

Report No. 13187-RU

Russian Federation Restructuring the Coal Industry: Putting People First

(In Two Volumes) Volume I: Main Report

December 12, 1994

Infrastructure, Energy & Environment Division
Country Department III
Europe and Central Asia



World Bank

CURRENCY EQUIVALENTS

Currency Unit = Ruble (Rb)

Rubles per US Dollar

Foreign Exchange Auction/Interbank Market Rate

Average for Period

December 1991	170
December 1992	420
December 1993	1,190
July 1994	1,998

BORROWER'S FISCAL YEAR

January 1 - December 31

WEIGHTS AND MEASURES

METRIC SYSTEM		US SYSTEM
1 meter (m)	=	3.2808 feet
1 kilometer (km)	=	0.6214 mile
1 square meter (m ²)	=	1.196 square yards
1 metric ton (tonne)	=	1.102 short tons
1 kilocalorie (kcal)	=	0.252 British thermal units
1 tonne of coal-equivalent (tce)	=	6.88 million kcal
1 kilogram (kg)	=	2.20462 pounds (lb)

ACRONYMS AND ABBREVIATIONS

GDP	Gross Domestic Product
Oblast	Region - a Soviet (now Russian) territorial administrative unit: other administrative units include republics, okrugs and krais
NO _x	Nitrogen oxides
SO _x	Sulfur oxides
ugol	coal (in Russian)
USAID	United States Agency for International Development

Russian Federation

Restructuring the Coal Industry: Putting People First

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December 12, 1994

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Contributors

This report was prepared by D. Craig, G. Hughes and M. Canning (World Bank). The report draws heavily on an earlier report (November 1993) prepared by G. Hughes and J. Strongman.

The present report summarizes material that was originally presented in the following annexes: Coal Resources, Production and Employment (J. Strongman, D. Craig & J. Procak); Coal Market Prospects by Region & Basin (G. Hughes, D. Craig & J. Procak); International Experience of Coal Restructuring (J. Strongman); Coal Transport (J. Holt & J. Procak); Social Protection (M. Canning & N. Koliadina); Environmental Issues (G. Hughes); and Costs, Subsidies and Employment in Coal Mining (G. Hughes).

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Deputy-Minister A. Yevtoushenko (Ministry of Fuels & Power) and Mr. Y. Malyshev (Managing Director of the national coal company, RosUgol) were the main coordinators of the work in Russia. Numerous individuals from RosUgol, the Ministry of Fuels & Power, various coal-related Institutes and other agencies represented on the Inter-Ministerial Coal Commission contributed material for this report.

Mr. J. Brown, Chief of Infrastructure, Energy & Environment Operations in the Russia & Central Asia Department of the World Bank, directed the work program. Q. Fan, L. Fox and L. Lovei were the peer reviewers.

Structure of the Report

This document is the Main Report of a report by the World Bank on *Restructuring the Coal Industry* in the Russian Federation.

The first version of the Main Report was issued on November 12, 1993, and discussed with the Ministry of Fuels & Power and the national coal company (RosUgol) in December 1993 in Moscow. As a result of these discussions, the focus of the report has shifted from the coal industry as a whole to a more detailed analysis of the impact of restructuring in each of the main coal basins.

The first six supporting Annexes--see Contents on page 1--were prepared between October 1993 and April 1994.

Between December 1993 and April 1994, the initial analysis was supplemented by studies financed under the USAID's Cooperative Agreement with the World Bank:

- a study of subsidies and employment in the coal industry
- a study of financial performance of coal mining companies

In February 1994, the Bank awarded a third contract to foreign and local consultants to estimate the social and financial costs of reducing employment in the coal industry, focusing mainly on mine closures and associated environmental requirements:

- after initial work by local consultants, the study was suspended due to local constraints
- as a result, this report does not attempt to present quantified cost estimates of the costs of mine closures and employment reduction

In May 1994, a 17-person delegation from the Inter-Agency Coal Commission--representing key government economic and social agencies, RosUgol and the coal labor unions--visited Washington to discuss the more detailed findings presented in the Annexes. The second version of the Main Report reflects the findings presented to the Inter-Agency Coal Commission in May 1994 and comments made by the participants.

A seventh Annex--on Costs, Subsidies & Employment--was prepared in July 1994.

In August 1994, the Bank presented the second version of the Main Report and Annexes 1-7 to the Government as a discussion draft. The Government then convened a meeting of the Inter-Agency Coal Commission on September 23, 1994, to review the report. Representatives of the World Bank participated. It was agreed that the third version of the report (the current version, issued December 1994) would reflect the outcome of the review meeting.

As part of the preparation for September 23 review meeting, approximately 25 agencies submitted written comments on the World Bank report:

- the full text of the Russian commentary is now reproduced as the eighth annex in the companion volume of this report
- a summary of the Russian commentary appears as the second part of the Executive Summary in the Main Report

The Government has agreed that *Restructuring the Coal Industry - Putting People First* should be published to inform discussion of the future of the Russian coal industry. However, the Government has stressed that publication does not imply any endorsement of the recommendations of the report.

Restructuring the Coal Industry

Executive Summary

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Overview

1. This report is about people--coal miners, other workers in the coal industry, and their families--many of whom work and live in isolated communities where production of coal is the only reason to be there. The coal industry is now shrinking and many of these people face the prospect of losing their jobs. In some regions the chances of finding a new job are low. Yet the existing social safety net is totally inadequate to cope with the large numbers of families who will be affected. ***The Government has a choice. Either the restructuring can continue in an adhoc and sometimes chaotic manner, driven by inevitable bankruptcies of local coal companies, and causing immense social distress and political tension. Or the Government can use the existing budget subsidies to provide an adequate social safety net for those who agree to leave the coal industry.*** This report suggests ways to implement the second of these options.
2. Over the last 20-30 years, the coal industry world-wide has been through a long and painful period of restructuring. Employment in the coal industry has fallen by more than 75% in countries such as Belgium, France, Germany and the U.K., and by more than 50% in the U.S. In Russia, this process of restructuring has yet to begin. The future "viable core" of the Russian coal industry will probably be about two-thirds its current size. And total employment in this viable core could be less than half current levels. Nonetheless, even after restructuring, the Russian coal industry will remain one of the largest in the world.
3. The current situation in the coal industry in Russia is catastrophic. Demand for coal has been falling for several years; yet employment in the coal industry has remained unchanged. Coal prices have been decontrolled; yet subsidies to the coal industry still consume about 1.2% of GDP--second only to agriculture as a burden on the government budget. Subsidies to the coal industry are larger than the industry's total wagebill; yet miners' wages in some basins are being paid 3-6 months in arrears. In short, subsidies are protecting production rather than people. And the way subsidies are used is blocking rather than assisting the process of restructuring.
4. Restructuring of the coal industry in Russia will take place in an economic context that is radically different from that of other countries. Virtually all industrial sectors in Russia face the prospect of major restructuring. Most industrial sectors do not have access to large government subsidies to support this process. The coal industry is therefore receiving special treatment. The Government has already started to reduce coal subsidies in real terms. The longer restructuring takes, the greater the burden on the government budget. Given the many urgent demands on the budget, it would be desirable to limit the phase-out period to no more than 3-5 years. The challenge facing the Government and the coal industry is to ensure that the declining subsidies are used efficiently--and in a way that minimizes hardship in coal communities affected by employment reduction.

5. The goal of restructuring is to adapt to the new market environment. This environment varies greatly from one coal basin to another, particularly now that rail freight costs are a significant part of the delivered cost to the coal consumer. ***The Government's strategy for restructuring should be decentralized.*** The key actors should be the local mining companies and the local governments in those areas. The management team of each local mining company must have the freedom to set its own selling prices and to negotiate wages, benefits, implementation of severance packages and mine closures directly with their employees. This will require radical labor market reforms.
6. Local mining companies should work together with their local government agencies, coal labor unions and community representatives--using external assistance where necessary--to prepare their own restructuring programs and related social programs. Formal *Social Assessments* may be a useful way to determine what people in mining communities really need or want. The Federal Government should review the corresponding expenditure proposals, then develop regional guidelines which determine how much of the declining subsidies can be used to cofinance the proposed costs of severance, mine closures and social programs. It may be necessary to create a special group within the Federal Government to administer the cofinancing program.
7. ***Employment reduction, with or without mine closures, should not take place until an adequate social safety net is in place and fully funded.*** Equally important, the process by which the necessary employment reductions are handled--by local mining companies and by local employment and social protection agencies--is as crucial to its success as the overall size of the adjustment. Ill prepared and badly managed mass layoffs will worsen the problem of long-duration unemployment, damage the social fabric and delay economic recovery in coal producing regions.
8. The impact of restructuring on employment will vary greatly across the coal basins. In the Kemerovo oblast (the Kuzbass) and the Komi Republic (the Pechora basin), the likely employment reductions are very large in relation to total employment in these regions. As an additional element of the social safety net, the Government should consider setting up transitional programs of employment creation in these regions. These might include environmental restoration of mining areas and rehabilitation of infrastructure in mining communities. However, ***the Government should also take all possible steps to promote labor mobility between regions.***
9. The remainder of the Executive Summary lists the key findings and recommendations relating to: (a) price decontrol; (b) subsidies & wages; (c) transport costs; (d) coal industry strategy; (e) employment reduction; (f) the social safety net; (g) housing; (h) safety, health & environment; and (i) next steps and targets.

Price Decontrol

1. In July 1993, the Government removed formal controls on coal prices. This was a courageous and necessary first step towards restructuring the coal industry. However, the anticipated benefits of price decontrol in stimulating competition, promoting better cost control and efficiency, and initiating the restructuring of the industry have been undermined by the perverse incentives created by the subsidy system. These benefits will not be realized until the Government introduces a credible program to phase out coal subsidies.
2. In principle, the new coal mining companies (former coal mining associations) are now free to set their own ex-mine coal prices. The resulting market prices will differ greatly between basins and mining companies because of quality and transport cost differentials. In practice, the national coal company (RosUgol) has a strong influence on coal prices through the allocation of subsidies. This allows the coal industry to maintain a system of cross-subsidies between mining companies, ie, within basins and between basins. These cross-subsidies have allowed mines that are no longer viable under the new coal market conditions--due to high production costs and/or high rail freight costs--to stay in operation.
3. Mining companies which could have increased their ex-mine wholesale prices sharply relative to the average for all coal, because of locational or other advantages, have not done so. Instead, the subsidy system has encouraged them to hold down their prices and rely upon government transfers rather than exposing themselves to the uncertainties of market competition.
4. The coal industry's total costs of production have barely changed since 1991, despite the large fall in output. In most coal basins, there was a sharp increase in real average operating costs per tonne from 1993 Q2 to 1993 Q3 following the decontrol of prices. The driving force behind cost increases in 1993 was wages, especially the component linked to the Tariff (or collective bargaining) Agreements whose cost is covered by specific subsidies.

Subsidies and Wages

1. As a percentage of GDP, the fiscal burden of Federal Government coal subsidies rose from 1.0% in 1991 and 1.1% in 1992 to 1.4% in 1993. These subsidy levels are clearly unsustainable. The subsidies are also higher than necessary. In 1993, for example, the coal industry had access to a cash surplus of about 900 billion rubles after receiving subsidies. This surplus amounted to slightly over one-half of the total subsidies paid during the year.
2. According to the federal budget approved in June 1994, coal subsidies will be approximately 20% lower in real terms (taking inflation into account) than in 1993. A transition towards lower subsidies therefore has already begun. The main problem now is how to complete the phase-out of coal subsidies without causing unnecessary hardship.
3. ***The subsidies are not achieving their purpose, which is to protect people during a difficult transition. Instead, the subsidies are being used to protect production.*** In 1993, the coal industry allocated 35% of subsidies to wages, 16% to social services, and 49% to operating losses and investment. Subsidies actually delivered to the coal industry amounted to 227,000 rubles per worker per month. This is more than enough to pay not only the costs of social services in mining communities, but also the entire wage bill of the coal industry--145,000 rubles per worker per month in 1993--including all the provisions of the Tariff Agreements. Instead, wage payments have been up to 3-6 months in arrears in some basins.
4. Nearly one-half of total subsidies in 1993 were allocated for price supports (to cover operating losses) and investment. Allocating subsidies in this way leads to unnecessary expenditure on materials and other non-labor operating costs to produce coal that has no market. These subsidies encourage mining companies to sell coal at prices which are well below the marginal costs of production, which depresses prices and profits for the low-cost, potentially profitable part of the coal industry.

Recent Trends

million tce	1990	1992	1993 est.	1997 proj.
<u>Steam Coal</u>				
consumption	203	187	174	117
electric power	111	96	88	58
other	92	91	86	59
exports	16	14	12	6
imports	22	29	23	10
sales	199	172	163	112
<u>Coking Coal</u>				
consumption	46	45	40	29
exports	19	10	11	12
imports	7	6	4	4
sales	58	49	47	37
<u>All Coal</u>				
consumption	250	232	214	146
exports	35	24	23	18
imports	29	35	27	14
sales	256	221	210	150
<i>memo</i>				
total sales				
in millions of tonnes:	369	320	304	217

Comments:

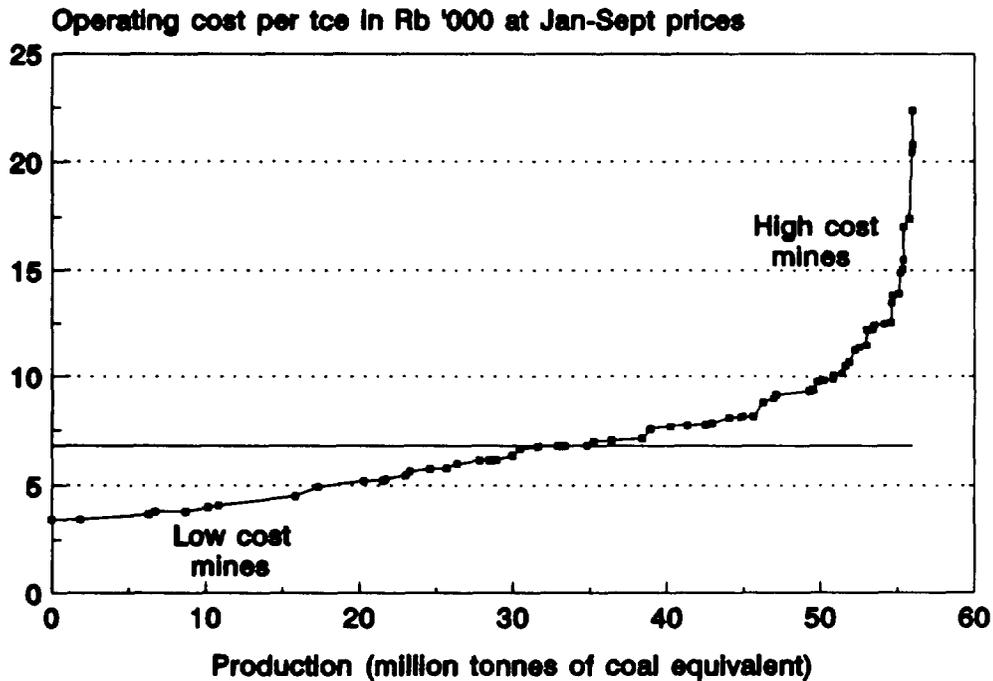
- consumption of steam coal by its largest customer--the electric power and heat supply industry--has declined and will not recover over the medium term
- consumption of coking coal by its largest customer--the steel industry--has declined and will continue to decline over the medium term
- exports and imports play a small role in the overall coal market in Russia but will remain locally important in some areas

Transport Costs and the Coal Market

1. The development of the coal industry in Russia before 1990 took little account of the basic facts of economic geography because transport costs were heavily subsidized or ignored altogether. However, the situation has completely changed as a result of large real increases in rail freight rates during 1992 and 1993. As a result, differences in transport costs are at least as important as differences in production costs in determining the competitiveness and potential profitability of production at different mines. Coal basins that are close to their customers will now have the opportunity to take a much larger share--of a shrinking coal market--than basins that are further away.
2. In Russia, as in many other countries, the relationship between the railways and the coal industry is a difficult one. The railways have substantial monopoly power in the transport of coal, which allows them to set tariffs above long run marginal costs. On the other hand, coal accounts for 25% of total rail freight, which gives the coal industry considerable bargaining power in negotiating contracts with individual railway lines. Careful analysis suggests that by late 1993 freight rates for coal in Russia exceeded the economic costs (long run marginal cost) of moving coal. The railways appear to have used their monopoly power to earn revenues from the transport of coal which were being used to subsidize their passenger operations. This suggests that a regulatory body is required to supervise the setting of freight and other tariffs by the railways.
3. Scenarios of market competition between coal basins and mining companies have been examined for a range of freight tariffs spanning the estimated economic cost of coal transport in mid-1993. The results suggest large potential differences between various coal basins. For example:
 - The largest basin, the *Kuzbass*, would face a fall in output of about 50% over a wide range of freight rates because of its distance from many of its main markets.
 - The *Donbass* is well-located relative to most other coal basins and enjoys a high degree of "natural protection" at all but the lowest freight rates, so that its decline in output is likely to be relatively small.
 - The competitive position of the small *Moscow/Tula* basin is very sensitive to the level of rail freight rates because its production costs are very high and the quality of its coal is poor. These factors offset the benefits of being located close to the main purchasers of its coal unless freight rates are moderately high.

Coal Industry Strategy

Cost curve for thermal coal production in the Kuzbass



The horizontal line shows the projected competitive market price for the low freight tariff scenario.

1. If prices are allowed to adjust to competitive market levels in each coal basin, about two-thirds of total capacity should become profitable over the medium term. The remaining one-third has very little chance of ever being profitable and therefore should close. These proportions will vary widely from basin to basin. In most basins, the lowest cost one-third of capacity will be clearly viable, while the profitability of the mines in the middle of the cost curve will depend on how successfully these mines compete with other basins for the long-distance part of their market. As an indication of the likely outcome in the most important coal basin, the figure above shows the cost curve for the Kuzbass. The horizontal line shows the projected market price for coal under the low freight tariff scenario.

2. Within each basin, reductions in output and capacity *should* start at the mines with the highest operating costs. Mines with high operating costs usually have larger numbers of workers per ton of output. So employment will fall more rapidly than output in most basins. However, productivity improvements in the "competitive core" of low-cost mines will also displace large numbers of workers from the industry. The Bank's analysis suggests that direct employment in coal mining in the new market environment is likely to fall by at least 50% overall.
3. This adjustment will be very unevenly spread across the various coal basins. For the Donbass and the Moscow basin the fall might be no more than 20-30%, whereas under some scenarios the decline in direct employment might be as high as 70-75% for the Kuzbass and the Pechora basin. ***The most difficult situation will be in the Kuzbass, where total employment could fall from about 300,000 to 70-80,000 workers at the end of the restructuring period.*** About half the total reduction in employment in the Russian coal industry will occur in the Kuzbass. These estimates of the potential scale of the adjustment in employment are not sensitive to the exact size of the coal market in the next 5-10 years, so that there is no reason to postpone the process of adjustment.
4. The coal industry needs a bold strategy that will adapt the industry to the new market conditions and the inevitable phase-out of subsidies--and deliver visible results within 1-2 years. During this first phase of restructuring, ***the Government and the coal industry should focus almost all of their attention on the two extremes of the cost curves:***
 - the *management teams* of the newly independent mining companies should start to re-build their companies around a core of unsubsidized, low-cost, profitable mines (ie, in the bottom part of the cost curves);
 - the *Government*--eg, via the Inter-Ministerial Coal Commission--should directly administer a declining amount of subsidies--assisting the mining companies to reduce capacity and employment, including mine closures where necessary (ie, mines in the top part of the cost curves).
5. In general, the slower the restructuring program, the more it will cost the Federal budget. Experience in Western Europe suggests that the Government should try to concentrate most of its budget support for coal restructuring into a period of five years or less.
6. The restructuring process cannot be planned entirely in advance. The Government needs a strategy for the overall process and a detailed program for the first 1-2 years. The initial program should test a variety of mechanisms and provide experience for implementing a decentralized program which takes account of differing needs and circumstances.

