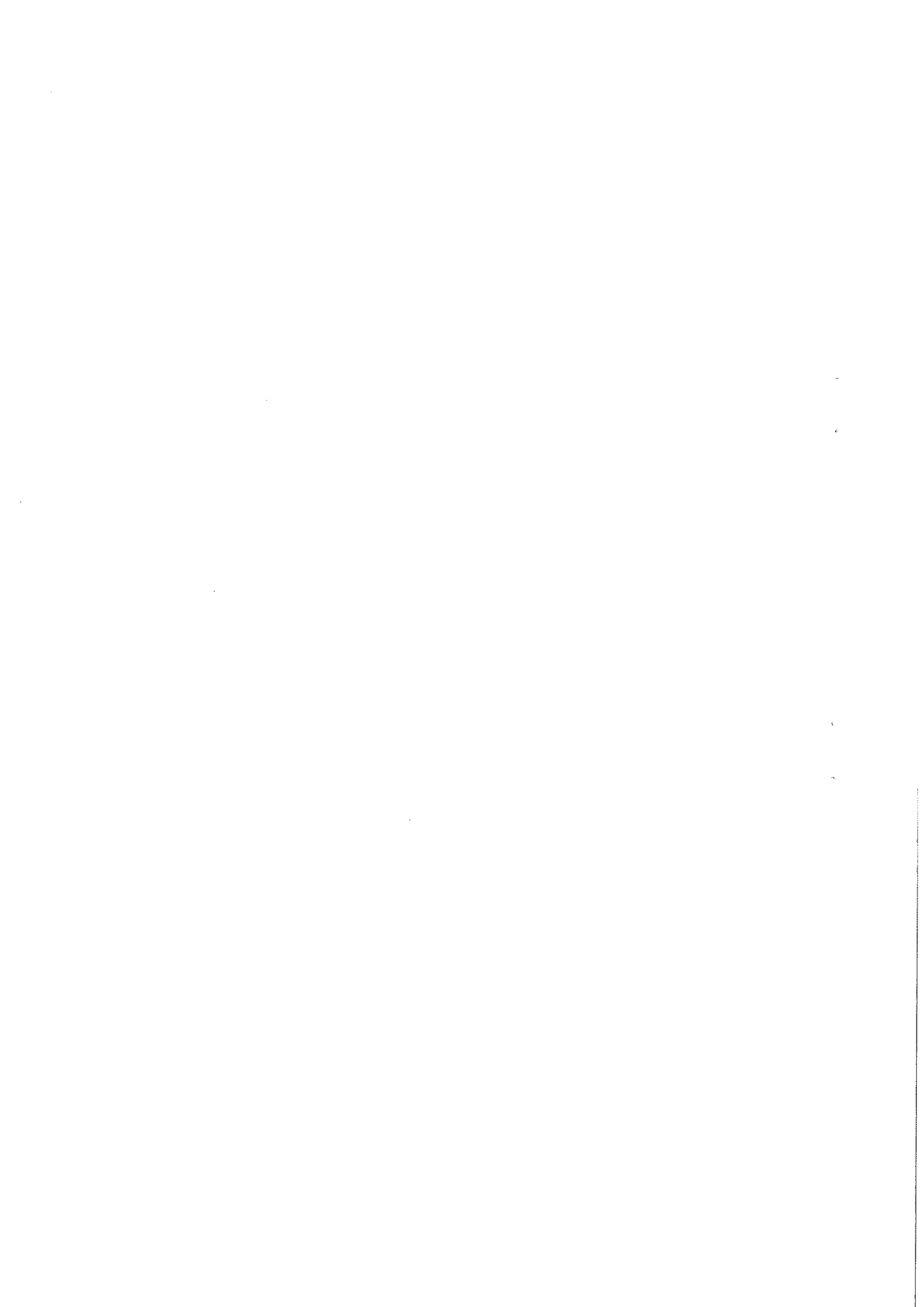
University of Surrey

May 1983

SURREY ENERGY ECONOMICS CENTRE

DISCUSSION PAPER

NO. 14.



WHAT FUTURE FOR BRITISH  
COAL POLICY?

Colin Robinson  
and  
Eileen Marshall

University of Surrey

May 1983

SURREY ENERGY ECONOMICS CENTRE

DISCUSSION PAPER

NO. 14.

## 1. Introduction

About two years ago we produced an assessment of the prospects for the British coal industry<sup>1</sup>. In contrast to the views then popular we argued that, assuming unchanged government policy, home demand for British coal would be likely to decline in the 1980s and 1990s, possibly falling from over 120 million tonnes in 1980 to well below 100 million tonnes a year by the end of the century. We suggested that the National Coal Board's plans to raise production to 170 million tonnes a year by the end of the century<sup>2</sup> were "based on out-of-date assumptions which make them look extraordinarily optimistic" and that the Department of Energy's somewhat lower coal forecasts<sup>3</sup> also rested on "unrealistic assumptions ... which give them a significant upward bias". In particular, we challenged the underlying assumptions made by both the Board and the Department that there would be substantial growth in British manufacturing industry and that coal prices would remain very low relative to oil prices. We suggested also that protecting British coal from imports was unlikely to promote security of supply and we proposed that consumers should be free to import coal.

