

A scrutiny of the motives for hard coal subsidies in Western Europe

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Security of energy supply, and employment considerations are frequently said to provide major justifications for the colossal subsidies to West European coal production. This paper scrutinizes the validity of the two motives. The production cut following from subsidy elimination would result in a very small change of West European energy self-sufficiency, with doubtful repercussions on supply security. The impact on the region's employment would be barely perceptible. Germany stands out as the country that would be most heavily affected by coal subsidy elimination. Even in Germany, however, the public support expended on coal could be put to much more efficient alternative use for the promotion of energy supply security and employment creation. It is concluded that the two motives for coal support lack validity.

Large amounts of hard coal are mined in Western Europe. In 1991, 197 million tonnes were produced, around 6% of the global total. Four countries, France, Germany, Spain and the UK, account for virtually all output in the area. Coal production in these countries is heavily subsidized. It has to be, for while the imported price (cif West European harbours) was below US\$50 per tonne in that year (steam coal), the average production costs (ex mine) were estimated at US\$109 (EEC, 1992).

Assessments of total coal subsidization in the four countries yield somewhat ambiguous results. Computations by the European Commission (EEC, annual) and the IEA (IEA, 1993) suggest that in 1991, the 'producer subsidy equivalent' may have amounted to US\$10 billion, and that the total, including subsidies not directly related to current production, was of the order of magnitude of US\$17 billion. Measured per tonne of output, this is almost twice as much as the cost of imports. When measured per unit of value added, subsidization of coal appears to be far more generous than the overall public support of US\$133 billion, provided to the heavily protected agriculture in the European Union (OECD, 1991). Per employed person, total subsidization in that year corresponded to US\$58 000 in coal and US\$16 000 in agriculture (Radetzki, 1994).

Two reasons are regularly provided to explain the high levels of public support to the West European coal industries. The first one is supply security. Domestic coal production is seen as a measure to increase the degree of energy self-sufficiency, and so to protect against harmful disturbances, in terms of price hikes or physical interruptions of international energy supply. The second reason is concern about the unemployment that would arise as mines are closed.¹

The purpose of this paper is to make a critical review of these purported rationales for West European coal subsidization. The next section provides a basis for the ensuing discussions, by briefly assessing the volume of West European coal output that would be viable without subsidies. The supply security argument is then reviewed in the third section, followed by the employment argument. The findings and conclusions are summarized in the last section.

The benchmark year, with which the hypothetical, unsubsidized circumstances are compared is 1991. This year has been chosen because it is the most recent one

¹Additional reasons sometimes adduced in support of subsidization comprise nostalgia, tradition, and the view that miners have to be compensated for injustices in past history. These will not be dealt with in the present paper.

Table 1 West European hard coal production, (million tonnes)

	Total	France	Germany	Spain	UK
1973	286	26	104	10	132
1980	266	20	95	13	130
1985	225	17	89	16	94
1991	197	11	73	14	96
1991 (hypothetical) ^a	49	2	9	0	37

^aHypothetical numbers after full adjustment to a regime without coal subsidies

Source: IEA (annual b); Radetzki (1995).

for which the full data needed for the analysis are available at the time of writing. Furthermore, the dramatic changes that have occurred subsequently make it difficult to use later years for benchmarking. The severe recession of 1992 and 1993 has had a strong impact on West European coal consumption, which in turn temporarily (?) suppressed domestic output, especially in Germany and the UK, the region's major producers. In addition, the period has seen a very energetic effort by the UK government to streamline the industry and to privatize it. The number of collieries was reduced from 65 in 1991 to only 19 during spring 1994, with an ensuing output contraction (BCC, 1993 and 1994). The process of change is not yet completed. In the case of the UK, therefore, the years after 1991 constitute a period of continuous transition.

Viability of West European coal in the absence of subsidies

A companion paper (Radetzki, 1995), attempts to establish the volume of coal production in Western Europe likely to survive after full adjustment to a regime where subsidies have been eliminated. The underlying analysis of that paper is based on current and potential cost data, taking into account the cost suppression likely to

arise when West European coal producers are forced to compete head on with imported coal. Table 1 draws on these results. It reports actual coal production in Western Europe between 1973 and 1991, and the hypothetical output in the conditions of the early 1990s, deemed to remain commercially viable on a sustained basis after subsidies have been removed.