Employment Reduction

1. Since employment will decline in all coal basins, the initial focus of the adjustment program should be on reducing total employment without significant geographical differentiation. Once a target of a 25-30% reduction has been achieved in each basin, the emphasis should shift to regional programs with most of the resources allocated to the Kuzbass and Pechora basins. These programs should include measures to promote mobility out of the hardest-hit areas to areas with better mining or other economic prospects.
2. The age structure of employment in the Russian coal industry makes it a little easier to design an employment reduction scheme. If all employees in the 45-and-over age group were to leave the coal industry, total employment would already fall by 30-35%. This would be a major step towards the forecast employment reduction target of about 50%. While the number of new recruits to the coal industry is not high--probably less than 3% each year--we would also recommend that most recruitment cease immediately.
3. More than 20% of the employees of the coal industry are over the age of 50--the most common retirement age for men in the coal industry--and are therefore receiving both a pension and a wage. The Government should establish the principle that no-one who receives a pension from the coal industry can also be employed in the coal industry. However, pensioners could seek employment outside the coal industry. And, since coal industry pensioners believe their pensions are inadequate, the Government may also decide to give them small, once-only payments to compensate for the unexpected loss of an "entitlement".
4. ***Voluntary programs are the key to minimizing hardship in the employment reduction program.*** An offer of special, once-only payments would induce many workers in the 45-50 age range, who account for approximately 10% of the coal industry's labor force, to opt for early retirement. In the longer term, as the focus switches to regional programs, voluntary severance programs should be extended to cover all workers. The terms and conditions of such programs will have to differ between regions and companies to reflect the differences in the employment adjustment that is required and differences in general economic prospects.
5. ***The new mining companies must take full responsibility for their own wage bills without relying upon wage subsidies.*** This implies that each company should negotiate their employment levels and wages directly with their employees rather than following a national Tariff Agreement. The level of wages in each coal basin will be determined by what each mining company can afford to pay. In some of the less profitable mining companies, the wage premium in the coal industry relative to wages in other industries will fall. This decline will make it more attractive for miners in these regions to accept special payments to leave the coal industry. This mechanism is crucial to the success of the employment reduction program.

Social Safety Net

1. Employment reduction in the coal industry cannot start until there is an adequate and fully funded social safety net in place for miners, other coal industry workers, and their families. This social safety net should include the following elements:
 - the existing system of social security benefits and unemployment benefits available throughout Russia;
 - the existing (or at least an adequate) level of social services in mining communities--with special attention to likely financing problems in areas where mines are reducing employment or closing down;
 - the existing system of coal industry pensions--which are typically higher than in other industries;
 - a new and temporary system of special lump-sum payments--designed to persuade coal industry employees to leave the industry, voluntarily where possible (see facing page);
 - a new and temporary system of special employment programs in the mining regions hardest hit by unemployment caused by restructuring.
2. ***Social Services.*** About 5% of the total subsidy paid to the coal industry in 1993 went to social services, such as clinics, kindergartens, schools, etc. As soon as possible, the Ministry of Finance should start making these payments directly to oblast or local governments. At the same time, the mining companies should transfer the corresponding social assets and staff to oblast or local governments. This process has already started in some localities. It is particularly important to ensure that the necessary federal-regional/local fiscal transfers take place without delay in Kemerovo, the Komi Republic and Rostov.
3. ***Special Employment Programs.*** For the Komi Republic (the Pechora coal basin) and the Kemerovo oblast (the Kuzbass), the projected employment reductions in the coal industry are very large in relation to total employment in these regions. In principle, many of the workers leaving the coal industry could use their special payments to move to other regions. In practice, miners in all countries are less mobile than other social groups. And in Russia there are many additional obstacles to moving, such as lack of housing in the regions to which they wish to move. In recognition of the acute social tensions that are likely to arise, the Government could consider setting up temporary special employment programs in the worst hit coal basins. These might include environmental restoration of mining areas and rehabilitation of infrastructure. However, it will be important to avoid large infrastructure investments in localities with poor economic prospects.
4. ***From 1996 onwards, all subsidies budgeted for the coal industry should be directed to: social services, special lump-sum payments, and special employment programs.***

Housing

1. In 1993, about 50% of the total Social Subsidy for the coal industry--175 billion rubles--was spent on housing maintenance. This is a key element in the wages in-kind paid to those working in the coal industry. The entitlement to free housing maintenance is built into the coal industry Tariff Agreements. At the same time, a significant proportion of the housing owned by the coal industry is occupied by households which contain neither coal workers nor those retired from the industry. The provision of subsidized housing is a distraction for the management of coal companies. It also limits the willingness of households to move and to accept special payments to leave the coal industry.
2. Those living in housing owned by the coal industry should take full responsibility for the cost of housing maintenance. Since this will involve the loss of an entitlement under the Tariff Agreements, it will be necessary for the new coal mining companies to take any such reduction in wages in-kind into account when negotiating local wage agreements with their employees.
3. The best way to organize this transfer would be to give all such housing to its current occupants, either individually or through condominium associations. A second best solution would be to transfer all housing assets from the new mining companies to local governments. In either case, oblast or local governments may wish to provide transitional assistance, phased out over 3-4 years, so that maintenance costs/charges or rents rise gradually to cover true costs.

Safety, Health & Environment

1. Worker health and safety in the coal industry have deteriorated in recent years. The main causes are shortages of funds for maintenance and investment, as well as deteriorating motivation and discipline, particularly in underground operations. The only way to reverse this trend is to create a healthy, profitable coal industry that generates enough revenue to resolve these problems. Closing old, worked-out mines will reduce the accident rate. In newer mines, re-investing profits in improved productivity will also improve worker health and safety.
2. In addition to the "occupational" impacts of coal mining on miners' health and safety, there are significant "environmental" impacts on the local populations where coal is burned as a fuel. In particular, mining communities burn large amounts of coal, often in open hearths or in small boilers. This form of combustion typically releases particulates from low stacks where they become a major source of respiratory problems. Also, SO_x and NO_x releases from coal combustion cause major problems for human health and the environment in general. As coal consuming communities in Russia demand progressively better enforcement of ambient air quality standards, the coal market will pay higher prices for coals with lower ash and sulfur contents. The future profitability of individual mining companies will depend to a large extent on how actively they adapt the quality of their output to these environmental concerns.
3. ***Better mining practices are the key to better health, safety and environmental performance in the mining industry.*** In operating mines, proper mine planning and good operational practices can dramatically improve mine safety and reduce environmental damage for relatively small expenditures. In addition, such measures will help to reduce mine operating costs. For mines that are already closed, the Government will have to take the lead in deciding priorities for dealing with disturbed lands, spoil heaps and water contamination--and for finding suitable financing mechanisms.

Lessons from Western Europe

Over the last 30 years the output of the British coal industry has fallen from about 200 million tonnes per year to 81 million tonnes in 1993, while total employment in the industry fell from 490,000 to 30,000 in September 1993. Much of this contraction occurred in the period from 1981 to 1993 which saw the closure of 189 (out of 211 in 1981) underground mines and 255,000 workers (out of 285,000 in 1981) leave the industry. During this period the industry received over US \$32 billion in grants and other government assistance, nearly 75% of which was allocated to cover the operating cost of British Coal while less than 12% was used to cover the cost of severance and early retirement payments to workers leaving the industry -- equivalent to an average of one year's wages per worker laid off.

During this adjustment the industry engaged in an expensive and ultimately vain effort to increase productivity and competitiveness by maintaining a high level of investment. Capital expenditures amounted to more than US \$15 billion over 1981-93. Most of this had to be written off as mines, even quite new ones, were closed as it became clear that few underground mines, even after heavy investment, could compete with imported coal from Australia, the USA and South Africa. Indeed, the level of closures and write-offs would have been even higher if it had not been for special arrangements which ensured that the power generating companies maintained their purchases of coal from British Coal. It is widely expected that total output of coal will fall to less than 40 million tonnes in 1998 when the coal market is fully liberalized.

The West German coal industry has experienced a similar decline in coal production over the last 30 years, but employment has fallen less dramatically than in Britain -- from 400,000 to 90,000 -- though the number of mines has been reduced from 139 to 17. Both the decline in production and in employment have been slowed by measures which ensure a minimum size of market for German coal output, despite production costs of \$150 per tonne which are three times as high as the cost of imported coal. The key protection is provided by legislation which ensures that (a) electricity utilities purchase 45 million tonnes per year of domestic coal at prices which cover production costs, and (b) steel plants purchase all their coal from domestic mines with a government subsidy making up the difference between domestic costs and world market prices.

The cost of these measures has been borne largely by German electricity consumers. They pay a special levy -- averaging 7.5% in 1993 -- added to electricity tariffs to cover a part of the additional expenses involved in burning domestic coal rather than cheaper fuels. There are also hidden costs of environmental controls required because the utilities were not permitted to switch to gas for power generation. As a result, electricity prices for industrial consumers in Germany are among the highest in Western Europe and are 50% or more higher than those in neighboring countries such as Denmark, France and Netherlands. Electricity-intensive industries have, as a result, tended to move out of Germany to relocate where electricity prices are more favorable.

As a counter-example, the French experience shows that downsizing the coal industry can be managed at a lower cost by concentrating budget support on severance pay, job creation, and mine closures. West European experience therefore suggests that attempts to slow the decline of the Russian coal industry either by providing government finance for heavy investment expenditures or by guaranteeing sales of coal to power companies at above-market prices would be very costly to the budget and the economy as a whole, and in the end would not prevent a fall in the number of underground mines and in employment in the industry. The additional costs of power production would increase the locational (and other) problems faced by heavy industrial plants in Siberia and the Urals, accelerating their decline, and raising overall levels of unemployment in these regions.

Next Steps

Launch restructuring process as soon as possible...

- 1. progressively reduce subsidies (see Targets: facing page)--and make subsidy payments directly from the Ministry of Finance to local mining companies and local governments**
 - 2. re-target remaining subsidies to special payments, the social safety net, and mine closures (below)**
 - 3. offer small special payments to workers on pensions (50-and-above age group)--to leave the coal industry**
 - 4. offer larger special payments to workers in the 45-50 age group to leave the coal industry--then extend the offer to all workers on a regional or company by company basis**
 - 5. stop recruitment to the coal industry--and, where necessary, relocate miners with special skills from high-cost to low cost mines**
 - 6. transfer social services from mining companies to oblast or local governments--and provide adequate funding**
 - 7. create transitional special programs in areas where unemployment is expected to be high--particularly Komi Republic and Kemerovo oblast**
 - 8. in low-cost mines:
mining companies should re-invest profits to improve productivity, coal quality and environmental performance**
 - 9. in high cost mines:
reduce production capacity to the most efficient faces or, where necessary, cease production (see Targets: next page)--with adequate funding for environmental restoration**
-

Targets: 1994-96

Set initial targets for 1994-96 and test alternative ways to proceed...

1. set employment reduction targets, eg:
 - by end-1995: all pensioners leave coal industry payroll
 - by end-1996: 50% of 45-50 age group leave coal industry payroll

 2. set mine closure targets, eg:
 - by end-1995: close at least 10 unviable mines
 - 1995-2000: close 15-25 unviable mines each year

 3. set subsidy reduction targets, eg:
 - reduce total coal-related subsidies (as % of GDP) according to an agreed schedule, eg: 1.3% in 1994; 1.0% in 1995; 0.6% in 1996; 0.3% in 1997; and zero in 1998
 - after 1994: abolish subsidies for operating losses and investment
 - in 1995: provide transitional subsidies for
 - wages/employment in mines in oblasts where mining employment accounts for more than 5% of total employment
 - social services and housing maintenance where their transfer has not been completed
 - allocate all remaining subsidies in 1995 and all subsidies from 1996 onwards solely for
 - special payments to workers leaving the industry
 - temporary special programs in mining areas with high levels of unemployment
-

Targets: 1994-96

Comments:

- the pace of adjustment recommended in setting the subsidy targets is a compromise between two targets: improving the Government's fiscal position and reducing excess employment in the mining branch, in both cases as rapidly as possible
- the current level of subsidies could be substantially reduced--by 50% or more--while still protecting the industry's workers and their dependents, so that reallocating a declining level of subsidies should provide ample funding for measures to reduce the social costs of adjustment in the industry
- after an initial period (of no more than 2 years) during which a national program is implemented, the emphasis must shift to decentralized regional programs which are designed to meet appropriate regional targets and whose details reflect local needs and circumstances
- in some countries, special payments have been designed to decline over time--so that coal industry employees have a strong incentive to leave the industry quickly rather than wait
- similarly, the Government should offer to finance mine closure costs for only a limited period--say 1-3 years--after which the mining companies would have to carry these closure costs out of their own cashflow
- in cases where mining companies agree to transfer mines to a government-managed closure program--before the deadline--operations would cease immediately and government funds would be used only for costs directly related to closure, ie, not to cover operating losses
- these adjustments will release resources from inefficient, uncompetitive tail of the industry and will permit a viable and vibrant group of mining companies to emerge--enabling Russian coal to compete both with other sources of energy and in foreign markets

Basic Actions

The Coal Commission noted that the following basic actions, recommended in the draft report, are consistent with the ongoing economic reforms in Russia:

- *the government needs to pay special attention to the social safety net provided for coal industry employees who lose their jobs during restructuring;*
 - *where necessary, the coal industry social safety net should include special employment programs;*
 - *local governments, local coal companies and local coal labor unions should play a major role in the preparation and implementation of coal industry restructuring programs;*
 - *the coal industry restructuring program should include not only restructuring of the local coal companies but also programs for social and economic development of coal producing regions;*
 - *the coal industry restructuring program should be financed by local coal companies with co-financing from federal and local government budgets;*
 - *coal subsidies from federal and local budgets should decrease each year according to a pre-determined but flexible schedule;*
 - *the mechanism by which subsidies are channeled to the coal industry should be improved so that the remaining subsidies provide incentives to move towards the goals of the proposed coal industry restructuring program.*
-

Russian Commentary (Summary)

1. *On September 23, 1994, the Inter-Agency Coal Commission (Inter-Agency Commission on Social and Economic Problems of Coal Producing Regions) of the Russian Federation met to consider the World Bank's draft report on Restructuring the Coal Industry in Russia. The minutes of the meeting noted:*
 - *the areas where the basic actions recommended in the report are consistent with the ongoing economic reforms in Russia;*
 - *five areas where additional work will be needed as next steps towards preparation of a Russian coal industry restructuring program.*

2. *As part of the preparations for the meeting of the Coal Commission, approximately 25 agencies¹ submitted written comments on the World Bank report. These agencies included: the ministries and specialized government agencies represented on the Coal Commission; RosUgol and many of its subsidiary companies; the two coal labor unions; and local government agencies in the coal-producing regions of Kemerovo, Komi, Rostov and Tula.*

3. *The rest of this Executive Summary:*
 - *lists the basic actions adopted by the Coal Commission (facing page);*
 - *very briefly summarizes the Russian written comments in each of the five areas identified by the Coal Commission:*
 - *future coal demand*
 - *mine closures and labor redeployment*
 - *coal subsidy phase-out*
 - *coal labor agreements*
 - *legal framework for restructuring*

^{1/} *Ministry of Economy, Ministry of Finance, Ministry of Social Protection, Ministry of Labor, Ministry of Fuels & Power; Federal Employment Service, State Property Committee, Bankruptcy Committee, Metallurgy Committee; the two coal labor unions; RosUgol, the national coal company; TsNIEUgol coal institute; and several government agencies and coal companies from each of: Kuzbass, Komi Republic, Rostov oblast and Tula oblast.*

Future Coal Demand

1. *Most of the Russian agencies commented on the fact that their own coal consumption forecasts are significantly higher than those of the Bank. In general, Russian agencies forecast stabilization of coal consumption in the near term, followed by increasing coal consumption as GDP recovers:*
 - *In some cases the differences reflect different expectations about future GDP. Russian agencies generally assume a shorter and shallower recession before the economic recovery starts.*
 - *Russian forecasters are also more pessimistic than the Bank about the scope for reducing energy intensity--and therefore coal consumption--in the Russian economy. Russian forecasters assume a relatively slow rate of change of the composition of GDP and of the sectoral composition of consumption and investment. Their focus is therefore mainly on the scope for improving technological efficiency in existing industries and the likely shortage of investment funds for financing new technologies.*
2. *For the same reasons, Russian electricity consumption forecasts are also higher than those of the Bank. Since electricity generation is coal's largest single market, this flows through into the coal consumption forecasts, leading to higher demands for steam coals from basins such as Kansk-Achinsk.*
3. *Many commentators make the case that coal prices cannot be allowed to rise to unsubsidized levels because of the likely impact on manufacturing costs, inflation in general, inter-enterprise arrears and bankruptcies. A related argument is that higher coal prices will only increase the likelihood that the Government will have to subsidize other sectors, ie, there may be no net reduction in the subsidy burden. These arguments in favor of below-cost coal prices are used to support some of the higher Russian coal consumption forecasts.*

- 4.** *The role of foreign trade is also important for total coal demand. Several commentators expect imports of power station coal from Ekibastuz in Kazakhstan to be phased out in favor of domestic coals from Kuzbass and Donbass. There is also a widespread view that the Government has a responsibility to promote coal exports, either by regulating rail freight tariffs or by subsidizing transport of coal for export. On the other hand, there is some concern that the phasing out of coal subsidies will drive up domestic coal prices to the point where foreign coal suppliers may be able to displace local coals, particularly in coastal areas such as the Far East.*
- 5.** *In some cases the Russian forecasts are targets for coal production rather than forecasts of coal consumption. For example, the Ministry of Finance notes that the Government's objective is to stabilize coal production and then to increase it. In these cases, there is an assumption--either explicit or implicit--that the Government will intervene in the energy market to protect coal from competition from oil or natural gas. The two main justifications for such an intervention are to enhance national security (ie, to achieve a more diverse fuel supply within Russia) and to increase export revenue (ie, by switching oil and gas from the domestic market to export).*
- 6.** *In addition to the comments on total coal demand, there are also comments on the likely competitive position of individual basins. There is a widespread view that Pechora will retain its market for power station steam coals and that the Kuzbass will retain a large part of its long-distance coal sales.*

Mine Closures & Labor Redeployment

1. *As a result of their commitment to higher coal consumption forecasts, most Russian agencies foresee fewer mines becoming unprofitable under unsubsidized market conditions than indicated in the Bank forecasts. Perhaps more importantly, Russian agencies are of the view that an unprofitable mine can only be closed if the Government can pay for the physical costs of mine closure, the costs of creating guaranteed replacement jobs for all displaced workers and, where necessary, the costs of re-locating communities and building new housing and social facilities. For this reason, these commentators see the rate of mine closures as being determined by the cost of closures--which is largely unknown at present²--and the availability of government subsidies for this purpose.*
2. *The Ministry of Economy also makes a case for maintaining a reserve production capacity of 25% above current production requirements. As a related point, the Ministry of Fuels & Power notes that premature mine closures will involve a difficult choice between very costly mothballing of mines currently under construction or a permanent loss of valuable coal reserves.*
3. *RosUgol's comments emphasize the fact that restructuring is already underway, albeit at a pace that is considered appropriate for the current conditions in Russia. Coal industry employment was reduced by 72,300 over the last 18 months (1993 and first half 1994); the proportion of miners in the total coal industry workforce has risen from 41% to 46.5% over the same period; and local mining companies have started to divest their social facilities to local governments. RosUgol has also diversified its investment activities to create 2,500 new, non-mining jobs in 1993 and has plans to create a further 5,000 in 1994.*