At that time our views were regarded by many as excessively pessimistic and unduly critical of government support for coal. In an unusual display of unanimity, the NCB and the NUM issued a joint statement which said our work showed "..... a total absence of any strategy which recognises the over-riding importance of diminishing the dependence of the Western economies on imported energy". However, subsequent events in the coal industry suggest

that there was little substance in the NCB's vision of an expanding market for coal. Although the considerable decline in coal consumption in the last two years can be attributed partly to general recession, both the Department of Energy<sup>4</sup> and the NCB<sup>5</sup> have implicitly acknowledged that their previous long term coal forecasts were much too high by reducing those estimates considerably. Towards the end of 1982 the Coal Board gave the Commons Select Committee on Energy a UK coal demand range for the year 2000 of 113-142 million tonnes, compared with its previous figure in "Coal for the Future" of 135-200 million tonnes. The Department of Energy's Sizewell evidence gives a demand range of 100 to 140 million tonnes in 2000 compared with its earlier figure (in Energy Projections 1979) of 128-165 million tonnes. Perhaps with even greater realism, the present NCB chairman is reported to have said British coal production could be down to 100 million tonnes a year by 1990<sup>6</sup>.

In this paper we attempt to bring up to date the analysis and conclusions of our 1981 paper, although the main lines of argument of that paper still stand. We begin with some discussion of recent history since we believe there are important lessons to be learned from studying the experience of the last few years.

## 2. The recent history of coal

### 2.1 Output and markets

Figure 1 is intended to put the recent history of coal into perspective by illustrating the trend of output since the beginning of the century. It traces the long decline of the British coal industry from its peak in 1913, when production was

about 292 million tonnes to 1982 when about 120 million tonnes was produced; as the figure shows there have been occasional periods of temporary revival (as in the late 1940s and early 1950s) superimposed on the downward trend. The period of steepest decline was from 1957 to the mid 1970s when oil and later natural gas were substituting for coal. Output then stabilised during the period of rapidly rising oil prices from 1973 onwards but began to fall again after 1980.

Table 1 illustrates in more detail some of the salient features of the coal industry since the time of nationalisation. Up to the mid 1950s production and consumption rose, but in the twenty five years from 1957 onwards deep-mined output and home consumption were both approximately halved; opencast production remained about constant. By 1982 employment was less than 30 per cent of what it had been in 1957 and productivity (output per man year) was about 67 per cent higher.

Coal's falling share of the fuel market is illustrated in Table 2. The lower half of the table shows that coal's share halved from 1960 to 1973 and fell slightly thereafter. The top half of the table shows that only about a third of Britain's fuel production is now coal, compared with almost 100 per cent in 1960. Oil and gas (mainly from the North Sea) today account for over 60 per cent of the country's fuel output. Britain is once again a net exporter of fuel, as in the inter war period, but the bulk of the net exports are now oil rather than coal; in 1982 fuel production exceeded fuel consumption by about 14 per cent.

The dependence of coal on the power generation market is indicated in Table 3. Other markets which coal used to serve have now been switched wholly or partly to other fuels so that in 1982 over 70 per cent of coal consumption was in power stations.

A closer look at experience since 1970 (Table 4) shows how drastically markets for coal outside power generation have declined in the last twelve years. Even the electricity generation market for coal has been falling since 1980. Particularly disappointing for the NCB must be its poor performance in the industrial market where it had hoped for a big expansion (see 3 below). Sales to industry, however, have dropped to about 7 million tonnes a year, or little more than a third of what they were in 1970. Even though coal prices have fallen relative to oil prices (Table 6 below) and the government has in recent years provided 25 per cent grants (now supplemented by EEC "soft loans") to encourage conversion from other fuels to coal, there has been little sign of a rush to convert.

## 2.2 Productivity, costs and prices

In "Plan for Coal", formulated in 1973 and published in June 1974, the Coal Board assumed an increase in output per man shift of at least 4 per cent per annum up to 1985. A considerable rise in productivity had occurred in the 1960s (Table 1) but in the 1970s that rise was halted so that the Board's target was far from being achieved. Table 5 shows considerable fluctuations in output

per man shift around a slight downward movement from 1973 to 1979. Only in the last three years has there been some increase in productivity as compared with the early 1970s. After taking into account the change in definition mentioned in the footnote in Table 5, it appears that the rate of increase of output per man shift from 1973 (the base year of Plan for Coal) to 1982 has been less than  $\frac{1}{2}$  per cent per annum.

In a period of rising wages and other costs, the slow growth of productivity has inevitably resulted in large increases in coal prices. Table 6 illustrates the movement of industrial coal prices and compares them with heavy fuel oil prices (both expressed in pence per therm) over the last fifteen years. In most of the period 1967 to 1973 the price of industrial coal was within 90 and 110 per cent of the price of fuel oil. The huge oil price increases of 1973, however, brought the relative price of industrial coal down suddenly to only about half the fuel oil price. Since 1974 coal prices have risen substantially faster than oil prices but coal still apparently retains a good deal of the competitive advantage it gained in 1973-74. Coal prices are about  $5\frac{1}{2}$  times what they were in 1973, whereas fuel oil prices have been multiplied 9 times.

Looking at the last ten years as a whole, there is evidence that periods of sharp increases in oil prices (such as 1973-74 and 1978-81) are followed by subsequent periods (1974-77 and 1979-82) when coal prices also rise considerably. Such a link between oil



prices and coal prices is hardly surprising. The monopolistic position of the British coal industry and the strong bargaining power of the NUM allows workers and managers in coal mining to capture much of the "rent" which becomes available as prices of competitive fuels increase. In the last two years the link has been strengthened by the government's policy of restricting coal imports, thus enhancing the monopoly already granted by the State to British coal.