It appears that the hypothetical output would be only 25% of actual output. Spanish production, which has recorded the highest actual cost of output among the countries listed, is expected to be discontinued altogether. The very high cost levels of the German coal industry are seen to lead to a much sharper relative output contraction than in the UK and France, where the costs are lower.

The shift from actual 1991 to hypothetical non-subsidy numbers appear less dramatic when considered in an historical context. It is posited that subsidy elimination would have reduced output by 148 million tonnes below the actual 1991 production. This has to be gauged against the long term decline of the West European coal industry. The actual, subsidized, 1991 output was 69 million tonnes less than in 1980, and 250 million tonnes below the output recorded in 1950!

Coal production and energy supply security

Insecurity of energy supply comprises two facets. The first is a failure to obtain physical supplies at all. The second is a sudden and dramatic increase in the cost of energy supply, with disturbing consequences for energy consumers. There is a widespread presumption that such insecurity is predominantly related to imports, while domestic sources ensure stability, in terms of volumes as well as prices. The underlying rationale appears to be that the national government can exercise a considerable degree of control over domestic output, but not over for-

Table 2 The importance of energy imports and domestic hard coal in Western Europe's TPES^a (%)

	Total	France	Germany	Spain	UK
Net energy imports					
1973	61.6	79.5	49.3	78.2	50.6
1980	48.6	75.4	48.7	77.0	5.9
1990	39.7	47.4	48.0	64.5	2.0
1991	40.0	52.9	52.1	66.1	2.0
1991 (hypothetical) ^b	46.4	55.3	64.1	73.7	17.8
Domestic hard coal output					
1973	14.7	10.2	20.4	11.5	34.4
1980	12.4	7.0	17.8	10.2	35.2
1990	8.5	3.7	14.1	9.1	25.8
1991	8.3	3.0	13.6	7.6	25.4
1991 (hypothetical) ^b	1.9	0.6	1.6	0	9.6

^aTotal primary energy supply. This is the broadest measure of domestic energy usage. ^bHypothetical numbers after full adjustment to a regime without coal subsidies.

Source: IEA (annual a, b).

ign supply. The analysis begins by assuming that this presumption is true, and explores the shifts in Western Europe's energy import dependence, as well as the role of coal in reducing this dependence.

Table 2 measures the significance of energy imports and of domestic coal production in total energy consumption in Western Europe as a whole, and in the four hard coal producing countries of significance in the region, for selected years between 1973 and 1991. For the latter year, the table also provides a set of hypothetical numbers based on the lower coal production in a regime without subsidies, as discussed in the preceding section. The hypothetical 1991 rows subsume that the entire loss of coal production will be replaced by energy imports. Several noteworthy observations emerge.

It is clear that the West European energy import dependence has been sharply reduced over the past 20 years. In 1973, at the outbreak of the first oil crisis, the region imported more than 60% of its energy needs. In the early 1990s, this share hovered around 40%. The shift towards European energy sources is explained by North Sea oil and gas, and by the impressive expansion of nuclear power (considered a domestic energy source). The decline in import dependence occurred despite a large reduction in the share of domestic coal, from almost 15% of total energy consumption in the beginning of the period, to about 8% at its end. Without coal subsidies, and with all lost coal production replaced by energy imports, the 1991 import dependence would have risen to 46%. Even if all coal production in the region was discontinued, an admittedly extreme case, the dependence on imported energy in that year would have remained below 50%, much lower than in the early 1970s.

The table also provides data for the four West European countries which continue to produce significant quantities of coal. The justification for treating each country separately is in considerable doubt, given the profound and increasing economic and political integration of the region. With completely free trade flows within the expanded EU (after the addition of new members in 1995), the import dependence of each individual country becomes a somewhat meaningless concept. Nevertheless, the differing developments for each of the coal producing countries are briefly recounted.

In France, the actual declines in both energy import dependence and usage of domestic coal are primarily due to the very impressive expansion of nuclear power. The share of nuclear generation in total primary energy supply (TPES) rose from 2.2% in 1973 to 8.4% in 1980 and to above 36% in 1990 and 1991. Though the declining coal production was compensated in part by rising coal imports, the share of coal in TPES nevertheless shrank from about 17% in the 1970s to 9% in 1990 and 1991. Domestic coal output corresponded to 3.0% of

TPES in 1991. Even a total replacement of coal production by imported energy would have only a small impact on overall import dependence.