^{2/} *the Ministry of Fuels & Power suggests a cost of 100-120 billion rubles in mid-1994 prices (50-60 million USD) per mine closure under Kuzbass conditions*

4. *In the short term, the Federal Employment Service (FES) is gearing up to cope with a government directive to close 34 mines in the second half of 1994, with an estimated loss of 28,000 jobs. The FES believes that local government services in Rostov (Donbass), Tula and Chelyabinsk will be able to provide adequate services with their own resources. However, Komi (Pechora basin) and Kemerovo (Kuzbass) will need additional resources from the Federal Government.*
5. *For the longer term, RosUgol suggests that it may be possible to close 100 unprofitable mines by the year 2000, with a corresponding loss of 254,000 jobs. These targets can be compared with the Bank forecast that somewhere between 135 and 155 mines will become unprofitable after subsidies have been phased out, and that employment in these mines is in the range 425-476,000.*
6. *However, mine closures will not be the only cause of job losses. For example, comments from Kuzbassrazrezugol, a company which operates low-cost surface mines in the Kuzbass, confirm that they plan to continue expanding their output while simultaneously reducing their labor force. The company therefore will be well placed to compete profitably with other coal producers in the Kuzbass.*
7. *All Russian commentators emphasize the need for redundancy programs to be well planned and adequately funded, particularly in the areas of job creation and re-location. Most commentators, including the coal labor unions, insist that the Government provide guaranteed alternative employment for redundant miners. A few, mainly the Ministry of Labor, accept the principle of voluntary departures with severance payments.*
8. *Comments from the Tula region present a slightly different perspective, reflecting the fact that, unlike other basins, Tula already has the experience of closing a number of mines. The authorities in Tula underline the need for truly local "transition programs" that are well coordinated with other local institutions, especially housing and community services. The Tula authorities volunteered to participate in any pilot program of mine closures.*

Coal Subsidy Phase-Out

1. *Virtually all Russian agencies agree that the transition to a market-based coal industry needs to take place over a longer period than the 3-5 years suggested by the Bank. Many respondents refer to the fact that the British, French and German coal industries have taken several decades to restructure at a cost of tens of billions of dollars--and under economic conditions that were much less difficult than the current conditions in Russia:*
 - *The Ministry of Social Protection notes that the World Bank scenarios imply an 8-9% annual decline in coal industry employment in Russia, compared with only 2-3% annual decline in France and Germany on average during the restructuring period.*
 - *RosUgol notes that subsidies per ton in 1993 were \$70 in Germany and \$98 in France, compared with \$5 in Russia in 1993, rising to \$9 in 1994.*
2. *The Russian commentaries indicate a broad consensus, which includes the Ministry of Finance, that the first step should be to change the structure of the subsidies rather than to reduce the level. Most agencies agree that subsidies should be used primarily for costs associated with labor redeployment and mine closures. However, some agencies continue to advocate investment in mine modernization.*
3. *While most agencies believe it would be impossible to phase out coal subsidies completely in three or even five years, RosUgol suggests that an annual subsidy reduction of 15% in real terms might be a feasible target.³ However, they caution that even this rate of subsidy reduction will lead to very large increases in coal prices. These price increases will cause great hardship, particularly in regions where coal from distant basins is the only available source of fuel. RosUgol recommends a separate coal transport subsidy for these regions. The Ministry of Finance notes that decisions about increasing, maintaining or reducing coal subsidies will set a precedent for other restructuring industries in Russia. These decisions will therefore have a significant, long term impact on the government budget.*

^{3/} *RosUgol prefers the annual subsidy reduction target to be expressed in "real" terms rather than as a percentage of GDP, since GDP itself may continue to decline over the next few years*

Coal Labor Agreements

1. *The coal labor unions fear that any changes to the present system of labor agreements (so-called Tariff Agreements) in the coal industry would allow the local companies to shift all the costs of restructuring onto the employees. Other commentators also express concerns about the implications of changing the Tariff Agreements.*
2. *The Ministry of Labor supports the general principle that local coal companies should be "self-sufficient" in terms of labor costs, ie, that they should decide what total wagebill they can afford to pay out of an unsubsidized cashflow. However, their comments do not draw any conclusions about how to adapt the Tariff Agreements to reflect this principle.*

Legal Framework for Restructuring

1. *The Russian comments indicate a general consensus that decentralization to the local level will be a key part of the restructuring process. However, there are differing views about the role of Moscow agencies in the supervision of the process.*
2. *RosUgol supports the view that "regional" coal companies should be strong and independent with full control over all functions from production through to marketing. As soon as market conditions permit, these companies should secure as large a part of their sales as possible in the form of long term contracts with their largest customers. The State Property Committee (GKI) also supports decentralization, provided it does not lead to a single monopoly coal company in each coal basin. In GKI's view, the companies would therefore be more "local" (within a basin) than "regional" (covering a whole basin). RosUgol and GKI both recommend legal changes to support their conceptions of decentralization.*
3. *Several agencies, including RosUgol, note that coal restructuring in other countries has generally been implemented under the aegis of a unified national coal company--such as British Coal, Ruhr Kohle or Charbonnages de France. The US experience is the most obvious exception. RosUgol believes that they (RosUgol) are well placed to play a similar role in the restructuring of the Russian coal industry.*
4. *Finally, the Ministry of Social Protection notes that implementation of a coal restructuring program involves a large number of mainly social--not sectoral--agencies from several different levels of government. If the program is to succeed, the Government will have to legislate key parts of the program so that these become binding on all levels of government.*

Restructuring the Coal Industry

I. The New Coal Market in Russia

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Demand for Coal Russia - total

1. See Figure 1 *Coal Demand Projections: Reform Scenario* (facing page).

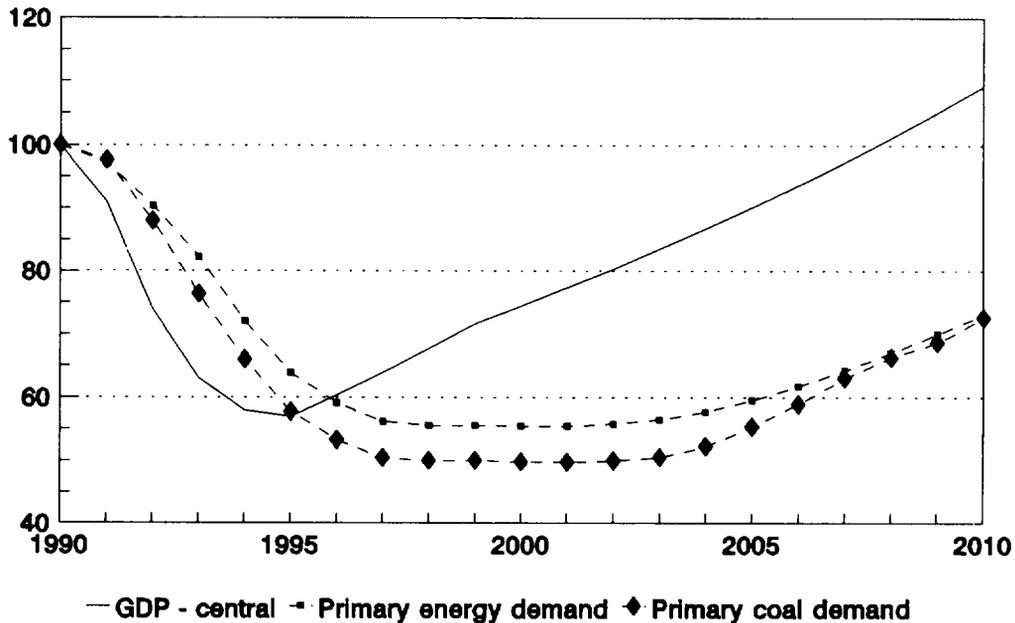
2. **Decline in GDP**
Russia has experienced a very sharp decline in GDP since 1990. The World Bank's central projection is that GDP will bottom out by the end of 1995 at a little less than 60% of its 1990 level. After 1995, growth in per capita income could average 5.5% per year during the initial recovery phase until 2000, with a slightly slower growth rate thereafter. The decline in GDP has been accompanied by a shift from investment towards consumption and this trend is expected to continue. The shift away from investment will further depress industrial demand for energy. The combined impact of these trends is that GDP should recover to 75% of 1990 levels by the year 2000, but with consumption and investment at 80-85% and 50-60% of 1990 levels, respectively. Government projections typically are for a less deep recession with GDP recovering to about 90% of 1990 levels by the year 2000.

3. **Energy prices**
For the period out to 2000, energy demand will be driven mainly by the level and structure of GDP. Adjustment of domestic energy prices, which is assumed to occur by about 1996, will also have some impact on energy demand and on the market shares of different fuels. The impact of energy price rises on overall energy demand will be very limited until broader economic reforms make industrial enterprises sensitive to prices, costs and profits. If these reforms are put into effect quickly (1994-95), energy consumption could fall as low as 56% of 1990 levels by the year 2000. If reforms are delayed until 1995-2000, energy consumption in 2000 could be around 66% of 1990 levels.

Demand for Coal Russia - total

Figure 2

Coal Demand Projections : Reform Scenario (Indices with 1990 = 100)



World Bank estimates

4. Coal's market share

Taking account of experiences in other countries and the restructuring of the Russian economy, it is expected that coal will continue to lose market share to gas and electricity. Coal's share of electricity generation will also decline during the period when electricity consumption is below 1990 levels. For these reasons, coal consumption will fall more rapidly than total energy consumption until 1995 and grow more slowly than total energy during the economic recovery. The World Bank's projection is that coal demand will be about 60% of 1990 levels in 1995 and in the range 50-60%, ie, about 210-250 million tonnes per year by the year 2000--depending on how rapidly the Government implements the reforms needed to make enterprises sensitive to prices.

**Demand for Coal
Russia - total**

1. See Table 1 *Coal Consumption, 1990-1997* (facing page).
2. Consumption of steam coal by its largest customer--the electric power and heat supply industry has declined and will not recover over the medium term.
3. Consumption of coking coal by its largest customer--the steel industry-- has declined and will continue to decline over the medium term.
4. Exports and imports play a small role in the overall coal market in Russia but will remain locally important in some areas.

**Demand for Coal
Russia - total**

**Table 1: Coal Consumption, 1990-1997
(million tce)**

	1990	1992	1993 est.	1997
<u>Steam Coal</u>				
consumption	203	187	174	117
electric power	111	96	88	58
other	92	91	86	59
exports	16	14	12	6
imports	22	29	23	10
sales	199	172	163	112
<u>Coking Coal</u>				
consumption	46	45	40	29
exports	19	10	11	12
imports	7	6	4	4
sales	58	49	47	37
<u>All Coal</u>				
consumption	250	232	214	146
exports	35	24	23	18
imports	29	35	27	14
sales	256	221	210	150
<i>memo</i>				
total sales				
in millions of tonnes:	369	320	304	217

Source: RosUgol and World Bank estimates

Demand for Coal Region by Region

1. See Table 2 *Demand for Coal by Region, 1990-1997* (facing page).

2. The target year (1997) is a "typical" year in the period 1995-2000, during which coal demand will remain relatively "flat". The units are millions of tonnes of coal-equivalent (tce).

3. The regional coal demand scenarios in Table 1 start from 1990 data on consumption of steam coal and coking coal in each of the eleven economic regions:
 - World Bank scenarios for 1997 electricity and heat generation--the largest single component of steam coal demand--were used to estimate the regional pattern of steam coal demand in 1997, after taking into account:
 - likely output of lower-cost, existing hydro and nuclear plants in these regions
 - likely shares of coal, natural gas and fuel oil (mazut) in the remaining electricity and heat generation loads

 - World Bank scenarios for 1997 output of iron and steel were used to estimate the regional pattern of coking coal demand

 - in the regions where coal competes with natural gas--the Urals and European Russia--the scenarios assume that coal consumers will be more sensitive to coal prices (a price elasticity of 10%) than in other regions

Demand for Coal Region by Region

Table 2: Demand for Coal by Region 1990-1997
(million tce)

	1990	of which coking	1997	of which coking
Northwest	3.7		2.2	
North	16.8	7.3	10.0	4.6
Center	22.7	8.3	13.5	5.2
Center-Black Earth	5.4		3.4	
Volga Vyatka	5.5		3.5	
Volga	5.5		3.4	
North Caucasus	12.1		7.5	
Urals	51.6	21.5	30.2	13.6
West Siberia	56.5	8.6	32.5	5.4
East Siberia	44.0		24.3	
Far East/North East	26.6		15.3	5.1
DOMESTIC DEMAND	250.4	45.7	145.5	28.8
Exports	35.0	19.0	18.0	12.0
Imports	29.0	7.0	14.0	4.0
TOTAL DEMAND	256.4	45.7	149.5	28.8

Source: RosUgol (1990) and World Bank estimates (1997).

Competition between Coal Basins Coal Transport Costs

1. The economics of the coal industry within Russia have completely changed as a result of increases in rail freight rates for coal during 1993. According to World Bank estimates, rail freight rates for coal in Russia in late 1993 were already high enough to cover the economic costs of moving coal. Nonetheless, there is a real risk that coal freight rates will continue to move upwards if the Government fails to introduce a suitable regulatory framework for the railways. One of the essential features of this regulatory framework would be to eliminate the present cross-subsidization of passenger traffic by freight traffic.

2. The World Bank used two scenarios for coal rail freight rates to simulate what might happen in a fully de-controlled and competitive coal market in a target year such as 1997:
 - the "low" tariff is below the current tariff (after adjusting for inflation) --so tariffs will only fall to this level if tariff increases fall behind the general rate of inflation
 - the "high" tariff is higher (after adjusting for inflation) than the economic cost of coal rail freight in Russia (World Bank estimates)-- however, coal rail freight tariffs may reach these levels if the railways remain unregulated

3. The "low" and "high" coal rail freight scenario in rubles per tonne-kilometer (Rb/t-km) are, respectively:
 - 3.0 and 5.0 Rb/t-km for greater than 800 km
 - 4.5 and 7.5 Rb/t-km for 400-800 km
 - 6.0 and 10.0 Rb/t-km for less than 400 km

4. These costs are in Jan.-Sept. 1993 rubles:
 - this allows ruble costs to be converted to US dollars at approximately 1000 Rb/US\$
 - so these tariff scenarios are equivalent to about *0.3 to 0.5 US cents per tonne-kilometer for long hauls* (further than 800 km)

Competition between Coal Basins Coal Transport Costs

Table 3: Delivered Coal Prices and Rail Freight, 1997¹

Sample Transactions Market/Coal Basin	(Rb/tce, January- September 1993 prices)		Freight/ Delivered Cost (%)
Center: Steam Coal			
	Minehead	Delivered	
From Moscow/Tula	16,396	19,925	18%
From Donbass	12,003	19,925	40%
From Kuzbass	6,800	19,925	66%
 Center: Coking Coal			
From Pechora	12,205	20,353	40%
From Kuzbass	8,000	20,353	61%

Source: World Bank estimates.
¹ based on "Low" rail freight rate scenario

5. See Table 3 *Delivered Prices and Rail Freight, 1997* (above).

6. Even if rail freight rates for coal remain at the "low" end of the scenario range, the share of rail freight costs in the delivered price of coal will vary greatly when the Russian coal market becomes competitive. For example, for coals delivered to the Center (Moscow) region:
 - from 18% to 66% for steam coals
 - from 40% to 61% for coking coals

Competition between Coal Basins Coal Production Costs

1. We then use Cost Curves to summarize the costs of production in each basin--see Figures 2-10 (in Basin Profiles: pages 46-63, below)

2. Production costs in these curves are:
 - per tonne coal-equivalent (tce)
 - 1992 costs converted to Jan.-Sept. 1993 rubles
 - total *variable operating costs* (see below for definitions)
 - adjusted to reflect the fact that a tce of high quality coal is worth more to the consumer than a tce of low quality coal:
 - anthracite (high efficiency, clean, long flame): premium of 10%
 - low *sulfur* coals (less than 1%): premium of 10%
 - high sulfur coals (greater than 2%): penalty of 10%
 - low *ash* coals (less than 15%): premium of 10%
 - high ash coals (greater than 30%): penalty of 10%

3. These costs *do not include*:
 - any capital costs or financial charges
 - social and similar costs
 - costs involving unpaid debts to suppliers or other third parties
 - costs involving barter with other enterprises

4. These costs *do include*:
 - all wage payments [arrears in wage payments were not large in 1992; also the Tariff Agreements did not play a major role in wage setting until 1993]

5. It is *unclear* whether:
 - costs are recorded at the minemouth or when the coal leaves the coal preparation plant
 - costs are recorded on a cash basis or an accrual basis
 - all costs are consistently recorded without omissions

6. The best interpretation of these costs is that they include most variable costs--and therefore provide a first indication of the *short-run costs* that apply in a period of declining demand and limited investment

Competition between Coal Basins Market Adjustment Scenario

The analysis for the Market Adjustment Scenario proceeds in the following steps:

1. we estimate that demand for coal in the target year 1997 will be about a third less than in 1992--this target year could be almost any year in the period 1995-2000, since demand is projected to be fairly "flat" over the whole period
2. demand for coal in 1997 will be distributed across the economic regions of Russia approximately as in Table 2 (page 37)
3. individual coal basins will have to compete with each other to maintain or increase their share of a smaller market--the basin that can deliver coal of a particular quality at the lowest *delivered* price will win the sales contract
4. for each combination of coal basin and regional market, we estimate *future delivered prices* (ie, prices that would ensure full cost recovery for the companies that produce and deliver the coal) for steam and coking coal, based on:
 - 1992 coal production cost curves (translated into 1993 rubles) for each of the nine major basins
 - a range of rail freight costs: "low" and "high"
5. we then simulate the coal market to estimate the likely range of *coal sales for each basin* in target year 1997
6. we use the 1992 cost and employment curves to estimate a "low" and a "high" case for:
 - the total *employment* in each basin in 1997--and, correspondingly, the number of workers who could become unemployed over the transition period
 - the *number of mines* that could stay in operation in each basin in 1997--and, correspondingly, the number of mines that may have to close over the transition period

Scenario Results, 1997 Coal Output by Basin

See Table 4 *Coal Output by Basin, 1992-1997* (facing page). The scenario results below show 1997 outputs as a percentage of 1992 base year output (showing results of "low" then "high" rail freight tariff scenario):

Pechora 50-62%

- will become the dominant supplier of coking coal to the Center region
- will stop all production of steam coal, regardless of rail freight tariffs

Moscow (Tula) 57-95%

- would be protected by high rail freight tariffs (for sales of low grade steam coal in the Center region) from competition from Donbass and Kuzbass
- is very sensitive to rail freight tariffs and would continue to contract if rail freight tariffs remain at the lower end of the range

Donbass/South 86-93%

- is largely protected by recent rail freight tariff increases and will contract less than most other basins if rail freight tariffs stay inside the range used for the scenarios
- will remain an important supplier of steam coals to regions west of the Urals but will continue to reduce output of coking coal

Urals 49-70%

- will cease production of coking coal and will continue to reduce output of steam coal, regardless of rail freight tariffs
- will also lose some of the local (Urals) market to Kuzbass and Donbass if rail freight tariffs remain at the lower end of the range

Kuzbass 55-49%

- will be the dominant supplier of coking coal only in the Urals and so will have to cut total coking coal output to less than 50% of 1992 levels
- will also lose some of its steam coal sales west of the Urals
- will face the largest reduction of output (about 45 million tce) of any basin
- will not be as sensitive to further changes in rail freight tariffs as other, smaller basins

Kansk-Achinsk 87-69%

- will keep its local minemouth markets at any rail freight tariff
- could remain competitive in long-distance sales--both westwards and eastwards--at the lower end of the rail freight tariffs

East Siberia 87%

- will dramatically increase its share of the local East Siberian market at the expense of coal shipments from other basins into East Siberia

Far East 53-77%

- will supply all demand in the Far East region if rail freight tariffs reach the high end of the range
- will lose some of the local market to Kansk-Achinsk coals if rail freight tariffs remain near the lower end of the range

North East 87-91%

- will slightly reduce its output of steam coals to match lower demand for steam coal in the region

Table 4: Coal Output by Basin
(million tce)

BASIN	1992 Base		1997 Low Freight Tariff Scenario		1997 High Freight Tariff Scenario	
	All Coal	of which, coking	All Coal	of which, coking	All Coal	of which, coking
Pechora/North	17.8	12.5	8.8	8.8	11.1	11.1
<i>% 1992 Base</i>	<i>100%</i>		<i>49%</i>		<i>62%</i>	
Moscow/(Tula)	3.1		1.8		3.0	
<i>% 1992 Base</i>	<i>100%</i>		<i>58%</i>		<i>97%</i>	
Donbass/South	17.5	1.4	15.0	0.4	16.3	0.7
<i>% 1992 Base</i>	<i>100%</i>		<i>86%</i>		<i>93%</i>	
Urals	9.3	0.7	4.5		6.5	
<i>% 1992 Base</i>	<i>100%</i>		<i>48%</i>		<i>70%</i>	
Kuzbass	96.2	40.3	52.8	19.7	47.4	17.7
<i>% 1992 Base</i>	<i>100%</i>		<i>55%</i>		<i>49%</i>	
Kansk-Achinsk	28.7		25.0		19.8	
<i>% 1992 Base</i>	<i>100%</i>		<i>87%</i>		<i>69%</i>	
East Siberia	18.5		16.1		16.1	
<i>% 1992 Base</i>	<i>100%</i>		<i>87%</i>		<i>87%</i>	
Far East	10.7	0.2	5.7		8.2	
<i>% 1992 Base</i>	<i>100%</i>		<i>53%</i>		<i>77%</i>	
North East	13.3	5.1	11.6	5.1	12.1	5.1
<i>% 1992 Base</i>	<i>100%</i>		<i>87%</i>		<i>91%</i>	
TOTAL	215.1	60.2	141.3	34.0	140.5	34.6
<i>% 1992 Base</i>	<i>100%</i>		<i>65%</i>		<i>65%</i>	

Source: RosUgol (1992) and World Bank estimates (1997).