### 2.3 Recent History summarised

Conditions in the 1970s and early 1980s in many ways should have provided a favourable environment for the British coal industry. World coal consumption revived after the oil price increases from 1973 onwards (Table 7), international trade in steam coal began to grow and coal's share of world energy rose a little after many years of decline. There can be little doubt that long run prospects are good for low-cost coal producers, such as Australia, the United States and South Africa. But the British coal industry, which in its present condition is a comparatively high cost producer by world standards, has not participated in the revival of coal. Its share of the UK fuel market has fallen slightly since 1973 and home consumption has dropped from 133 to 111 million tonnes over the same period. Production has been prevented from falling as fast as home consumption only because there has in the last few years been an increase in coal exports at prices below full costs and because coal stocks have been allowed to rise sharply - from about 28 million tonnes at the end

of 1979 to over 53 million tonnes (nearly six months home consumption) at the end of March 1983. Inevitably the NCB's financial position has deteriorated - it made a loss before grants of £475 million in 1982/83 - and the amount of government support it receives has again become an issue. We discuss government support and future directions of government policy after a brief consideration of prospects for the industry.

### 3. Prospects for British coal

The outlook for British coal was examined in some detail in our 1981 paper. In brief, we then concluded that in the absence of a change in government policy coal sales might be expected to fall to 75-110 million tonnes by the year 2000. Our market-by-market estimates are given in Table 8 and compared with the then current NCB and Energy Department forecasts. The biggest absolute differences are in the power generation and industry markets where our estimates are of the order of half the NCB's figures.

As explained in the Introduction, both the Board and the Department have recently reduced their forecasts: the lower ends of their ranges now fall within the ranges in our 1981 paper. No details appear to be available of the NCB's latest estimates by markets but the Department of Energy's Sizewell evidence gives projections of coal consumption by market. The main features of the new Energy Department estimates for the year 2000 as compared with the 1979 projections appear to be:-

- the huge increase in coal sales to industry suggested in Energy Projections 1979 (which we described as right at the optimistic extreme of what can be expected) has been very drastically reduced. Instead of 39-45 million tonnes (Table 8) the new range is about 8-21 million tonnes. Our range was 15-25 million tonnes.
- the previous estimate of coal consumption for substitute natural gas manufacture of up to 15 million tonnes has been reduced to zero. Our figure was a token 2-3 million tonnes.
- the range of coal sales to power generation has been increased from 66-78 million tonnes to 64-98 million tonnes (compared with our 40-60 million tonnes). The upper end of the new range assumes electricity demand growth of over 3 per cent per year in the 1990s and a significantly faster rise in oil prices than in coal prices.

Of course, no one can estimate with any precision what coal demand will be in the latter part of this century. However, in our view, the Energy Department's latest coal demand projection of 100-140 million tonnes in 2000 is still on the high side, mainly because we believe, in contrast to nearly all the cases considered in the Department's Sizewell evidence, that with unchanged policy there is a fairly high probability that coal prices will rise faster than oil prices in the 1980s and 1990s. In such circumstances we would expect coal demand to be no higher than the bottom part of the Department's range and in the important power generation

market we would be surprised if coal demand exceeded 60 million tonnes in the year 2000. It is quite likely that the Energy Department will, in future, reduce its coal demand forecasts still further. However, it seems to us a useful step forward that the NCB and the Department of Energy are no longer producing estimates which imply a considerable expansion of British coal in the next twenty five years. In the past it has not always been made clear whether such estimates represented genuine attempts at forecasting or whether they were merely expression of hope. Whatever they were, it is unfortunate that their constant reiteration resulted in severely disappointed expectations in the workforce (which in turn may have contributed to industrial unrest) as employees found themselves in an industry where there was such an obvious contrast between grandiose expansion plans for the long term future and the state of decline or at best stability in which the industry always seems to be.

#### 4. Recent government policy towards coal

Despite the coal industry's long term history of decline, it is still a large employer (with just over 200,000 miners) and it provides work in some areas with otherwise relatively poor employment prospects such as Scotland, Wales and the North East. Coal mining is by many people's standards an unpleasant and hazardous occupation but with a well-organised workforce which has a sense of solidarity and a history of political and economic struggle. Although improving working conditions and increasing affluence have no doubt resulted in some change in attitudes, the

miners have in recent years still been perceived by governments as having considerable political power. Successive postwar governments have therefore adopted policies towards the coal industry which for many years have sheltered it from the competition of other sources of energy.

Throughout the period of declining coal output and employment from 1957 to the mid 1970s the NCB and the NUM campaigned for government protection. To an extent they succeeded. Fuel oil was taxed from 1961 onwards, the electricity supply industry was on occasions persuaded to give preference to coal over oil, coal imports were at times regulated and substantial government financial assistance was given to the NCB<sup>7</sup>. However, the industry did not manage to persuade governments to agree to the coal output target of 200 million tonnes a year which it was urging from the late 1950s to the late 1960s. Government views of likely future coal demand were much more modest: for instance, the 1967 Fuel Policy White Paper estimated UK coal consumption at 152 million tonnes in 1970 and 120 million tonnes in 1975.

