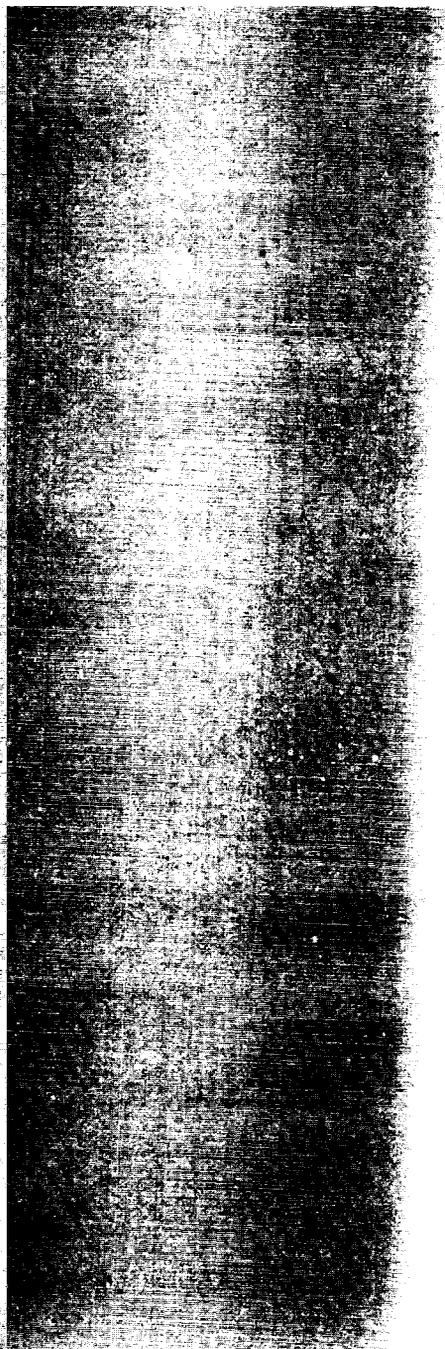


Report No. 15056-UA

# Ukraine Coal Industry Restructuring Sector Report

March 4, 1996

Infrastructure Division  
Country Department IV  
Europe and Central Asia Region



### CURRENCY EQUIVALENTS

Currency unit = Karbovanets, abbrev. Krb  
 US\$1 = 150,000 Krb (as of August 1995)

### WEIGHTS AND MEASURES

atm	atmosphere
bcm	billion cubic meters
Gcal	Gigacalorie (10 <sup>9</sup> cal)
GJ	Gigajoule (10 <sup>9</sup> J)
GW	Gigajoule (10 <sup>9</sup> W)
kg	kilogram
km <sup>2</sup>	square kilometer
koe	kilograms oil equivalent
kWh	kilowatt hour mt million metric tons
MW	Megawatt (10 <sup>6</sup> W)
PJ	Petajoule (10 <sup>15</sup> J)
t	metric ton
tce	ton of coal equivalent
tcn	thousand cubic meters
toe	ton of oil equivalent
TWh	Terawatt hour (10 <sup>12</sup> Wh)

### CALORIFIC VALUES

1 Unit of Fuel	Gcal
Coal (ton)	5.0
Wood (solid m3)	1.8
Natural gas ('000m3)	8.1
Mazut (ton)	9.7
Diesel (ton)	10.2
Gasoline (ton)	10.5
Kerosene (ton)	10.3
Liquified Petroleum Gas (ton)	10.8
Crude Oil (ton)	10.0

### CONVERSION FACTORS

1 Gcal = 4.187 GJ = 3.968 million Btu = 1,163 kWh; 1 tce = 7 Gcal; 1 toe = 10 Gcal  
 1 kWh of hydro or imported electricity is converted to primary energy at 250 grams of oil equivalent.

### CHEMICAL COMPOUNDS

NO <sub>x</sub>	Nitrogen Oxides	SO <sub>2</sub>	Sulfur Dioxide
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### ABBREVIATIONS

CIS	Community of Independent States
CHP	Combined Heat and Power
DONUGI	Donetsk Coal Mining Research Institute
EBRD	European Bank for Reconstruction and Development
ECU	European Currency Unit
GDP	Gross Domestic Product
LPG	Liquid Petroleum Gas
MCI	Ministry of Coal Industry
VAT	Value-Added Tax

### FISCAL YEAR

January 1 - December 31

**UKRAINE**  
**COAL INDUSTRY RESTRUCTURING**  
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    Domestic Energy Resources and Main Production Areas

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The Minister and Deputy Ministers of Coal Industry were the main coordinators of the effort on the Ukrainian side. The staff of the Ministry of Coal Industry, Ministry of Economy, Ministry of Finance, Ministry of Power, Ministry of Social Protection, State Committee of Housing and Communal Services, and several coal industry enterprises actively participated in the work of the missions.

Data for the report were collected by the Donetsk Coal Mining Research Institute. The first draft of the report was prepared in November 1995. The draft was discussed with representatives of the Government of Ukraine in a meeting organized by the Know How Fund in the United Kingdom in January 1996. The Ukrainian team was led by V. Yevtukhov, Vice-Prime Minister for Fuel and Energy, and the Bank team by D. Lallement, Division Chief, EC4IN. Based on comments from the Government, the report was revised and is expected to be presented at a conference in Ukraine in April 1996.

The report drew on the document "Program for the Development of the Coal Mining Industry of Ukraine and its Social Sphere up to the Year 2005" approved by the Cabinet of Ministers in 1994. In addition, a number of earlier World Bank reports on Ukraine were also utilized such as the Energy Sector Review, Environment Study, and Country Assistance Strategy. We wish to thank the authors of these reports for allowing us to use some of their findings.

## UKRAINE

### COAL INDUSTRY RESTRUCTURING

#### Executive Summary

i. The Ukrainian coal industry is in a deep crisis. Between 1990 and 1995, coal output (after washing) decreased by about 50 percent to less than 70 mt/year. The productivity of Ukrainian coal miners -- about 600 thousand workers are employed directly in coal extraction -- is low not only by international comparison, but even by historical Ukrainian standards. In the 1980s, domestically produced coal covered about one third of Ukraine's primary energy consumption, and was also one of Ukraine's major export commodities. Coal exports almost totally disappeared in 1995, and imported coal and other fuels captured a large share of the Ukrainian market as a result of artificially maintained high domestic coal prices, untimely delivery and poor coal quality.

ii. Despite the high domestic coal prices, the coal industry is unable to cover its production costs due to high material, energy and labor costs. In addition to producing coal, the mining companies also deliver services including pre-school education, health care, housing, recreation, etc. Carrying the cost of these services further reduces the competitiveness of Ukrainian coal mines. Payment arrears accumulated by many of the large coal consumers further contribute to financial difficulties, leading to the inability of many mining enterprises to pay salaries. The capacity and the willingness of the state to subsidize coal production dropped to an all-time low by 1995, due to a general decline of budgetary revenues in a shrinking economy, and the recognition by policy makers that further large-scale production subsidies endangered the macroeconomic stabilization effort.

iii. The objective of this report is to propose a strategy that enables the viable core of the industry to survive while keeping the fiscal and social costs of restructuring within acceptable limits. In order to become competitive again, the industry should utilize labor and other resources more effectively so it can produce better quality coal at an average cost that is at least 20 percent lower than the cost of coal produced today. In turn, this requires the implementation of a comprehensive restructuring and reform program with the following main building blocks:

- liberalization of coal markets;
- establishing new corporatized entities by combining economically viable coal mines, washing plants and marketing organizations;
- rapidly closing uneconomic mines;
- mitigating the social costs of restructuring by facilitating the transfer of employees to other mines, limiting new recruitment, and funding job creation programs;
- transferring the social assets and responsibilities of the coal industry to other organizations;
- leaving the financing of investments to the mining companies; and

- focussing budgetary support on the cost of mine closures, including social costs, and the divestiture of social assets.

iv. Even if the proposed program is adopted, the adjustment will be difficult. It will require the closure of at least one third of the mines and the shedding of up to half of the labor force in the 1996-2000 period. Furthermore, the probability of a less favorable outcome is quite high, especially if the current crisis is prolonged by halfway measures. The proposed program is described in more detail below.

### **Market Liberalization**

v. The current system of centrally set wholesale and "accounting" prices creates a number of distortions. The stipulated wholesale prices send the wrong signals to consumers by keeping steam coal prices 20-30 percent above the price of imported coals, and overcharging consumers for washed coal. "Accounting prices" that the mines are paid imply a cross-subsidy from low cost mines to high cost ones, thereby reducing incentives to increase efficiency and denying the opportunity to re-invest profits. In addition, the unpredictability of the administratively established "accounting prices" impedes the ability of the low cost mines to obtain credit from the banking sector.

vi. In 1995, most coal was still distributed under a centralized system rather than marketed under contracts which engage suppliers and consumers. While officially only a small portion (less than 1 percent) of the coal was distributed as "state order" with explicit payments from the state, more than 90 percent of domestic coal production was distributed through Uglesbyt, in a way very similar to the previous central allocation and distribution system and with the same distorting results on the development of a true market. A number of factors reduced the willingness of the mines to pursue direct contracts: (i) high cost mines received the cross-subsidized "accounting" price if they sold through Uglesbyt; (ii) low cost mines had difficulties finding promptly paying customers since they lacked marketing skills; and (iii) there was a perception of state guarantees behind the payments for the fulfillment of "sector orders/plans".

vii. The consequences of maintaining this system are negative for the consumers, the coal industry and the state budget. Under cash shortages, Uglesbyt distributes available coal among consumers regardless of the payment capabilities of the clients and with little regard to coal quality. Consumers as well as producers have little influence on the distribution. Large consumers have completely lost confidence in the mining industry's capability to supply cleaner coal, and, each time they get access to cash, they prefer to buy imported coal that is of better quality and is delivered in time. Finally, as the events during the third quarter of 1995 demonstrated, the government still has a moral obligation to ensure that the salaries of coal miners are paid, and can be forced to inject money into the economy earmarked for coal purchases. Uglesbyt acts as the distributor of this money among the mining companies, thereby re-confirming the perception of state guarantees behind "sectoral orders", and promoting further coal sales to insolvent customers.

viii. Uglesbyt's monopoly to sell most of the domestically produced coal to domestic customers should be phased out. This implies that the limit on the share of coal that mines can sell directly (either domestically or abroad) at liberalized prices should be increased gradually and reach 100 percent by the time the corporatization process is completed (see below). This would allow the industry to adjust to the

elimination of cross-subsidies between the associations/independent mines that the introduction of direct sales from the mines to customers implies.

### **Corporatization of Economically Viable Mines**

ix. The Ministry of Coal Industry (MCI), together with the Ministry of Economy and other entities, prepared a Presidential Decree on the restructuring of the coal industry. According to this Decree, MCI will give a separate legal entity to each mine (and other subdivisions) in the coal associations in the first quarter of 1996. Non-core activities (such as construction, transport, engineering, machine building, shops, etc.) and social assets will be separated from coal mines and coal washing plants. The entities that are created will be transformed into joint stock companies (JSCs) by September 1, 1996. It is foreseen that the viable mines and washing plants will be incorporated into about 20 holding companies. The remaining (non-core) enterprises will be privatized. Social assets will be transferred to local governments during 1996 and the first half of 1997 (see below). The holding companies will also include the local marketing branches of Uglesbyt, while Uglesbyt's central planning, coal distribution and revenue transfer functions will disappear. The JSCs will be free to negotiate and determine their own prices (although a temporary declaration requirement will be in effect in 1996 if the contractual price is above the "world market price").

x. The 39 uneconomic mines that have already been identified for closure by MCI (see below) will not be transformed into JSCs. These mines will be administered separately, and closed according to a "state program" to be developed by MCI and submitted to the Cabinet of Ministers in the second quarter of 1996. A single organisation, Ukrainian Coal Company (UCC) that reports to MCI and is funded directly from the budget should manage the closure process. The "charter" of this organisation should specify that it is required to close the mines as quickly and economically as practical, so it does not become a subsidized coal production company, competing with the JSCs. However, the exclusion of 39 uneconomic mines will likely fall short of ensuring the profitability of more than a small minority of the JSCs. Further measures are needed to reduce the costs of the new JSCs. One option is to increase the number of mines that are excluded from the JSCs. Another option is to provide a method for the JSCs to return mines to the state for closure. One way to achieve this would be to include existing "marginal" or "short-life" mines in the JSCs on a lease basis. The JSCs would not own the assets of these mines, and therefore would not carry the burden of the financial liability for closure and environmental restoration. Instead, the JSCs would have a fixed term lease and licence, enabling them to operate the mines. On termination of the lease and licence, renewal would be possible, but neither party would be under an obligation to renew the arrangement. Employees at the mines would have contracts of employment with the JSCs.

### **Closure of Uneconomic Mines**

xi. A significant part of the coal industry is irreparably uneconomic. The resources required to keep these high cost mines in operation are needed for the full utilization and modernization of the capacity of lower cost mines that have a chance to remain competitive. Without closing uneconomic mines these resources cannot be liberated, increasing the probability that even the lower cost mines will lose their competitiveness in the long run. In the first half of 1995, MCI decided that at least 39 mines with a total coal output of 4.8 mt (1994 figure) should be closed. Out of these, 24 mines are to be closed in the first group starting in 1995.

xii. The closing of these 39 mines will reduce the average cost of domestically produced coal only by 4.3 percent. Even assuming that the capacity utilization of the remaining mines will increase to make up for the forgone production of the closed mines (since the lower cost mines will be allowed to reinvest their profits), the average unit cost of domestically produced coal will decrease by less than 8 percent. In order to restore the competitiveness of the Ukrainian coal industry, average unit costs need to be reduced by at least 20 percent. This will require, among other things, the closure of at least 75 high cost mines over a period of 4-5 years (the closure of these mines itself will reduce the average unit cost only by about 9 percent, with possible additional gains coming from the increased capacity utilization of remaining mines). However, if the productivity of workers in the remaining mines does not keep pace with increases in labor costs or the improved capacity utilization of these mines fails to materialize, the number of required mine closures may easily reach 100.

xiii. The originally prepared plans estimated the time required for the closure of a mine at 3 years (on average), with a range of up to 13 years. The experience of other countries that closed uneconomic mines has demonstrated that rapid closures with only a minimal recovery of old plant and machinery are the cost effective approach. The preparation of closure plans should be guided by the main objective of cost minimization, and other objectives such as job creation and social services should be addressed separately. Therefore, the original closure plans should be reconsidered in the light of the urgency of the situation, with the objective of finding simpler, cheaper and faster ways to implement the closure program. MCI or its subsidiary (Ukrainian Coal Company) could invite competitive bids from competent organisations, and award a contract to implement the technical tasks related to the closure to the lowest technically satisfactory bidder. Payments under these contracts should be staged according to well-defined milestones, for example (i) the completion of underground works; (ii) the demolition of surface buildings; and (iii) filling or capping the shafts. Following this approach is likely to reduce closure costs significantly.

### **Mitigation of Social Impacts**

xiv. The closure of uneconomic mines and the need to reduce costs in all mines after the industry starts to operate competitively will significantly reduce the number of jobs in coal extraction. Even under a relatively optimistic scenario, about half of the people directly employed in coal extraction may have to leave over the next five years. Taking into account likely job reductions in other areas (e.g., washing plants, construction, and the social sphere), 300-400 thousand people may need to exit from the coal industry in the medium term. The number of workers that the Ukrainian coal industry needs to shed is one of the highest ever attempted by a single industrial branch in Europe. This task is even more complicated by the high concentration of the mining activities in the Donbas region. Furthermore, the country and the mining industry has to start this process in a period of extreme scarcity of financial resources and the lack of alternative employment due to the depression the economy is currently going through. While indicating the need for specific measures to mitigate the social impacts of restructuring, these considerations also emphasize that the design of these measures should take into account macroeconomic and fiscal realities.

xv. In order to minimize disruption and harm to the individuals involved, natural attrition should be the main method of job reduction. Based on employment statistics for 1994 and for the first half of 1995, it appears feasible for many of the employees at the already designated 39 mines to be redeployed at other mines, without a sustained increase in the total number of employees, provided that new recruitment is reduced/eliminated. In most cases, the transfers can be absorbed by natural attrition

in less than one year, and in the worst case in less than two years. In order to compensate for the additional costs of transferring employees from one place of work to another, a payment per transferred employee should be made to the association/JSC that takes the employee over. The eligibility of the association/JSC to receive the transfer payment should depend on the association/JSC demonstrating that it introduced, at least 3 months before the closure starts, a policy of limiting the recruitment of new employees to X percent per year of its total labor force, and is committed to maintain this policy in the medium term.

xvi. It is unlikely that all employees will wish to be transferred or can be offered comparable jobs. A substantial share of surface workers and older underground workers is likely to become redundant. In addition, surplus labor is likely to be shed by the newly created JSCs in response to competitive pressures to reduce costs. The potential losses of employment in certain regions (particularly in the Donbas) present a genuine concern even if natural attrition is utilized to shed most of the surplus employees. There will be a need for regionally based programs that support that create jobs in order to offset the general decline in the level of the economic activity in the coalfield areas. Among the options to facilitate job creation, re-employment support, retraining of displaced workers and the provision of credit for new business ventures seem to be the least costly and contradictory to market mechanisms. The loan applications should be subject to a careful screening procedure and ex-post evaluation. In addition, the approved applicants could also be given start-up technical assistance in the form of shared office space, communications facilities, training, etc. At a later stage, public employment schemes could be introduced to help the long term unemployed in economically distressed regions.

xvii. The most effective measures, however, are likely to be the ones that restore economy-wide growth, such as further reduction of the budget deficit, monetary stability, liberalized trade regime, transparent and predictable legal and regulatory framework, and promotion of the private sector. The ability of the economy to absorb the employees who leave the coal industry will be particularly dependent on the progress of reform in the Donetsk, Lugansk, Volyn, Dnipropetrovsk and Kirovograd oblasts, where the mines are located. Using the number of privatized enterprises as an indicator of economic reform, Donetsk and Dnipropetrovsk oblasts were among the best performers nationally in 1994-95. The picture was less favorable for Lugansk, Kirovograd and Volyn. The pace of privatization was reflected in the amount of foreign direct investment; Donetsk and Dnipropetrovsk oblasts attracted several times more investment than Lugansk, Kirovograd and Volyn. There is ample scope to speed up privatization even in Donetsk, the most advanced oblast (the oblast achieved only 64% of its medium/large scale privatization target in 1995). Furthermore, a policy that actively supports the establishment of new businesses is also needed. Although oblast administration established an office that gives information on procedures and facilitates new ventures, there are still too many bureaucratic requirements. Entrepreneurs also have difficulties finding office space, and gaining access to infrastructure. Ukrainian local and regional authorities may want to study the experience of Central European cities that successfully promoted the growth of the private sector by keeping local taxes low and registration procedures simple, and by establishing "incubator houses" for small ventures and "industrial parks" for larger businesses.