Main assumptions:

- the new joint stock Mining Companies will set delivered prices that ensure full recovery of variable costs, mine by mine, and full recovery of total costs for the companies that transport and deliver the coal
- coal consuming regions will purchase the coals that meet their quality specifications at the lowest delivered cost
- coal rail freight tariffs will lie somewhere in the range from "low" to "high"
- the difference between total output in Table 4 and total demand in Table 2 reflects the exclusion of all trade except for exports of 5.1 mtce of coking coal from the North East and imports of 10 mtce of steam coal to the Urals (from Ekibastuz)
- differences between total output for the two freight tariff scenarios reflect the impact of freight tariffs on delivered prices and thus the demand for coal in 1997

Scenario Results, 1997 Employment

See Table 5 *Number of Mines and Employment, 1992-1997* (facing page). The scenario results below show 1997 employment as a percentage of 1992 base year employment (showing results of "low" then "high" rail freight tariff scenario):

Pechora 30-45%

- would reduce the number of mines from 18 mines to 5-7 mines, depending on freight tariffs
- would reduce employment from 70,400 to 21-32,000
- would be responsible for 9-10% of total employment reduction in the coal industry

Moscow (Tula) 34-80%

- would reduce the number of mines from 22 mines to 9-19 mines, depending on freight tariffs
- would reduce employment from 41,000 to 14-33,000
- would be responsible for 2-6% of total employment reduction in the coal industry

Donbass/South 71-82%

- would reduce the number of mines from 42 mines to 28-33 mines, depending on freight tariffs
- would reduce employment from 135,400 to 97-111,000
- would be responsible for 6-8% of total employment reduction in the coal industry

Urals 20-34%

- would reduce the number of mines from 33 mines to 7-13 mines, depending on freight tariffs
- would reduce employment from 79,400 to 16-27,000
- would be responsible for 12-13% of total employment reduction in the coal industry

Kuzbass 28-24%

- would reduce the number of mines from 91 mines to 33-40 mines, depending on freight tariffs
- would reduce employment from 296,300 to 72-83,000
- would be responsible for 45-53% of total employment reduction in the coal industry

Kansk-Achinsk 50-30%

- would reduce the number of mines from 9 mines to 2-4 mines, depending on freight tariffs
- would reduce employment from 25,500 to 8-13,000
- would be responsible for 3-4% of total employment reduction in the coal industry

East Siberia 59-46%

- would reduce the number of mines from 12 mines to 7-8 mines, depending on freight tariffs
- would reduce employment from 24,400 to 11-14,000
- would be responsible for 2-3% of total employment reduction in the coal industry

Far East 26-48%

- would reduce the number of mines from 36 mines to 12-18 mines, depending on freight tariffs
- would reduce employment from 63,100 to 17-31,000
- would be responsible for 8-10% of total employment reduction in the coal industry

North East 46-52%

- would reduce the number of mines from 10 mines to 5-6 mines, depending on freight tariffs
- would reduce employment from 27,100 to 13-14,000
- would be responsible for about 3% of total employment reduction in the coal industry

Scenario Results, 1997 Employment

Table 5: Number of Mines and Employment Levels by Basin
Employment in '000s

BASIN	1992 Base		1997 Low Freight Tariff Scenario		1997 High Freight Tariff Scenario	
	Number of Mines	Direct Employment	Number of Mines	Direct Employment	Number of Mines	Direct Employment
Pechora/North	18	70	5	21	7	32
Moscow/(Tula)	22	41	9	14	19	33
Donbass/South	42	135	28	97	33	111
Urals	33	79	7	16	13	27
Kuzbass	91	296	40	83	33	72
Kansk-Achinsk	9	26	4	13	2	8
East Siberia	12	24	8	14	7	11
Far East	36	63	12	17	18	31
North East	10	27	5	13	6	14
TOTAL	273	763	118	287	138	338

Note: Mines with low employment per tonne of output (ie, mines with high labor productivity)--often surface mines--tend to be further away from their consumers than higher-cost mines. As a result, total employment is much lower under the Low rail freight cost scenario than under the High rail freight cost scenario.

Direct Employment

- corresponds approximately with Personnel of Industrial Enterprises in the coal industry
- *includes* Non-Industrial Personnel (of industrial enterprises), such as kindergarten, housing, agricultural and "other" personnel
- *excludes* Personnel of Non-Industrial Enterprises, such as construction and design enterprises and trade/food services

Coal Basin Profiles Pechora/North

1. Coal resources (physically recoverable):
 - 8.8 billion tonnes hard coal (thermal)
 - 3.6 billion tonnes coking coal

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- hard coal:	4000-5500	25-30	1.5-3.0	9.0
- coking coal:	5700-6000	16-18	0.5-0.7	15.5

3. Key transport distances from Pechora:

	regions supplied	distance (km)
	North	2,000
	Center	2,200
	Northwest	2,400

4. Underground versus surface, 1992:

	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	24.4	35.2	18
- surface:	0.0	0.0	0
- total:	24.4	35.2	18

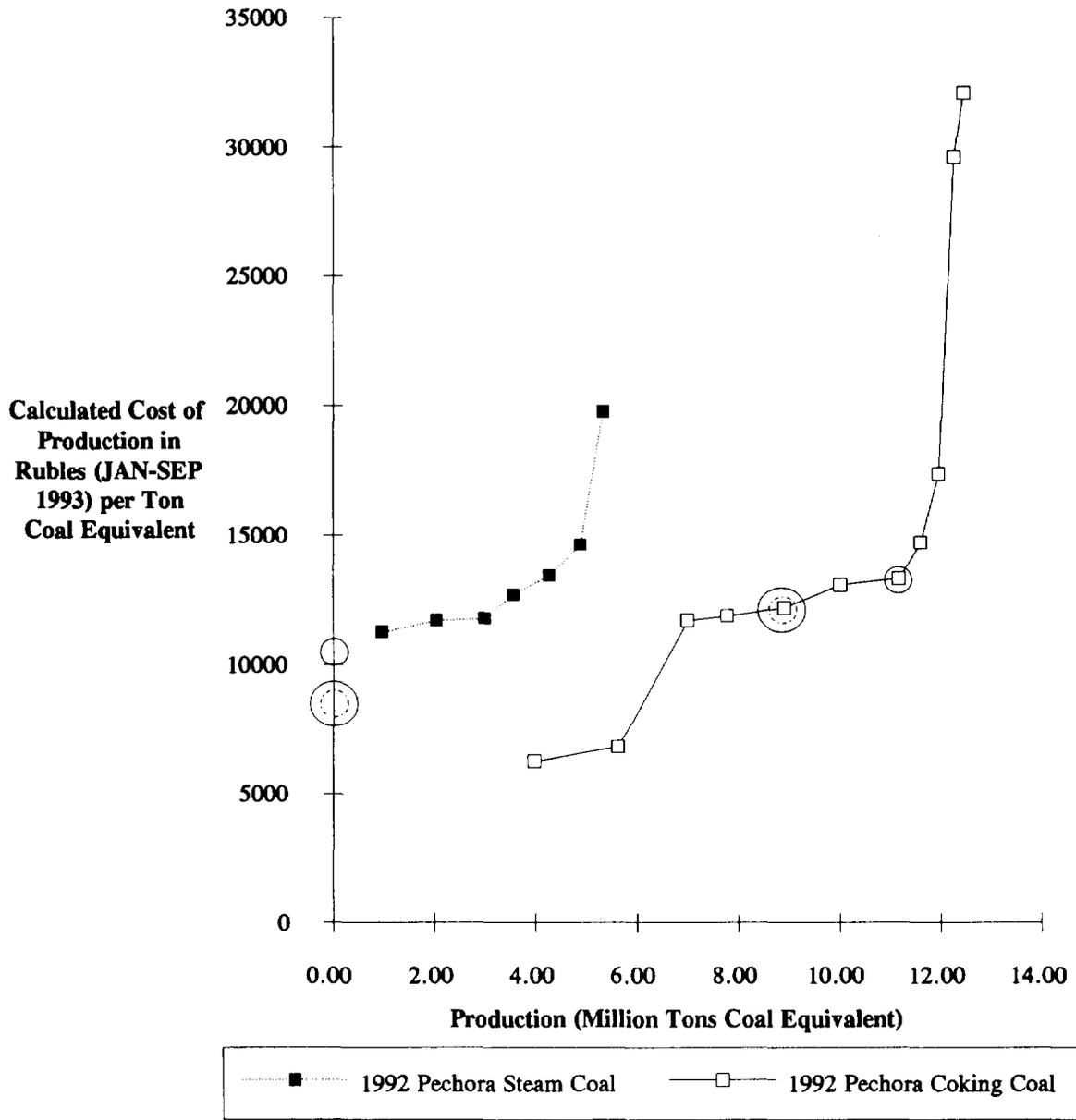
5. Forecast changes 1992 - 1997:

	production (million tce)	employment (thousand)	number of mines
- all coal:			
1992	17.8	70.4	18
1997	8.8 - 11.1	21.4 - 32.0	5 - 7
- of which, coking:			
1992	12.5	n.a.	n.a.
1997	8.8 - 11.1	n.a.	n.a.

 - see Figure 2 (facing page): circles on the steam coal and coking coal Cost Curves indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios

Figure 2

1992 Pechora Coal Supply Curves



○ = 1997 Low Rail Tariff Scenario

○ = 1997 High Rail Tariff Scenario

Coal Basin Profiles Moscow/Tula

1. Coal resources (physically recoverable):
 - 4.4 billion tonnes brown coal

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- brown coal:	2300-2700	30-40	3.0-4.5	9.2

3. Key transport distances from Tula:

	regions supplied Center	distance (km)
		200

4. Underground versus surface, 1992:

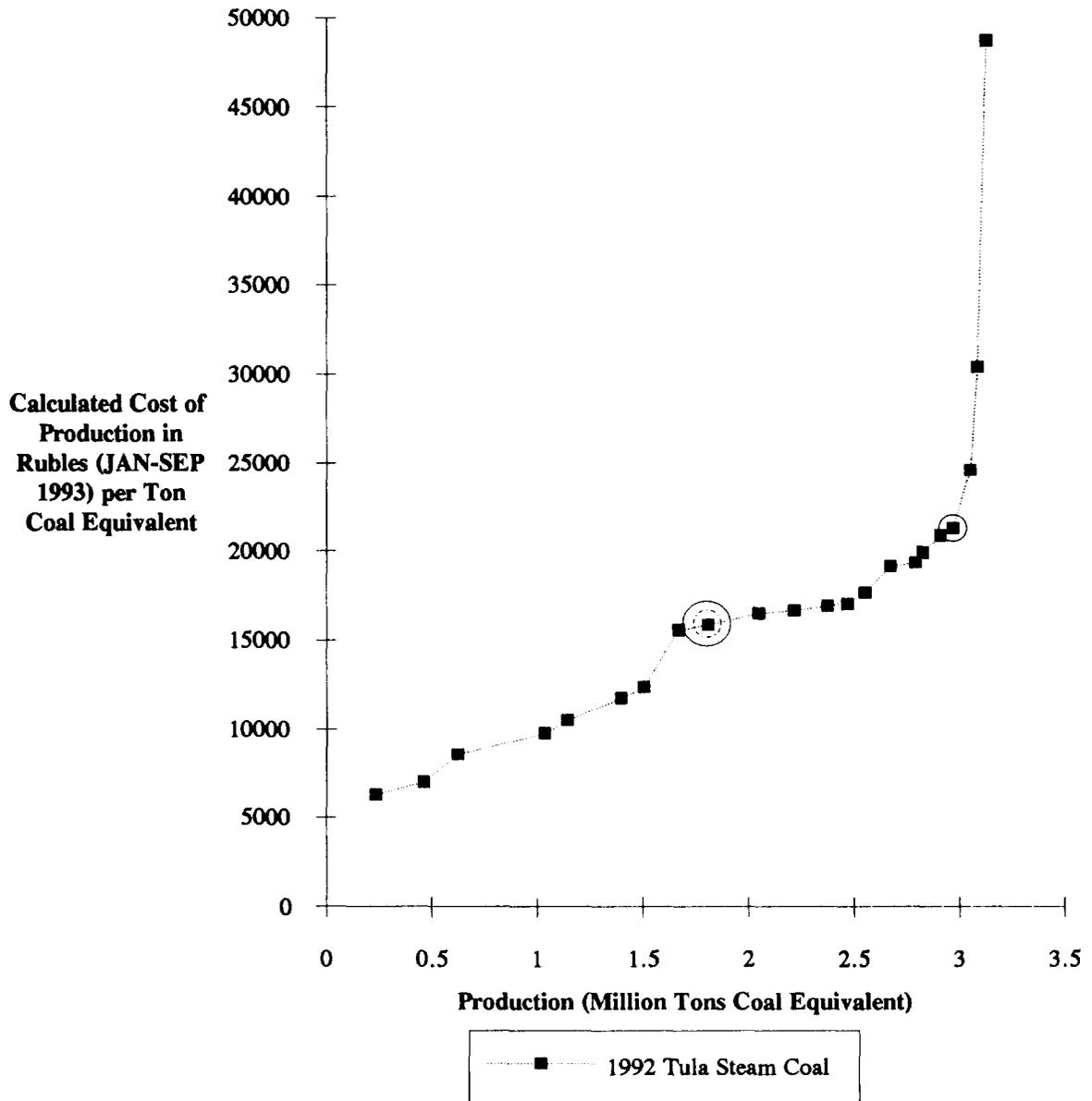
	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	7.2	21.1	18
- surface:	2.0	1.4	4
- total:	9.2	22.5	22

5. Forecast changes 1992 - 1997:

	production (million <u>tce</u>)	employment (thousand)	number of mines
- all coal:			
1992	3.1	41.0	22
1997	1.8 - 3.0	14.0 - 33.0	9 - 19
- of which, coking:			
1992	0.0	n.a.	n.a.
1997	0.0	n.a.	n.a.
-	see <u>Figure 3</u> (facing page): circles on the steam coal Cost Curve indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios		

Figure 3

1992 Moscow Basin Coal Supply Curves



- = 1997 Low Rail Tariff Scenario
- = 1997 High Rail Tariff Scenario

Coal Basin Profiles Donbass/South

1. Coal resources (physically recoverable):
 - 9.3 billion tonnes hard coal (thermal)
 - 0.3 billion tonnes coking coal
 - 7.0 billion tonnes anthracite

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- anthracite:	5500-6000	20-30	2.0-3.5	20.5
- coking coal:	n.a.	n.a.	n.a.	1.8

3. Key transport distances from Donbass:

	regions supplied	distance (km)
	North Caucasus	300
	Volga	400
	Center	1,200

4. Underground versus surface, 1992:

	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	22.3	76.1	42
- surface:	0.0	0.0	0
- total:	22.3	76.1	42

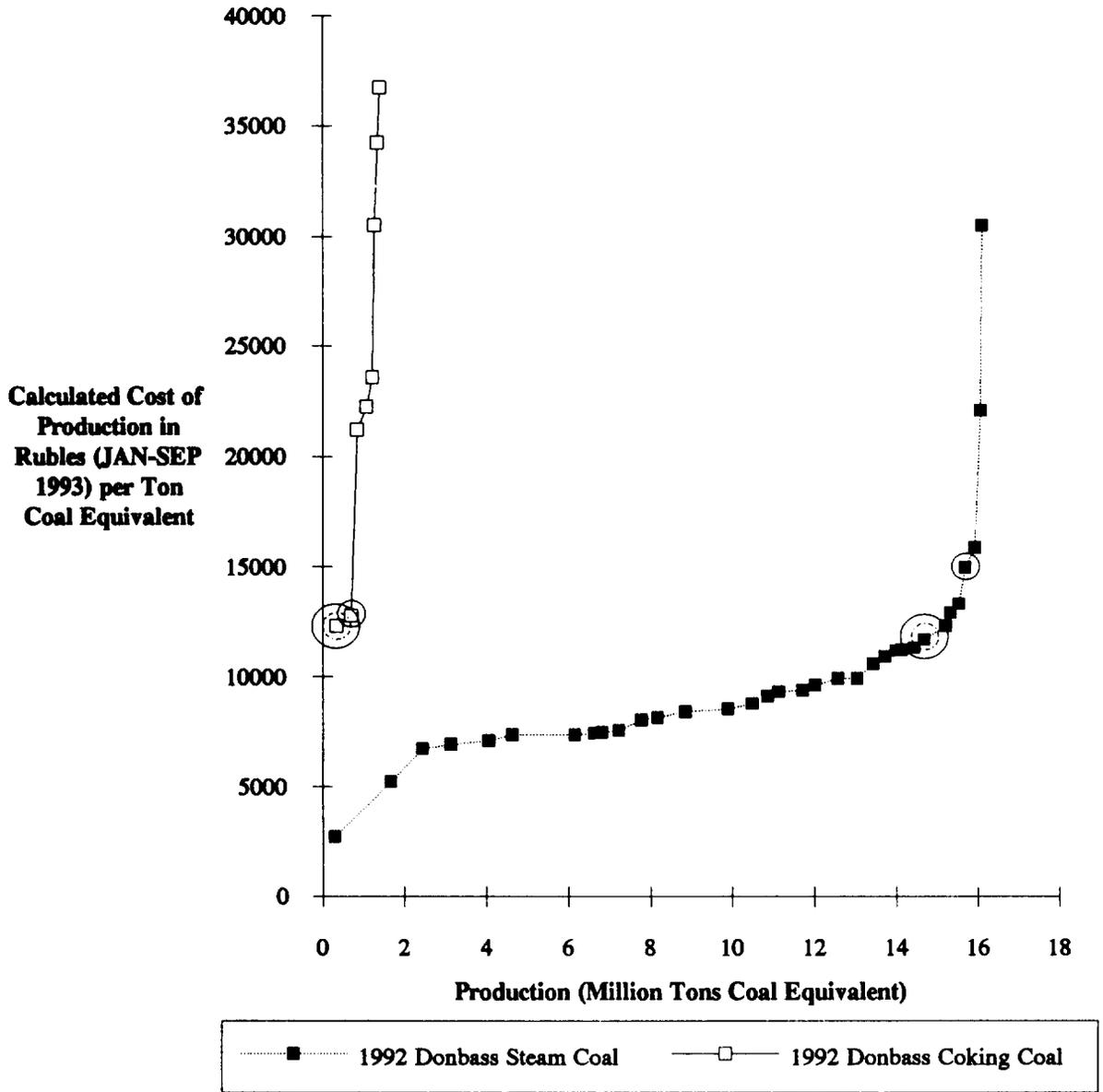
5. Forecast changes 1992 - 1997:

	production (million <u>tce</u>)	employment (thousand)	number of mines
- all coal:			
1992	17.5	135.4	42
1997	15.0 - 16.3	96.7 - 110.8	28 - 33
- of which, coking:			
1992	1.4	n.a.	n.a.
1997	0.4 - 0.7	n.a.	n.a.