The oil price rises in the early 1970s apparently produced more sympathy for the industry from the government. The 1974 Plan for Coal, which aimed to expand output to 135 million tonnes in 1985, was endorsed by the government; it was followed by Coal for the Future in 1977 which set out the Plan 2000 target of 150 million tonnes from deep mines and 20 million tonnes from open-cast operations in 2000. According to the NCB deep-mined output would

fall to only 80 million tonnes in 2000 if there were no further major investment schemes. Thus the Board estimated that 70 million tonnes of annual deep-mined capacity must be brought into operation between 1985 and 2000 to offset the exhaustion of existing pits and to raise annual output to 150 million tonnes.

When it came to office in 1979, the present government seemed intent on dismantling part of the considerable edifice of protection which surrounded the coal industry. Under the Coal Industry Act of 1980, "deficit grants" (about £190 million in 1979-80) previously given to the Coal Board to cover its losses were to be eliminated by 1983-84 so that the Board would have to break even without such grants. "Social grants" (including payments to the miners' pension scheme) amounting to about £60 million in 1979-80 were to remain and there was a new provision to allow deferment of interest charges on some capital projects until they started to show a return. On balance, government support for the coal industry was to be significantly reduced under the terms of the Act.

However, by February 1981 the government had performed a remarkable about-turn. In that month the NCB let it be known to the mining unions that it would probably want to close between 20 and 50 pits in the next five years, claiming that its problems resulted from the recession and tight government financial constraints. After an outbreak of unofficial strikes and the

threat of a national strike, the government agreed in principle to give more aid to the industry whereupon some of the pit closure proposals and the strike threat were withdrawn. The main steps taken by the government, in addition to existing measures such as the £8 per tonne fuel oil tax and the relatively easy financial target set for the NCB were as follows. A strict limit was placed on coal imports by the CEGB and BSC, which had risen considerably in 1980; a £50 million grants scheme to encourage boiler conversion to coal from oil and gas was initiated; and, under the 1982 Coal Act, up to £1.75 billion of grants were to be provided to the NCB in the period up to 1983-84 - about three times the provision of £0.6 billion under the 1980 Act. Thus a government, initially committed to reducing coal protection, was evidently forced into increasing protection<sup>8</sup>.

At the time we described the policy change of February 1981 as "a prime example of surrender to a powerful producer group with little regard to the interests of society as a whole". We suggested that, despite all the protection, consumers might not turn to British coal because of "reservations about switching to a fuel in which there is a powerful domestic monopoly, with all that may imply in terms of higher prices and vulnerability of supplies".

5. Reluctance to convert to coal

Experience since the first oil "shock" of 1973-74 does suggest extreme reluctance on the part of British fuel consumers to convert to coal - much more than one would anticipate from the normal time lags which slow the process of adjustment in the energy market and from the environmental disadvantages of coal as compared with gas or oil. In the large integrated power generation system of the CEGB it is relatively easy to substitute one fuel for another by changing the "merit order"; if oil prices rise, coal-fired stations are used more intensively and oil-fired stations less intensively, with an opposing change if coal prices rise. Thus the CEGB could respond to the oil price increases of the 1970s by increasing its coal burn and reducing its oil burn, and it could react to threatened industrial action in the coal industry in 1982 by burning more oil. However, most consumers do not have such large multi fuel systems: to convert from an existing fuel to coal implies an investment decision which will only be taken if the expected total costs of the new equipment are less than the expected running (avoidable) costs of the existing equipment.

In contemplating such investments consumers are likely to be swayed by their views on three important factors:

- the initial capital cost of conversion (allowing for British government subsidy and EEC "soft" loans)



- the expected prices of coal and oil several years ahead
  
- the perceived security characteristics of coal and oil

Capital costs are in some cases likely to be very substantial despite government subsidies, for consumers who no longer have the transportation, storage and handling facilities for coal. The evident unwillingness to convert is probably also related to fears of rising prices and insecurity of supply. Consumers may have noticed the "catching-up" tendency in coal prices relative to oil prices in recent years (see 2.2 above); thus they can reasonably be sceptical whether coal prices will in the long run remain as depressed as they are now compared with oil prices, given the Coal Board's statutory monopoly recently fortified by de facto import restrictions. It is long run relative price expectations - not current relative prices - which influence the willingness to convert.

The other probable reason for slowness to convert is consumers' concern about the frequent threats of disruption to coal supplies which make a nonsense of the Coal Board's claim that, as a producer of indigenous fuel, it provides its customers with security of supply. For all the anxieties which are sometimes expressed about possible oil supply interruptions, the most serious actual disruption of Britain's fuel supplies within the memory of most consumers came not from oil but from coal during the miners' strike in the winter of 1973-74. Furthermore, perceptions of the relative security characteristics of oil and coal have probably changed in recent years as Britain has become a

substantial oil producer while threats of industrial action in the coal industry have become more frequent and coal imports have been limited. Potential consumers have, as it were, added a premium to the expected price of coal so as to allow for its evident relative insecurity as a source of fuel.

## 6. Policy in the future

We would conclude from the analysis above that the policy of protecting British coal from imported coal and from other fuels has been largely self-defeating in the last few years. If it continues, it will probably be no more successful in the future. For the reasons outlined in Section 5, consumers are unlikely to turn in numbers to a fuel which may entail substantial conversion costs, which they regard as prone to supply interruptions and whose relative price they expect to increase significantly in the future. More protection, which is inevitably seen as strengthening the British coal industry's monopoly power, confirms and enhances such expectations.