Germany is alone among the coal producing countries in Western Europe, in not having reduced its energy import dependence. The share of nuclear power rose by 10 percentage points between 1973 and 1991, that of domestic coal declined by 7 percentage points, while the combined share of mainly imported oil and gas stagnated at around 55% of the total. Imports of energy comprised about half of TPES both in the early 1970s and in the early 1990s, as a consequence of these changes. Removal of coal subsidies would reduce domestic coal output by an amount corresponding to 12% of TPES, and would raise the country's import dependence to 64%.

Spain's energy import dependence declined by 12 percentage points in the 18-year period ending in 1991. The expansion of nuclear power, from 2.5% to more than 20% of TPES, was the major factor behind this change. Among the four countries, Spain stands out in four respects. First, despite the noted decline, its import dependence is by far the highest. Second, it recorded a rising coal output in the period under scrutiny. Third, its coal production costs are by far the highest (Radetzki 1995). And fourth, it is the only country where the importance of coal in the total energy mix rose in the years under consideration. But the increasing overall significance of coal is primarily due to a fourfold expansion of imports between 1973 and 1991. Elimination of coal subsidies would wipe out coal production entirely, and raise the country's dependence on energy import by 5 percentage points, to 74%, the highest in the group, but still somewhat less than in 1973.

The UK recorded the most dramatic decline in import dependence during the 1970s and 1980s, primarily because oil and gas from the North Sea substituted for imported fossil fuels. In 1991, the domestic coal industry played a far more important role in the UK than in the other West European producing countries. But even if all subsidies were removed, and coal output declined by more than half, the UK energy import dependence would remain quite low.

The conclusion from this simple analysis of data is fairly straightforward. It is hard to support coal subsidization at a West European level on import dependence grounds. The figures show that the continent's energy import dependence has experienced a dramatic fall over the past decade, and that it would rise only modestly if coal subsidies were removed. It is equally hard to support coal subsidies on import dependence grounds in France, because domestic coal is quite marginal in TPES, and in the UK, whose import dependence would remain extremely low even without coal subsidies. Coal subsidization on this ground could be justified only in

the case of Germany and Spain, because the two countries' dependence on energy imports is high even with subsidies in force, and because this dependence would rise substantially as subsidies were removed.

The issue has thus been reduced from a West European level to a problem faced by two countries. But while a strong relationship between coal subsidies and import dependence has been identified for Germany and Spain, it is necessary to explore whether increasing import dependence really compromises supply security, and, if so, whether the social cost of subsidies is worth the benefit of the ensuing improvement in energy supply assurance. These issues will be presently explored.

The presumption that imports of energy generally create a greater hazard to supply security than does domestic supply appears fallacious.² It is true that the imports of a critical raw material from a given distant source raise special problems of supply security due to war and the risk of ensuing cuts of transport routes. Obvious examples are the potential hazards to the European imports of oil and gas, if unrest in the Middle East leads to closure of the Hormuz Strait, or if unresolved tensions between Russia and Ukraine prompt the latter to refuse Siberian gas transit to Western Europe. It is also true that foreign dominated cartels, like OPEC, can hike up export prices with impunity, since they are out of reach of the national governments of importing countries. In contrast, it is believed that domestic producers could be commandeered to deliver at prices set by the government, if an important national interest is threatened.

The risk of rupture and price explosions will subside as the number of sources of import supply and their geographical separation increase. At the same time, the versatility of many international markets offers the possibility to overcome shortages by shifting among many more suppliers than those operating in a single nation. On balance, therefore, it is by no means clear that a high import dependence raises more serious security of supply problems than domestic self-sufficiency. In many cases, the contrary is true, especially when domestic output is concentrated, in terms of geography and decision units.

The geographic widening of food supply sources over the past 200 years has made famines increasingly rare, precisely because it has permitted the substitution of far away supplies for failed regional or domestic output.

In 1984 a prolonged strike in the UK reduced coal output by 57% (UN annual), creating serious problems for coal users. Because of limited port installations, the capacity to import was restrained. Even though imports

doubled, they still accounted for a small share of total coal needs. Clearly, a lesser initial reliance on domestic output would have reduced the shortfall. In fact, the hardships experienced during the strike planted political seeds that ripened into the tough government programmes in the early 1990s to prune and privatize the industry.