 - see Figure 4 (facing page): circles on the steam coal and coking coal Cost Curves indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios

Figure 4

1992 Donbass Coal Supply Curves



⊖ = 1997 Low Rail Tariff Scenario

○ = 1997 High Rail Tariff Scenario

Coal Basin Profiles Urals

1. Coal resources (physically recoverable):
 - 0.5 billion tonnes hard coal (thermal)
 - 0.3 billion tonnes coking coal
 - 1.7 billion tonnes brown coal

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- hard coal:	4000-5000	25-35	3.5-5.5	2.1
- brown coal:	2700-3000	35-40	0.5-1.0	19.4
- coking coal:	n.a.	n.a.	n.a.	1.0

3. Key transport distances:

	regions supplied	distance (km)
	Urals	200

4. Underground versus surface, 1992:

	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	9.1	32.4	25
- surface:	13.4	8.5	8
- total:	22.5	40.9	33

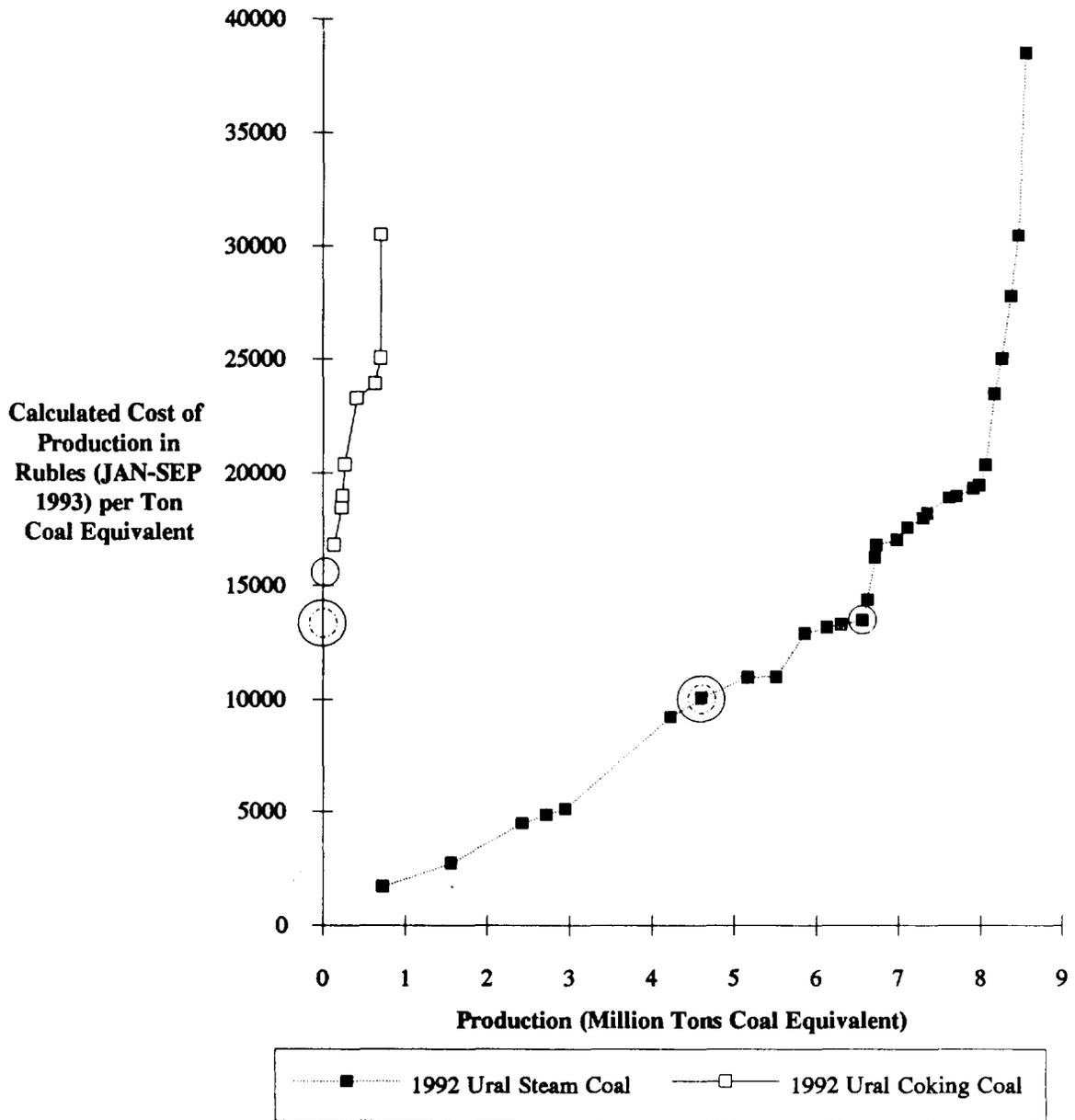
5. Forecast changes 1992 - 1997:

	production (million tce)	employment (thousand)	number of mines
- all coal:			
1992	9.3	79.4	33
1997	4.5 - 6.5	16.0 - 26.9	7 - 13
- of which, coking:			
1992	0.7	n.a.	n.a.
1997	0.0	n.a.	n.a.

 - see Figure 5 (facing page): circles on the steam coal and coking coal Cost Curves indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios

Figure 5

1992 Ural Basin Coal Supply Curves



⊖ = 1997 Low Rail Tariff Scenario

○ = 1997 High Rail Tariff Scenario

Coal Basin Profiles Kuzbass

1. Coal resources (physically recoverable):
 - 76.8 billion tonnes hard coal (thermal)
 - 38.2 billion tonnes coking coal
 - 96.5 billion tonnes brown coal

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- hard coal:	5000-6000	10-20	0.3-0.7	68.1
- coking coal:	5500-6500	10-20	0.3-0.7	45.0
- anthracite:	n.a.	n.a.	n.a.	1.5

3. Key transport distances from Kuzbass:

	regions supplied	distance (km)
	West Siberia	300
	Urals	1,900
	Center	3,500
	Northwest	4,500

4. Underground versus surface, 1992:

	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	68.0	153.3	69
- surface:	46.6	36.2	22
- total:	114.7	189.6	91

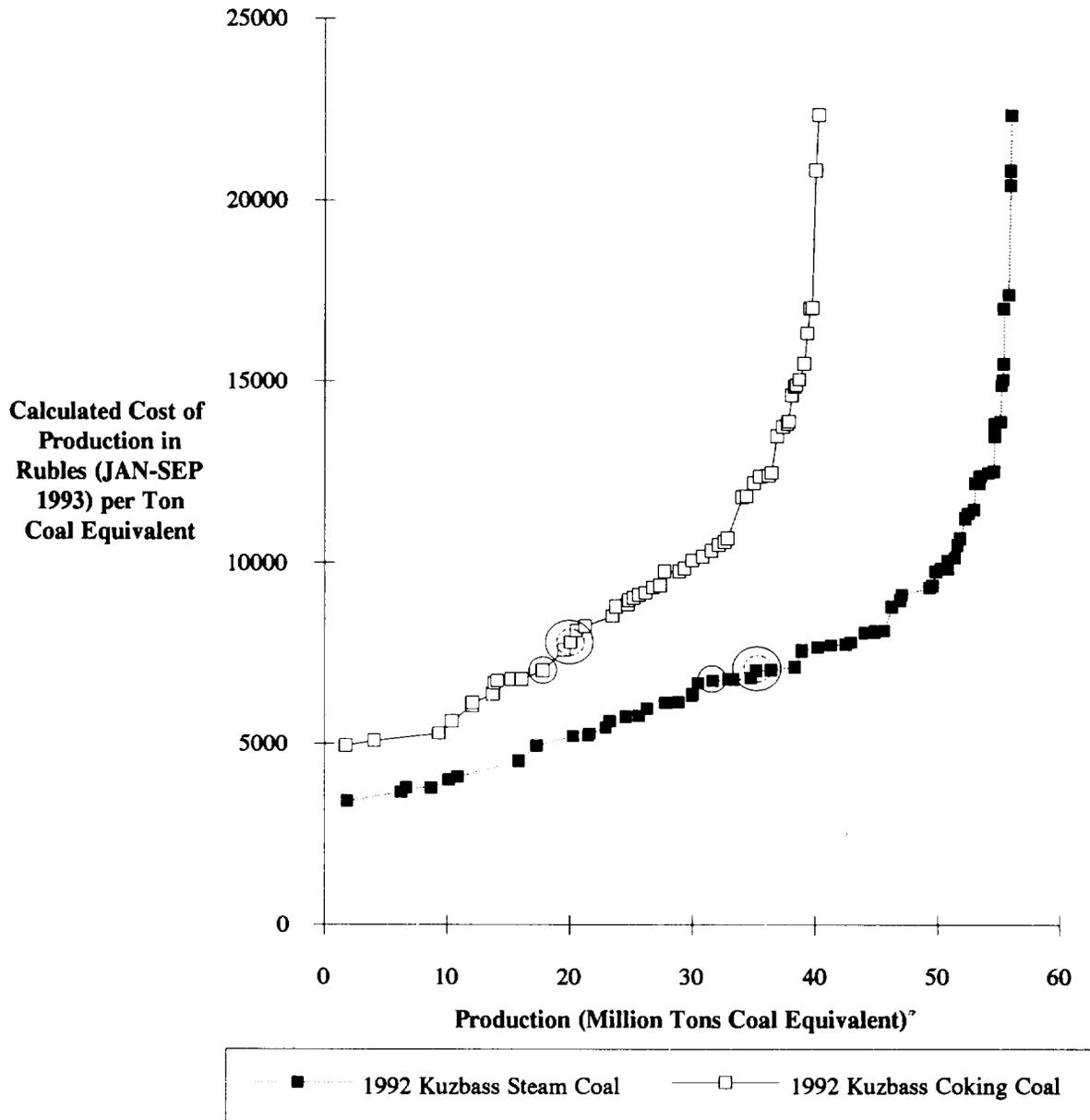
5. Forecast changes 1992 - 1997:

	production (million <u>tce</u>)	employment (thousand)	number of mines
- all coal:			
1992	96.2	296.3	91
1997	47.4 - 52.8	71.8 - 82.6	33 - 40
- of which, coking:			
1992	40.3	n.a.	n.a.
1997	17.7 - 19.7	n.a.	n.a.

 - see Figure 6 (facing page): circles on the steam coal and coking coal Cost Curves indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios

Figure 6

1992 Kuzbass Coal Supply Curves



- ⊙ = 1997 Low Rail Tariff Scenario
- = 1997 High Rail Tariff Scenario

Coal Basin Profiles Kansk-Achinsk

1. Coal resources (physically recoverable):
 - 78.0 billion tonnes brown coal

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- brown coal:	3400-3700	15-20	0.4-0.6	50.8
- hard coal:	5000-5500	15-25	0.4-0.6	6.6

3. Key transport distances from Kansk-Achinsk:

	regions supplied	distance (km)
	West Siberia	400
	East Siberia	900
	Urals	2,300

4. Underground versus surface, 1992:

	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	2.0	2.6	3
- surface:	55.4	10.7	6
- total:	57.3	13.3	9

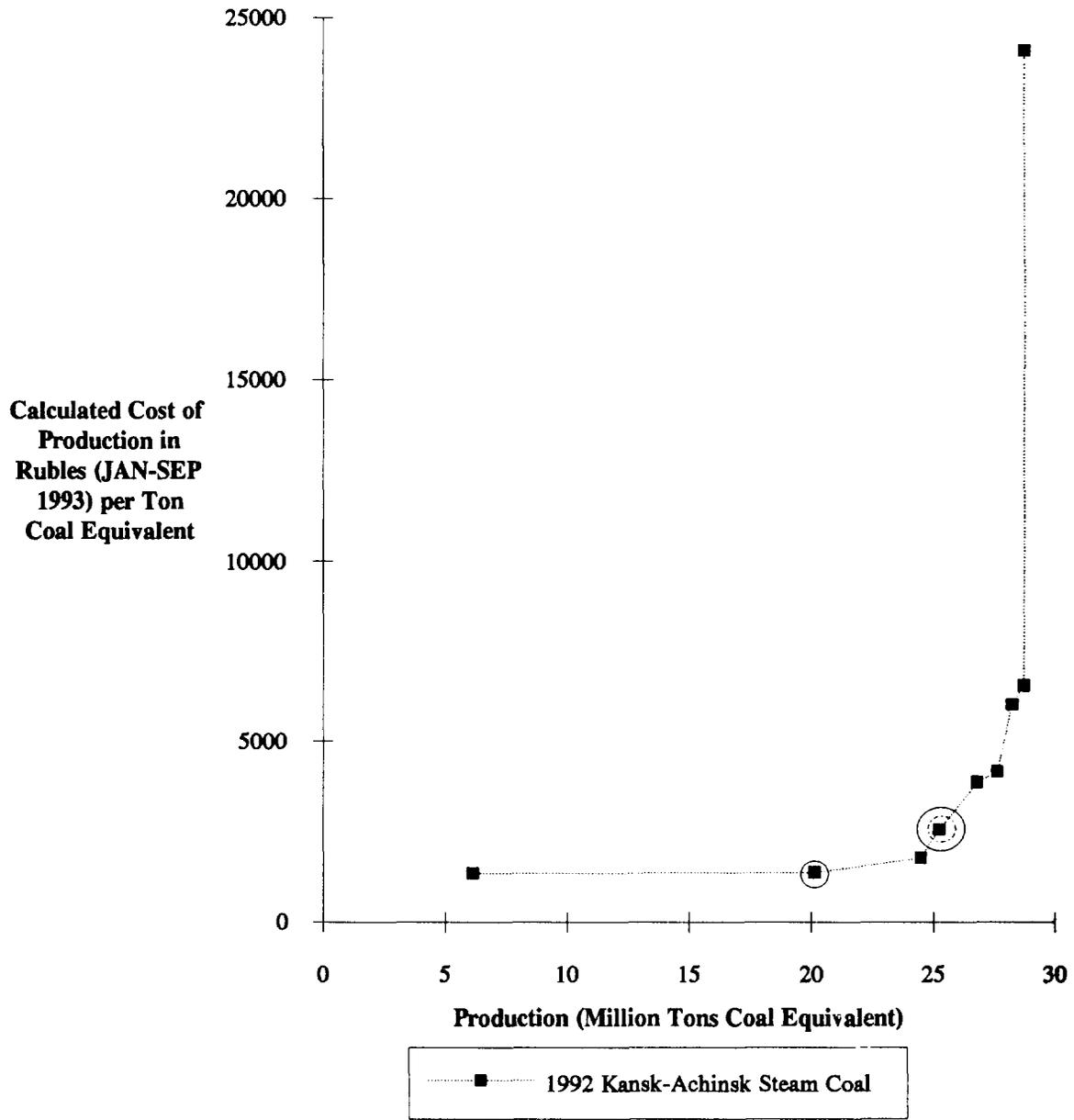
5. Forecast changes 1992 - 1997:

	production (million <u>tce</u>)	employment (thousand)	number of mines
- all coal:			
1992	28.7	25.5	9
1997	19.8 - 25.0	7.6 - 12.8	2 - 4
- of which, coking:			
1992	0.0	n.a.	n.a.
1997	0.0	n.a.	n.a.

 - see [Figure 7](#) (facing page): circles on the steam coal Cost Curve indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios

Figure 7

1992 Kansk-Achinsk Coal Supply Curve



⊙ = 1997 Low Rail Tariff Scenario

○ = 1997 High Rail Tariff Scenario

Coal Basin Profiles East Siberia

1. Coal resources (physically recoverable):
 - 2.0 billion tonnes brown coal
 - 11.0 billion tonnes hard coal (thermal)

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- brown coal:	3000-4000	15-25	0.5-1.5	28.7
- hard coal:	n.a.	n.a.	n.a.	7.6

3. Key transport distances:

supplied (km)	regions	distance
	East Siberia	400

4. Underground versus surface, 1992:

	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	24.4	2.0	18
- surface:	0.0	9.7	0
- total:	24.4	11.7	18

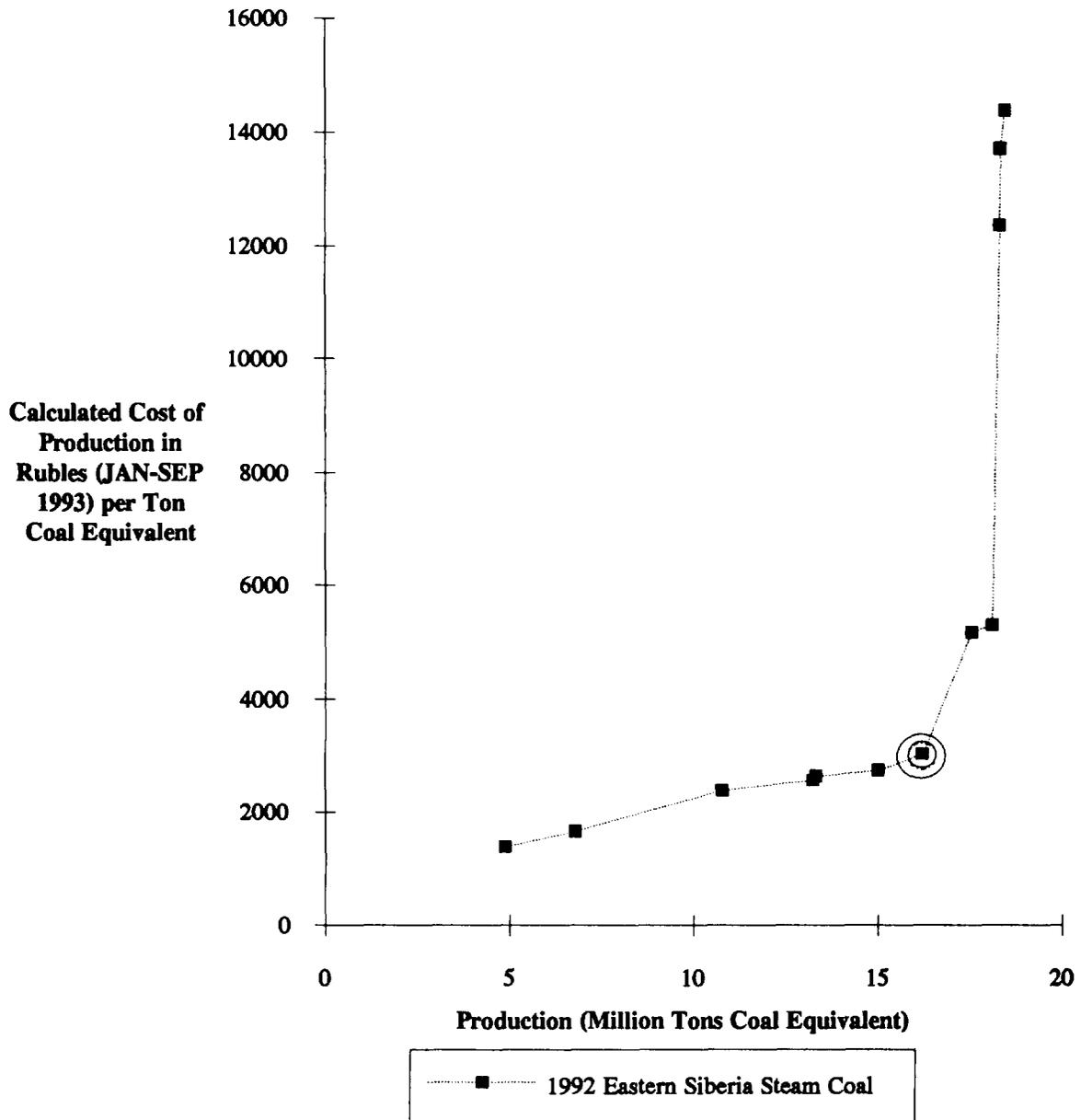
5. Forecast changes 1992 - 1997:

	production (million tce)	employment (thousand)	number of mines
- all coal:			
1992	18.5	24.4	12
1997	16.1	11.2 - 14.4	7 - 8
- of which, coking:			
1992	0.0	n.a.	n.a.
1997	0.0	n.a.	n.a.