### 6.1 More competition in the British coal market

For such reasons, we have argued<sup>9</sup> that the focus of policy should change. Instead of trying to keep up coal output and consumption by sheltering the NCB from competition, the government should encourage competition, as it has done in other sectors of the economy, in an effort to hold down coal costs and prices. An immediate need is to remove the de facto restrictions on coal imports which prevent British consumers taking advantage of coal

supplied from areas (such as Australia, South Africa and the United States) with favoured geological conditions which therefore have a comparative advantage in coal production. Freedom to import from a variety of sources would not only keep down fuel prices; it should also improve security of supply compared with a situation in which the NCB is virtually the sole supplier of coal to British consumers.

The removal of import restrictions seems a particularly important policy change to make. It is quite probable that such restrictions will eventually have to be dropped anyway if we are correct in saying that, under a protectionist regime, coal prices in Britain will rise towards the level set by oil prices. In those circumstances British coal would most likely become appreciably more expensive than imported coal and consequent pressure from consumers would probably cause the restrictions to be lifted. Instead of waiting for a consumers' revolt, it would be advantageous for the Government to act now. Inland transport costs would probably prevent deep penetration of imports into the British market, but the presence of actual and potential competition from a significant margin of overseas-produced coal is capable of bringing significant benefits to consumers in terms of lower prices and improved security of supply.

However, a more fundamental re-think of coal policy, going beyond the removal of import controls, is now highly desirable. "Policy" in the past has been formed as a series of ad hoc and sometimes (as in 1981) instant responses to pressing short-term problems. Although this kind of policy formulation is common in many areas of government activity, it is not more commendable for that. For

the last decade, the development of a sensible policy towards the coal industry has been hindered by inflated demand forecasts from the NCB and the Energy Department which misled many people into the belief that the industry's expansion prospects were bright. Now that forecasts and plans are becoming more realistic, a corresponding policy change is needed.

As our 1981 paper explained, a continuation of old-style protection seems likely to lead to continuing decline even though increasingly expensive government support is provided. The best chance of avoiding decline is to take actions which aim to remedy the underlying causes and thereby hope to alter consumers' expectations so that they come to believe that secure supplies of coal will be available at competitive prices. Freedom to import coal is an essential precondition if such a change in expectations is to occur, but another essential measure seems to us to be a clear move towards increased efficiency by means of the concentration of output in the comparatively low-cost pits in the central areas\* (which also have a considerable transport cost

\* Unfortunately, insufficient detailed information on costs is at present available for an outside observer to be able to identify with any confidence which are the lowest-cost pits. However, publication of the Monopolies and Mergers Commission Report on the coal industry (which is apparently imminent) should remedy some of this information deficiency. According to the NCB (in evidence to the Commons Select Committee on Energy) 90% of its operating loss of about £250 million in 1981-82 was accounted for by 30 of its 190 pits.

advantage over imports). The industry would then be in a much stronger competitive position than it enjoys now and its output might well be higher than it would be if present policy continues.

The Coal Board has closed some uneconomic capacity in recent years but the rate of closure has been only about half the 3-4 million tonnes a year assumed in the Plan for Coal. Concentration of the industry might more readily and quickly be accomplished if there were some form of "privatisation". In various ways, the coal industry seems to us a good candidate for privatisation since it is not a "natural monopoly" (as, for example, are the local distribution networks of the gas and electricity industries) and a substantial part of the existing industry appears capable of competing with other fuels without protection.

The precise form of privatisation is a matter for debate but the aims would be to introduce capital market discipline to the industry, to provide private capital for expansion and possibly to bring more competition to the British fuel market by having several British coal suppliers rather than just one. If there were several companies supplying coal to the British market, consumers would have greater freedom of choice and there might be some less obvious benefits. There might, for instance, be some employment-creating effect if more decentralised pay bargaining resulted in greater wage differentials. Some pits now classed as "uneconomic" might become profitable if wages were more closely

related to productivity than under the existing NCB productivity scheme (useful though that scheme has been in widening differentials).

A degree of "privatisation" would help to free the industry from the politicisation and continual government interference with management decisions (for instance, the imposition of short time horizons) which are features of industries which are owned and/or heavily protected by the State and which frequently lead to confusion of objectives and poorly-motivated management. Privatisation would also lead to a clearer distinction between the commercial objective of managing the coal industry efficiently and wider aims which society might wish to pursue. As we explain below, more effective ways could be devised than those used at present to deal with social problems related to the coal industry.

#### 6.2 Problems resulting from a faster rate of closures

Concentration of the industry on the profitable core of pits, whether or not accompanied by privatisation, would make more apparent social and human problems which are now partly concealed because coal mining in the sub-marginal areas has become primarily a means of providing social insurance. Such problems may in any case be accentuated in the future by the spread of more automated methods which will reduce the labour-intensity of mining. There is a case for tempering the effects of declining employment in mining, as in other industries, but it seems to us

more logical for society as a whole to help people who become unemployed and communities which consequently suffer difficulties rather than for it to support the output of coal. In recent times redundancy payments for coal industry employees have been increased and the age limit for early retirement in the industry has been reduced to 50. Such measures seem sensible ways of dealing with the real income losses resulting from falling employment in mining. No doubt more funds will need to be provided for a time if there is to be a faster rate of closure of unprofitable pits, and it will be necessary to improve existing measures designed to remedy labour market imperfections (mobility and re-location allowances and retraining programmes). Such aid for people has in-built time limits (for instance as they are re-employed or reach normal retirement age) and it is a more explicit charge on the community than the less obvious cost of sustaining uneconomic output indefinitely. Moreover, aid for people does not have the disadvantage - which measures to subsidise, support and protect output tend to have - of strengthening the bargaining power of the industry's employees relative to the rest of the community.