These examples point to the severe limitations in the national governments' ability and/or willingness to control the domestic supply of critical raw materials, and to the stabilizing roles played by foreign supply.

One would have to study the economic and geographical structure of the domestic versus international supply under consideration, to determine which of them offers the greatest security to the users. Consider again the case of coal and energy in Germany in the early 1990s.

Domestic coal supply in Germany is heavily concentrated at the corporate level. Ruhrkohle, the leading producer, had an output of 55 million tonnes in 1991 and 1992 (Ruhrkohle, 1993), 75% of the country's total. Technical breakdowns do not constitute a serious impediment to total supply, since many physically separated mines, both within and outside Ruhrkohle, contribute to overall output. A widespread and prolonged strike appears to be the major plausible threat. The very heavy corporate concentration of production adds to the potential danger, if the labour action were directed against Ruhrkohle as a whole.

German consumption of oil in 1991–1992 amounted to 2.8 million barrels per day (mbd), virtually all imported, though with a significant share from the North Sea. However, given the fungibility of oil flows, it appears more relevant to review the supply security issue in a regional West European context.

In 1991–92, Western Europe consumed a total of 13.5 mbd. Imports from outside the region amounted to more than 10 mbd, of which close to 4 mbd from the Middle East, some 2 mbd from North Africa, and another 1.5 mbd from the FSU (BP, 1992, 1993). Thus, more than one-half of consumption, and three-quarters of imports, originated in countries deemed to pose substantial political risk (EIU, quarterly), and ensuing supply disruptions. In addition, large international flows of oil have to be transported over long distances, with stretches prone to potential military hazards. Finally, the oil prices are in effect determined by a small group of exporters in the Middle East, and the history of recent decades reveals the risks faced by oil users due to these exporters' erratic price objectives.

Similar uncertainties apply to the German and West European supplies of natural gas, even though the region's own output accounts for a much larger share of total gas usage. In 1991–92, Germany consumed about 63 billion cubic metres (BCM) of gas, of which more

³This statement has been made before. The following arguments draw their inspiration from Adelman (1972), Gordon (1970) and Steenblik and Wigley (1990).

than 60 BCM was imported. Western Europe produced some 200 BCM, and imported about 75 BCM, all from the FSU and Algeria, with small prospects for replacement of these imports in the short and medium term in the event of supply disruptions. The political uncertainties of the two exporting countries, the politically problematic transport, especially of Russian and Turkmeni gas, and the effective tie of European gas prices to the price of oil, pose problems of supply security quite akin to those applying to oil.

A qualitative comparison of the above supply characteristics indubitably suggests that oil and gas imports pose a greater threat to energy supply security in Germany (and in Western Europe), than does the domestic production of coal. However, the risk difference is hard to quantify.

The risk profile of international coal supply appears to be far more benign than those of oil and gas. First, the concentration among exporting countries is less than in the case of global oil exports or of gas supplies to Western Europe. Second, the major exporting countries, Australia, Canada, Colombia, South Africa and the USA, pose many fewer political insecurity issues than do the exporters of oil and gas to Europe. Third, the trans-ocean freight routes from these countries to Western Europe involve little military threat, compared to the oil and gas cases. Fourth, the international coal market has for a long time been characterized by competitive conditions, and the likelihood for monopolistic collusion is slim. Hence, violent deviations of prices from costs are rare. And fifth, the export supply curve is quite flat. Given a reasonable amount of time and some limited price incentive, each major exporting country could substantially stretch its international supply. Hence, the security of international coal supply poses much lesser problems than the supply of oil and gas. One might surmise that the security of international coal supply is superior even to that of German domestic production, even though definite proof would be hard to obtain.

This is not to say that a diversity of exporters working in competitive conditions provides a full assurance to the importing users. It takes time to shift to alternative sources, and to adjust to the consequent alterations in imported coal quality, if a sudden rupture in the traditional trading channels occurs. The difficulties experienced by the importers in France and other countries, by the failing supply from Poland caused by political strikes in the early 1980s, provide an illustrative example. As noted by the UK example, however, domestic supply too can suffer from identical problems.