### **Divestiture of Social Assets**

xviii. The coal industry owns and operates a wide range of social assets (kindergartens, houses, medical facilities, etc.). About 77,000 people (or about 8 percent of all employees) are engaged in the operation and maintenance of these assets. The average cost recovery from the beneficiaries of social

after deducting contributions from the beneficiaries, the cost of operating and maintaining these assets is expected to amount to US\$ 150 million, representing about 7 percent of total coal production costs. The continued provision of these services by the mines would (i) continue to divert the attention of management from the key task of coal production; (ii) increase the cost of coal thereby reducing the competitiveness of domestic coal mining industry; and (iii) maintain the existing inefficiencies in service provision.

xix. According to the Presidential Decree on restructuring (see above), the basic method to be applied in the divestiture of social assets is the transfer of the assets to local governments. Following the transfer, opportunities for the improved utilization of these assets and their privatization should be explored. Specifically, city-wide programs should be adopted to rationalize the utilization of kindergartens. Summer camps, resthouses, vacation facilities, and the majority of housing stock should be privatized. Profilatoria and sanatoria should be placed under existing medical facilities operated by local governments and their utilization rationalized. Together with the housing stock, the assets and staff of the maintenance organizations and utilities should also be transferred.

xx. Because cost recovery ratios can be increased only gradually, local governments will need to be provided with substantial financial support for the operation and maintenance these assets. In addition, local governments should also receive technical assistance in the management of operation and maintenance activities and the development of social service rationalization and rehabilitation programs. Financial assistance should be subject to a sliding scale, e.g., covering 60 percent of total costs (including rehabilitation that cannot be postponed) in the first year, 40 percent in the second year, 20 percent in the third year, and no assistance afterwards.

### **Investments**

xxi. The future of the coal industry in Ukraine depends, to a large extent, on the evolution of domestic coal demand. Based on a forecast presented in this report, coal consumption is expected to be in the range of 75-95 million tons in 2000, and 85-105 million tons in 2005, probably closer to the lower bound. However, the "Program 2005" adopted by the government in March 1994 has foreseen a demand of 150 mt/year in the 2000-2005 period, and proposed large investments to increase production capacity. These as well as previous state-supported mine development investments should be stopped. The highest priority investments, in parallel with managerial/organizational changes, should be aimed at utilizing the full production capacity of existing lower cost mines that have good geological potential.

xxii. The focus should be on increasing the running time of the coal cutting machines at the longwall faces and de-bottlenecking the roadways to and from the faces. Face equipment could be partly upgraded and conveyor belts could be renewed. Modern roof control techniques could be introduced. Poor sections of piping for secondary ventilation, compressed air supply and gas and water extraction could be renewed. Obsolete or worn pumps, fans, electric cables and switchgear could be replaced. Investments specifically designed to support organizational/managerial changes for improved mine safety and health could include the purchase of equipment to extract gas, suppress dust, improve ventilation, control air quality and provide personal protection. Although there is an overcapacity in existing coal washing plants, there may be some potential to increase efficiency of selected plants in a low-cost manner. In order to reduce coal transport costs, smaller, semi-mobile modern plants could be considered for some mines.

xxiii. Recently, two mechanisms have been introduced to address the problem of funding investments in coal exploration and mining. The first one is the system of "differentiated rents" deducted from the wholesale price. The collected rental payments will be available to finance investments primarily in coal exploration and to cover the cost of restructuring. In order to reduce uncertainty and avoid perverse incentives, the rents should be set in a transparent manner based on geological factors (independent of actual performance) and left unchanged (in real terms) for an extended period. An additional consideration is the ability of the mines to carry the extra burden that this rental payment system creates. Therefore, the size of the rent should be limited to a few percent of the sale price.

xxiv. The second mechanism is the Energy Development Fund that utilizes revenues from import taxes on coal (ECU 1-2/t) and light oil products (15 percent or at least ECU 15/t). Total revenues of the fund are estimated at US\$ 120-150 million/year. The main problem with this fund is that it might maintain a system of centrally determined and funded investments despite the proven inefficiency of such a system in the coal mining industry in the past. The solution is to liberalize prices and allow financially independent companies to decide about investments and compete for credit from the banking sector. In view of the low efficiency of centrally planned and funded investments, a policy of self-financing (from accumulated funds or credit) of mine development and equipment replacement investments should be followed. The resources that accrue to the fund should be applied to finance the technical and social cost of mine closures and other expenses associated with the restructuring process.

### **Budgetary Support**

xxv. In view of the critical situation of the Ukrainian coal industry, most of the cost of restructuring has to be borne by the budget. However, it is important to channel budgetary support in a way that minimizes the risk of distorting decisions about future production activities and investments. In other words, the market rather than the government should decide about the allocation of resources for coal production. This can be achieved if budgetary support is primarily aimed at relieving the industry of unproductive expenditures such as the cost of social protection and mine closures while phasing out the utilization of public funds for investments.

xxvi. Budgetary resources that support the operation and maintenance of social assets should initially be provided to the mining companies. Over time, as the assets are divested, more and more support should be channelled to local governments. Assuming that (i) support from the central government budget is gradually reduced over time; and (ii) cost savings from rationalization and privatization proceeds are fully utilized to finance the rehabilitation of remaining assets, about US\$ 130 million support from the central government needs to be budgeted for 1996, US\$ 90 million for 1997, and US\$ 45 million for 1998. Additional resources need to be provided to regions/cities where major job losses occur for the retraining of workers and the establishment of funds that facilitate job creation (credit lines and public employment programs). The necessary budgetary outlay for this purpose is estimated at US\$ 20 million per year.

xxvii. All other budgetary support for restructuring should be channeled through Ukrainian Coal Company, the organization entrusted with the implementation of mine closures. Assuming that, on average, about 20 mines will be closed annually in the 1996-2000 period, the budget of Ukrainian Coal Company should be about US\$ 130 million per year, consisting of US\$ 50 million per year to cover technical closure costs, US\$ 15 million per year to cover environmental protection costs, US\$ 15 million per year for payments to cover the cost of transferring employees from the closing mines to other mines,

US\$ 25 million per year for severance pay and re-employment support to workers who do not wish to (or cannot) be transferred; and US\$ 25 million per year for disability payments and the provision of coal to pensioners.

xxviii. It will cost substantially less for the budget to pay for the closure of uneconomic mines than to cover their losses indefinitely. This can be seen if, after excluding payments associated with the transfer of social assets, disability, and the coal to pensioners, the remaining US\$ 125 million per year budgetary outlay is compared to the cost savings due to the closure of uneconomic mines. The closure of 80-100 mines, even without taking into account possible gains from the improved capacity utilization of the remaining mines, is expected to reduce the average unit cost of domestically produced coal by 9-12 percent and save US\$ 200-250 million per year if the production of these mines is replaced with imported coal. Savings will be substantially higher if the remaining mines, after reinvesting profits that they are allowed to keep under this scenario, are able to improve the utilization of their capacity, thereby making additional imports unnecessary.

## I. INTRODUCTION AND BACKGROUND

### A. Introduction

1. In 1994, Ukraine's coal industry employed 998 thousand people, or 4.3 percent of the labor force of the country<sup>1</sup>. The coal industry supplied 76 mt of coal, with a market value of about US\$ 2,300 million, meeting 24 percent of total primary energy demand in Ukraine. Coal miners received one of the highest salaries among industrial employees, were the best organized, and wielded considerable political influence. The presidential and parliamentary elections of 1994, for example, were scheduled one year ahead of time in response to demands made by striking coal miners.

2. The Ukrainian coal industry is in a deep crisis. Between 1990 and 1995, production decreased by 50 percent. Coal used to be one of the major Ukrainian export commodities (20 mt of coal was exported in 1990), however, coal exports almost totally disappeared in 1995, while imported coal captured 20 percent of the Ukrainian market as a result of high domestic coal prices, problems with timely delivery and coal quality, and the aggressive marketing of Russian and Polish coals. The productivity of Ukrainian coal miners is extremely low by international comparison, and now it is low even by historical Ukrainian standards: employees engaged in the core production activities produced on average only 105 t of saleable coal per capita in 1995, a drop of 34 percent since 1990<sup>2</sup>. Despite high domestic coal prices, the coal industry was unable to cover its costs. Payment arrears accumulated by many of its traditional customers further contributed to the financial crisis, leading to the inability of many mining enterprises to pay salaries. The ability and the willingness of the state to subsidize coal production dropped to an all-time low by 1995, due to a general decline of budgetary revenues in the shrinking economy, and the recognition by policy makers that further large-scale production subsidies endangered the macroeconomic stabilization effort.

3. In Ukraine as elsewhere in the former Soviet Union, mining companies not only produced coal, but also delivered services including pre-school education, health care, housing, recreation, etc. The services were provided to employees, their families, and in some cases to the population at large. In an open economy, carrying the cost of these services further reduces the competitiveness of coal mines. While some scope for rationalization certainly exists, the complete elimination of these services would be untenable from a socio-political point of view, further complicating the restructuring of the coal mining industry.

4. The purpose of this report, prepared in response to a request by the Ministry of Coal Industry, is to outline a comprehensive reform program for the Ukrainian coal sector. In order to survive the current crisis, the coal industry should reduce its production costs and improve the quality of saleable coal. While striving to achieve these goals, the industry has to operate within strict financial and social constraints. The budgetary burden and the social costs of the adjustment -- subsidies to the mining industry as a percentage of budget expenditures and the unemployment ratio in the most affected regions - should remain tolerable.

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<sup>1/</sup> For the purpose of this report, the coal industry/coal sector is defined as all the enterprises that report to the Ministry of Coal Industry as of 1995.

<sup>2/</sup> For comparison, hard coal mines produce about 200 t of coal per employee per year in Russia, 400 t in Poland, 2,000 t in the United Kingdom, and 4,000 t in North America.

5. The first chapter of the report provides an overview of past development policies in the coal sector, and briefly describes the environmental performance of the coal industry. The second chapter analyzes domestic demand and the export outlook for the coal industry. The third chapter describes the production and import of coal, including an analysis of production costs and the use of labor. The fourth chapter describes institutional and pricing arrangements, and outlines options for restructuring. The fifth chapter discusses the issues that will emerge during the restructuring process. Finally, the appendix contains an Action Plan that summarizes the most important recommendations.

### **B. Past Development Policies**

6. Large-scale coal production in Ukraine began in the Donets Basin (Donbas) in 1870, at the outset of the railroad era in the Russian Empire. By 1913, annual production reached 25 million tons, 87 percent of the total produced within the Empire. Extensive development of the Donbas was spurred by the nearby availability of primary resources for iron and steel production: iron ore is brought in from nearby Kriviy Rih and ferro-alloy manganese from Nykopil. Coal output reached its peak in 1976 with 191 million tons (run-of-mine, before washing), including more than half of the total metallurgical coal production of the Soviet Union. In addition to metallurgical coal, anthracite and other high grade thermal coals are also abundant in the Donbas, as well as coalbed gas. There are significant shallow and surface minable lignite deposits in the northern part of the Donbas and west of the Dnieper River. Bituminous coking coal deposits can be found in the Lviv-Volyn Basin near the Polish border.

7. Ukraine's total coal reserves amount to 52 billion tons of which 23 billion tons are proven and probable (excluding possible) reserves. Cumulative coal production has been more than five billion tons. Ukraine has practically unlimited supply of coal. However, a large portion of the reserves appear to be uneconomic. The geological reasons for the high costs and the low productivity are great depth, high temperature, frequent gas outbursts and thin coal seams. These factors are still worsening: average depth, temperature and rock pressure increase as mining proceeds from top to bottom; and the average seam thickness decreases as miners exploit the easier, thicker seams first before proceeding to more difficult, thinner seams. As mining progresses towards greater depth and away from the shaft, transport of men, materials and coal become longer and more difficult. Air passage ways increase and air temperature is rising consequently. Sinking of wider and deeper shafts, to get easy access to the coal, cannot be economically justified for deep and thin coal seams. Therefore, engineers and planners of the former Soviet Union decided to invest in Siberia and Kazakhstan where coal occurs in thick seams near the surface and a higher return on the investment can be expected. More generally, mining shifted from underground to surface operations everywhere in the world. This trend was reinforced by the rapidly increasing availability of oil and gas after World War II. Deep coal mining in Western Europe reacted since the late 1950s by closing uneconomic, non-competitive mines, and increasingly concentrating the declining production on the best mines only.

8. Following independence, the Ukrainian coal industry hoped that the declining trend of coal production would be reversed with generous support from the state. In 1992-94, long term planning focussed on finding ways to increase coal output in order to reduce Ukraine's dependence on imported fuels. The reduction of production costs did not receive a high priority, and no decision to concentrate coal production on the best mines was made. Instead, funds were systematically channeled from the better mines to the worse mines to sustain the operation of the latter. As a result, improvisations were made in the poorer mines and sacrifices in the better-ones, dragging down the industry as a whole. The poorer mines possess now a complicated network of cross-cuts and inclines which was continuously extended with relatively low investments, causing rapidly increasing operating costs due to restrictions

in the transport of men, materials and coal. The better mines could not make full use of their potential, due to a lack of funds for rationalization and modernization investments.

9. In early 1994, the Cabinet of Ministers approved a "Program for the Development of the Coal Mining Industry of Ukraine and its Social Sphere up to the Year 2005". The "Program" was based on the expectation that coal demand would stabilize in 1994 and then rapidly increase. Accordingly, the "Program" included the construction of 21 new mines, capacity increases in 14 existing mines, and reconstruction of 46 mines, to be funded by the state. In addition, the "Program" included the construction of housing of 18.8 million m<sup>2</sup>, hospitals with 9,612 beds, ambulatories with a capacity of 20,780 patients per day, cultural facilities with a capacity of 7,458 people, schools for 87,132 students, and kindergartens for 34,975 children. The closure of 48 mines in the 1995-2005 period was also planned, mostly in response to the expected exhaustion of their mineable coal reserves. The closure of ten washing plants was also proposed. While the "Program" included the corporatization of enterprises and the replacement of centrally controlled wholesale prices with contractual prices agreed between buyers and sellers, the target date for the implementation of these actions was left unspecified.

10. In 1995, the new government recognized that the devastating state of the industry calls for speeding up the corporatization and price liberalization process, and the rapid closing of the most uneconomic mines. Thirty nine mines were selected for closure, including 24 mines that were to be closed in the first group in 1995-1998. The government promised to help to alleviate the social problems connected with the closing of mines, and urged the coal industry to focus on the rationalization of the better mines through organizational/managerial changes and targeted investments. In addition, preparatory work was started so that the corporatization and restructuring of the coal industry can be completed in 1996. It became clear that without a fundamental change of established attitudes and practices, further deepening of the current crisis of the coal industry is unavoidable.

### C. Environmental Performance

11. **Mining and washing of coal.** Environmental problems generally associated with coal mining include: (i) the discharge of saline mine drainage to surface waters; (ii) surface disposal of waste rock and tailings in large, poorly controlled and managed disposal dumps; (iii) coalbed methane disposal; (iv) disposal of coal washery waste, particularly waste containing a high percentage of combustibles; (v) temporary storage of coal; and (vi) land subsidence. Most of these problems can be observed in Ukraine. In addition, Ukrainian mines have a poor safety and health record.

12. Ukrainian coal mines extract an average of 3 m<sup>3</sup> of waste water (which must be removed from mine shafts) for every ton of coal produced.<sup>3</sup> Some of this waste water is used in mine operations or in coal washing plants that are in close proximity to mines. However, the volume of water reused by coal mines and washeries is small, and 80-95 percent of the water removed from the mines is eventually discharged to the surface environment. Salinity concentration of these waters range from an innocuous 30 mg/l to an environmentally hazardous 4,000 mg/l. Saline water discharged from mines in the Donbas significantly degrades the quality, and therefore use, of surface waters originating or passing through this region. The dry climate of the east and southeast parts of Ukraine cause chronic water deficiency problems. This situation aggravates pollution levels in the North-Donets River, the largest river draining these areas. Salinization of agricultural soils is a growing problem in irrigated fields that use water from

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<sup>3/</sup> For example, the mines in the Donetskugol Association produce about 66 million m<sup>3</sup> of waste water per year, in the Stakhanovugol Association about 126 million m<sup>3</sup> per year, and in the Thorezanratsit Association 63 million m<sup>3</sup> of waste water per year

the North-Donets river, and there are no alternative sources of irrigation water that can easily be developed (ground water tends to be naturally saline or too limited and difficult to extract, and interbasin transfer of water from the Dnieper River is of inadequate volume). Therefore, the surface discharge of saline water from mine dewatering should be reduced. In addition, concentrating the mining activities in the better mines would also reduce waste water discharges.

13. Mine waste rock and coal washery tailings have been accumulating on the surface for many years. These dumps tend to undergo internal spontaneous combustion, and are rarely effectively rehabilitated. It appears common practice to mix large particle coal washery wastes and material removed from coal washery tailings dams during dam rehabilitation with waste rock in dumps operated by coal mining associations. Without careful placement of this material in dumps, the chance of spontaneous combustion within the dumps is high.<sup>4</sup> Washery waste storage ponds cover large areas, and the material discharged to the ponds has 30-50% percent combustible content.<sup>5</sup> When these storage ponds are rehabilitated (settled small particle material removed), the waste is either sent to thermal power stations for use as a fuel or placed in mine waste rock storage dumps. Many of the dumps are located in residential areas or in prime development sites in the regional administrative centers (including Donetsk).

14. The main environmental problems caused by the waste dumps and ponds are (i) health problems associated with elevated airborne dust concentrations; (ii) shallow groundwater contamination by saline water leachate; and (iii) public health, safety and nuisance problems indirectly caused by high temperatures generated within the dumps when they catch fire. The disposal and rehabilitation of waste rock dumps has become a particularly difficult problem because of encroachment of urban development up to the boundaries of the mines. In addition, the method of waste placement in the dumps is generally unacceptable. Slopes of the dumps are far too steep, the height of dumps tend to be too great, little attention has been given to disposal methods that prevent oxygen and water from entering the dump, and even temporary stabilization of small particle material to prevent its mobilization into the atmosphere is generally absent. Recent attempts to reform the dumps by removing part of the "cone" have been prompted by a desire to contain and extinguish fires. The injection of incombustible materials and/or the sealing of the sides of the dumps might prove to be more effective methods. However, experience suggests that once a fire starts in a dump, it is very difficult to extinguish. The emphasis should therefore be on prevention. The rehabilitation/reshaping of waste rock dumps for beneficial land use, including office/residential development, urban amenities, or agriculture could be considered. If economic, the commercial reclamation of coal from waste rock dumps can be part of dump rehabilitation (the mining companies estimate that 5-15 percent of waste rock dumps is coal, but the true amount could be higher as suggested by the high number of waste dumps on fire). It is more likely that the washery tailings piles can be economically reprocessed since these contain a much higher percentage of coal. However, the material is extremely fine and will require small semi-mobile processing plants specially designed to separate this very fine material.

15. Reduction of methane concentration in mine ventilation air is a prime concern in the gassy coal mines of the Donbas (in some locations, gas content is as high as 40 m<sup>3</sup> per ton of coal). To reduce

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<sup>4/</sup> For example, the Donetskugol Association, one of the two associations with operations within the boundaries of Donetsk city, operates 107 waste rock dumps, of which 37 are currently on fire. Approximately 220 million m<sup>3</sup> of waste rock is stored in these dumps, with more material added daily. Thorezanratsit operates 96 waste rock dumps, with a total volume of about 131 million m<sup>3</sup>, with 26 dumps being currently on fire.