In addition to assisting individuals, there may well be a case for providing direct aid to communities affected by the decline in mining employment. If the communities have social value, it seems to us they should be given aid which is not tied to the maintenance of coal mining as is the indirect aid they receive now via subsidisation of the Coal Board. Local communities in receipt of aid might well decide there were better ways of using the funds

than keeping their members in such a dangerous and insecure occupation as coal mining in unprofitable pits. Although in some circumstances, they might choose to keep open their pits (perhaps as co-operatives), in others they might feel that the encouragement of small-scale local enterprise would provide better prospects for the long term future.

In our view, if governments continue with present policy towards coal they will spend a great deal of money to little purpose. Security of supply is, if anything, reduced by protecting British coal and the production which is kept in being is high-cost and thus tends to increase fuel prices. Present policy helps to reduce some of the problems which individuals and local communities would suffer if there were free competition between British coal and other fuels. Nevertheless, we question whether the best way to remedy such problems is to subsidise a public corporation to produce more of its product than consumers wish to buy. It is not even clear to what extent employment in the country as a whole is promoted by existing policies. In the short run employment in coal mining is increased, but the consequent misallocation of resources most likely results in employment losses elsewhere. Furthermore, in the long run a more efficient coal industry might well help to preserve employment opportunities as compared with the results of maintaining policy unchanged.



### 6.3 Conclusions

We would conclude that the aim should be to identify and exploit the undoubted strengths of British coal by policies designed to increase efficiency. Such policies would include increasing competition by allowing imports, concentrating production in the low-cost areas, introducing private capital resources for expansion and the discipline of the private capital market to help safeguard the efficient use both of new and existing assets. Possibly also the structure of the industry should be changed so that there are several coal-supply companies to replace the NCB. Social problems arising from the closure of uneconomic pits or the substitution of capital equipment for labour are better dealt with by direct aid to individuals and communities than by insisting that high-cost production is kept in being.

3

REFERENCES

1. Colin Robinson and Eileen Marshall, What Future for British Coal? Hobart Paper 89, Institute of Economic Affairs, May 1981.
2. Department of Energy, Coal for the Future, 1977.
3. Department of Energy, Energy Projections 1979, 1979.
4. Department of Energy, Proof of Evidence for the Sizewell 'B' Public Inquiry, October 1982.
5. House of Commons, Second Report from the Select Committee on Energy Session 1982-83, Pit Closures, December 1982, para 35.
6. Financial Times, European Energy Report, 1 April 1983, page 13.
7. Details are in Colin Robinson, The Energy 'Crisis' and British Coal, Hobart Paper 59, Institute of Economic Affairs, 1974, pages 41-2.
8. A table of costs and subsidies to British coal, as compared with other EEC coal industries, is in the Commons Select Committee report on Pit Closures, op cit (Table 1).
9. Colin Robinson and Eileen Marshall, Britain's coal industry: the way to remove the air of depression, The Financial Times, 26 January 1983.

TABLE 1

## THE COAL INDUSTRY IN GREAT BRITAIN, 1947-1982

	SUPPLY (MILLION TONNES)		GROSS CONSUMPTION (MILLION TONNES)		EMPLOYMENT  NUMBER OF WAGE-EARNERS IN COLLIERIES AT YEAR-END+ (THOUSANDS)	PRODUCTIVITY  OUT-PUT PER MAN-YEAR (TONNES)+	
	PRODUCTION*		IMPORTS	HOME EXPORTS AND FOREIGN BUNKERS			
	DEEP- MINED	OPENCAST					
1947	190	10	1	188	5	717	269
1957	213	14	3	216	8	710	301
1967	168	7	-	167	2	385	416
1977	107	14	2	124	2	239	442
1980	112	16	7	123	4	228	483
1981	110	15	4	118	9	215	497
1982	106	15	4	111	7	200	502

\* INCLUDING LICENSED (NON-NCB) MINES BUT NOT RECOVERED SLURRY

+ NCB MINES ONLY

SOURCES: MINISTRY OF POWER STATISTICAL DIGESTS, DEPARTMENT OF ENERGY DIGESTS  
OF UK ENERGY STATISTICS, AND ENERGY TRENDS (DEPARTMENT OF ENERGY),  
FIGURES ORIGINALLY EXPRESSED IN TONS HAVE BEEN CONVERTED TO TONNES

TABLE 2

## UK FUEL PRODUCTION AND CONSUMPTION, 1960-1982

	1960		1973		1982	
	M.T.C.E.	% OF TOTAL	M.T.C.E.	% OF TOTAL	M.T.C.E.	% OF TOTAL
<u>FUEL PRODUCTION</u>						
COAL *	198	98.5	132	70.2	124	33.3
OIL	-	-	1	0.5	175	47.0
NATURAL GAS	-	-	43	22.9	55	14.8
NUCLEAR	1	0.5	10	5.3	16	4.3
HYDRO	2	1.0	2	1.1	2	0.6
TOTAL	201	100.0	188	100.0	372	100.0
<u>FUEL CONSUMPTION</u>						
COAL	199	69.6	133	34.8	111	33.9
OIL (ENERGY USES)	68	23.8	164	42.9	111	33.9
NATURAL GAS	-	-	44	11.5	71	21.7
NUCLEAR	1	0.3	10	2.6	16	4.9
HYDRO	2	0.7	2	0.5	2	0.6
NON ENERGY USES	7	2.5	20	5.2	13+	4.0
BUNKERS	9	3.1	9	2.5	3	1.0
TOTAL	286	100.0	382	100.0	327	100.
PRODUCTION AS % OF CONSUMPTION	70		49		114	