The emerging conclusion from the above discussion is quite clear. There might be a rationale for subsidizing domestic coal production on grounds of energy supply security, if the production lost in the absence of sub-

sidies is replaced by imported oil and gas. This rationale is hard to maintain, if domestic coal is replaced with imported coal.

The revealed preferences of eg German and Belgian policy makers over the past decades suggest that energy supply security cannot have been an overriding consideration in the decisions to replace shrinking domestic coal outputs, for then imported coal would have been the obvious substitute. In fact, domestic coal has been replaced, in the main, by increasing oil and gas imports.

There is, by necessity, a maximum cost of the supply security achieved by subsidized domestic coal production, given that supply security can be accomplished also by other means, eg imported stockpiles. This is easy to demonstrate. German average production costs in the early 1990s amount to US\$150 per tonne, in round numbers, while imports cost US\$50 or less in German harbours (Radetzki, 1994). Thus, substitution of imports for domestic production yields a saving to the German economy of at least US\$100 per tonne and year. Now, this saving would suffice to carry a stockpile of imported coal 10 times as large as the domestic production cut, if the annual physical and financial costs of stockpiling amount to 20% of the value of the stock. In this light, the argument that domestic production should be maintained on grounds of supply security, disintegrates completely.

The case of Germany has been used throughout in the discussion of coal subsidies on supply security grounds. Germany was chosen because this is the country where subsidy elimination would have the most important impact on import dependence, and, implicitly, on the security of supply. The emerging conclusion is that the argument is not valid for Germany. It is even less valid for France, Spain and the UK, or for the region as a whole, even when the lower coal production costs in France and the UK, and the ensuing lesser needs for coal subsidies, are taken into account.

West European coal employment

Removal of coal subsidies and the ensuing contraction of coal output will obviously lead to reduced employment in the West European coal industries. To appreciate the gravity of the employment implications, we must make assumptions about the slimmed, unsubsidized industry's labour needs, and compare the employment decline due to subsidy elimination, with the historical evolution of total coal employment, as well as with appropriate aggregate labour market numbers in the countries under study

Table 3 contains the base facts needed for the proposed exercises. It shows the changes in actual hard coal employment between 1980 and 1991, for each main coal producing country, and for Western Europe as a whole.

Table 3 Hard coal employment in Western Europe (000)

	Total	France	Germany	Spain	UK
1980	617	60	187	48	281
1985	463	48	166	49	171
1990	277	24	130	39	74
1991	252	21	123	38	62
Change 1980–91	-365	-39	-64	-10	-219
1991 employment in the absence of subsidies ^a	33	3	11	0	17
Change in 1991 employment due to removal of subsidies ^a	219	-18	-112	-38	-45
1991 hard coal employment in % of total civilian employment	0.14	0.09	0.34	0.31	0.24

^aAssuming that the proportional employment decline in countries with remaining production is 1.5 times the proportional decline in output.

Sources: Eurostat; UN (annual); ILO (annual).

It also provides alternative employment figures in 1991, assuming the non-subsidy production numbers given in Table 1. The industry's labour needs can be posited to fall by more than output, since the least productive mines will presumably be closed first, as subsidies are removed. In order not to underestimate the employment losses, it has been assumed that the proportional reduction of labour in countries with remaining production will be 1.5 times the proportional decline in output. Finally, the table relates the actual 1991 hard coal employment to total employment in each country and in Western Europe in aggregate.

As with the supply security considerations, the figures reveal that the future of hard coal industry employment is not a serious pan-West European problem. In 1991, hard coal generated 250 000 jobs, equal to 0.14% of total civilian employment. It is estimated that a coal industry without subsidies would have employed 219 000 fewer workers, reducing its share of total civilian employment by 0.12%. This decline is far smaller than the reduction which actually occurred in the preceding 11-year period. Between 1980 and 1991, employment fell by 365 000, or by 0.25% of the civil labour force. *Ceteris paribus*, the envisaged employment loss would raise West European unemployment from the 8.5% actually recorded in 1991, to just above 8.6%, certainly an undesirable change, but hardly of great macroeconomic significance. In employment terms, the hard coal industry is simply not significant enough in the West European context. Even a total elimination of all hard coal employment, presumably over half a decade or more, would be dwarfed by the one year (1989–90) change in the continent's agricultural employment (-258 000), or in manufacturing (+683 000), or services (+2 704 000) (OECD 1992).