<sup>5/</sup> Waste rock dumps that belong to the 22 washing plants of the Donetsk Coal Cleaning Association cover an area of 540 ha, while liquid washing waste disposal ponds cover 813 ha.

the risk of gas eruptions and explosions, methane gas is extracted from gas rich coal seams, in particular coking coal seams, ahead of mining.<sup>6</sup> Boreholes serve as the most commonly applied technique. It was estimated that coal mining activities liberated 3.4 billion m<sup>3</sup> of methane in 1990, the bulk of which was vented into the atmosphere. Much of the coalbed methane gas recovered annually by mine methane drainage systems are not considered of pipeline quality, and less than 20 percent of the drained methane is utilized (mostly in boilers). As an interesting example, Donetskgol has constructed a storage and filling station that supplies fuel for up to 200 trucks and buses operated by the association. In order to reduce the greenhouse effect (and possibly also mining costs), options for the improved extraction and utilization of the gas should be explored.<sup>7</sup>

16. Ukrainian mines have serious safety and health problems. Many of the coal seams extracted are gassy, and gas bursts from active coal faces have been frequent. The risks of gas bursts are particularly high in several coking coal mines with difficult geological conditions despite restrictions imposed on coal extraction under these circumstances. The degasification of coal seams and surrounding rock strata prior and during mining have also not been able to eliminate gas explosions. The number of lethal accidents is very high (259 miners were killed in 1994, and 263 in the first nine months of 1995), particularly when compared to coal output. Coal dust, in addition to being an explosion and fire hazard, negatively effects the health of underground workers. Lung disease is widely spread among Ukrainian coal miners. Health hazards are exacerbated by the lack of fresh air and high temperatures underground. Poor ventilation is the result of narrow cross sections of shafts and roadways, great depths and long distances underground, including a complicated network of roadways which support coal production from several production units dispersed throughout the mines. Since the main causes of safety and health hazards are geological in nature, more selectivity of mining is essential to increase the safety of workers. However, some of the accidents are caused by the low morale of workers, lack of motivation and authority of supervisors, inadequate safety training and instructions, and poor institutional arrangements for the enforcement of regulations and follow-through on analysing the causes of accidents.

17. **Use of coal as a fuel.** The use of coal as a fuel can result in significant environmental degradation, impacts on human health, and soil chemistry changes leading to loss of agricultural production. This phenomena is well recognized, can be felt at the local, regional and global level, and is more pronounced if pollution control over emissions are inadequate and the coal quality is poor. While engineering solutions exist to control harmful emissions from use of coal as a source of energy, pollution control is expensive, and that expense can rise significantly as the concentration of pollutants produced by coal combustion increases. The quality of the coal being used (sulfur, nitrogen, and ash content, and thermal capacity) is the main factor determining the volume of uncontrolled emissions from any facility using it as a source of fuel. Locally produced coal in Ukraine tends to have moderate to high ash and sulfur content (25-50 percent ash and 2.5 percent average sulfur content). Less than 5 percent of mines produce coal with less than 1 percent sulfur, and the output of these mines represents only 6 percent of the coal produced in Ukraine. Anthracite or semi-anthracite represents 60 percent of non-coking coal production, making some common methods of NO<sub>x</sub> control in thermal power stations difficult or impossible to use (e.g., application of low NO<sub>x</sub> burners).

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<sup>6/</sup> Before steeply inclined thicker seams can be mined, the mining of neighboring thin seams is required for decompression and gas release. In order to reduce costs, it would be worthwhile to investigate whether the requirement could be dropped by applying improved gas extraction technology.

<sup>7/</sup> A number of low-cost gas enrichment processes are available, such as Pressure Swing Absorption and Membrane Gas Separation. Following enrichment, existing natural gas pipeline systems could be used to transport gas away from the producing sites. Coalbed methane can also be used to power small to medium-sized internal combustion engines for electricity generation, and electricity can be used to refrigerate the air for ventilation in deep mines.

18. The Air Quality Act of 1993 sets charges for disposal of pollutants to the atmosphere. These are essentially user fees and are levied against all emissions, not just those over the "permissible" amount (for which the fee is increased 5 times). The base emission charge applied in Ukraine for both SO<sub>x</sub> and NO<sub>x</sub> was set at Krb 105,064/t in 1993, and it has not been changed yet. While this charge was equivalent to US\$ 30/ton at that time, inflation reduced its value to less than US\$ 1/t by mid-1995. A more realistic cost of discharging these pollutants to the environment (within internationally accepted ambient air quality standards) would be between US\$ 120-250/t. Therefore, the emission charges specified in the Air Quality Act of 1993 should be increased immediately to compensate for the inflation since 1993, and gradually increased after that by 4-10 times. In addition, the installation of permanent emission monitoring equipment should be required for all boilers with gross rated power output of more than 200 MW. These measures would favor the production and use of less polluting coals, minimizing pollution control costs and damage to the environment and human health.

19. Permanent disposal of coal fly ash alters land use of the disposal site permanently. Since the resulting land use is rarely as beneficial as that of the land in its original state, significant economic losses occur. Land markets, however, do not function in Ukraine, and their development will take considerable time. There is a disposal charge currently levied against enterprises by local environmental inspectorate offices for the disposal of coal fly ash, however, it is set at an unrealistically low level (Krb 46/t or UScent 0.03/t equivalent). Improvement in coal quality can be achieved through washing, and the percent ash reduction in the coal is usually reflected as an approximately equal reduction in the amount of ash that must be placed to permanent disposal after burning the coal. Although coal washing would significantly lower the ash content and also slightly lower the sulfur content of most Ukrainian coal, the Government places strong economic disincentives on the use of washed coal by setting the price of washed coal at artificially high levels (see Section B of Chapter IV), and setting ash disposal charges too low. Given proper coal prices and ash disposal charges, the purchase of washed coal should be more economic for the consumers than unwashed coal. Therefore, ash disposal charges should be increased several times, and the artificially high prices for washed coal first reduced, and later liberalized.

## II. DOMESTIC COAL DEMAND AND EXPORT

20. Although coal is a tradeable commodity, the cost of transporting coal over large distances is quite substantial. Therefore, from the point of view of meeting domestic demand, Ukrainian coal mines have a natural advantage over imported coals. In other words, the future of the coal industry in Ukraine depends, to a large extent, on the evolution of domestic coal demand.

21. In the 1990-1995 period, domestic consumption of coal decreased by 40 percent from 132 mt to 79 mt (see Table 2.1). Although most of the decrease was due to the general decline of economic activity, the share of coal in total primary energy consumption also declined from 27.6 percent to 25.2 percent, indicating that part of the coal market was taken over by other fuels (particularly natural gas and nuclear energy).

TABLE 2.1

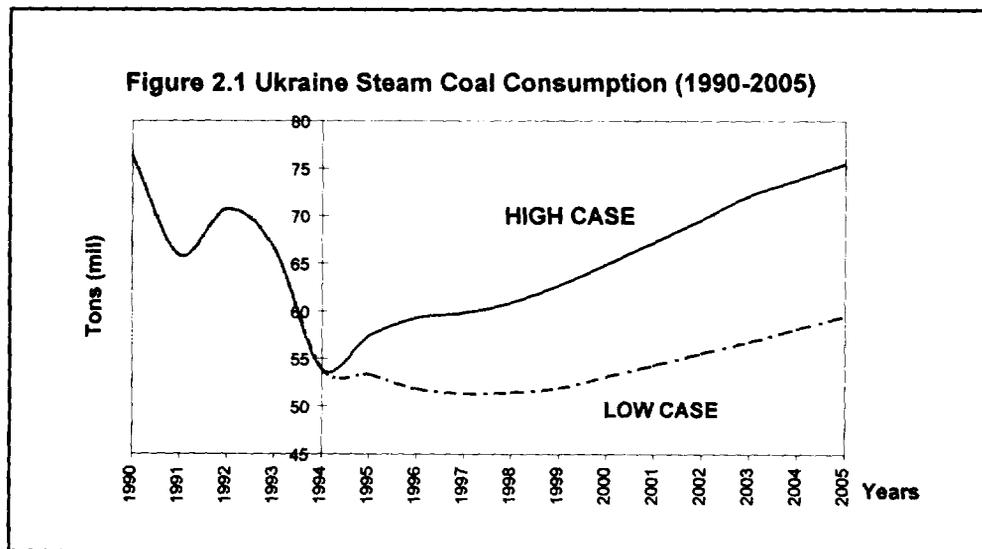
### PRIMARY ENERGY SUPPLY AND CONSUMPTION

Year	1990	1991	1992	1993	1994	1995
<b>PRODUCTION</b>						
washed coal (mt)	130.7	108.7	105.4	91.0	75.9	65.6
crude oil & condensate (mt)	5.3	4.9	4.5	4.2	4.2	4.0
natural gas (bcm)	27.8	24.0	22.0	19.2	18.3	18.1
peat & wood (mt)	4.3	4.0	3.7	4.1	4.0	3.9
nuclear (TWh)	76.2	75.1	73.7	75.2	68.9	70.5
hydro (TWh)	10.3	11.5	7.8	11.2	12.3	10.1
<b>Total Production (mtoe)</b>	<b>116.77</b>	<b>102.10</b>	<b>97.02</b>	<b>88.44</b>	<b>78.81</b>	<b>73.1</b>
<b>IMPORT</b>						
coal (mt)	21.1	12.7	11.7	8.7	7.5	16.0
crude oil (mt)	54.3	49.6	35.3	19.7	15.8	13.3
natural gas, net (bcm)	87.3	89.5	89.1	79.8	69.1	64.4
petroleum products (mt)	11.5	13.1	5.0	6.2	5.2	11.1
<b>Total Import (mtoe)</b>	<b>150.56</b>	<b>145.13</b>	<b>121.88</b>	<b>98.06</b>	<b>83.49</b>	<b>87.1</b>
<b>EXPORT</b>						
coal (mt)	20.0	13.7	7.8	3.5	4.6	2.4
petroleum products (mt)	11.3	8.4	6.4	1.1	1.7	1.4
electricity, net (TWh)	28.0	14.3	4.6	1.2	1.1	4.1
<b>Total Export (mtoe)</b>	<b>28.30</b>	<b>18.83</b>	<b>11.45</b>	<b>3.15</b>	<b>4.28</b>	<b>3.6</b>
<b>Primary Energy Consumption(mtoe)</b>	<b>239.02</b>	<b>228.40</b>	<b>207.45</b>	<b>183.35</b>	<b>158.02</b>	<b>156.6</b>
<b>Annual Percentage Change</b>		-4.4%	-9.2%	-11.6%	-13.8%	-1.7%

Notes: \*A ton of oil equivalent is defined as 10 million kcal. The applied conversion factors are: coal - 0.5, crude oil - 1.0, peat & wood - 0.2, hydro & electricity - 0.25, natural gas - 0.85, petroleum products - 1.0.

22. A forecast for the domestic demand for saleable coal up to the year 2005 is presented below. Over this period, coal consumption will be driven mainly by the evolution of coal demand in the two largest coal consuming sectors of the economy -- power plants and the steel industry -- which make up nearly three-fourth of the overall demand for coal. The uncertainty over the future course of the development of the electricity and steel sectors is accommodated by a high and a low demand scenario:

- (i) **Steam coal.** Under the Low Case, projected demand for steam coal is derived primarily from the World Bank's medium scenario for gross electricity consumption.<sup>8</sup> After bottoming out in 1997, electricity use is expected to recover at a moderate pace in the subsequent period. The share of coal in power plant fossil fuel consumption is not expected to differ significantly from the recently observed 45-47 percent. Under the High Case, steam coal demand is on a higher path due to the greater demand for electricity (as implied by the World Bank's high demand scenario) and the assumed increased share of coal -- up to 55 percent by 2000 -- in electricity generation.<sup>9</sup> In the general heat market, coal use is expected to trend downward until 1996-97 and hold steady later under both cases (see Table 2.2). The Low Case projects that consumption bottoms out in 1997-98, followed by a weak recovery. Even in 2005, steam coal demand would be only three-fourth of the pre-crisis level (1990). Under the High Case, the demand recovery is more buoyant, and in 2005 the projected consumption approaches the 1994 level; but under the Low Case, it stays about 20 percent lower (see Figure 2.1).



<sup>8/</sup> A detailed presentation of the Bank's electricity demand projection can be found in Annex 1 of the Staff Appraisal Report for the Ukraine Hydropower Rehabilitation and System Control Project, March 20, 1995 (Report No. 13663-UA).

<sup>9/</sup> The higher share of coal in electricity generation under this scenario is based on the program to rehabilitate coal-fired thermal power plants in order to, among other things, reduce the co-firing of imported fuels (oil and gas). It is worth noting that co-firing is also dependent on coal quality, therefore the coal industry itself can increase demand for coal by providing coal to the power plants that meets boiler design specifications.

TABLE 2.2

## FORECAST OF COAL CONSUMPTION (MILLION TONS, 1990-2005)

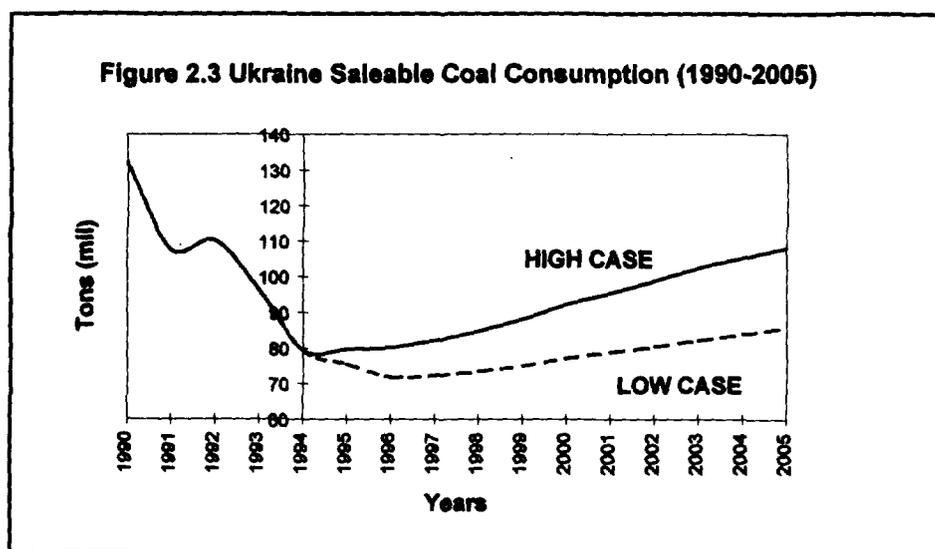
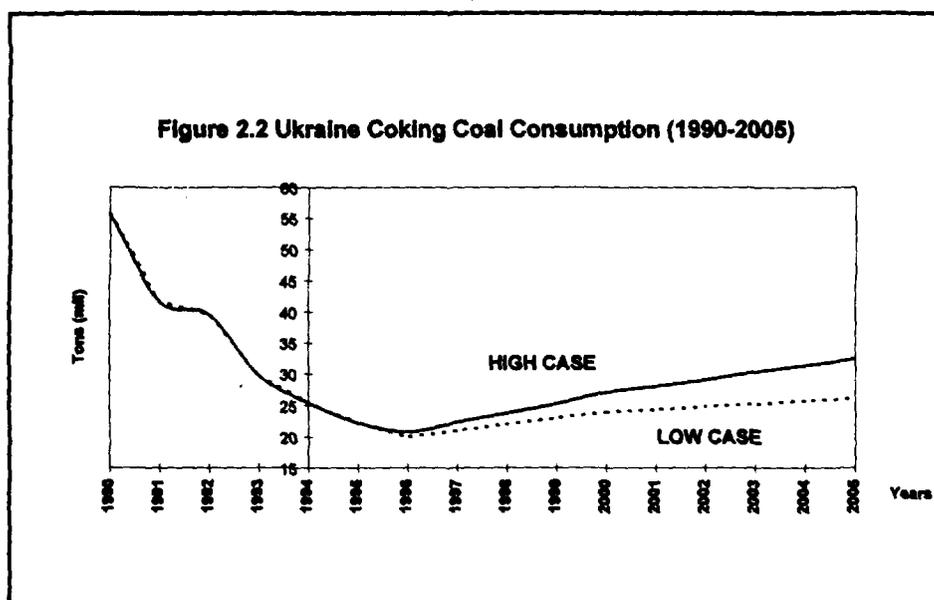
Low Forecast				
	1990	1995	2000	2005
Steam Coal				
Power Plants	31.8	36.0	36.2	42.6
General Heat Market	44.5	17.3	16.9	16.9
Households	16.2	6.3	6.0	6.0
Communal	3.6	2.5	2.4	2.4
Other	24.7	8.5	8.5	8.5
Total Steam Coal	76.3	53.3	53.1	59.5
Coking Coal	55.6	22.2	24.0	26.2
TOTAL	131.9	75.5	77.1	85.8

High Forecast				
	1990	1995	2000	2005
Steam Coal				
Power Plants	31.8	40.1	48.0	58.6
General Heat Market	44.5	17.3	16.9	16.9
Households	16.2	6.3	6.0	6.0
Communal	3.6	2.5	2.4	2.4
Other	24.7	8.5	8.5	8.5
Total Steam Coal	76.3	57.4	64.9	75.5
Coking Coal	55.6	22.2	27.1	32.5
TOTAL	131.9	79.6	92.1	108.0

- (ii) **Coking coal.** The demand for coking coal will be driven by the future course of the development of the steel sector. The severe decline experienced by the steel industry since 1990 appears to have slowed down to about 5 percent in 1995, and a mild recovery may begin in 1996-97. The Ministry of Economy predicts that steel production in 2000 could be 20 to 60 percent above the depressed level of 1994. Significant improvements are expected in the efficiency of coal utilization due to the wider adoption of continuous steel casting. Based on these assumptions, the Low Case projects that demand in 2005 will be close to the level registered in 1994. Under the High Case, the assumed larger steel output induces a moderate coal demand recovery, but even in 2005 coking coal use would be less than 60 percent of the 1990 level (see Figure 2.2).
- (iii) **Total coal demand.** While under the Low Case the overall demand for coal is seen to bottom out in 1996-97, followed by a mild recovery, under the High Case demand stabilizes in 1995-96, followed by a faster recovery until 2005. In the year 2000, aggregate coal consumption is

expected to be in the range of 75-95 million tons; and in the year 2005, 85-105 million tons, probably closer to the lower bound (see Figure 2.3).



23. Although it is not quantified in the forecast, coal demand is expected to level off in the 2005-2010 period. A least cost power investment analysis carried out by Bank staff indicates that no new coal-fired power plant will be built in Ukraine.<sup>10</sup> Technological changes in other sectors are also expected to suppress coal demand even if the economy continues to grow. Therefore, while domestic coal demand is expected to recover somewhat in 1999-2005, it will never reach the pre-independence level of 130 mt.

<sup>10/</sup> See Annex 3 of Report No. 13663-UA.

24. Demand for Ukrainian coal exports is expected to be modest, due to a number of factors. First, many of the traditional export markets buy less coal now, due to generally reduced coal demand in these countries. Second, the reliability of Ukrainian coal deliveries has deteriorated significantly over the last four years, due to the difficult financial situation of the mines and government restrictions on coal exports in response to seasonal fuel shortages in Ukraine. Third, Ukrainian mines will find it increasingly difficult to compete abroad with lower cost coal producers following the cutback in production subsidies.