 - see Figure 8 (facing page): circles on the steam coal Cost Curve indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios

Figure 8

1992 Eastern Siberia Coal Supply Curve



- ⊙ = 1997 Low Rail Tariff Scenario
- = 1997 High Rail Tariff Scenario

Coal Basin Profiles Far East

1. Coal resources (physically recoverable):
 - 10.4 billion tonnes brown coal
 - 5.3 billion tonnes hard coal (thermal)

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- brown coal:	3000-4000	20-40	0.3-0.5	24.7
- hard coal:	4500-5500	15-35	0.3-0.5	0.0

3. Key transport distances:

	regions supplied Far East	distance (km)
		500

4. Underground versus surface, 1992:

	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	8.9	28.1	24
- surface:	15.8	6.7	12
- total:	24.7	34.9	36

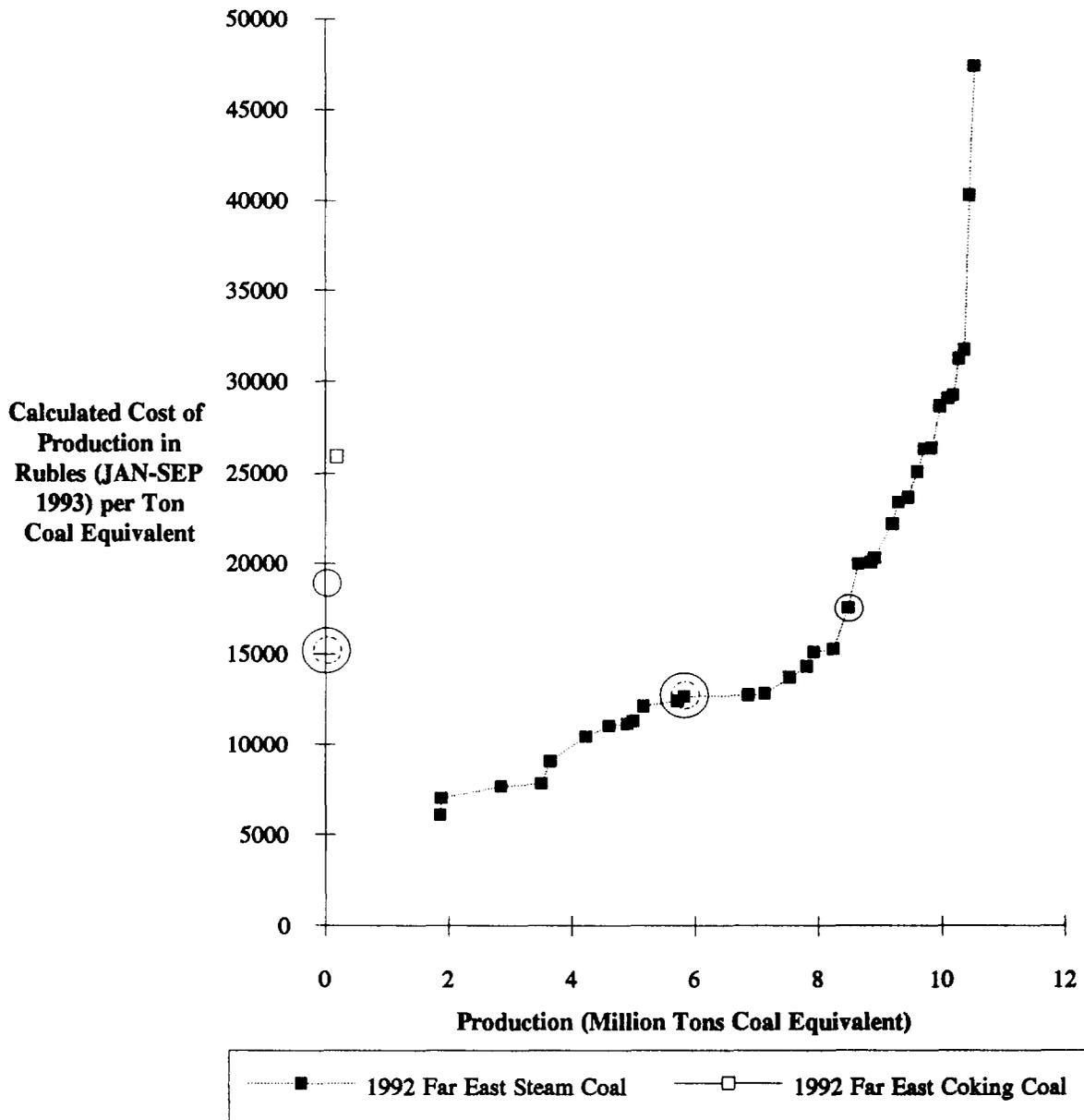
5. Forecast changes 1992 - 1997:

	production (million tce)	employment (thousand)	number of mines
- all coal:			
1992	10.7	63.1	36
1997	5.7 - 8.2	16.5 - 30.6	12 - 18
- of which, coking:			
1992	0.2	n.a.	n.a.
1997	0.0	n.a.	n.a.

 - see Figure 9 (facing page): circles on the steam coal and coking coal Cost Curves indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios

Figure 9

1992 Far East Coal Supply Curves



- ⊙ = 1997 Low Rail Tariff Scenario
- = 1997 High Rail Tariff Scenario

Coal Basin Profiles North East

1. Coal resources (physically recoverable):
 - 7.1 billion tonnes hard coal (thermal)
 - 4.9 billion tonnes coking coal

2. Typical coal quality:

	calorific content (kcal/kg)	ash content (percent)	sulfur content (percent)	production in 1992 (m. tonnes)
- hard coal:	4600-5500	15-20	0.2-0.4	9.3
- coking coal:	5500	15-20	0.3	5.6
- brown coal:	3700-4000	15-17	0.2	1.0

3. Key transport distances:

	regions supplied	distance (km)
	North East	500
	Japan/exports	3,000

4. Underground versus surface, 1992:

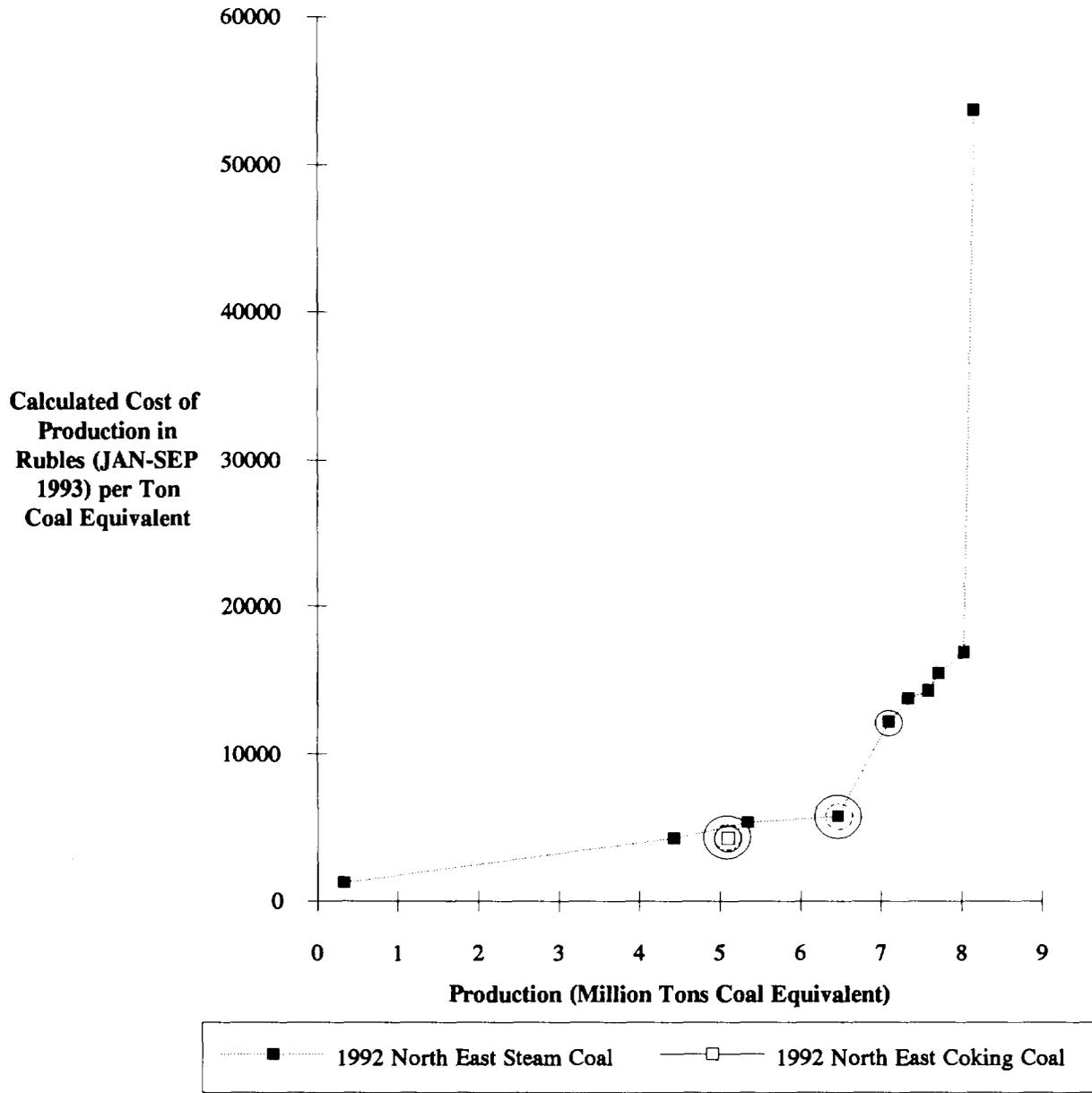
	production (million tonnes)	prod'n workers (thousand)	number of mines
- underground:	3.3	4.7	6
- surface:	12.8	4.3	4
- total:	16.1	8.9	10

5. Forecast changes 1992 - 1997:

	production (million <u>tce</u>)	employment (thousand)	number of mines
- all coal:			
1992	13.3	27.1	10
1997	11.6 - 12.1	12.6 - 14.1	5 - 6
- of which, coking:			
1992	5.1	n.a.	n.a.
1997	5.1	n.a.	n.a.
-	see <u>Figure 10</u> (facing page): circles on the steam coal Cost Curve indicate the maximum production cost at which mines can stay in business under the Low and High rail tariff scenarios		

Figure 10

1992 North East Coal Supply Curves



⊖ = 1997 Low Rail Tariff Scenario

○ = 1997 High Rail Tariff Scenario

Restructuring the Coal Industry

II. The Coal Industry's Response

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Recent Performance Mining Costs

1. See Table 6 *Average Real Operating Costs per Tonne of Coal Equivalent* (facing page).
2. Table 6 shows that average mine operating costs -- including wage payments under the Tariff agreement but excluding depreciation and non-productive costs -- have increased from 6326 Rb per tonne of coal equivalent in 1991 to 7395 Rb per tce in 1993 Q4, both at 1993 Q2 prices. This average encompasses large differences between basins. The largest real increases -- 160% and 90% respectively -- were for low cost surface mines in East Siberia and Kansk-Achinsk, whereas the real increases for the Donbass, Kuzbass and North East basins were less than 5%.
3. There were substantial changes in the median composition of mining costs across all mining associations over the period 1991-93. In 1992 the share of material inputs increased sharply as price liberalization generated large increases in the cost of energy, timber and explosives. While the increase in the share of electricity in total costs persisted through 1993, mines have adjusted their use of other material inputs so that the median real cost of material inputs per tonne of coal had fallen almost back to its 1991 level by the end of 1993 Q4.
4. Now, it is the increase in total wage costs -- underpinned by the wage subsidies linked to the Tariff Agreement which covered about one half of total wage costs in 1993 -- which is driving up mining costs. Since mines do not have to pay social security taxes on wages payments made under the Tariff Agreement, the real cost of social security taxes per tonne has fallen sharply. Though not included in operating costs, the amount set aside by mines for depreciation of fixed assets has declined by over 80% in real terms.

**Recent Performance
Mining Costs**

Table 6 - Average Real Operating Costs per Tonne of Coal-Equivalent

	Average operating costs in Rb per tce at 1993 Q2 prices					
	1991	1992	1993 Q1	1993 Q2	1993 Q3	1993 Q4
Donbass	9612	8834	11146	7923	10062	9608
East Siberia	1739	2615	2875	2519	4008	4575
Far East	10000	13177	12705	10189	12132	13911
Kansk Achinsk	989	1620	1484	1628	2766	1887
Kuzbass	6994	7858	7173	5984	7534	7327
Moscow/Center	11466	10160	16476	8360	12572	18421
North East	4700	5301	4353	4415	4696	4804
Pechora/North	9024	9607	12501	8100	11278	10702
Urals	10034	9671	10716	9425	9618	12736
All basins	6326	7017	7197	5733	7326	7395

Recent Performance Coal Prices

1. See Table 7 *Average Real Price per Tonne of Coal Equivalent by Coal Basin* (facing page).
2. Coal prices were liberalized in July 1993 and the artificial distinction between the prices paid to the mine and those charged to customers was abolished. As a result the average nominal price of coal increased from about Rb 5,700 per tce in 1993 Q2 to Rb 11,500 per tce in 1993 Q3. After this jump the real prices received by mines fell back in the final quarter, so that the average real revenue per tce for the second half of the year was slightly below that for the first half. Demand was clearly a constraint on the ability of mining associations to increase their prices. At the same time there is clear evidence of distortions in pricing behavior linked to the operation of the subsidy system.
3. For customers the increase was much greater -- from Rb 1540 per tonne to Rb 5860 for unwashed steam coal free-on-rail at the mine and from Rb 3190 per tonne to Rb 14620 for unwashed coking coal. From 1993 Q1 to 1993 Q4 ex-mine prices of coal to customers increased by 60-90% in real terms. Delivered prices increased by 40-60% in real terms over the same period.
4. The July price liberalization has radically changed the structure of the Russian coal market but it has not achieved its apparent objectives. The average revenue per tce in 1993 Q2 was approximately equal to the average operating cost. Price reform appears to have relaxed pressure on mines to hold down their costs, so that the average operating cost per tce increased sharply from Q2 to Q3. This change was not reversed in the final quarter, so that in 1993 Q4 the gap between operating costs and prices amounted to Rb 4600 per tce or 25% of the average price.
5. The price reform has done little to bring the regional pattern of prices into line with the structure that might be expected under a full market system allowing for differences in production and transport costs. In real terms the prices in Kansk-Achinsk and Kuzbass would have to fall, while prices in Donbass, Far East, Moscow, North East, Pechora and Urals would have to rise. These adjustments will involve real increases of 2-3 times for the Donbass and Moscow basins because of their locational advantages.

**Recent Performance
Coal Prices**

Table 7 - Average Real Price per Tonne of Coal-Equivalent by Coal Basin

	Average ex-mine revenues from coal sales (Rb per tce at 1993 Q2 prices)			
	1993 H1	1993 H2	Market forecast	
			Low freight tariff	High freight tariff
Donbass	5200	4500	10400	13500
East Siberia	2800	3900	3500	4500
Far East	11400	9100	11100	17500
Kansk Achinsk	1500	2100	1600	1400
Kuzbass	6900	7300	5600	5100
Moscow/Center	13000	6100	14800	20900
North East	5900	4300	11000	13500
Pechora/North	7400	8300	10400	12500
Urals	9500	7100	9400	11800
All basins	6000	5800		

Note:

The estimates in this Table are based on the best available data on the average revenue per tonne of coal received by each mining association by quarter in 1993. Some of the data comes from different sources and may contain hidden inconsistencies. For the first half of the year the estimates refer to the 'accounting prices' paid to mines rather than the wholesale prices paid by purchasers. This distinction was abolished in the price reform of July 1993.

Recent Performance Subsidies

1. See Figures 11-12 on subsidies, cost-price differentials and wage rates by Mining Association, 1993 (facing page).
2. In real terms the total level of subsidies provided to the coal industry remained approximately constant from 1991 to 1993, though there were large fluctuations in the quarterly figures in 1993. Wage subsidies linked to the Tariff Agreement increased from 16% of the total paid in 1992 to 36% in 1993 Q4 (and to 42% of the subsidies allocated in 1993 Q4).
3. The Budget allocation for coal subsidies in 1994 is Rb 7.74 trillion which represents a real decline of 20% relative to the amount paid in 1993. Even this sum may not be forthcoming, since it is supposed to be linked to the revenue from a special VAT levy whose yield is falling short of Budget projections.
4. Subsidies are notionally allocated to associations under 4 categories -- price subsidies to cover operating losses, social subsidies to cover expenditures on 'social costs', investment subsidies to cover depreciation and miscellaneous items, and wage subsidies linked to the Tariff Agreement. In 1993, 5 associations received no price subsidies; apart from special circumstances all associations were allocated subsidies under the other three categories.
5. Subsidies per tonne of coal produced in 1993 varied from Rb 112 per tonne for Borodinsky and Rb 718 per tonne for Mezdurechje -- two associations which operate single, large surface mines -- up to Rb 16,164 per tonne for Rostovugol and Rb 19,945 per tonne for Kizelugol. As might be expected, larger subsidies per tonne went to associations which had larger gaps between operating costs and average price per tonne. An increase in this cost-price differential of Rb 1,000 per tonne was associated with an increase in the subsidy received per tonne of almost exactly Rb 1,000 on average. This eliminated any incentive for associations to control their costs or to raise their prices to reflect their market situation.
6. Mines which receive large subsidies per worker tend to pay higher wages. This may reflect the role of the Tariff Agreement in determining both wages and subsidies. Equally, mines which receive larger subsidies are under less pressure to reduce their wage costs.
7. The average subsidy per worker paid in 1993 was Rb 199,200 per worker per month. The average wage rate was Rb 144,500 per month. For all of the associations below the dashed line in Figure 12 (25 out of 31 in total) the average subsidy per worker per month exceeded the average monthly wage. It is, therefore, difficult to understand why many miners were not being paid through much of the second half of 1993.