As is apparent above, the UK and Germany dominate West European coal output. They also dominate the region's coal employment, and would incur the largest absolute employment losses in consequence of subsidy elimination. However, the recent histories of the two countries' hard coal industries have developed along very different tracks. Long before 1991, the UK implemented a wholesale restructuring programme, reaping

very impressive efficiency gains. Germany did not. Between 1980 and 1991, coal output in the UK fell by 27%, that in Germany by 23%. At the same time, employment in the UK declined by 78%, while German employment was reduced by no more than 34%. In 1980 labour productivity in the UK was 90% of that in Germany. In subsequent years, German productivity remained virtually stagnant, that in the UK increased by strides. In consequence, by 1991, UK labour productivity had risen to 253% of German productivity in the latter year.

In the early 1990s, therefore, the prospect of subsidy elimination posed a somewhat limited employment problem to the UK, both historically, and in comparison with Germany. Potential reductions in the hard coal industry's labour needs work out at fewer than 50 000 persons in the UK, compared with the reduction of coal employment by 219 000 in the preceding decade. The UK employment shrinkage is less than half of the envisaged reduction in the unreformed German coal industry.

Germany stands out among the four countries listed in Table 3. In 1991, it accounted for almost one-half of total West European hard coal employment. This employment represented a higher share of overall civilian employment than in any of the other countries. The posited reduction in Germany's coal labour requirements in response to subsidy removal is also the largest, both in absolute and relative terms. As in the preceding section, it may therefore be appropriate to gauge the seriousness of the employment problem by looking at Germany, on the assumption that this country represents the most serious case. The procedure is akin to that adopted in the analysis of the employment consideration for Western Europe as a whole, but a few problems arise on account of unavailable statistics for united Germany.

In 1991, hard coal generated 123 000 jobs in Germany, equal to 0.34% of total civilian employment, more than twice the West European number. In 1980, the coal industry employed 187 000 workers, and its share of total civilian employment was 0.56%, so the reduction between 1980 and 1991 amounted to 0.22%. It is posited that a German hard coal industry without subsidies

would have employed 112 000 fewer workers than it actually did in 1991. Subsidy elimination is posited to reduce the coal industry's share of total civilian employment by 0.30%, or by almost 1.5 times as much as occurred in the preceding 11-year period. If everything else remained unchanged, therefore, coal subsidy elimination would raise German aggregate unemployment rates by 0.3 percentage points.

Full labour market statistics for united Germany are not yet available (OECD, 1994). Nevertheless, since Western Germany accounts for about 80% of total civilian employment in united Germany, it may be instructive to compare the posited coal employment reduction, 112 000, with recent changes in the West German labour market. Between 1989 and 1990, West German agricultural employment declined by 49 000, while employment in manufacturing and services rose by 92 000 and 278 000 respectively (OECD, 1992). For united Germany, these numbers would presumably be larger still. In this light, the posited coal labour reductions appear less than entirely overwhelming.

A parenthetical matter may be added with regard to the coal employment issue in Germany. Presumably, the concern of the labour market authorities in Germany, as in other West European countries, is with national employment, not with employment as such. Against this background, the defence of a colossal coal subsidization scheme by the employment argument appears somewhat beside the point, given that a large part of the labour force in German coal mines consists of immigrant *Gastarbeiters*.

Though the Spanish employment issue is much smaller than that in Germany, when measured in absolute terms, the relative magnitudes are quite similar in both countries. The closure of the Spanish coal industry would reduce employment by 38 000, 0.31% of the global Spanish employment. Nevertheless, this appears to be small in comparison with the overall labour market dynamics. In the year to 1990, Spanish agriculture lost 112 000 employment opportunities, against gains of 166 000 in manufacturing and 264 000 in services.

These comparisons reveal that the coal employment issue is more serious in Germany and Spain than in Western Europe as a whole. At the same time, the numbers derived above, comparing the posited coal employment fall due to subsidy elimination, with the historical employment decline in coal in Germany, and with the one-year dynamics of the overall labour market in the two countries, strongly suggest that the shrinkage in coal employment, if spread over a few years, should not cause any significant problems in the national labour market context.