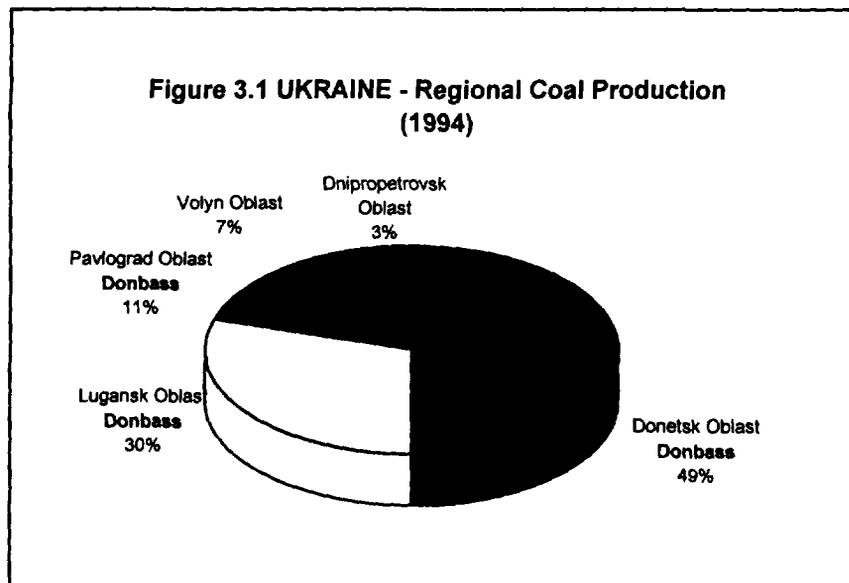
25. Despite the advantage of lower transport costs (and the recently introduced tax on imported coal -- see Section C of Chapter III below), it will be a difficult task for domestic coal producers to stop and reverse the trend of growing coal imports. Reducing the market share that was captured by imported coals would require not only the reduction of domestic production costs, but also dramatic improvements in the reliability and quality of coal deliveries. Based on these considerations, imported coals will probably be able to hold on to a significant part of the Ukrainian coal market even in the long run.

26. In summary, the plans that were prepared by the mining industry in 1992-94 forecasting a demand of 150 mt of coal per year in 2000-05 are clearly not realistic anymore. The coal industry should start adjusting to a long term production level of not more than 90 mt of (saleable) coal per year, and reduce its use of resources (labor, energy and materials) commensurately.

### III. COAL PRODUCTION, IMPORT AND EMPLOYMENT

#### A. Coal Mining

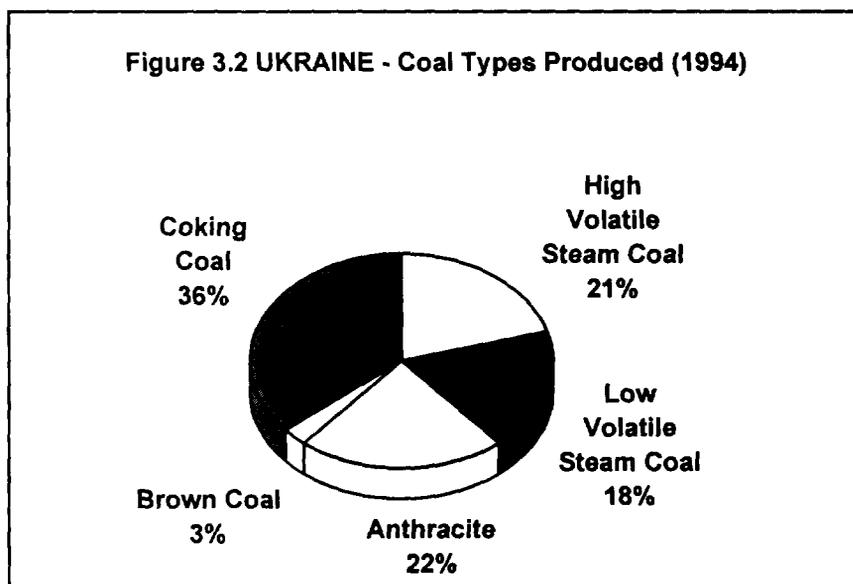
27. **Reserves and Output.** Mineable reserves in existing mines amount to about 10 billion tons, or 100 years at the present extraction rate (for less than 0.5 billion tons, the major mine development work in rock has been already completed). The average present depth of mining is about 750 meters; nearly 20 percent of the mines have already exceeded a depth of 1,000 m. The average annual depth progression is 10-15 meters. About 85 percent of the coal occurs in seams of up to 1.2 meter thickness; only 15 percent are thicker. About 65 percent have low inclination suitable for mechanization; 35 percent are steeply inclined. Most of the mines are very gassy, and in about one third of the mines there is a risk of gas eruptions, posing serious safety risks and causing fatal accidents (263 people were killed in the first nine months of 1995). Mine temperature can reach unbearable levels in the deeper mines. The average mine pumps about 6 cubic meters of water per ton of coal. Even in the better Ukrainian mines, mining conditions are worse than in West European mines (seam thickness is on average only about 60 percent of West European mines, which generally are uneconomic). Mining conditions are particularly poor in the central Donbas, where mines are plagued with a combination of great depth, high temperature, frequent gas outbursts and thin coal seams.



28. Reserves and mining operations are heavily concentrated in the Donbas; only 7 percent of total production originates from the Lviv area in Western Ukraine, where coal of similar quality is being mined under conditions similar to the Donbas. Another 3 percent originate from the Alexandria area, southwest of Dnipropetrovsk, where brown coal is being mined on surface and underground (see Figure 3.1). The Donbas coal basin covers the full range of hard coals, from highly gassy sub-bituminous coal to meta-anthracite. Mineable reserves are about 60 percent steam coal and 40 percent

coking coal. While in-situ coal is relatively clean, the run-of-mine coal (with 25-50 percent ash content) is heavily contaminated with rock, due to the thinness of the coal seams. The average sulphur content (2.5 percent) is high. Steam coal is mainly mined in the western and eastern parts of the Donbas, where the seams are relatively shallow and in general suitable for mechanization. High volatile coal dominates in the western, and low volatile coal (including anthracite) in the eastern steam coal mines. Coking coal is mainly mined in the central part of the basin, where the seams are more disturbed and either steeply inclined (in the northern extension), or deep (in the southern extension).

29. There are 244 coal mines: 239 underground mines (of which 226 in the Donbas) and 5 surface mines producing brown coal in the Alexandria area. The 244 mines include 28 merged mines, which could also be counted as 59 individual mines, raising the total number of mines to 275. The present average output of all mines is only 0.3 million t/year/mine (run-of-mine or raw coal), compared to about 2 million tons per year in Western Europe and Poland. In 1994, Ukrainian mines produced 94.4 million tons of

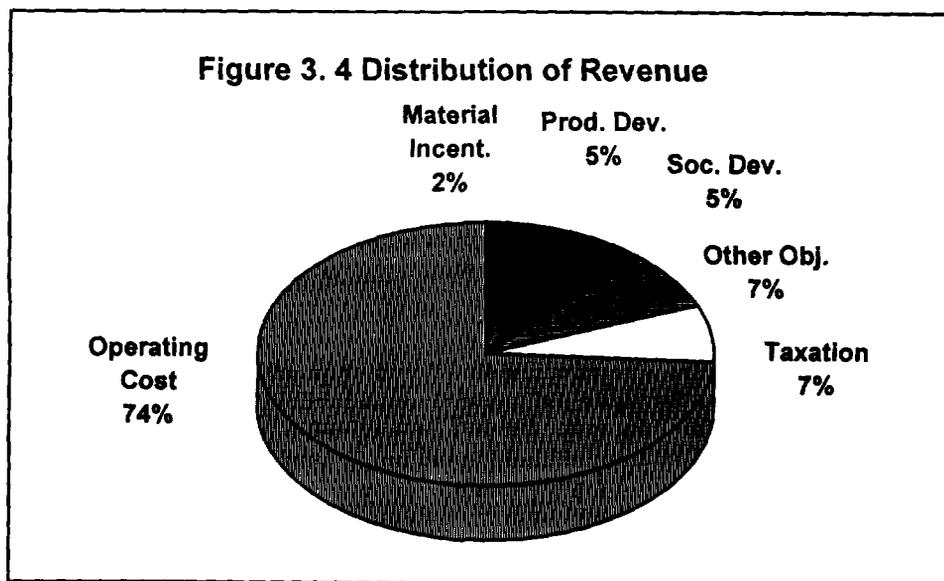
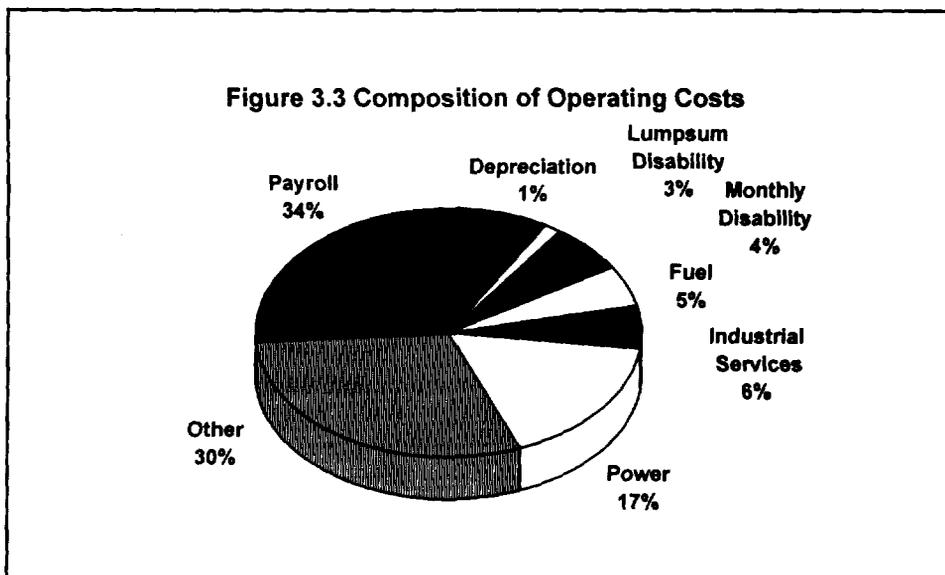


run-of-mine (or raw) coal, of which 64 percent was steam coal and 36 percent coking coal (see Figure 3.2). The steam coals are composed of high volatile coal, low volatile coal and anthracite in approximately equal parts; the share of brown coal is only 3 percent. Most production associations and independent mines (27 out of 35) produce a specific type of coal, only 8 produce a blend of different coal qualities. Steam coal only is produced by 20 associations and independent mines, coking coal only by 7. The largest producers and their relative market shares of each type of coal are: Pavlogradugol for high volatile steam coal (33 percent), Luganskugol for low volatile steam coal (31 percent), Thorezantratsit for anthracite (25 percent) and Donetskugol for coking coal (18 percent) -- (see Table 3.1).

30. **Production Costs.**<sup>11</sup> As defined in Ukraine, mine operating costs comprise material inputs such as fuel, electricity, timber and explosives; depreciation; wages (including production related bonuses); and social security and pension fund contributions. Figure 3.3 presents the average cost structure in the first quarter of 1995. Labor costs constitute 34 percent, followed by materials (30

<sup>11/</sup> The financial assessment of the coal industry is complicated by the high inflation that prevailed in Ukraine over the last three years, and the absence of adequate and systematic restatement of accounts in current values. Although certain inflationary adjustments are being made, there is an urgent need to adopt international accounting standards, especially IAS 29. The Ministry of Coal Industry and the associations/enterprises are urged to seek assistance from chartered accountants. The analysis in this section is based on the financial statements of all coal production/washing association and coal mine for the first quarter of 1995.

percent), electricity (17 percent), industrial services (6 percent), fuel (5 percent) and monthly and lump sum disability payments (4 percent plus 3 percent). Depreciation represented only 1 percent of production costs, due to the undervaluation of assets. The average coal price is formed by adding a margin for profit. However, as the distribution of revenue shows (Figure 3.4), a number of labor related and other costs are included in the profit margin. These items -- the maintenance of housing and other social expenses, discretionary incentive payments, land tax, environmental and other taxes and fines -- add up to 14 percent of total revenues. These expenses should be regarded as overhead or indirect costs of production, and be allowed as a deduction for tax purposes. Taking into account that capital costs are seriously undervalued, it is clear that many enterprises operating at a loss (based on proper accounting of costs) were liable to pay profit taxes. This distortion in the accounting/taxation system diverts cash resources from the mines, further compounding their ability to meet financial commitments.



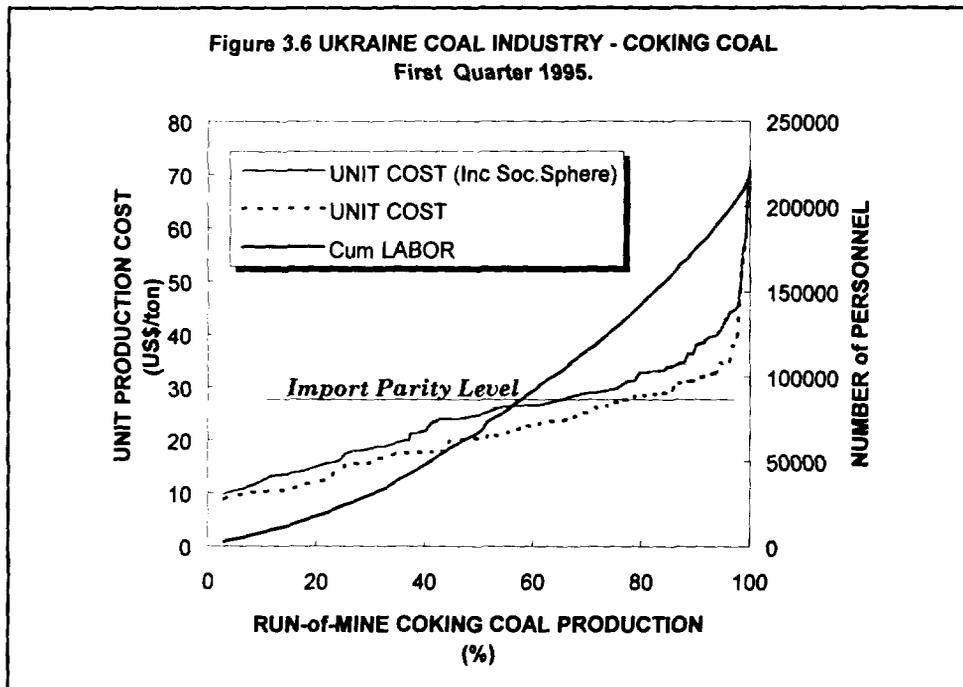
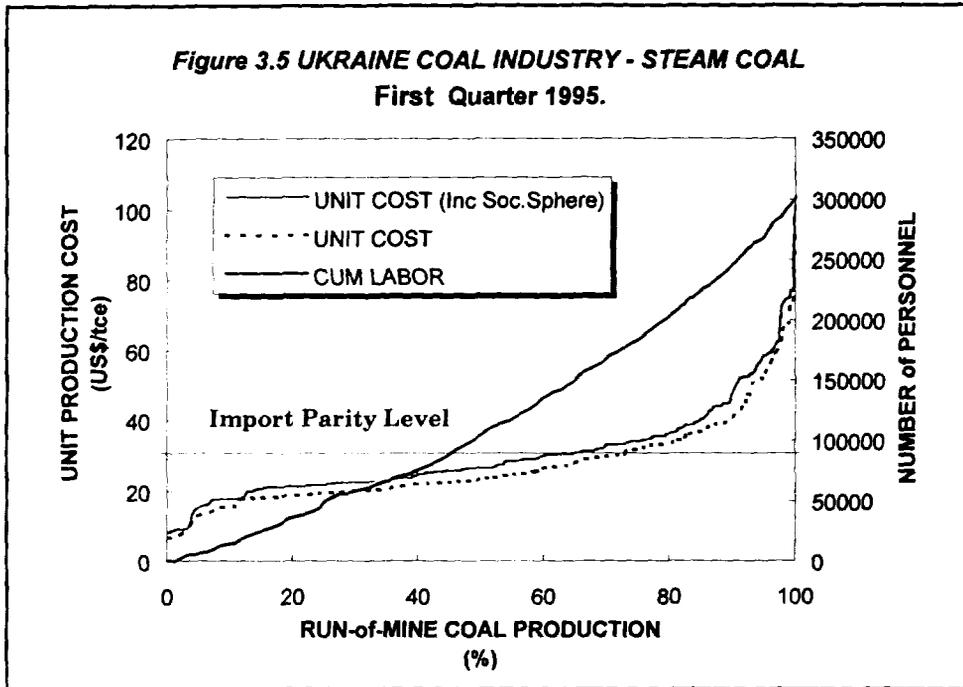
31. Based on the analysis of mine-by-mine cost data for the first quarter of 1995, two graphs showing the cost of steam and coking coal produced are presented in Figure 3.5 and 3.6.<sup>12</sup> Based on the figures, the coal industry has a high cost "tail" of uneconomic mines whose production is minimal with operating costs that are several times higher than the operating costs of lower cost mines. About 30 percent of the production of steam coal, and 25 percent of the production of coking coal might have been replaced with lower cost imported coal in the first quarter of 1995, resulting in savings of about US\$ 500 million for the year as whole (if social costs are also taken into account, the percentages change to 40 percent and 35 percent, respectively). The closure of these mines would have made 45 percent of the labor force redundant.