M.T.C.E. = MILLION TONNES COAL EQUIVALENT

\* INCLUDING RECOVERED SLURRY + PARTLY ESTIMATED

SOURCES: DIGESTS OF UK ENERGY STATISTICS, ENERGY TRENDS (DEPARTMENT OF ENERGY)

TABLE 3

INLAND CONSUMPTION OF COAL IN THE UNITED KINGDOM, 1957 AND 1982

	<u>1957</u>	<u>%</u>	<u>1982</u>	<u>%</u>
	<u>MILLION TONNES</u>	<u>OF TOTAL</u>	<u>MILLION TONNES</u>	<u>OF TOTAL</u>
POWER STATIONS	47.1	21.8	80.2	72.1
COKE OVENS	31.2	14.4	10.6	9.5
GAS WORKS	26.8	12.4	-	-
INDUSTRY	38.1	17.6	7.1	6.4
DOMESTIC*	36.2	16.7	6.7	6.0
RAILWAYS	11.6	5.4	-	-
OTHER	25.3	11.7	6.6	6.0
	<u>216.3</u>	<u>100.0</u>	<u>111.2</u>	<u>100.0</u>

\* HOUSE COAL AND MINERS' COAL

SOURCES: DIGEST OF UK ENERGY STATISTICS 1976 and 1981 AND  
ENERGY TRENDS (DEPARTMENT OF ENERGY)

TABLE 4

UK COAL CONSUMPTION BY MARKET, 1970-1982

	million tonnes			
	1970	1980	1981	1982
POWER STATIONS	77.2	89.6	87.2	80.2
COKE OVENS	25.3	11.6	10.8	10.6
INDUSTRY	19.6	7.8	7.0	7.1
DOMESTIC*	18.2	7.3	6.9	6.7
OTHER	16.6	7.2	6.5	6.6
	<hr/>	<hr/>	<hr/>	<hr/>
	156.9	123.5	118.4	111.2

\* HOUSE COAL AND MINERS' COAL

SOURCES: DIGESTS OF UK ENERGY STATISTICS, ENERGY TRENDS (DEPARTMENT OF ENERGY)

TABLE 5  
PRODUCTIVITY AT NCB COLLIERIES, 1968-1982

	TONNES	
	<u>OUTPUT PER MAN YEAR</u>	<u>OVERALL OUTPUT PER MAN SHIFT</u>
1968	454	2.12
1969	468	2.21
1970	468	2.24
1971	478	2.23
1972	402	2.22
1973	464	2.29
1974	405	2.18
1975	471	2.28
1976	452	2.23
1977	442	2.18
1978	452	2.25
1979	462	2.25
1980	483	2.32*
1981	497	2.38
1982	502	2.41

\* from 1980 onwards there were changes in the definition of OMS which probably raise the figures for the last three years shown by 1-2 per cent compared with the earlier figures

SOURCES: DIGEST OF UNITED KINGDOM ENERGY STATISTICS  
 ENERGY TRENDS (DEPARTMENT OF ENERGY)

TABLE 6

PRICES OF COAL AND OIL USED BY INDUSTRY, 1967 to 1982

	<u>COAL</u>	<u>FUEL OIL</u>	<u>COAL PRICE AS % OF OIL PRICE</u>
	PENCE PER THERM		
1967	2.15	2.06	104
1968	2.08	2.25	92
1969	2.11	2.22	95
1970	2.53	2.22	114
1971	3.02	3.33	91
1972	3.25	3.18	102
1973	3.40	3.11	109
<hr/>			
1974	3.70	7.37	50
1975	5.55	9.28	60
1976	6.87	10.63	65
1977	8.20	13.48	61
1978	8.90	12.64	70
1979	10.36	15.70	66
<hr/>			
1980	13.43	22.24	60
1981	15.52	26.65	58
<hr/>			
1982	18.64	28.08	66

NOTE: IN 1974, 1979 AND 1982 THERE WERE CHANGES IN THE METHODS USED TO COMPILE THE INFORMATION

SOURCES: DIGESTS OF UNITED KINGDOM ENERGY STATISTICS, ENERGY TRENDS (DEPARTMENT OF ENERGY)



TABLE 7  
WORLD ENERGY CONSUMPTION

	1965		1973		1981		AVERAGE ANNUAL COMPOUND RATES OF INCREASE	
	M.T.O.E.,	% OF TOTAL	M.T.O.E.,	% OF TOTAL	M.T.O.E.,	% OF TOTAL	1965-73	1973-81
OIL	1529	38.7	2798	47.3	2902	42.4	7.8	0.5
SOLID FUELS	1525*	38.6	1668	28.2	2007	29.3	1.1	2.3
NATURAL GAS	647	16.4	1076	18.2	1332	19.4	6.6	2.7
NUCLEAR	6*	0.2	49	0.8	191	2.8	30.0	18.5
HYDRO	242*	6.1	329	5.5	417	6.1	3.9	3.0
TOTAL	3949	100.0	5920	100.0	6849	100.0	5.2	1.8