Recent Performance

Figure 11

Subsidies and cost-price differentials by association, 1993

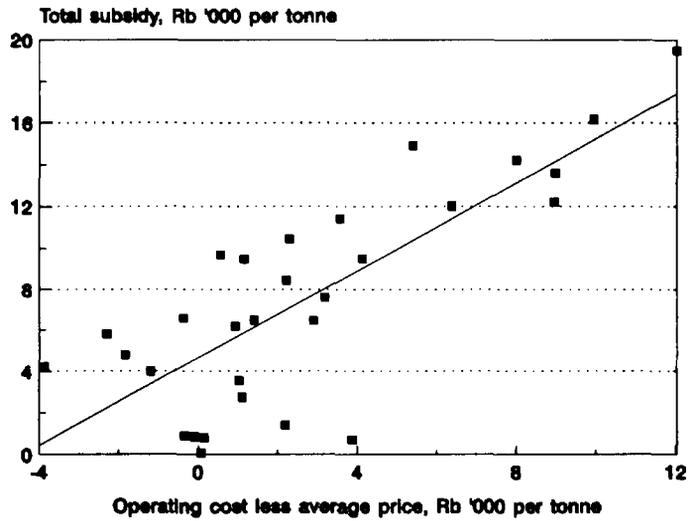


Figure 12

Subsidies and wage rates by association, 1993



Recent Performance Mine Finances

1. See Table 8 *Financial Position of Coal Associations, 1993* (facing page). Details are available in the Annex on *Costs, Subsidies and Employment*.
2. For four mining associations -- Rostovugol, Primorskugol, Tulaugol and Yakutugol -- the cost of materials and other productive inputs exceeded revenue from coal sales in 1993, thus yielding negative value-added. However, these associations have substantial scope for raising prices in moving towards competitive market pricing.
3. The industry made a gross loss of Rb 858 billion, but there were 8 mining associations which made gross profits. Three associations -- Borodinsky, Kuzbassrazrezugol and Rospadskaya -- had gross profits in excess of Rb 20 billion each. Adding the subsidies paid during 1993, the industry had a surplus over operating costs of Rb 880 billion. Every mining association had a positive cash surplus and for some this was very large, for example Kuzbassrazrezugol had a cash surplus of Rb 151 billion and Kuznetskugol one of Rb 104 billion.
4. A similar analysis for 1993 Q3 using different data sources confirms this general analysis. In the quarter immediately following the price reform the industry had a surplus of Rb 570 billion. Allowing for changes in receivables, payables and loan balances there was a positive cash flow of almost Rb 550 billion. Given the level of subsidies, this was not an industry in acute financial crisis and needing greater government assistance, despite claims to the contrary.
5. Much has been made of the problem of arrears, especially of overdue bills owed the mining associations. An analysis of changes in the industry's balance sheet reveals a more complex story. Total receivables did increase sharply in 1993 Q3 but by no more than might have been expected as a result of the large increase in ex-mine wholesale prices. Over the winter of 1993-94 commercial receivables increased from 48 to 90 days' production. At the same time total payables increased from 55 days' to 109 days' production, so that the net cash position improved rather than deteriorated. A more relevant indicator is the net level of overdue receivables and payables. In this case, too, the level of overdue payables increased by more than the level of overdue receivables, largely because mining associations were delaying their tax payments.
6. Over 50% of all overdue receivables and payables relate to rail freight charges which are supposed to be paid by mining associations and recovered from their customers. Incentives to pay promptly might be enhanced if customers had to contract directly with the railways for the transport of coal rather than indirectly through the mining associations.

Recent Performance Mine Finances

Table 8 - Financial Position of Coal Associations, 1993

Associations and independent mines	Coal revenues* (Rb bln)	Operating costs (Rb bln)	Value-added (Rb bln)	Profit measure (Rb bln)	Surplus measure (Rb bln)
Gukovugol	34.7	75.9	9.8	(41.2)	32.7
Obukhovskoye	16.1	18.4	11.3	(2.3)	9.6
Rostovugol	38.7	188.9	(25.1)	(150.2)	64.4
Vostsibugol	107.0	106.9	60.0	0.1	27.1
Dalnostugol	22.1	35.0	0.3	(13.0)	3.5
Primorskugol	16.2	100.0	(18.5)	(83.8)	43.2
Sakhalinugol	32.2	80.7	2.6	(48.5)	8.1
Borodinskiy	53.1	31.9	32.3	21.2	24.0
Krasnoyarskugol	29.0	27.7	17.7	1.3	15.7
Belovougol	36.8	60.5	10.1	(23.7)	11.4
Kiselevskugol	27.1	58.2	5.7	(31.2)	23.8
Kuzbassrazrezugol	200.6	169.3	112.6	31.3	151.1
Kuznetskugol	164.7	236.0	78.8	(71.3)	104.4
Leninskugol	57.3	103.0	22.2	(45.7)	26.4
Mezhdurechje	23.3	24.6	11.0	(1.3)	1.2
Prokopyevskugol	73.2	125.0	24.3	(51.8)	38.7
Raspadskaya	70.0	39.3	49.4	30.7	38.9
SeveroKuzbassugol	44.1	122.3	6.9	(78.2)	11.9
Vakhrusheva	11.2	8.8	8.0	2.4	8.6
Tulaugol	14.3	64.1	(5.5)	(49.8)	23.8
Severovostokugol	13.1	24.7	8.6	(11.6)	13.5
Yakutugol	42.6	90.3	(7.5)	(47.7)	29.4
Intaugol	35.7	74.2	12.5	(38.4)	20.3
Vorgashorskaya	39.7	27.3	28.4	12.4	15.7
Vorkutaugol	130.1	201.0	67.6	(70.9)	60.5
BashkirUgol	4.6	13.9	0.3	(9.4)	7.6
Cheljabinskugol	41.4	89.8	7.6	(48.4)	23.5
Kizelugol	12.5	38.8	0.7	(26.3)	10.4
Shumikhinskaya	0.9	2.8	0.1	(1.9)	0.2
Vakhrushevugol	11.7	18.7	5.2	(7.1)	7.2
Yuzhniy Kuzbass	61.1	57.9	27.3	3.2	16.9
Total	1,507.8	2,362.3	583.9	(857.8)	879.6

Note : (a) Revenues are estimated at ex-mine wholesale prices.

Recent Performance Employment

1. See Table 9 *Employment in the Coal Industry, 1992* (facing page)

2. Under the broadest definition of the Coal Industry, total employment is greater than 900,000 people, of whom:
 - 212,000 (23%) are "personnel of non-industrial enterprises" in the coal industry, including design & construction enterprises and trade & food services
 - 120,000 (13%) are "non-industrial personnel of industrial enterprises", including kindergarten, housing, agricultural and other personnel
 - ie, in a market economy, more than a third of total coal industry personnel would be employed either by independent contractors or by local government

3. Under a narrower definition of employment, there are 369,000 "workers for the extraction of coal", of whom:
 - 305,000 (83%) work in underground mining, although not necessarily underground
 - 64,000 (17%) work in surface mines

4. These definitions of employment cover employees who receive wages, ie:
 - they include workers who may also be receiving a pension
 - they do not include pensioners who are no longer receiving wages

Table 9: Employment in the Coal Industry, 1992

Russian Federation Total					914,331
Personnel of Industrial Enterprises					701,896
	Industrial Personnel				681,801
		Laborers			491,841
			For Coal Production		411,874
				Of which Workers for Extraction of Coal	368,996
				Underground Mines	306,116
				Underground	223,954
				Above Ground	81,161
				Surface Mines	63,881
			Other Laborers		80,167
		Office Staff			90,020
			For Coal Production		72,303
			Other Office Staff		17,717
	Non-Industrial Personnel ^{1/}				120,036
Personnel of Non-Industrial Enterprises					212,436
	Construction				106,887
	Design Organizations				2,196
	Other Organizations				81,059
	Trade/Food Service				13,303

^{1/} Includes kindergarten, housing, agricultural and other personnel.

Recent Performance Employment

1. See Table 10 *Labor productivity by coal type and basin* (facing page).
2. Table 10 illustrates the extent of variation both between mining basins on average and between mines within individual basins. It reports labor productivity in tonnes of coal-equivalent per man-year rather than the more usual tonnes per man-year in order to control for differences in coal quality which are often linked with ease of mining. The distinction between mines which may stay open and those which may close is made for illustrative purposes only in order to show the difference between high productivity mines which are relatively low on the cost curve and high productivity mines which are relatively high.
3. The differences are extreme. High productivity mines in East Siberia and Kansk-Achinsk produce over 1,000 tce per man-year by comparison with 50 tce per man-year or even less in the Donbass and Moscow basins. Coking coal mines tend to have lower labor productivity than thermal coal mines with the exception of the mine producing coking coal for exports operated by Yakutugol (North East basin).
4. The importance of transport costs is illustrated in this table. Mines with an average labor productivity of 90 tce per man-year in the Moscow basin or 150 tce per man-year in the Donbass have a good prospect of being competitive, whereas mines that are more distant from the main markets but have an average labor productivity of 250-300 tce per man-year in Kuzbass and East Siberia or even 580 tce per man-year in Kansk-Achinsk are likely to close.

**Recent Performance
Employment**

Table 10 - Labor productivity by coal type and basin

Coal basin	Labor productivity (tce per man-year)			
	Thermal coal		Coking coal	
	Open ^a	Close ^a	Open	Close
Donbass	150	53	112	51
East Siberia	1454	285		
Far East	269	77		79
Kansk-Achinsk	2633	581		
Kuzbass	738	267	572	192
Moscow/Center	90	33		
North East	718	130	1196	
Pechora/North	349	122		246
Urals	244	85		77
Total	404	224	473	166

Notes : (a) 'Open' refers to mines that will remain open under the 'high freight tariff' scenario. 'Close' refers to mines that will close under the same scenario. The differences between the labor productivity of mines in the 'open' and 'close' categories are mostly larger for the 'low freight scenario'.

Recent Performance Labor Market Adjustment

1. See Figure 13 *Mining as a share of total employment, 1992* (facing page).
2. The most common age at which miners become eligible for a pension is 50 for men and 45 for women. In some cases--eg, after 20-25 years of full-time underground employment--a miner may become eligible for a pension before the age of 50. In the absence of more detailed information, we will assume as an approximation that *all* coal industry employees become eligible for a pension at age 50 (below).
3. More than 20% of the employees of the coal industry are over the age of 50 and are therefore receiving both a pension and a wage. A further 19% fall in the age group 41-50 years. Less than 3% of employees are below 20 years old.
4. Contraction in total employment in the mining industry would involve a number of measures:
 - the cessation of most new recruitment
 - requiring all of those receiving a pension to leave the industry with special payments to compensate for their loss of expected earnings
 - offering special payments to workers in the age group 45-50 (or, perhaps 41-50) to induce them to leave the industry
5. A recent decree *On the Reform of State Owned Enterprises* (No. 1003, May 23, 1994) introduced special provisions for enterprises that are financially unsound but important for the state. If this decree is applied to the coal industry, the Mining Companies will be obliged to accept job applications from former employees, including pensioners. Special legal provisions may be needed to allow the Mining Companies to reduce employment of pensioners in general.
6. Figure 13 shows that the regional impact of a contraction in mining employment would be very different from one coal basin to another. In most oblasts the maximum plausible employment reduction is small relative to total employment in the oblast. However, for Kemerovo oblast (Kuzbass) and the Komi Republic (Pechora basin) the projected employment reduction is a large proportion of total employment. Special measures to mitigate the employment impact of restructuring the coal industry should be focused on these two regions.

Recent Performance
Labor Market Adjustment

Figure 13

Mining as a share of total employment, 1992
(% of total employment)



Recent Performance Social Costs

1. See Figure 14 *Mine social costs as a % of total oblast revenue, 1992* (facing page).

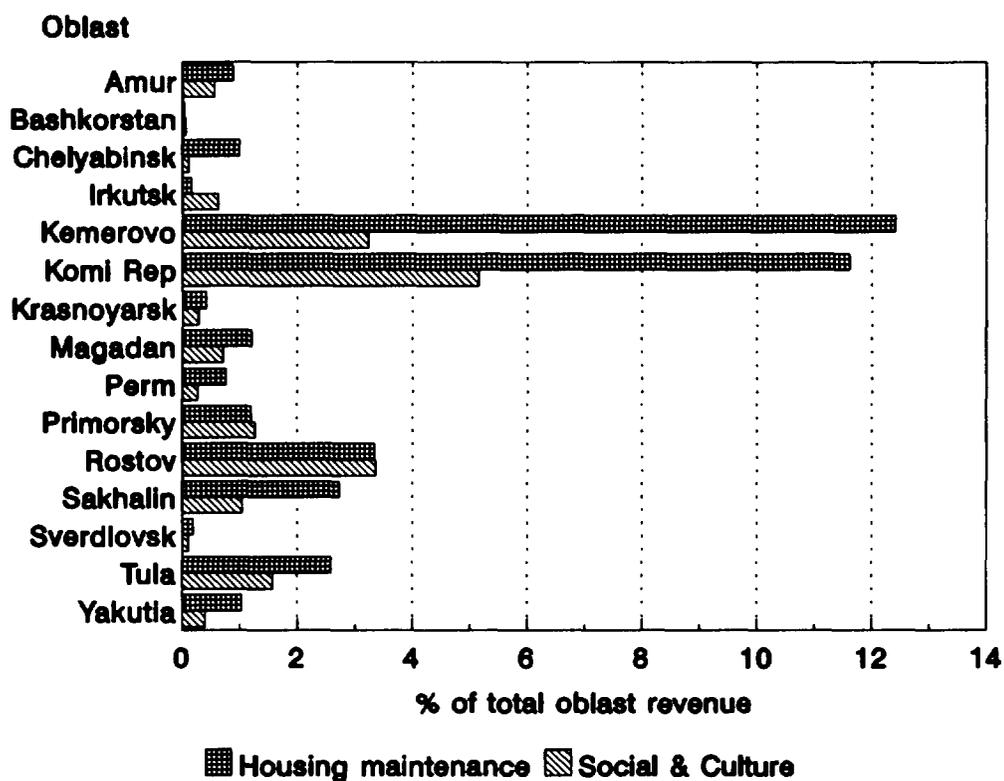
2. The responsibility for providing social and communal services should be transferred from mining associations to regional or local authorities. About 25% of what is categorized as social expenditures by mines should actually be regarded as wages in kind -- cheap coal, vacations, etc. A further 50% of social expenditures is devoted to housing maintenance. It would be better if the ownership of this housing were transferred to the occupants or to cooperatives who would be responsible in future for maintenance and improvement. Some adjustment in wages would be required in order to induce workers to accept this transfer, though the standard of maintenance tends to be very low.

3. Figure 14 illustrates the level of mine expenditures on genuine social and cultural services and on housing maintenance relative to total oblast revenues. It suggests that the transfer of these responsibilities should not cause significant fiscal problems for the oblasts concerned except in Kemerovo, the Komi Republic and, perhaps, in Rostov.

Recent Performance Social Costs

Figure 14

Mine social costs as a % of total oblast revenue, 1992



"Golden Rules" of Restructuring

1. Recognize the difficulty of restructuring and the constraints. Restructuring means change, which is never easy. The people and local communities must be extensively and effectively consulted as to the design and implementation of the reform program.
2. Be clear about the need for change. This leads to a better definition of the objectives and how to get there.
3. Secure high-level political commitment and involvement. Restructuring has overall winners and losers. The changes need to be politically feasible.
4. Have a very precise vision of what the end result of restructuring should be.
5. Plan the restructuring process carefully. Keep to a fixed schedule. The political commitment may last only for a limited period.
6. Separate clearly the roles of the main actors in restructuring. Policy formulation, regulation, ownership, asset management and operations are usually done by different institutions.
7. Recognize that restructuring takes more time and more effort than anticipated. The need for external assistance is often underestimated.
8. Exploit the best practices from other restructuring efforts. Don't reinvent the wheel on restructuring.

Restructuring Strategy Objectives

1. In the Coal Basin Profiles (pp.46-63 of this report), we indicated:
 - current levels of output and employment (1992)
 - changes needed for each basin to adapt to the realities of the new coal market in Russia, mainly:
 - lower demand for coal
 - higher rail freight rates for coal
 - increasing concern for coal quality
 - therefore likely future levels of output and employment (about 1997)

2. On the next two pages (pp.84-85), we present a snapshot of the main features of the Russian coal industry today--followed by a snapshot of the industry after it has adapted not only to the new coal market in Russia, but also to the new market economy in general. The difference between these two snapshots defines the objective, viz:
 - to move as quickly as possible towards a healthy, dynamic coal industry that operates profitably, without subsidies, in the new market economy of Russia

3. The three main actors are the Government, the mining companies and the labor unions. The Government has made some progress towards setting up a suitable framework within which the new Mining Companies can restructure themselves. The rest of this report describes:
 - the options for next-steps by the Government
 - ways in which the Mining Companies and labor unions could respond

Restructuring Strategy Objectives, cont'd

The Russian Coal Industry Today

1. coal prices are set by RosUgol in consultation with the Mining Associations
 2. coal consumers often cannot pay current coal prices because they cannot pass on increased costs to their own customers, eg, power and district heating plants that are price-controlled by local government
 3. coal production costs (without subsidies) are higher than customers are willing to pay--particularly in locations where natural gas and fuel oil are available as alternative fuels
 4. RosUgol sets prices and subsidies to protect weaker mining companies from competition
 5. coal companies pay more attention to quantity of output than to quality and timely delivery
 6. coal companies have no practically control over their labor costs and have no incentive to contract their operations or close high-cost mines
 7. companies that own low-cost mines cannot expand their operations because they cannot compete with subsidized high-cost producers
 8. outside investors are not entering the coal industry because the excess supply of coal is holding down prices and profits
 9. worker health and safety levels are poor and there is little progress towards improved environmental compliance--because the coal industry is preoccupied with simply surviving
-

Restructuring Strategy Objectives, cont'd

The Russian Coal Industry in a Market Economy

1. coal prices are set in the market place by negotiation between independent, commercial mining companies and their customers
 2. other energy prices are regulated in a way that is consistent with free market prices for coal
 3. coal production costs are low enough to compete with other fuels (natural gas and fuel oil) without subsidies--as a result, coal's share of the total energy market will be smaller but more enduring
 4. independent coal companies compete with each other to deliver coal to the customer at the lowest possible delivered price
 5. coal companies compete not only on price but also on the quality of their product and the reliability of their deliveries
 6. companies that own high-cost mines contract their operations and, if necessary, close high-cost mines
 7. companies that own low-cost mines retain enough profits to expand their operations and increase their share of the total coal market
 8. outside investors can enter the coal business if market opportunities exist
 9. profitable coal companies steadily improve their performance on worker health and safety and environmental compliance
-

Restructuring Strategy Progress: 1993-94

1. The Government has taken two initial steps towards providing a framework within which the new Mining Companies can restructure themselves:
 - price liberalization
 - enterprise commercialization & privatization

2. Price liberalization
 - the Government formally decontrolled coal prices in July 1993-- initially with positive results (see pp.68-69)
 - however, prices are not yet "free", since RosUgol now sets coal prices as part of the subsidy allocation process
 - the Government should ensure that, even before the end of the subsidy phase-out, the individual Mining Companies become fully responsible for negotiating their own selling prices

3. Enterprise commercialization & privatization
 - formation of joint stock companies:
this process is underway--in general, it transforms the previous Mining Associations and independent mines into joint stock Mining Companies in which the national coal company (RosUgol) holds a controlling interest
 - commercialization:
real commercialization of the new Mining Companies cannot proceed until the Government has made these companies fully responsible for their cashflow--both sales revenue and costs--see facing page
 - privatization:
management and employees will initially have a minority shareholding in the new, joint stock Mining Companies--however, other private investors will remain unwilling to purchase the Government's shares while future profitability remains uncertain

Restructuring Strategy Progress: 1993-94

4. Key problem areas:

- commercialization & privatization of the new Mining Companies cannot proceed any further while:
 - local Mining Companies remain under the control of a national coal monopoly (RosUgol)
 - there are still channels--ie, within RosUgol--that allow cross-subsidies to flow between the different Mining Companies--thereby slowing down adjustment to the new market conditions
 - the local Mining Companies do not have full control over their operating revenue, because:
 - selling prices continue to be influenced by the subsidy allocation process
 - the companies have been unwilling or unable to solve the problem of overdue payments by customers (arrears in receivables)
 - the local Mining Companies have very little control over the largest single element of their costs--labor costs--because:
 - the companies cannot reduce employment until an adequate social safety net is in place--including severance payments and special employment schemes in mining regions
 - wages are controlled by national wage agreements--the so-called Tariff Agreements
- there is no consensus yet between the Government, the coal industry and the labor unions about how to solve these problems

Restructuring Strategy Speed & Timing

Experience in other coal-producing countries has shown that the key decision for the Government is how quickly to push ahead with restructuring. Most of the feasible options lie somewhere between two extremes, which we describe as business-as-usual and privatize-or-close.