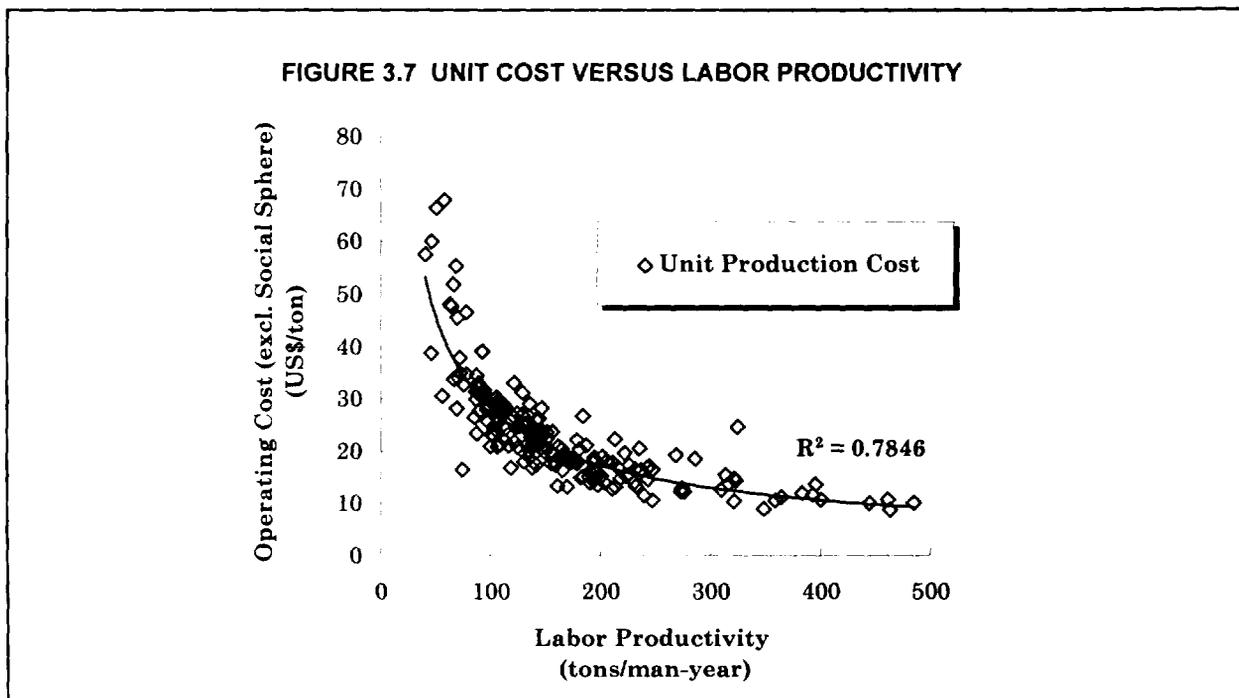
TABLE 3.1

## MAJOR COAL PRODUCERS

STEAM COAL			COKING COAL		
	Mt			Mt	
<b>High Volatile</b>					
Pavlogradugol	6.5	33%	Donetskugol	6.1	18%
Ukrzapadugol	6.3	32%	Krasnoarmeisku	5.6	16%
Selidovugol	2.1	11%	Makeevugol	4.9	14%
Other	4.6		Other	17.5	
<b>Total</b>	<b>19.5</b>	<b>100%</b>	<b>Total</b>	<b>34.0</b>	<b>100%</b>
<b>Low Volatile</b>					
Luganskugol	5.3	31%			
Donetskugol	2.6	15%			
Oktyabrugol	1.8	11%			
Other	7.6				
<b>Total</b>	<b>17.3</b>	<b>100%</b>			
<b>Anthracite</b>					
Thorezantratsit	5.2	25%			
Rovenkiantratsit	4.6	22%			
Sverdlovantratsit	3.2	15%			
Other	7.9				
<b>Total</b>	<b>20.9</b>	<b>100%</b>			

<sup>12/</sup> In the figures, costs are adjusted to include all directly production related expenses (one of the curves also includes all social expenses). The exchange rate used is Krb 122,000/US\$. The import parity price is adjusted downward in order to compensate for the lack of coal washing. Steam coal costs have been adjusted to the standard coal of 7,000 kcal/kg calorific value.





32. Mine-by-mine cost data for the first quarter of 1995 were analysed to investigate the relationship between unit cost (Krb/t) on one hand, and (i) fixed costs; (ii) production capacity; or (iii) number of employees on the other hand. The number of employees proved to be the most significant variable, explaining about 80 percent of the variation of unit costs (see Figure 3.7). This result suggests that unit costs are predominantly driven by variation in labor productivity which, in turn, is heavily influenced by differences in geological conditions. However, as argued in Section B of Chapter V, it is possible to increase labor productivity without an improvement in geological conditions by changing working practices and incentive structures.

### B. Coal Washing

33. There are 64 coal washing plants in the coal industry; another 10-15 is operated by the steel industry. The plants were mostly constructed in the 1960s and 1970s, but many were refurbished in the last 10-15 years. The plants typically include jigs for the +13 mm fraction, dense medium cyclones for the 0.5 - 13 mm fraction, and froth flotation for the 0-0.5 mm fraction (six of the plants have no froth flotation). On average, a washing plant is being fed by 5 mines. Forty five washing plants are specialised in steam coal, including 22 in anthracite.

34. In 1994, 63.7 million tons of coal were sent to the washing plants out of the 94.4 million tons of raw coal produced (in terms of "normative" tons as counted by the coal industry; the real tonnage may be 15-20 percent higher due to higher ash content). From this feed, the washing plants produced 37.2 million tons of cleaned coal, 7.9 million tons of uncleaned coal and 18.6 million tons of waste.

Excluding any changes of stocks, the marketed coal would amount to 75.8 million tons, composed as follows: 37.2 million tons (or 49 percent of the coal sold) of cleaned coal; 30.7 million tons (or 41 percent of the coal sold) raw coal shipped directly from the mines to consumers; and 7.9 million tons (10 percent of the coal sold) uncleaned coal shipped from washing plants to consumers. There are 64 washing plants in the coal industry, with an average capacity utilization of 43 percent.

35. Steam coal is being produced basically in two qualities: fine coal for power plants and large industrial consumers; and coarse coal for households and small industrial/commercial consumers. Much of the fine anthracite (smaller than 6 mm) is not being washed. Such anthracite fines account for 70 percent of all uncleaned coal from washing plants. Only 6 out of the 23 non-anthracite steam coal washing plants do not wash the fine coal. Almost all anthracite washing plants produce both coal qualities. The 19 coking coal washing plants clean all incoming coal. However, about half of the plants produce only a pre-concentrate with a relatively high ash content (about 15 percent), which is further cleaned in the plants belonging to the steel industry. Due to the strong decline of domestic coking coal production, much of the coking coal washing capacity is idle and could be used for steam coal washing. However, incentives to use spare washing capacities have been lacking.

36. The poor quality (in particularly, high ash content) of delivered coal results in unnecessary costs to the economy and the environment. The railways are unnecessarily burdened with the transport of rocks. Power plants produce at higher costs and lower outputs when using high-ash coal. Flue gas emissions and ground water pollution at ash dumps increase with the ash content of the delivered coal. The system of linking production bonuses to "normative" tons (i.e., tons with a lower ash content than the coal actually produced) has been ineffective to limit the amount of rock mined, while leading to unnecessary complication of statistics (it is difficult to find out the true tonnages and quality of run-of-mine coal). Instructions by the Ministry of Coal Industry to wash all coal have been equally ineffective to control the ash content.

### C. Coal Import

37. The declining trend in imports was reversed sharply in 1995. About 16 mt of coal was imported in 1995 -- an increase of more than 200 percent over the previous year. The share of imports in domestic consumption reached 20 percent, compared to 10 percent in 1994. The rapid growth in imports in 1995 was driven by (i) a price edge of US\$ 5-10/t of imported steam coal over domestic coal (for coking coal, the price difference was minimal); (ii) the higher reliability of imported coal deliveries; and (iii) the liberalized import regime. In response, the government introduced a duty of ECU 1-2/t (US\$ 1.3-2.7/t equivalent) on imported coals on July 1, 1995. Although the impact of the new duty on coal imports is still to be seen, this moderate tax of about 10 percent is not expected to eliminate coal imports. Maintaining a liberal import regime is a key pre-condition for the development of a well-functioning domestic coal market. Import competition forces domestic producers to reduce costs, improve product quality, and increase the reliability of deliveries. Therefore, the government should resist pressures for the imposition of higher taxes or quotas on coal imports.

### D. Employment, Wages and Benefits

38. Total employment in the coal industry was about 1.2 million in 1990, and decreased to 1.0 million (on average) in 1995. In the same period, the number of employees working directly in coal extraction decreased by 14 percent from 724 thousand to 620 thousand (see Table 3.2), while saleable coal output decreased by 50 percent from 131 mt to 66 mt. Looking in more detail at the composition of the workforce in 1994 and 1995, it can be seen that the largest reductions occurred in the categories of face workers and tunnellers, while employment decreased only slightly in construction, bricketting and services (the so-called non-productive sphere -- see Table 3.3).

TABLE 3.2

#### EMPLOYEES IN COAL EXTRACTION

	Employees in Coal Extraction
1990	723,924
1991	722,331
1992	717,764
1993	716,564
1994	681,445
1995	619,826

Source: Ministry of Coal

TABLE 3.3

#### EMPLOYEES IN THE COAL INDUSTRY, AVERAGES FOR 1994 - 1995

	1994	1995	1995 to 1994 % Change
<b>Total in Production</b>	809,642	741,064	-8.5
Coal Extraction	681,445	619,826	-9.0
Breakage face workers (incl.)	85,400	72,500	-15.1
Tunnellers	51,800	44,300	-14.5
Washing	26,920	24,567	-8.7
Bricketting	2,132	2,103	-1.4
Machine Building	67,485	62,541	-7.3
Construction	11,123	10,638	-4.4
Other	22,702	21,389	-5.8
<b>Total in Non-Productive Sphere</b>	<b>115,900</b>	<b>109,400</b>	<b>-5.6</b>
<b>Overall Total</b>	<b>925,542</b>	<b>850,464</b>	<b>-8.1</b>

Source: Ministry of Coal

39. Miners typically work a five-day week. Underground shift length is six hours at the workplace, with travelling time to the workplace being additional. When weekends are worked this is accommodated in a roster rather than worked as overtime. Consequently, overtime is low. The remuneration package consists of cash and benefits. Benefits include provision and maintenance of houses, free heating of homes (or free allowance of 6 t of coal per household per heating season), low cost access to kindergartens, sanatoria, and other social services. A notable privilege is that miners pay a flat personal income tax of 10 percent, while others pay taxes according to a steeply progressive tax system. Miners have traditionally been on the top of the pay league. Although their position has deteriorated somewhat over the last few years, the coal industry as a whole still provided the highest salaries among the industrial sectors in 1994 (even at the subsector level, only nuclear plants provided higher salaries -- see Table 3.4). However, in the Russian Donbas, salaries were reportedly 200 percent higher, causing both discontent among Ukrainian miners and increased migration to Russia.

TABLE 3.4

## AVERAGE MONTHLY INCOME BY INDUSTRY FOR 1994

INDUSTRY	AVERAGE INCOME PER MONTH (1,000 Krb)
All Industry	1,782.3
Nuclear Power Plants	4,447.5
Coal Industry	3,101.9
Thermal Power Plants	2,961.8
Oil Extraction	2,927.5
Power Industry	2,923.5
Gas Industry	2,606.0
Oil Refining	2,542.0
Ferrous Metal	2,295.4
Non-Ferrous Metal	1,915.7
Food	1,809.6
Chemicals	1,773.7
Construction Materials	1,750.3
Glass & China	1,685.6
Paper	1,552.0
Textiles	1,355.7
Machine Building/Metal Processing	1,340.2
Machine Building	1,290.6
Light Industry	1,258.2

Note: The average exchange rate was Krb 50,000/US\$ in 1994.

40. Miners' salaries have continued to increase during 1995, despite there being no increase in the general tariff rates between March and September, and despite falling production. The explanation for this is that mine directors (in response to pressure from the workforce) have agreed to increase wage rates in an attempt to compensate for inflation and the attractions of alternative employment (particularly the better paid mining in Russia). Despite these increases, the miners' position deteriorated in comparison with the other employees in the official economy in the first half of 1995. While in 1994,

coal miners earned 174 percent of average industrial earnings in Ukraine (see Table 3.4 above), in July 1995 coal miners fell to the 15th place in the income league earning 131 percent of the industrial average. For miners in the Donetsk oblast, incomes fell to less than 106 percent of average industrial earnings in the oblast by July.

41. Salaries are established on the basis of nationwide and local arrangements. An overall tariff agreement between the government and labor unions sets out the framework that is used in the national level sector agreement between the Ministry of Coal Industry and the labor unions representing the coal miners. This coal industry tariff agreement sets minimum rates for all classes of mining work, and describes how qualifications and working conditions affect pay. These rates are applied to the actual jobs according to collective agreements between the management of each mine and the unions. Certain workers are paid on the basis of norms and performance, others receive daily wages. All categories of workers receive bonuses related to the achievement of the plan. The variation of average wages between mines and associations is relatively high (e.g., in early 1995, the association with the highest average salary paid about 100 percent more the one with the lowest salary), reflecting performance against the plan and the share of higher paid underground workers. Within one association, workers of the same category may be paid up to two times more in one mine than in another mine, creating strong incentives for miners to move between mines. Differences are even higher among occupations; faceworkers are the highest paid category (Table 3.5).

TABLE 3.5

## SALARIES IN COAL EXTRACTION IN 1995 (FIRST QUARTER)

Occupation	Payments Per Month (1,000 Krb)	Bonus As a Percentage of Total Pay
Faceworkers (steep)	20,408	37%
Faceworkers	19,621	25%
Tunnellers	19,176	23%
Other underground	13,846	19%
Surface	5,211	16%
All in coal extraction	13,456	20%

Source: Ministry of Coal

42. Underground miners, after at least 10 years of work as a miner, qualify for pension at the age of 50 for men, and 45 for women, ten years earlier than normally. Even surface workers in coal production enjoy a five-year privilege. In addition, 20 years of underground facework or tunnelling qualifies miners for pension irrespective of age. The maximum pension is four times the nationwide minimum pension plus a flat rate addition (in May 1995, this was Krb 2.476 million per month, or about US\$ 18/month). About 160,000 miners receive a pension while continue working in the industry. Both active workers and pensioners are entitled to receive 6 t of coal per heating season free of charge, unless they live in houses that are connected to the district heating system. Miners who become partly or fully disabled may receive a lump sum reparatory payment and also monthly disability benefits. In 1995, lump sum reparatory payments approached US\$ 30,000 equivalent per recipient, and total disability payments

represented 7 percent of coal production costs for the industry as a whole. While pensions are paid from a nationwide pension fund financed from payroll taxes, mines have to cover disability payments directly.

43. For the first three months of unemployment, redundant miners (and workers in any other sector of the economy) receive severance pay at the rate equal to their previous monthly salary. After the first three months, miners actively seeking work receive unemployment benefit for 9 months (15 months with less than two years before retirement age) equal to 75 percent of their average wage (reduced to 50 percent after the second three months). Unemployment benefit is not paid to those with a pension or other income exceeding the minimum wage. Unemployment benefits are covered from the nationwide employment fund financed from a 2 percent payroll tax.

## IV. RESTRUCTURING OF THE COAL SECTOR

### A. Current Institutional Arrangements

44. The Ministry of Coal Industry (MCI), the key government agency for the coal sector, was established in late 1994, taking over the responsibilities of the former State Coal Committee. MCI is responsible for the development of government policy in the coal sector, appointment and supervision of enterprise managers, approval of coal production and marketing plans, establishment of coal prices, advising the government on the allocation of subsidies (and directed credit), and decisions regarding the closure and development of mines. In summary, MCI represents the policy maker, the owner and the regulator for the coal sector.

45. Until 1995, coal prices used to be regulated by the Ministry of Economy. In early 1995, the regulatory function was turned over to MCI, with the exception of coal prices for household consumers. The Ministry of Economy still plays an important role in the development of annual and long term production and investment programs and financing arrangements. In addition, it sets the margins the local retail outlets can charge to household consumers over the wholesale price of coal. The role of the Ministry of Finance is focussed on the approval of subsidies in connection with the annual budget cycles. Local governments, depending on their budgetary resources and the climate in the region, establish the amount of coal that can be sold to each household at subsidized prices. Local governments also set the price households pay for extra coal purchases, taking into account the wholesale prices set by MCI, and the retail margins set by the Ministry of Economy.

46. There are 383 enterprises in the coal industry. Out of these total, 295 enterprises are organized into 40 associations, the rest are free-standing (or independent). Twenty three associations are engaged in coal production, three in coal washing, and the rest are active in geological research, shaft design, mine construction, mine automation and mechanization, and equipment repair (see Table 1 in Annex 1). The three coal washing associations (Donetsk, Lugansk, Antratsit) operate 45 washing plants, 17 washing plants belong to coal production associations and 2 to independent mines. The 88 independent enterprises include coal mines, peat production plants, machine building plants, engineering and research institutes, construction companies, and transportation and marketing enterprises (see Table 2 in Annex 1). Only 12 mines are independent, all of which in the Donbas. Normally, the independent mines are larger than the other mines (their average annual output is 60 percent higher), more modern and more efficient (the average unit production cost of independent mines is 25 percent lower than the unit cost of the rest of the mines). Concerning the legal status of the enterprises, 28 are joint stock companies mostly engaged in machine building and construction (only one of the mines, Komunist in the Oktiabrugol Association, is a joint stock company). The rest of the enterprises in the sector have not been corporatized yet.

47. Coal industry enterprises own and operate 890 kindergartens, 68 summer camps for children, 269 houses of culture, 60 sanatoria, 136 rest houses, 144 sport facilities, and more than 20 million m<sup>2</sup> of housing plus related heating networks and boilers. Some of these assets are managed by labor unions. In 1994, the cost of operating the social assets was Krb 12 trillion, equal to about 7 percent of the market value of coal produced. Only a small share of these costs was covered by contribution from the beneficiaries. Seventy percent of expenditures were on housing, 20 percent on kindergartens,

5 percent on cultural facilities, 4 percent on rest houses and sanatoria, and 1 percent on other social assets.

48. One of the enterprises, Uglesbyt, plays a particularly important role. It used to have an exclusive right to purchase coal from the mines and washing plants and sell coal to customers (including export). In early 1995, coal mining enterprises were allowed to arrange themselves the marketing of 20 percent of their coal. For the remaining 80 percent of coal produced in Ukraine, Uglesbyt is still responsible for (i) purchasing the coal from the association or independent mine at the pit-head; (ii) arranging the transport to the washery; (iii) selling the coal to the washing plant; (iv) purchasing the saleable coal from the washing plant; and (v) selling the coal to the end-user. These operations are carried out in accordance with a web of contracts between Uglesbyt, the production association (or mine), the washing plant and the customer.

49. Uglesbyt is the only authorized agency allowed to export coal. It conducts exports mainly on the basis of intergovernmental agreements with CIS and other Eastern European countries. Uglesbyt is not responsible for stocking coal; stocks are held at the mines and coal preparation plants. Sometimes, Uglesbyt takes no responsibility for agreeing on coal quality standards with the customer (e.g., raw coal can be sold at a discounted price under an agreement between the producer and the customer, with Uglesbyt handling every other aspect of the sale). Uglesbyt's charges are limited to 0.25 percent of the accounting price (see below), representing a rather modest marketing fee. Uglesbyt handles most of the coal sales to power plants, coking plants, households (through local retailers), and budgetary agencies. Coal that is directly sold by production associations (or independent mines) typically goes to the construction industry, agriculture, and small industrial customers.

50. While Uglesbyt is now called a "Coal Trade Association" and its many field offices at the producers have an important shipping function, it also continues (de facto) to be the executor of "sector orders", based on a "sector plan". Estimates of demand and supply from large consumers and producers are collected and reported by line ministries to the Fuel Department of the Ministry of Economy. These estimates form the basis of a "sector plan" for the mines and a distribution plan for Uglesbyt. Both consumers and producers regard the "sector plan" and its execution through Uglesbyt as a safety net provided by the state and firmly believe that settlement of payments is ultimately a government obligation. This is a fundamental barrier to any true market development in the coal sector and one of the root causes of its inefficiencies. While there is awareness in Uglesbyt that the functions of trading company and government agency for distributing coal are inherently incompatible, many people also believe that the traditional distribution system fulfills an important social role which cannot be abolished immediately without a high risk of social and political unrest.