\* PARTLY ESTIMATED

SOURCE: BP STATISTICAL REVIEWS OF THE WORLD OIL INDUSTRY (ANNUAL)  
AND BP STATISTICAL REVIEW OF WORLD ENERGY [1981]

TABLE 8

PRESENT AND FUTURE COAL MARKETS

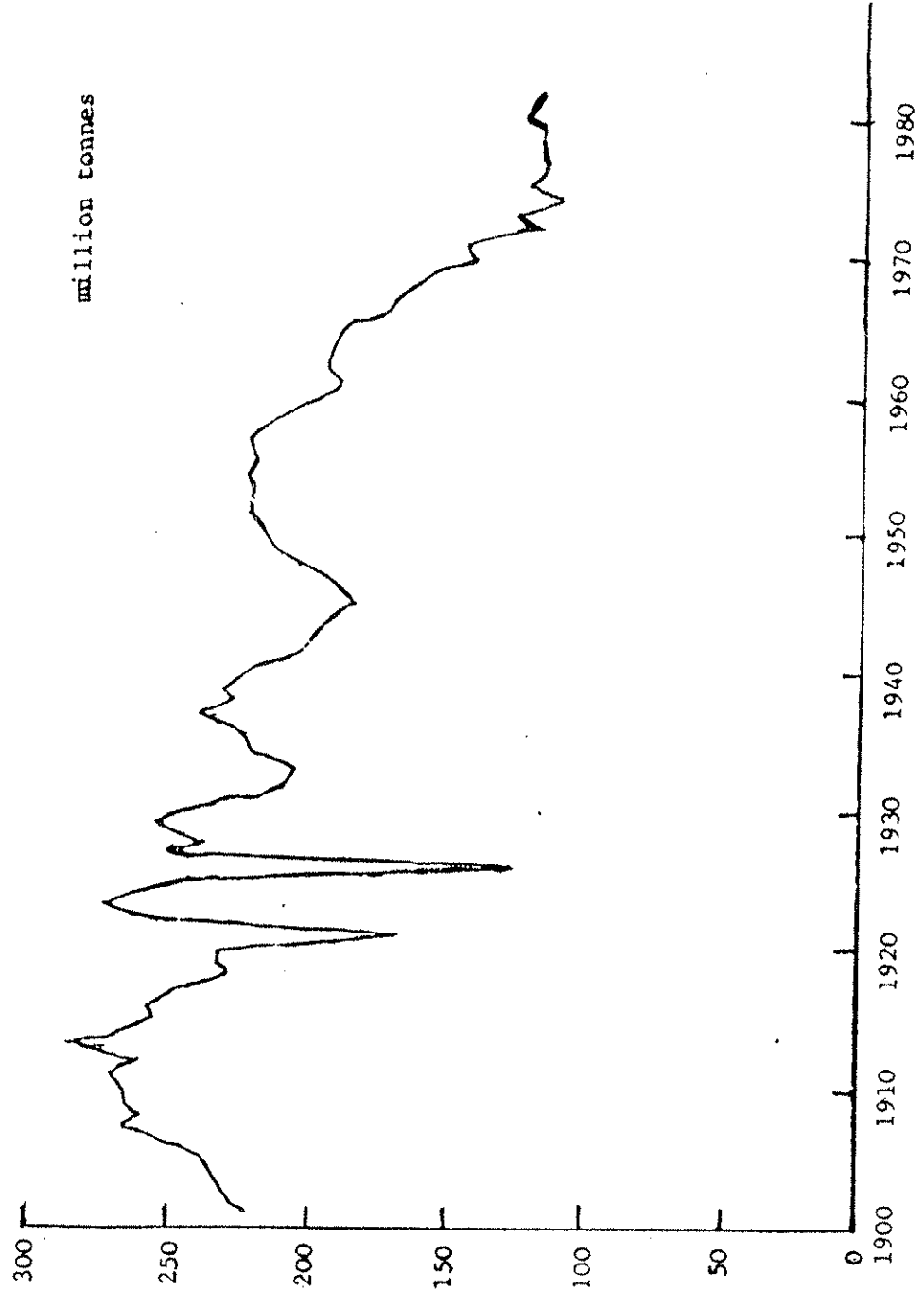
	YEAR 2000 ESTIMATE		MILLION TONNES
	DEPARTMENT OF ENERGY ESTIMATES*	ROBINSON / MARSHALL ESTIMATES+	
1980 ACTUAL	NCB ESTIMATES*	DEPARTMENT OF ENERGY ESTIMATES+	
POWER STATIONS	90	66- 78	40- 60
COKE OVENS	12	16- 19	13- 15
INDUSTRY	8	39- 45	15- 25
DOMESTIC/ COMMERCIAL (INCLUDING SNG)	14	7- 23	7- 10
	124	128-165	75-110

\* STATEMENT BY SIR DEREK EZRA ON 16 JANUARY 1979 TO COMMISSION ON ENERGY AND THE ENVIRONMENT.

+ ENERGY PROJECTIONS 1979 AND EXPLANATORY LETTER FROM DEPARTMENT OF ENERGY TO VALE OF BELVOIR INQUIRY SECRETARIAT, 18 JANUARY 1980.

+ WHAT FUTURE FOR BRITISH COAL ?, p.70

Fig. 1 TOTAL PRODUCTION OF COAL IN GREAT BRITAIN



Source: Digest of UK Energy Statistics, Ministry of Power Statistical Digests.