1. *business-as-usual ("do nothing")*

- *coal industry employment would remain unchanged while coal sales continue to fall*
- *investment in the low-cost, potentially profitable part of the coal industry would cease--causing steadily deteriorating performance on worker safety, environmental compliance and coal quality*
- *financial losses in the Mining Companies would continue to increase--causing some combination of:*
 - *increasing delays in wage payments--and therefore hardship, poverty and labor unrest in mining regions*
 - *actual bankruptcy of local Mining Companies--and therefore unplanned, large scale unemployment--with no special payments and an inadequate social safety net*
 - *larger subsidies from the federal budget--at a time when these subsidies need to be phased out as part of stabilizing the national economy*

Comment:

the business-as-usual option is not feasible--the Federal budget cannot afford to continue subsidies at current levels, let alone increase them each year indefinitely

2. *privatize-or-close ("big bang")*

- *non-social subsidies would cease immediately*
- *the Government would reduce its ownership share in all Mining Companies to zero--leaving ownership in the hands of management, employees and private investors*
- *each local Mining Company would control a mix of profitable and unprofitable mines and would have to decide how to use the profits:*
 - *to re-invest in profitable mines, and/or*
 - *to cover operating losses in unprofitable mines, and/or*
 - *to make special payments to workers who agree to leave the company*
- *to avoid bankruptcy, most local Mining Companies would have to lay off large numbers of employees--again, with no special payments and an inadequate social safety net*

Restructuring Strategy Speed & Timing

Comments:

- In practice, most of the Russian economy is following the privatize-or-close route, since government funding is simply not available to continue business-as-usual. If the coal industry is to follow any route other than privatize-or-close, the reasons for giving special treatment to the coal industry need to be clearly justified and explained.
- Coal is the major source of employment in many coal regions, particularly in the Kuzbass and Pechora. Miners are also relatively immobile. A "phased approach" (below) is therefore the only option to avoid the prospect of entire mining regions becoming social disaster areas. A phased approach will increase the burden on the Federal budget over the short to medium term, but will allow Government support to the coal industry to be reduced to zero over the longer term.

3. *phased approach (3-5 years)*

- *real commercialization of the new, local, joint stock Mining Companies would be the key element of the restructuring strategy*
- *as soon as possible, the Government would transfer administration of the existing Social Subsidy from the local Mining Companies to the appropriate level of local government--this process has already started in some areas*
- *the Government would offer to finance mine closures for only a limited period--say up to 3 years--after which the local Mining Companies would have to carry these closure costs out of their own cashflow*
- *over a somewhat longer period--say up to 5 years--the Government would offer to co-finance--ie, with contributions from the local Mining Companies--the costs of employment reduction in all mines, including:*
 - *special payments to workers who agree to leave the coal industry*
 - *transitional employment opportunities in regions where mining-related unemployment will be unusually high*
- *in the rest of this report we present more detailed suggestions about how to implement such a "phased approach"*

Comments:

- In general, the slower the restructuring program, the more it costs the Federal budget. Experience in Belgium, France, Germany and the UK suggests that the Government should try to concentrate most of its budget support for coal restructuring into a period of five years or less.
- The process cannot be planned entirely in advance. The Government needs a strategy for the overall process and a detailed program for the first 1-2 years. The initial program would test a variety of mechanisms and provide experience for designing the rest of the program. The most important decision is the decision to get started.

Phased Approach: 1994-96 Overview

1. *The Government*

should take eight key steps to ensure that the new joint stock Mining Companies can begin to operate commercially:

immediately--start consultations at regional and local levels to:

- re-target social subsidies in mining communities
- launch an *Employment Reduction Program*
- launch a pilot *Mine Closure Program*
- make subsidy payments directly from the Ministry of Finance to the local Mining Companies and local governments

as soon as possible:

- move towards company-to-labor wage agreements
- encourage divestiture of "non-core" functions
- ensure adequate competition between the new coal companies
- introduce a suitable regulatory framework for the railways

2. *The new Mining Companies*

should take full control of all aspects of their cashflow:

immediately:

- prepare a mine-by-mine pricing and marketing strategy to cope with the elimination of subsidies
- prepare targets for productivity improvement (mainly employment reduction) for all the mines in the company's portfolio
- identify the mines that will be profitable, possibly profitable and definitely unprofitable with the new prices--with and without the target levels of employment reduction

as soon as possible:

- decide on the company's participation in the Government's Employment Reduction Program, ie, co-financing of special payments for workers to leave the coal industry
- decide which mines to put into the Government Mine Closure Program
- open discussions with the local coal labor unions about wages, employment levels, special payments and mine closures
- prepare a business plan for re-investing profits of low-cost mines in improved productivity and coal quality

Phased Approach: 1994-96 Overview

Competitive core of low-cost mines

The management teams of the new, local Mining Companies should start to rebuild their companies around a core of unsubsidized, low-cost, profitable mines, ie, those at the bottom of their cost curves.

Even in these low-cost mines, some employment reduction may be necessary--to improve profits.

The management's decisions about how to *re-invest the profits* from these mines--to improve efficiency, to improve product quality or to expand output--will be the key to the survival of their company.

In a competitive market, low-cost mines will expand even while total coal demand is still contracting, ie, they will put additional pressure on unprofitable mines to close. The mines at the low-cost end of the coal industry could expand their output by 20-30% over the next 3-5 years with relatively modest investments.

Possibly profitable medium-cost mines

Each of the local Mining Companies will own a number of mines for which future profitability is highly uncertain. Each management team should prepare medium term programs to reduce costs and increase revenues in these mines. In cases where the company is unable to make these mines profitable, the company will have to start its own mine closure program.

Unprofitable, high-cost mines

In each of the new Mining Companies, the high-cost mines impose a very large burden on the cashflow of the company. They absorb the profits from the company's low-cost mines and prevent the company from investing to generate future profits.

The management teams of the companies should decide as rapidly as possible which mines they wish to transfer to the Government for closure.

**Phased Approach: 1994-96
Social Subsidies**

1. See *Recent Performance* (pp.66-81) for data on social subsidies.

2. The most important component of the Social Subsidy is the 25% that goes to social services, such as health clinics, kindergartens, schools, etc. At present, the Ministry of Finance makes these payments to the local Mining Companies. If possible within six months:
 - the Ministry of Finance should start making these payments directly to the appropriate level of local government, usually the oblast

 - the local Mining Companies should transfer the corresponding social assets and staff to the local government--this process is underway in some areas

3. In Kemerovo, Komi Republic and Rostov, it will be important to ensure that these federal-regional fiscal transfers take place without delay. In other oblasts, these fiscal transfers will be relatively small compared with the oblast's total budget revenue.

4. About 50% of the Social Subsidy goes to housing maintenance. And this entitlement to free housing appears to be built into the coal industry wage agreements--the so-called Tariff Agreements. The Government should transfer full responsibility for housing maintenance to the house owner-occupants. If necessary, the Government should consider making small, special, lump-sum payments to house owner-occupants to compensate them for the loss of an entitlement under the Tariff Agreements.

5. As soon as these special payments have been made to house owner-occupants, the Government should cut the total Social Subsidy to a level that just covers social services--see above.

Phased Approach: 1994-96 Labor Agreements

1. See *Recent Performance* (pp.66-81) for data on wages and the Tariff Agreements.
2. In the Russian industrial sector, including the coal industry, national labor agreements (so-called Tariff Agreements) present a major obstacle to the newly commercialized companies that are struggling to adapt to free market conditions.
3. Under the current labor agreements, the local Mining Companies have almost no control over the wages of their employees. The inadequacy of the social safety net--notably the absence of severance payments and alternative employment opportunities in the major mining regions--makes it very difficult for the Mining Companies to reduce employment. The companies therefore have no control over the total wagebill, ie, over the largest single element of their costs.
4. At present, the Tariff Agreement component of the subsidy system offers a positive incentive to maintain employment. We recommend that the Government shift this funding from wage subsidies to special payments to workers leaving the coal industry.
5. After subsidies have been shifted away from wages, the level of wages in each coal basin will be determined by what the local Mining Companies can afford to pay. In some of the less profitable mining companies, real wages will fall relative to wages in other industries. This decline will make it more attractive for miners in these regions to accept special payments to leave the coal industry. This mechanism is crucial to the success of the employment reduction program.
6. The key step for each local Mining Company will be to take full responsibility for the wagebill in their company, ie, to negotiate the employment levels and wages directly with their employees.

Phased Approach: 1994-96 Employment Reduction Program

1. See *Recent Performance* (pp.66-81) for data on composition and age structure of coal industry employment.
2. The Government should immediately stop recruitment to the coal industry--except in cases where special skills are needed in the lowest-cost mines and cannot be re-located there. In general, the Government should specify that support for special payments will be available only to Mining Companies that have ceased recruitment.
3. The Mining Companies need to reduce employment in practically all mines, ie, both in mines that are to remain in operation and in mines that are to be closed. The companies should offer special payments to workers to leave the coal industry. This may require the company to shift some of the remaining workers from one mine to another within the company.
4. The first target group should be the pensioners (generally the 50-and-above age group) who remain on the company payroll as workers. The Government should establish the principle that no-one who receives a pension from the coal industry can also be employed in the coal industry. Employment reduction for coal industry pensioners may have to be involuntary. However, they could seek employment outside the coal industry. And, since coal industry pensioners believe their pensions are inadequate, the Government may also decide to give them small, once-only payments to compensate for the unexpected loss of an "entitlement".
5. The second target group should be the workers in the 45-50 age group who are approaching retirement. The Mining Companies should offer somewhat larger special, once-only payments to this group to leave the coal industry. The management of each local Mining Company should have some flexibility in defining the target group. For example, some companies may wish to retain certain skills in the 45-50 age group.
6. The Government should decide what level of support it will provide to Mining Companies that offer these special payments. As a starting point, the Government should announce that the only subsidies to the coal industry--other than for social services--will be for special payments to workers leaving the industry.
7. For the Komi Republic (the Pechora coal basin) and the Kemerovo oblast (the Kuzbass), the projected employment reductions in the coal industry are very large in relation to total employment in these regions. As an additional element of the Employment Reduction Program, the Government could set up transitional special programs in these regions. These might include: environmental restoration of mining areas, and rehabilitation of housing and other infrastructure in mining communities.

Phased Approach: 1994-96 Mine Closure Program

1. See *Scenario Results* (pp.44-45) for projections of possible mine closures in each basin.
2. The most effective way for local Mining Companies to become profitable is to close their highest-cost mines. Closing mines eliminates not only labor costs but also unnecessary expenditure on materials and other non-labor operating costs. For this reason, as part of the reorientation of subsidies towards special payments to workers leaving the coal industry, the Government would allocate a large part of the special payments to the Mine Closure Program.
3. For a limited period--perhaps 1-3 years--the Government should offer to take mines that have no prospect of becoming profitable into a government-managed Mine Closure Program. After that time, the Mining Companies would have to carry the costs of any additional mine closures out of their own cashflow.
4. Once they are in the Mine Closure Program, mines should receive government funds only for social costs and other expenditures directly related to closure, but not for operations:
 - production must stop at these mines as soon as possible--to avoid the situation (observed, for example, in Poland) where excess production from these (subsidized) mines depresses prices and profits of the newly commercialized (unsubsidized) Mining Companies
 - funding of the Mine Closure Program would need to cover environmental restoration of disturbed lands and spoil heaps and mitigation of water contamination
5. The Government could launch the Mine Closure Program immediately by starting with the relatively uncontroversial cases where the mine's coal reserves are practically exhausted. There are at least 10 mines in this category that the Government could offer to close by end-1995. At the same time, the Government should adopt a target of closing 15-25 unviable mines each year until the year 2000.

Phased Approach: 1994-96
Divestiture

1. The local Mining Companies should transfer social functions to local government, where possible--see Social Subsidies (p.92).

2. From its position as the controlling shareholder in the new Mining Companies, the Government should also require the companies to divest "non-core" (ancillary and non-mining) enterprises as separate joint stock companies.

Phased Approach: 1994-96

Competition

1. In general, the number of new, joint stock Mining Companies (former Mining Associations) appears to be sufficient--in each coal basin and in each coal product market--to ensure adequate competition. Some of the specialized coking coal producers may have some degree of market power. However, these producers are also facing monopsonist buyers in the steel industry. It may be necessary in future to break up some of the larger Mining Companies into more than one joint stock company--but only if monopoly power becomes a problem in their markets.

2. It may also be necessary for some of the smaller Mining Companies to combine into larger joint stock companies--but only if they prove to be too small to invest and survive in a competitive coal market. This process should not require any intervention from the Government. Local Mining Companies should be allowed to merge or to acquire other companies, subject to the normal provisions of the Anti-Monopoly Law.

Phased Approach: 1994-96 Investment

1. In each of the local Mining Companies, the management's decision on how to re-invest profits from the company's low-cost mines will be crucial for the survival and recovery of the company during the transition to zero subsidies.

2. As a first step in each case, the company management team should look at ways to improve productivity, coal quality, environmental performance and worker health and safety *without making any investments*, ie, simply by improving organization and management. For example:
 - by improving work organization and spare parts management to maximize equipment utilization factors
 - by selective mining, blending, stockpile control and tighter washery procedures

3. When coal market opportunities expand in future, limited investments in surface mines are likely to be the lowest cost way to increase coal output. In these mines, the first priority will be to improve utilization of existing major mining equipment (shovels, trucks and draglines, bucket wheel excavator systems) by providing adequate fleets of auxiliary mining equipment (bulldozers, graders, front-end loaders).

4. In cases where investment appears profitable in underground mines, the basic strategy should be to concentrate production at the most efficient faces, ie:
 - close high-cost faces
 - re-equip a smaller number of longwall faces with heavy duty, high output equipment
 - rationalize underground transport systems using modern, high capacity equipment
 - switch to modern technologies for excavating underground roadways and for roof bolting support systems

Phased Approach: 1994-96 Subsidy Phase-Out

1. One of the Government's objectives is to eliminate subsidies to the coal industry as quickly as possible. However, there are two types of subsidies:
 - *recurrent subsidies*: for example, the wage subsidies that are linked with the present Tariff Agreements
 - *special payments*: these are an "investment" today that will pay itself off by reducing the need for recurrent subsidies over future years

2. The Government should phase out recurrent subsidies immediately, with the exception of subsidies to social services in mining communities:
 - after 1994: zero subsidies for operating losses and investment
 - in 1995 only: wage subsidies confined to oblasts where mining employment accounts for more than 5% of total employment
 - after 1995: zero recurrent subsidies other than social services--a very small part of the total

3. The Government should decide on the initial funding level for special payments to be used for:
 - miners and pensioners who leave the coal industry
 - house owner-occupants who take over responsibility for maintenance
 - physical costs of mine closures, including environmental costs
 - special programs in mining areas with high levels of unemployment

4. The total subsidy payment to the coal industry should decline at an agreed rate in real terms each year. The total subsidy projected for 1994 appears to be about 40% lower in real terms than in 1993. The total subsidy may have to decline somewhat more slowly in the next two years if the Government is to co-finance a reasonable share of the special payments.

Phased Approach: 1994-96 Subsidy Phase-Out

"Investing" in Subsidy Reduction: Financial analysis of an employment reduction program

To illustrate the potential costs and benefits at 1993 prices of a managed program of voluntary severance, an analysis has been carried out for a hypothetical program to reduce mining employment in the Kuzbass by 200,000 over 5 years starting in 1995. The number of job losses builds up from 20,000 in 1995 to 80,000 in 1997 and then declines to 20,000 again in 1999. The following assumptions have been made about the costs and savings associated with such a program :

Costs :

- (a) Layoff counselling, retraining and other assistance - Rb 500,000 per job loss.
- (b) Special employment programs for 25% of those losing jobs initially, declining to 5% in year 5 and zero thereafter - Rb 100,000 per month per person covered.
- (c) Additional spending for the social safety net (pensions, unemployment benefits, etc) for 75% of those losing jobs initially, declining to 50% in year 2 and 5% in year 11 - an average of Rb 60,000 per month per person covered (40% of the average wage).
- (d) Severance payments which might range from 0.5 to 5 times annual wages for workers earning an average of Rb 150,000 per month according to age, length of service and other circumstances.

Savings :

The decline in the demand for coal implies that maintaining production in high cost mines in order to protect jobs imposes a cost on the economy (and on the government in the form of additional subsidies) equal to the average operating cost per worker in those mines which would otherwise close. This assumes that surplus output produced in mines which are kept open has a zero marginal value. Since profitable mines should be able to expand their output at a very low marginal cost if that were required in future, this is a plausible assumption.

The analysis shows that the net cost per job loss amounts to Rb 4.64 million in the first year after which there is a net saving of Rb 1.5 million in year 2 rising to Rb 2.1 million in year 11. The cumulative net saving becomes positive in year 4 and the discounted present value at a real interest rate of 10% is Rb 5.8 million. For the complete program the net cash flow is shown in the table below:

Year	1995	1996	1997	1998	1999	2000
Job losses	20,000	40,000	80,000	40,000	20,000	
Net savings (Rb billion)	(93)	(156)	(279)	32	198	338
Cumulative savings (Rb billion)	(93)	(248)	(528)	(496)	(297)	41

There are positive cash savings from year 4 onwards, while the discounted present value is Rb 964 billion. A phased program of this kind could easily be financed by redirecting subsidies away from general support for most mining associations towards funding for employment adjustment, while achieving a gradual reduction in the overall level of subsidies. At the end of the program the Kuzbass would be left with a highly competitive mining sector making profits of about Rb 100 billion per year at 1993 prices.

MAP *Major Coal Producing Regions and Transport Flows*
(facing page)