### **B. Coal Prices, Subsidies and Marketing**

51. **Coal Prices.** In 1992-94, coal prices were kept significantly below domestic production (and import) costs. On March 1, 1995, following the transfer of responsibility for setting coal prices from the Ministry of Economy to MCI, average coal prices were raised to US\$ 33/t, a level that was calculated to cover the average cost of domestic production. Actual coal prices paid by the end-users depend on type, calorific value, ash content, moisture content, sulphur content and size, and are determined in a price list issued by MCI (see Table 3 in Annex 1). Interestingly, although transactions are settled in domestic currency, coal prices are set in US\$ as a means of providing indexation for

inflation. In early 1995, the Ministry of Economy set the upper limit for the price of coal for households at Krb 3.6 million/t (US\$ 28/t equivalent) for the "basic need" amount per heating season (this price was raised to Krb 4.5 million/t in September 1995 to reflect the depreciation of the exchange rate). The actual prices the households pay are set by local governments, who are given a subsidy (Krb 20 trillion in 1995) to cover the difference between the price limit set by the Ministry of Economy and the price based on the price list issued by MCI. Prices paid by Uglesbyt to the producers (associations and independent mines) are the so-called "accounting prices", which are determined by modifying wholesale prices on a mine-by-mine basis with a factor that takes into account the production costs of each mine (while keeping the average "accounting price" equal to the average wholesale price). This arrangement allows the cross-subsidization of high cost associations and mines by low cost ones. Coal is exempt from the value added tax, i.e., the mines are entitled to tax refunds.

52. As mentioned in Section C of Chapter III above, steam coal prices seem to be 20-30 percent above import parity, while the prices of coking coals are more or less aligned with imports. In other words, the burden of keeping coking coal prices aligned with international prices is carried by the consumers of steam coal (power plants and other industrial customers). The centrally determined prices send wrong price signals encouraging consumers to use unwashed coal and make producers indifferent to washing. For instance, washed and unwashed anthracite fines (AShO vs. ASh) differ in heating value only by 11 percent, whereas the price difference according to the wholesale price list is 28 percent (the inferred cost of washing would be US\$ 7/t, whereas coal can be washed at a cost of US\$ 2/t). At this price, the cost of one Kcal from washed anthracite is the same as from fuel oil, creating a disincentive for power plants to purchase washed anthracite. For the producer, no extra gain can be made by washing, due to the application of "accounting prices" that do not depend on the wholesale price.

53. "Accounting prices" are determined by MCI and are based on a normative unit cost of production of each mine assuming that the planned level of production is achieved. Recently, production has been repeatedly falling behind plans, resulting in prices that are inadequate to ensure the internal generation of cash needed to support the level of mine development to maintain production. Net industry cashflow was negative US\$ 56 million in the first quarter of 1995 (see Table 4 in Annex 1). With few exceptions, all mining associations experienced a cash shortfall that was met by curtailing capital replacement/maintenance and using subsidies originally intended for social sphere expenditures (see below).

54. The true financial strength of individual mining companies is obscured by the cross-subsidization inherent in the pricing mechanism. In order to eliminate this distortion, the net profit for each association/independent mine has been restated using the average coal price received by the industry as a proxy for the sale price for each company. After adjustment for taxation, the picture that emerged shows that many more companies would have recorded net losses (see Table 5 in Annex 1). Since cross-subsidization allows the losses of one association to be written off against the profits of another, it reduces somewhat the tax burden of the coal industry (if the system of "accounting prices" had not been in effect in the first quarter of 1995, the profit tax payable by the coal industry would have been US\$13 million more).

55. However, annual cross-subsidies of about US\$ 400 million that the high cost mines receive from the low cost ones reduce the incentives to increase efficiency, and, for the better mines, deny the opportunity to re-invest profits to maintain or further improve performance. In 1995, this system of transfers between mining associations, independent mines, and Uglesbyt is working with great

difficulties. The difficulties are due to the increasing level of receivables on sales arranged through the regional units of Uglesbyt, and also by the increasing reluctance of the more profitable mines and the regional Uglesbyt offices to transfer the payments to the high cost mines. For example, Uglesbyt in Donetsk had a positive rent balance of Krb 1.4 trillion at the end of June 1995, but elected to retain these funds to improve its strained working capital position. Another example is the independent, corporatized Komunist mine that sold its coal directly and decided not to transfer "rental" payments to Uglesbyt during the first half of 1995.<sup>13</sup> The reduced flow of cross-subsidies exacerbates the cashflow position of the highest cost mines, bringing them closer and closer to the point of collapse with little hope of survival.<sup>14</sup>

56. **Subsidies.** In addition to being exempt from VAT, the coal industry have received substantial subsidies under a number of headings (e.g., compensation for low prices, support of centralized investments, geology survey) and channels (e.g., budgetary grant, credit from the budget, credit from the National Bank guaranteed by the budget) since Ukraine's independence. These subsidies have significantly contributed to the overall budget deficit. The support for the coal industry was equivalent to 8.3 percent of total budgetary expenditures, or about 4 percent of GDP in 1993, and 5.6 percent of budget expenditures or 3 percent of GDP in 1994 (without taking into account household price subsidies but including credit provided/guaranteed by the budget). In the revised budget adopted in mid-1995, Krb 20 trillion or US\$ 130 million equivalent of production/investment subsidies were allocated to the coal industry, equivalent to less than 1 percent of GDP in 1995. The declining trend of subsidies (in real terms) clearly indicated a change in the direction of fiscal policy, despite considerable political pressure to reverse the trend.<sup>15</sup>

57. At the end of the first quarter 1995, accounts receivables of the mining companies amounted to US\$210 million or the equivalent of 31 days of coal sales. Due to the inadequacy of prices/subsidies, accounts payable amounted to US\$ 338 million or the equivalent of 67 days of production costs. However, the average receivables and payables (31 and 67 days) hide enormous variability between the mining associations ranging from 4 to 174 days (see Figure 1 in Annex 1). The liquidity of the coal industry further deteriorated during 1995, and accumulated payables (including not only mines but all other enterprises) reached Krb 171 trillion (US\$ 1,050 million equivalent) by August 1995, representing about 6 percent of total inter-enterprise arrears in Ukraine. By the same date, receivables reached Krb 124 trillion (US\$ 760 million), indicating that the coal industry became an even larger net debtor. However, due to a number of government initiatives addressing fuel and energy

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<sup>13/</sup> When Uglesbyt diverted funds which were intended to reduce the arrears of Donbasenergo to the Komunist mine claiming that the funds were equal to overdue "rents", mine management decided to challenge this action in court.

<sup>14/</sup> Ulegorskaya mine, which was the fifth highest cost mine in 1995, is on the point of collapse, illustrating the position many mines are facing. By mid-1995, the mine was 3 to 4 months in arrears on wage payments, 7 months on accounts payable (including amounts owed to its own association), and completely lacked mining development capital or the means to raise the funds required. Its production was rapidly declining, with the result that its unit cost surpassed US\$ 100/t. At the same time, its accounting price of US\$ 37/t, despite being US\$ 10/t higher than the wholesale price, covered only about one third of costs. Clearly the mine cannot ever expect to recover its current cashflow deficit or earn a return on its assets, and will be forced to close with or without an orderly closure plan.

<sup>15/</sup> In October 1995, the Ukrainian Parliament adopted a resolution requesting that the government should take further steps to stabilize the situation in the coal industry, including the cancellation of debt/arrears, provision of additional subsidies, and enhancement of privileges for underground workers.

payment arrears, the stock of unpaid bills for coal deliveries (part of the total stock of receivables) stopped growing after May 1995, and stabilized at a level of Krb 40 trillion (equal to about 50 days of coal sales). Non-payment by budgetary organizations was one factor responsible for these arrears, and, in response to coal miners' demand for overdue wages, the Ministry of Finance transferred Krb 4 trillion to budgetary organizations in August 1995 so that coal bills could be paid. In addition, credits of about Krb 15 trillion were issued to the steel and power industries earmarked for the payment of arrears to coal mines.

58. **Marketing.** Most coal is still distributed under a centralized system rather than marketed under contracts which engage suppliers and consumers. While officially only a small portion (less than 1 percent) of the coal is distributed as "state order" with explicit payments from the state, more than 90 percent of domestic coal production is distributed through Uglesbyt, in a way very similar to the previous central allocation and distribution system and with the same distorting results on the development of a true market. Despite the opportunity provided by MCI in April 1995 that producers could sell 20 percent of their coal directly, the actual volume of direct sales at liberalized prices was less than 10 percent of domestic coal supplies in the second and third quarter of 1995. There were a number of factors that reduced the willingness of the mines to pursue direct contracts:

- (i) higher than average cost mines received the cross-subsidized "accounting" price if they sold through Uglesbyt, so these mines were less interested in direct contracts;
- (ii) the low cost mines had difficulties finding promptly paying customers and acquiring marketing skills; and
- (iii) there was a perception of state guarantees behind the payments for the fulfillment of "sector orders/plans".

59. The consequences of maintaining this system are negative for the consumers, the coal industry and the state budget. Under cash shortages, Uglesbyt distributes available coal as equitably as possible among consumers, regardless of the payment capabilities of the clients and with little regard to coal quality. Consumers as well as producers have little influence on the distribution. Large consumers have completely lost confidence in the mining industry's capability to supply cleaner coal, and, each time they get access to cash, they prefer to buy imported coal that is of better quality and is sold on commercial terms. Finally, as the events in August 1995 demonstrated (see above), the state still has a moral obligation to inject money into the economy earmarked for coal purchases. Uglesbyt acts as the distributor of this money among the mining companies, thereby re-confirming the perception of state guarantees behind the sectoral orders, and promoting further coal sales to insolvent customers.

### C. Uneconomic Mines

60. The cost curves in Figures 3.5 and 3.6 above provided a snapshot of the Ukrainian coal industry in the first quarter of 1995. Future developments in labor productivity, wages, material input costs, exchange rates, etc. will undoubtedly change the costs of both domestically produced and imported coal. Assuming that the cost of imported coal does not increase radically in the future, the slope of the supply curves indicate that a significant part of the coal industry is hopelessly uneconomic. The resources required to keep high cost mines in operation are badly needed for the full utilization and modernization

of the capacity of lower cost mines that have a good chance to remain competitive. Without closing uneconomic mines these resources cannot be liberated, increasing the probability that even the lower cost mines will lose their competitiveness in the long run.

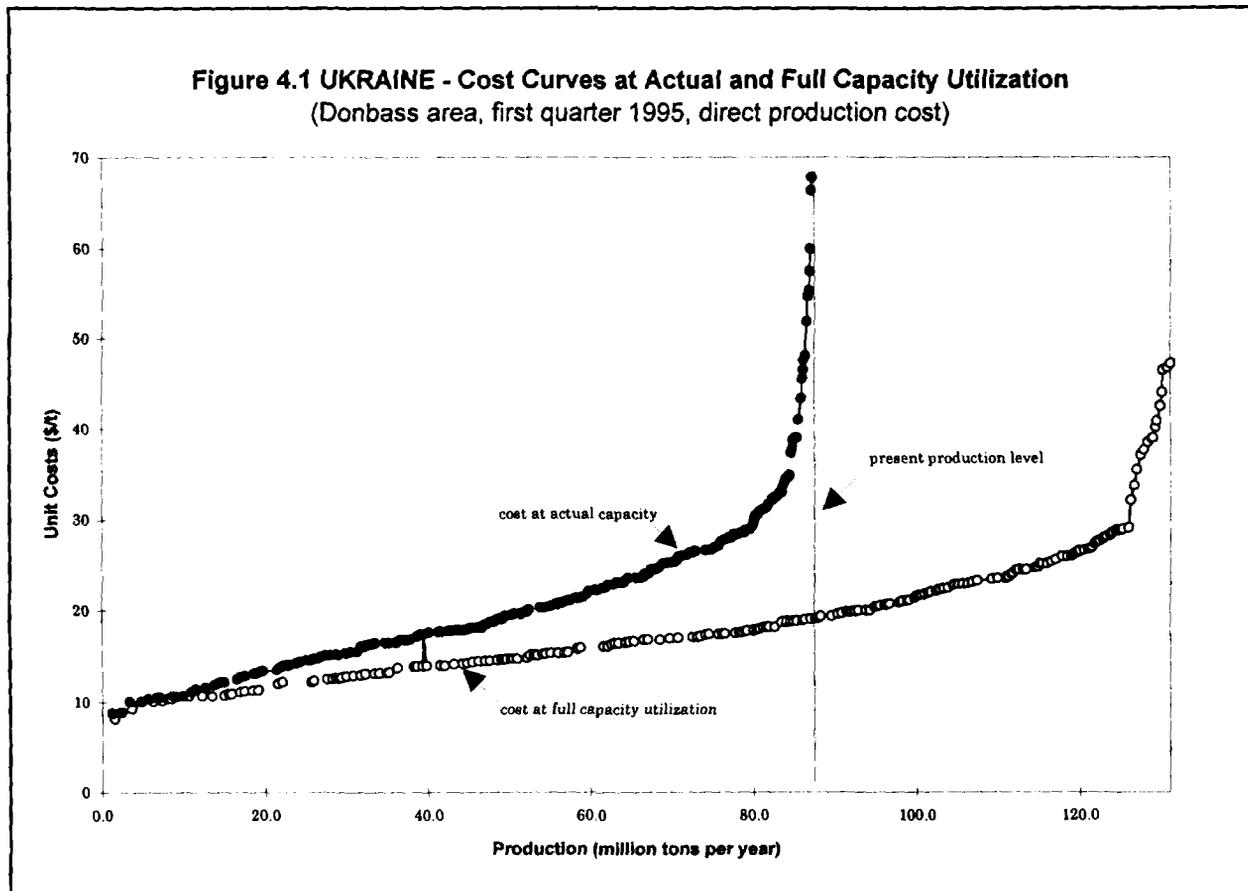
61. Domestic coal production capacity is estimated at 145 mt/year (run-of-mine coal, based on a rating which takes into account geological conditions, and the capacity of underground transport, ventilation, shaft hoisting and surface installations), and is being utilized only 60 percent in 1995. Production costs per ton of coal produced would be significantly lower if production were concentrated in high productivity, low cost mines. In order to illustrate this, Figure 4.1 present the re-calculated cost curve for the Donbas area (based on first quarter of 1995 data) under the assumptions that (i) the existing capacity of lower cost mines is fully utilized; and (ii) 40 percent of mining costs are fixed, i.e., independent of the volume of coal produced. Assuming that total raw coal output stays at the level observed in early 1995, full capacity utilization of the low cost mines would reduce average unit costs by 28 percent, equivalent to an annual saving of about US\$ 600 million<sup>16</sup>. About 45 percent of the mines would become redundant. Although the utilization of the full capacity of lower cost mines cannot be achieved immediately and also requires additional resources, this simplified calculation demonstrates that the potential benefits of closing uneconomic mines and concentrating production in the low cost mines are very large.

62. In early 1995, the Ministry of Coal Industry decided that the survival of the viable core of coal mines requires the closure of at least 39 mines with a total coal output of 4.8 mt in 1994 (Order No. 47 of the Minister, February 17, 1995). The remaining mines were placed into two categories: (i) 57 underground mines that have a secure future and can stand on their own; and (ii) 156 underground mines and 5 surface mines that, if given additional support, can survive and become competitive. Out of the total of 39 mines to be closed, the closure of 13 mines was scheduled to start in 1995. During subsequent revisions of the program, the number of mines to be closed in the first batch was increased to 24. Of the 24 mines, three mines will be merged with existing mines and their surface installations demolished, and 21 mines will be fully closed.

63. It is highly unlikely that the closure of only 39 mines will be sufficient to place the rest of the coal industry in a sustainable position. Taking into account that the average unit cost of coal produced in these 39 mines was 72 percent higher than the average unit cost in the rest of the industry, the closing of 39 mines -- assuming that the production of the remaining mines does not change -- will reduce the average cost of domestically produced coal by 4.3 percent. Even if we assume that the capacity utilization of the remaining mines increases to make up for the forgone production of the closed mines (since the lower cost mines will be allowed to reinvest their profits), the average unit cost of domestically produced coal will decrease by less than 8 percent. In order to restore the competitiveness of the Ukrainian coal industry, average unit costs need to be reduced by at least 20 percent. This will require, among other things, the closure of at least 75 high cost mines over a period of 4-5 years (the closure of these mines itself will reduce the average unit cost only by about 9 percent, with additional gains coming from the increased capacity utilization of remaining mines). However, if the productivity of workers in the remaining mines does not keep pace with increases in labor costs or the improved capacity utilization of these mines fails to materialize, the number of required mine closures may easily

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<sup>16/</sup> This figure compares to savings of about US\$ 500 million under a scenario of substituting imported coal for the output of the high cost mines (see Section A of Chapter III).



reach 100.

#### D. Corporatization and Development of Competition

64. Closing high cost mines is a necessary but not sufficient condition of overcoming the current crisis in the coal industry. There is an urgent need to increase the competitiveness of coal produced in the remaining Ukrainian mines. This, in turn, requires the efficient utilization of material inputs, shedding of excess labor, and increased attention to meeting customer demand in terms of quality and timeliness of supply. The experience of many countries has demonstrated that market liberalization is the only way to achieve these objectives.

65. In view of the long history of central planning in Ukraine, the development of competitive markets for steam and coking coal will take time. It requires (i) the freedom of consumers to purchase coal from a number of domestic and foreign coal suppliers at prices that are agreed between consumers and suppliers rather than centrally determined; (ii) autonomous, commercialized mining enterprises that focus on the profitable utilization of their capital assets; and (iii) hard budget constraints for both consumers and suppliers. These conditions are discussed in more detail below.

66. **Liberalization of prices and marketing.** Coal imports have already been liberalized, and, as described in Section B above, the mining companies have been authorized to sell 20 percent of the coal they produce at prices negotiated directly with their domestic customers. However, the rest of the coal produced domestically has to be sold to Uglesbyt at centrally established "accounting prices" that support high cost producers at the expense of low cost mines. Coal exports are also administered and controlled by Uglesbyt, and particularly restricted during the fourth and first quarters of the year. Uglesbyt's monopoly to sell most of the domestically produced coal to domestic customers should be phased out. This implies that the limit on the share of coal that mines can sell directly (either domestically or abroad) at liberalized prices should be increased gradually and reach 100 percent by the time the corporatization process is completed (see below). This would allow the industry to adjust to the elimination of cross-subsidies between the associations/independent mines that the introduction of direct sales from the mines to customers implies.

67. **Corporatization.** In order to meet the second condition (i.e., to create autonomous, commercially oriented companies), mining enterprises need to be transformed into joint stock companies and eventually privatized. Recognizing this, MCI, together with the Ministry of Economy and other entities, prepared a Presidential Decree on the restructuring of the coal industry. According to this Decree, MCI will give a separate legal entity to each mine (and other subdivisions) in the coal associations in the first quarter of 1996. Non-core activities (such as construction, transport, engineering, machine building, shops, etc.) and social assets will be separated from coal mines and coal washing plants. The entities that are created will be transformed into joint stock companies (JSCs) by September 1, 1996. It is foreseen that the viable mines and washing plants will be incorporated into about 20 holding companies. The remaining (non-core) enterprises will be privatized. Social assets will be transferred to local governments during 1996 and the first half of 1997 (see below). The holding companies will also include the local marketing branches of Uglesbyt, while Uglesbyt's central planning, coal distribution and revenue transfer functions will disappear. The JSCs will be free to negotiate and determine their own prices (although a temporary declaration requirement will be in effect in 1996 if the contractual price is above the "world market price").