There is a further dimension to the employment problem. Coal production is often geographically con-

centrated, with the coal mines being the major regional employer. A shrinkage of the industry could then involve serious regional repercussions stretching well beyond coal mining itself. But even if this broader approach is adopted, the prevailing subsidy schemes come out as exceedingly expensive measures for overall employment preservation, when the total subsidy cost over time is related to the number and quality of jobs preserved in consequence.

It was noted in the introduction that coal subsidization in Western Europe in 1991 corresponded to US\$58 000 per employed person, far more than the average mining wage. Very high levels of subsidization in West European coal have prevailed for several decades, and have become a perennial feature of the industry (Gordon, 1987). In recent years, Germany has stood out in this respect. Total coal subsidization per employee rose steadily, from US\$37 000 in 1986 to US\$92 000 in 1991 (Radetzki, 1994). In 1992, the average wage levels in German hard coal attained US\$36 000 per year (Ruhrkohle, 1993), so throughout this period, German subsidies exceeded the total wage bill.

The claim that subsidies of such magnitude are needed on employment grounds, whether exclusively for coal workers, or for the coal mining regions in general, is neither credible nor reasonable. Perennial subsidization of an economic activity on employment grounds could be justified at a small fraction of labour costs, if there is some intrinsic value in the labour opportunities being saved. Higher levels of subsidization could be warranted in the face of a temporary survival threat to the activity under consideration. Neither of these conditions applies to German or West European coal. The intrinsic values distinguishing hard coal employment from other types of employment are hard to perceive. The uncompetitiveness of the industry, warranting public support in the first place, have been there for a long time.

The transitional employment problems from discontinued coal subsidies should not be belittled. This problem, however, is bound to be overwhelmed by the longer-run employment case against coal subsidies (and all other subsidies): that you have to tax people to pay for subsidies, and that by doing so you deprive them of spending power which might otherwise have been directed towards products from industries offering more sustainable employment prospects. Redirection of the subsidies to less capital intensive and more viable sectors of the German and Spanish economies could generate far more employment than maintenance of the present arrangements. The same is true of the other West European coal producing countries, despite their lower levels of subsidy per unit of labour.

Conclusions

The West European coal industries are uncompetitive. Colossal public subsidies are required to ensure their survival at the current levels of output. These subsidies are regularly justified by energy supply security concerns and by the employment problems that would arise if support was withdrawn and the industries were forced to shrink.

A closer scrutiny suggests that these justifications have little validity.

The supply security issue has lost some of its potency in Western Europe, in consequence of an impressive increase of the region's energy self-sufficiency after 1973, following the expansion of oil and gas supplies from the North Sea, and of nuclear power generation. At the same time, domestic coal has become an increasingly marginal element in Western Europe's energy supply, so its role as a safeguard against international energy shocks has shrunk. While the imports of oil and gas to the region do present serious supply security issues, the same is not true of imported coal. One could argue that the geographically diversified and competitive international coal market offers a greater security of supply than the domestic corporate and trade union monopolies in some of the West European coal producing countries. Finally, the magnitude of subsidies is so large that even a partial diversion of these resources would suffice to finance very large strategic reserves of cheap imported coal.

Coal employment in Western Europe would undoubtedly decline if the industry had to fend for itself. But the coal industry is not a large-scale employer. In none of the countries does it account for more than a fraction of 1% of total civilian employment. The plausible employment reduction in response to coal subsidy elimination is much smaller than that which actually occurred in the industry during the 1980s, despite subsidy maintenance. It is also quite small when compared to the annual changes in sectoral employment in individual coal producing countries.

Subsidies have become a perennial feature of the West European coal industry. In recent times, overall subsidization has exceeded the total wage bill by a considerable margin. If redirected to less capital intensive and economically more viable sectors than coal, the resources expended on subsidies could generate far greater employment effects than in their concurrent use.

On these grounds it is concluded that the justifications in favour of coal subsidies are not valid. Instead, these subsidies should be seen as an expression of the power of minorities who stand to gain from legislation in their special interest, and who remain unopposed because of the political weakness of the generality of the people, a condition quite common in the modern post-industrial state (Abramovitz, 1989). Simply expressed, the capital owners of the West European coal industries, in union with their labour, are taking the taxpayers and consumers for a ride.

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