68. The corporatization, as ordered by the Decree, would be a significant step forward. In order to meet the deadlines, detailed work on a number of key issues has to be started immediately, preferably with the help of experienced consultants:

- (i) Drafting the charter and determining the organizational structure of the JSCs. The allocation of mines to JSCs should minimize the disruption and costs of transferring employees from closed mines to continuing mines.
- (ii) Separation of the non-core activities. Organizational structures will need to be set up for the non-core activities. Transitional contracts between the non-core activities and the JSCs may have to be drafted for the continuing supply of materials and services. The terms of these contracts should be such as to avoid placing an unjustified burden on the finances of the JSCs in the short term, and to provide a pathway towards genuine competition for the supply of goods and services to the mining sector in the medium term. The goal should be the speedy privatization of the viable non-core activities, and the closure of those non-core activities that are uneconomic.

- (iii) **Transfer of social assets.** A detailed implementation plan, including financing arrangements, needs to be worked out for the transfer of the social assets to the local authorities.
- (iv) **Mines scheduled for closure.** The 39 uneconomic mines that have already been identified for closure by MCI (see below) will not be transformed into JSCs. These mines will be administered separately, and closed according to a "state program" to be developed by MCI and submitted to the Cabinet of Ministers in the second quarter of 1996. A single organization, Ukrainian Coal Company (UCC) that reports to MCI and is funded directly from the budget should manage the closure process. The "charter" of this organization should specify that it is required to close the mines as quickly and economically as practical, so it does not become a subsidized coal production company, competing with the JSCs.
- (v) **Price liberalization.** The management of the JSCs will, for the first time, have the responsibility for negotiating commercial sales contracts for all the coal that they produce. The companies will have to acquire gradually the skills needed to fulfill this function.

69. As argued in Section C above, the exclusion of 39 uneconomic mines from the JSCs will likely fall short of ensuring the profitability of more than a small minority of the JSCs. Further measures are needed to reduce the financial burden on the new JSCs of operating loss making mines. These measures could take one of two forms:

- (i) Increasing the number of mines that are excluded from the JSCs. Not all associations have mines among the 39 that are to be separated (Donetskugol being a notable example, despite its plan to start closing a number of mines); or
- (ii) Providing a method for the JSCs to return mines to the state for closure. One way to achieve this would be to include existing "marginal" or "short-life" mines in the JSCs on a lease basis. The JSCs would not own the assets of these mines, and therefore would not carry the burden of the financial liability for closure and environmental restoration, both of which would be regarded negatively by potential investors during privatization. Instead, the JSCs would have a fixed term lease and licence, enabling them to operate the mines. On termination of the lease and licence, renewal would be possible, but neither party would be under an obligation to renew the arrangement. Employees at the mines would have contracts of employment with the JSCs.

70. **Hard budget constraints.** The hardening of the budget constraints for consumers and producers -- the third condition for the development of competitive coal markets -- is closely related to the progress of economic reform and stabilization. Repeated government rescue operations in the form of directed credits, subsidies and debt write-offs, the belief that politically "important" enterprises will not be allowed to go out of business, and the lack of proper bankruptcy procedures have led to widespread non-payment and the proliferation of barter trade. Two measures would be particularly important to stop the accumulation of receivables and payables in the coal industry. First, the Government should announce that no production subsidy will be available for the newly established JSCs.

The JSCs that are unable to cover their expenses should be declared bankrupt, and undergo further restructuring, including the transfer of their uneconomic mines to the Ukrainian Coal Company and the replacement of managers. Second, the commercialization and privatization of major coal customers -- power plants, coking plants, and the network of local fuel retail outlets under oblast/city authorities -- should be completed as soon as possible. In this respect, the corporatization of power generating companies and work towards the establishment of a wholesale market for electricity were particularly important steps in 1995. Ultimately, privatization is the most effective measure to eliminate soft budget constraints. Coal mining is a competitive industry, well suited to private ownership. There is a need to develop a privatization program for those JSCs that demonstrate profitable operation in the completely liberalized coal market.

71. **The role of MCI.** MCI will have a central role in and responsibility for the reform of the Ukrainian coal industry. In particular, MCI, in coordination with the Ministry of Economy, the Anti-Monopoly Committee and the State Property Fund, will need to:

- (i) determine the composition of the new JSCs and manage the separation of non-core activities;
- (ii) manage the transfer of social assets to local authorities;
- (iii) represent the state as a shareholder in the JSCs, and arrange and manage performance-related contracts for senior management; and
- (iv) establish and supervise the activities of the Ukrainian Coal Company entrusted with managing mine closures.

## V. IMPLEMENTATION OF THE RESTRUCTURING

72. Taking into account the depth of the crisis in the coal industry and the difficult economic situation in the country as a whole, the implementation of the restructuring of the coal industry is one of the most challenging tasks that the Ukrainian government is faced with. Unless immediate action is taken, the further deepening of the crisis with the associated large economic and social costs will be unavoidable. However, the restructuring process itself is also not without risks. Mitigation of the potential negative social consequences of the restructuring will require considerable budgetary resources. To ensure the effective utilization of these resources, the government should study the experience of other countries that coped with similar problems before. In addition, the implementation of the restructuring will have to take into account certain peculiarities of the Ukrainian coal industry, such as the wide range of social services that companies provide to their current and former employees.

### A. Preparation and Implementation of the Mine Closing Program

73. In spite of the remarkable speed by which the newly established MCI decided to start the closure of uneconomic mines, progress in implementing the closure program was slow in 1995. MCI issued a Mine Closure Manual in June 1995. By October 1995, closure plans were completed for 16 mines, however, coal production ceased at only a few mines. The timescales projected for completing the closures are generally several years rather than months, in line with the recommendations of the Manual ("cessation of activities at a mine must be a long term and well-planned process").

74. The closure plans prepared by design institutes would involve a total expenditure of Krb 1 to 13 trillion per mine (US\$ 6 to 70 million equivalent), of which technical closure costs would range from Krb 0.65 to 3 trillion (US\$ 4 to 19 million equivalent) per mine. The time required for the closure is typically estimated at 3 years, with a range of up to 13 years. The experience of other countries that closed uneconomic mines demonstrates that rapid closures with only a minimal recovery of old plant and machinery are the cost effective approach. In Great Britain, for example, the average technical cost of closing mines in 1992-1995 was US\$ 3.3 million per mine (see Annex 2). The preparation of closure plans should be guided by the main objective of cost minimization, and other objectives such as job creation and social services should be addressed separately. Therefore, the already prepared plans should be reconsidered in the light of the urgency of the situation, with the objective of finding simpler, cheaper and faster ways to implement the closure program. A number of practical proposals are made below.

75. **Closure contracts.** To implement the closure itself, MCI or its subsidiary ("Ukrainian Coal Enterprise") could invite competitive bids from competent organisations, and award a contract to implement the technical tasks related to the closure to the lowest technically satisfactory bidder. Payments under these contracts should be staged according to well-defined milestones, for example (i) the completion of underground works; (ii) the demolition of surface buildings; and (iii) filling or capping the shafts.

76. **Labor issues.** Currently planned mine closures include provisions for the recovery of equipment and materials from underground. Due to the low quality of salvaged material, this activity is highly uneconomic, and amounts to a very expensive scheme to create temporary jobs for mineworkers until other employment can be arranged. Mine closure costs as prepared by the design institutes

sometimes include investments at other mines, such as the development of a new face or the provision of new pumping equipment, also with the purpose of providing employment. However, it would be more appropriate to address the question of potential unemployment separately from the technical aspects of the mine closure plans.

77. The option that should be considered first is the redeployment of labor to mines that are not designated for closure. Based on employment statistics for 1994 and 1995 (see Section B below), it appears feasible for many of the employees at the already designated 39 mines to be redeployed at other mines within the same associations, without a sustained increase in the total number of employees, provided that new recruitment is restrained. In most cases, the transfers can be absorbed by natural attrition in one to two years. In order to utilize this opportunity, the following steps should be undertaken when a mine closure process starts:

- (i) the association or the future joint stock company (JSC) where the mine belongs should provide, on an individual basis and immediately prior to the cessation of production, a counselling service to the employees of the closed mine, to discuss the options available and their preferences;
- (ii) most of the employees should be offered immediate employment at another entity of the same association/JSC where the mine to be closed belongs (see corresponding provisions in the next para.);
- (iii) in order to compensate for the additional costs of transferring employees from one place of work to another, a lump sum payment per transferred employee should be made to the association/JSC from a centrally established fund; and
- (iv) the closing mine should be taken over by the Ukrainian Coal Company set up to implement mine closures.

78. In order for the transfer of employees not to damage the economic viability of the association/JSC, the eligibility of the association/JSC to receive the above lump sum payment should depend on the association/JSC demonstrating that it introduced, at least a month before the closure starts, a policy of limiting the recruitment of new employees to X percent per year of its total labor force, and intends to maintain this policy in the near future. However, it cannot be expected that all employees will wish to be transferred or can be offered comparable jobs. A substantial share of surface workers and older underground workers is likely to become redundant. In addition, surplus labor may be shed by the newly created JSCs in response to competitive pressures to reduce costs. These issues are reviewed in more detail in Section B below, together with the discussion of job creation programs.

79. **Social protection.** In addition to severance payments, the provision of free coal to pensioners and disability benefits are the main residual liabilities of closing mines to their former employees. In the short run, the distribution of free coal for pensioners who don't benefit from district heating (a tradition in the mining industry) may be transferred to the Ukrainian Coal Company. In the long run, however, this practice should be phased out together with the subsidization of district heating. Similarly, the liability for disability payments should be transferred to the Ukrainian Coal Company first, to be replaced by an industry-wide disability insurance system later (e.g., all mines would pay a fixed

contribution per employee to the insurance scheme). The share of disabled workers in the workforce should be reduced through early retirement.

80. **Housing and other social assets.** Early versions of the Closure Manual recommended that when mines are closed, workers on the waiting list for houses should be provided with new houses. In addition to perpetuating the belief that the provision of housing for everybody is the social responsibility of the state, this policy would be (i) financially unaffordable in view of the large number of people on the waiting list;<sup>18</sup> (ii) economically inefficient since it would reduce labor mobility in regions that lose jobs;<sup>19</sup> and (iii) contradictory to the policy of creating a housing market dominated by private housing. The correct policy would be to (i) transfer waiting lists together with employment to the remaining mines; and (ii) place miners who elect not to be transferred to other mines on municipal waiting lists for housing. More generally, the practice of subsidized housing construction for employees should be phased out.

81. The existing stock of houses and other social assets (e.g., sanatoria, kindergartens) that belong to the mines designated to be closed should be either privatized or turned over to the local governments. Some argue that these assets should be rehabilitated before their transfer. Since the maintenance of housing and infrastructure has been neglected for many years, this requirement would considerably delay the transfer and may also result in suboptimal expenditures. A better option would be the speedy transfer of these assets regardless of their physical condition while providing the local governments with additional resources to perform the necessary repairs and to fund the recurring costs of operating and maintaining the assets (see Section C below).

82. **Environmental aspects.** The closure of uneconomic mines should result in a reduction of environmental problems provided that (i) the physical closure itself is done in an environmentally acceptable manner; and (ii) resources are allocated to the containment and eventual rehabilitation of residual environmental problems. For example, the level of mine water should be controlled by closing access shafts with a watertight seal (where this is technically feasible) or by pumping and proper disposal in order to prevent mine water from reaching and contaminating the groundwater that is a vital resource for many rural communities. In some cases, surface waters may become contaminated by sewage when a mine pumping system is closed down and the large volume of water that diluted untreated sewage is shut off. The solution is to allocate funds for the improved treatment of municipal waste water. Another example is the need to fund the efforts to prevent, control and eliminate fires in mine waste piles. If these efforts cease or are reduced due to lack of funds from coal production, new fires could commence and existing fires could increase in intensity with extremely negative environmental impacts.

83. The Closure Manual should include specific guidelines for (i) the collection, storage and/or disposal of mine waste water; (ii) rehabilitation and reuse of the mine site (surface area of the mine property); (iii) rehabilitation of waste dumps including the maximum slope of final landform, type

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<sup>18/</sup> There are about 100 thousand people on the waiting list in the coal industry as a whole. Assuming that 30 percent of the people on the waiting lists are employed in mines that need to be closed, and the average cost of building a house/apartment is US\$ 10,000/family, the housing cost associated with mine closures (even if the rehabilitation of the existing housing stock is excluded) would amount to US\$ 300 million.

<sup>19/</sup> The construction cost for a two-room apartment in the Volyn region, for example, is estimated at US\$ 16,000, but its price on the market is only about US\$ 5,000.

and thickness of topsoil cover, possible post-rehabilitation land uses, required fertilization and vegetation, etc.; and (iv) long-term monitoring of closed mines and rehabilitated waste rock dumps, including identification of responsibility for implementing the monitoring program. The cost of these activities should be included in the budget of the Ukrainian Coal Company.

84. The focus of production on mines with better geological conditions would substantially improve the safety and health of mine workers. Many of the uneconomic mines scheduled for closure are also among the most unsafe and unhealthy mines. In the remaining mines, the concentration of operations on fewer and better performing units would have a positive impact on health and safety. In addition, a number of organizational/managerial changes should be implemented to further improve safety and health. Such changes should include the strengthening of the independence of government mining inspectors, more rigorous application of the law, more responsibility of managers and supervisors, and better training of workers. During the rehabilitation of mine operations, a special focus could be given to improved ventilation and air quality control (see Section D below).

### **B. Reduction of Surplus Labor**

85. Although labour productivity is very low, it is not widely accepted that too many people are employed in coal extraction. The labour department of the Ministry of Coal, the Employment Service in Donetsk, and labor unions contend that there is a shortage of miners (particularly in the basic professions). While there were significant reductions in the overall number of people employed at mines in coal extraction in both 1994 and the first six months of 1995 (see below), these net reductions have not occurred as a result of an employment policy aimed at the elimination of overmanning. On the contrary, it appears that the traditional role of providing employment is still an important objective within the coal industry. Although without it the industry cannot become commercially viable, there is little general recognition of the need to reduce the number of jobs, nor is there a proper financial incentive through the pricing system to do so.

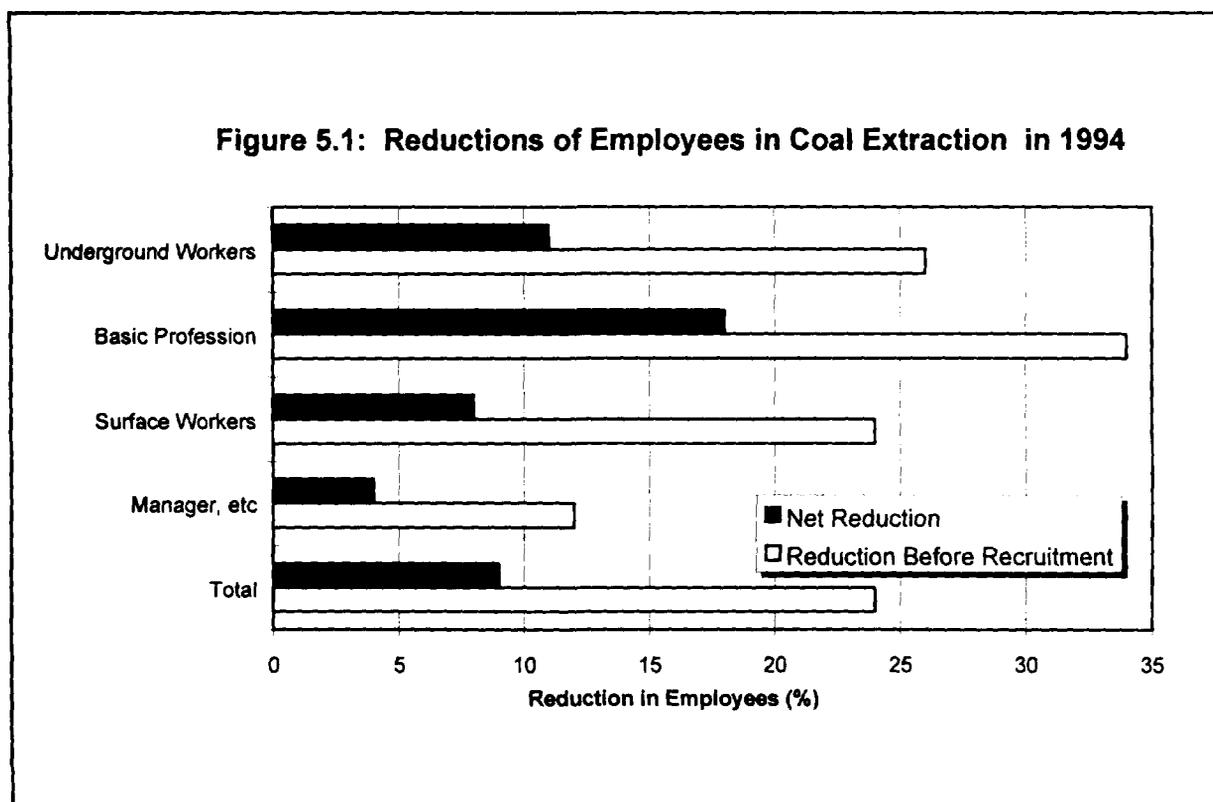
86. Two kinds of pressures to reduce the number of jobs in coal extraction are likely to appear in the medium term: (i) the closure of uneconomic mines; and (ii) pressure and incentives to reduce costs in all mines after the industry starts to operate competitively. The 39 mines already designated for closure employ 50 thousand people, or about 9 percent of all employees in coal extraction. Additional 30 to 40 mines employing 70-80 thousand people may also need to be closed. In the remaining mines, there is a need to revise working practices in order to reduce costs, implying further reductions in workforce requirements. Both international comparisons and local experience suggest that opportunities exist for very significant productivity increases and corresponding reductions in the labor force.<sup>20</sup> Altogether, about half of the people directly employed in coal extraction may have to leave over time. Taking into account likely job reductions in other areas (e.g., washing plants, construction, and the social sphere), 300-400 thousand people may need to exit from the coal industry in the medium term, and the probability of an even larger contraction of employment is quite high.

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<sup>20/</sup> The manager at the already corporatized Komunist mine (the mine sells its coal directly and is interested in reducing costs) put in place contracting arrangements for 170 key workers in early 1995, which are claimed to have doubled their productivity.

87. **Natural attrition.** A key issue is how the job reductions in coal extraction that will arise from mine closures and other rationalisations can be implemented with minimum disruption and harm to the individuals involved. This can be achieved through natural attrition, provided that the job losses are spread amongst a number of mines, rather than concentrated at the closing or rationalised mine. The viability of this approach depends crucially on the scale of natural attrition that occurs.

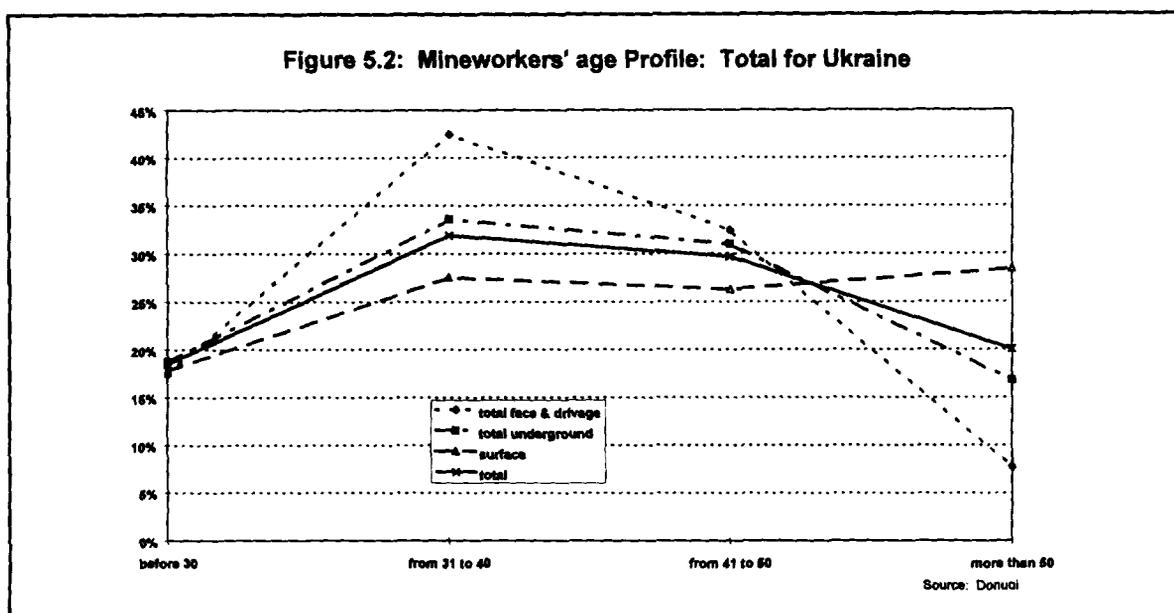
88. Recent data suggest that the workforce engaged on coal extraction is very fluid. It is estimated that about 24 percent of employees left their jobs in 1994, and all but 9.2 percent were replaced. The attrition rate was highest for the main professions (coal production workers and drivage) at nearly 34 percent, and the net reduction in this group was also highest at almost 18 percent (see Figure 5.1). Recruitment was about 15 percent for both underground and surface workers (these figures are after adjustment to discount people who are simply transferring from one mine to another). Many of the recruits are re-entrants to the industry. Workforce reductions continued in 1995. The number of people employed at coal extraction at mines had fallen to about 620 thousand by mid-1995. Despite continuing recruitment, the labor force of the industry is already contracting at a rate of 60,000-80,000 employees/year, more than the number of jobs at the 39 mines designated for closure.



89. In 1994, the reductions resulted from a large proportion of the workforce (about 14 percent) simply deciding to leave the industry (not because of age, discipline, incapacity, or other "involuntary" reasons). The evidence from the employees' age profile (see Figure 5.2) is that it is

predominantly the younger members of the workforce who are leaving in this way, many a member of key professionals. It is far from clear where they go. A commonly held view is that some go to Russia, while others into trade and the shadow economy, but there are no statistics.

90. The best way of achieving the job reductions is, given its high level, to allow natural attrition to eliminate labour surpluses. Offering the possibility of transfer to the employees of closing mines to another mines of the associations/JSCs will help to solve the under-supply of labour in certain categories within the associations/JSCs. This will also minimise the disturbance and hardship caused to miners at closing mines. Transfers between mines are well established and generally accepted, although transfers beyond daily travelling distance may not be feasible at a significant scale due to difficulties with the availability of housing. However, some people already travel long distances to work (up to 50 km) when transportation is provided. Therefore, it may be necessary to provide transportation to the new workplace.



91. The deteriorating relative position of miners in pay (see Section D of Chapter III) has no doubt contributed to the high natural attrition rate. However, increasing miners' average pay rates to a level that attracts many applicants and stops natural attrition would be inconsistent with the need to reduce manpower, and should be avoided. It is certainly possible that real shortages of the basic professions will develop. In response, for basic profession workers the locally agreed increases have already doubled the minimum rates based on the tariff agreement. The funding of these additional wages has been achieved by reducing other costs, for example materials. This practice may itself be contributing to the decreasing production levels currently experienced. A better approach would be to increase productivity by changing working time and working practices. Unfortunately, longer underground shifts are forbidden by the Labour Code, so, unless the Labour Code is revised, there will be little flexibility for improving the efficiency of work schedules.

92. **Job creation.** As described above, the first mine closure plans prepared were based on the assumption that when a closure leads to redundancies, new jobs should be created for those made redundant, and this should be funded as part of the closure. The plans contained measures to create both short term or temporary jobs, and longer term jobs. Environmental restoration and salvage were examples to create short term jobs, and diversification projects (new factories) or the financing of the creation of additional capacity at other mines (e.g., building a new face) were examples of proposed attempts to create long term jobs. With the possible exception of essential environmental work, it is doubtful whether such proposals are justified, since (i) operating even more non-core enterprises within the coal industry would further dilute the management's focus on solving the problems of the core business; and (ii) the job creation schemes proposed may provide only temporary employment due their eventual unprofitability.

93. Potential losses of employment in certain regions (particularly in the Donbas), however, present a genuine concern even if natural attrition is utilized to shed many of the surplus employees. There will be a need for regionally based programs that facilitate employment generation in order to offset the general decline in the level of the economic activity in the coalfield areas. This function cannot and should not be fulfilled by the coal industry; the leading roles should be played by the nationwide Employment Service, and local and regional authorities. However, current expenditures on job creation activities are relatively modest and the ability of local and regional authorities to implement retraining and job creation programs are limited. Without the provision of additional resources and the strengthening of the respective agencies, it will not be possible to meet the needs that will arise as a result of mine closures and the rationalization of employment in the remaining mines. Nevertheless, the design of job creation programs should take into account macroeconomic and fiscal realities. The coal industry is not the only sector of the economy that needs to reduce the number of employees, and people who lose their jobs in other sectors will feel entitled to similar levels of assistance from the state.

94. Among the options to facilitate employment generation, limited re-employment support, retraining of displaced workers, and the provision of credit for new business ventures seem to be the least costly and contradictory to market mechanisms. Retraining should be demand driven, and the credits should not be subsidized -- their major attraction would be that they are available in a situation where it is virtually impossible to borrow money for longer than three months. The loan applications should be subject to a careful screening procedure and ex-post evaluation. In addition, the approved applicants could also be given start-up assistance in the form of shared office space, communications facilities, training, etc. At a later stage, public employment schemes could be introduced to help the long term unemployed in economically distressed regions.

95. The most effective measures, however, are likely to be the ones that restore economy-wide growth, such as further reduction of the budget deficit, monetary stability, liberalized trade regime, transparent and predictable legal and regulatory framework, and promotion of the private sector. The ability of the economy to absorb the employees who leave the coal industry will be particularly dependent on the progress of reform in the Donetsk, Lugansk, Volyn, Dnipropetrovsk and Kirovograd oblasts, where the mines are located. Using the number of privatized enterprises as an indicator of economic reform, Donetsk and Dnipropetrovsk oblasts were among the best performers nationally in 1994-95. The picture was less favorable for Kirovograd, Lugansk and Volyn. The pace of privatization was reflected in the amount of foreign direct investment; Donetsk and Dnipropetrovsk oblasts attracted several times more investment than Kirovograd, Lugansk and Volyn.

96. However, there is ample scope to speed up privatization even in Donetsk, the most advanced oblast (the oblast achieved only 64% of its medium/large scale privatization target in 1995). Furthermore, a policy that actively supports the establishment of new businesses is also needed. Although oblast administration established an office that gives information on procedures and facilitates new ventures, there are still too many bureaucratic requirements. The registration of small firms requires a company statute, a business plan approved by the oblast/city administration, a protocol about the establishment of the company, and the payment of a registration fee equal to about three months of the average wage. Entrepreneurs also have difficulties finding office space, and gaining access to infrastructure. Ukrainian local and regional authorities may want to study the experience of Central European cities (e.g., Szekesfehervar in Hungary) that successfully promoted the growth of the private sector by keeping local taxes low and registration procedures simple, and by establishing "incubator houses" for small ventures and "industrial parks" for larger businesses.

### C. Divestiture of Social Assets

97. The coal industry owns and operates a wide range of social assets (see Table 5.1). About 77,000 people are employed in the operation and maintenance of these assets. The average cost recovery from the beneficiaries of social services is only about 20 percent, with a range of 10-60 percent among production associations. In 1995, after deducting contributions from the beneficiaries, the cost of operating and maintaining these assets is expected to amount to US\$ 150 million, representing about 7 percent of total coal production costs. Seventy percent of expenditures were on housing and related utilities (for example, the coal industry operates about 1,000 boilers), 20 percent on kindergartens, 5 percent on cultural facilities, 4 percent on rest houses and recuperation facilities, and 1 percent on other social assets.

98. The utilization of some of these assets is very low. The kindergartens in the Donetskugol production association, for example, had a capacity of 14,443 children, an enrollment of 11,500 children, and average attendance of 6,510 children in the first quarter of 1995. Overstaffing is widespread; the ratio of less than 3 children to 1 kindergarten employee is lower than in market economies. The lack of cost recovery, cost controls and competition in the provision of these services have resulted in large inefficiencies.

99. The continued provision of these services by the mines would (i) continue to divert the attention of management from the key task of coal production; (ii) increase the cost of coal thereby reducing the competitiveness of domestic coal mining industry; and (iii) maintain the existing inefficiencies in service provision. According to the Presidential Decree on restructuring (see Chapter IV), the basic method to be applied in the divestiture of social assets is the transfer of the assets to local governments. Following the transfer, opportunities for the improved utilization of these assets and their privatization should be explored:

- (i) City-wide programs should be adopted to rationalize the utilization of kindergartens;
- (ii) Summer camps, resthouses, vacation facilities, and many sport and cultural facilities should be privatized;

- (iii) Profilactoria and sanatoria should be placed under existing medical facilities operated by local governments and their utilization rationalized; and
- (v) Most of the housing stock should be privatized. Together with the housing stock, the assets and staff of the maintenance organizations and utilities should also be transferred to local governments. Rationalization measures may include cost-effective solutions such as the contracting out of housing maintenance to private companies, and the establishment of non-profit tenants/owners associations.

TABLE 5.1

## SOCIAL ASSETS OWNED BY THE COAL INDUSTRY IN 1995

	NUMBER	CAPACITY	EMPLOYEES
Kindergarten	890	107,564	30,431
Summer camps	68	28,800	593
Cultural facilities/clubs	269	147,051	4,002
Sanatoria/profilactoria	60	9,620	2,925
Medical facilities	42	n/a	n/a
Rest Houses/rest areas	136	18,451	3,496
Sports facilities	144	n/a	1,172
Housing stock	21 million m <sup>2</sup>	410 thousand families	n/a
Housing maintenance organisations and utilities	n/a	n/a	34,400

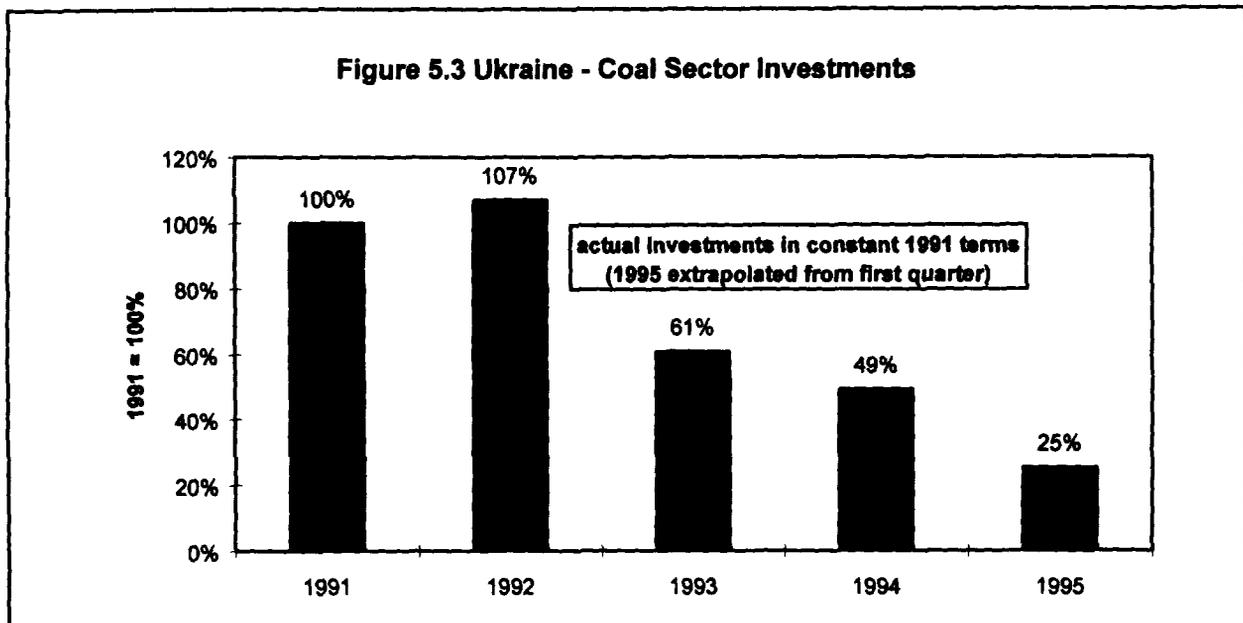
Source: MCI

100. Because cost recovery ratios can be increased only gradually, local governments will need to be provided with substantial financial support for the operation and maintenance these assets. In addition, local governments should also receive technical assistance in the management of operation and maintenance activities and the development of service rationalization and rehabilitation programs. Financial assistance should be subject to a sliding scale, e.g., covering 60 percent of total costs (including essential rehabilitation) in the first year, 40 percent in the second year, 20 percent in the third year, and no assistance afterwards. Annex 3 summarizes the proposed approach in a matrix format.

#### D. Investments

101. **Investment Priorities.** After the second World War, the former Soviet Union channeled its investments for development of new coal mining capacity to Kazakhstan and Siberia, where large coal deposits with much more favorable geological conditions exist. Ukrainian coal mines were old and received little funds for rehabilitation and modernization. Nevertheless, until recently, relatively large sums have been regularly invested to maintain existing production capacity under increasingly difficult

geological conditions and declining productivity. Up to the years 1991/92, annual investments were equivalent to more than 20 percent of total production costs. About 80 percent of the investments were financed by the coal industry, and 20 percent by the state budget. After 1992, a rapid decline of the investment volume (in real terms) commenced (see figure 5.3). Today, investments are less than 25 percent of the 1991/92 level, out of which the state budget finances less than 10 percent.



102. With further reductions in investments, there is a risk that the industry collapses. Due to the nature of their production process, mines have to develop new mining areas constantly as old ones are being depleted. If all investments for mine development were stopped, coal production would have to cease in a few years. It is essential to ensure that low-cost mines have the means to continue their mine development. In the past, worsening geological conditions and productivity did not stop the state from funding mine development investments in the high cost mines in order to maintain employment and meet production targets. That policy led to catastrophic economic results. Today, utmost care should be exercised in selecting investments in the coal industry, given the difficult geological conditions of Ukrainian coal mines, and the lack of the capacity of the state to provide funds.

103. Most, if not all, of previous state-supported mine development investments should be stopped, including the ones under the program for 1994-2005 adopted by the government in March 1994. The construction of a few new mines was started under the program, but most of the works have stopped recently due to lack of funding. Costs for new equipment and materials have increased dramatically and, unless radical design changes are possible, completion of these new mines would be uneconomic. Central European countries, such as Hungary, Poland or the former Czechoslovakia invariably stopped investments in mines with such difficult geological conditions in 1990s.

104. Major state-supported reconstructions were also started at existing mines to improve access to undeveloped coal reserves or to expand production capacity. These works include the development of new, deeper mining horizons, as well as the sinking, deepening and widening of shafts,

and their equipping with modern hoists. In most cases, the present production capacity of mines under such reconstruction is much higher than their actual production (only 6 out of the 21 mines presently under reconstruction produce at a rate commensurable with their present capacity), and it is difficult to understand why an expensive reconstruction program aiming at still higher production capacity should be maintained. In addition, the capital cost of completing their reconstruction are too high in relation to the expected future increase of output.<sup>21</sup> A critical review of selected on-going reconstructions is highly desirable. Such review should be carried out by the mining companies themselves (with assistance from qualified consultants) rather than centrally ordered and implemented by the traditional design institutes. In relatively modern mines, mining companies implemented more economical development plans than the ones originally drafted by the design institutes.

105. The highest priority investments, in parallel with managerial/organizational changes, should be aimed at utilizing the full production capacity of existing lower cost mines that have good geological potential. The focus should be on increasing the running time of the coal cutting machines at the longwall faces and de-bottlenecking the roadways to and from the faces.<sup>22</sup> The routine daily maintenance shift unnecessarily reduces machine availability. Even for the better longwalls, roadways are often in deplorable condition, rendering access exhausting and time-consuming. A major campaign is needed to open and renew existing roadways, as well as to rapidly advance new ones. Face equipment could be partly upgraded and conveyor belts could be renewed. Modern roof control techniques could be introduced. Poor sections of piping for secondary ventilation, compressed air supply and gas and water extraction could be renewed. Obsolete or worn pumps, fans, electric cables and switchgear could be replaced. Investments specifically designed to support organizational/managerial changes for improved mine safety and health could include the purchase of equipment to extract gas, suppress dust, improve ventilation, control air quality and provide personal protection. Although there is an overcapacity in existing coal washing plants, there may be some potential to increase efficiency of selected plants in a low-cost manner. In order to reduce coal transport costs, smaller, semi-mobile modern plants could be considered for some mines.

106. **Financing Options.** In view of the low efficiency of centrally planned and funded investments, a policy of self-financing (from accumulated funds or credit) of mine development and equipment replacement investments should be followed. However, the system of "accounting prices" seriously impedes the ability of low cost mines to obtain credit from domestic and foreign commercial banks. Not only their profitability is reduced due to the diversion of some of their revenues to uneconomic mines, but the unpredictability of the administratively set "accounting price" creates a risk that banks would not want to undertake.

107. Recently, two mechanisms have been introduced to address the problem of funding investments in coal exploration and mining. The first one is the system of "differentiated rents" deducted from the wholesale price. The collected rental payments will be available to finance investments

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<sup>21/</sup> Planned capital expenditures are ranging from about US\$ 200 to more than US\$ 1000 per t/year additional coal production capacity. Using 10 percent interest per year as the economic cost of capital, future coal output would have a capital cost of US\$ 25-100/ton of coal produced, demonstrating that the investments are clearly uneconomic.

<sup>22/</sup> Present daily output of a Ukrainian longwall is less than 20 percent of an international longwall, and is less than half of the Ukrainian rates achieved in the 1980s.

primarily in coal exploration and to cover the cost of restructuring. In order to reduce uncertainty and avoid perverse incentives, the rents should be set in a transparent manner based on geological factors (independent of actual performance) and left unchanged (in real terms) for an extended period. An additional consideration is the ability of the mines to carry the extra burden that this rental payment system creates. Therefore, the size of the rent should be limited to a few percent of the sale price.

108. The second mechanism is the Energy Development Fund. The second proposal has already been adopted. On August 26, 1995 the Cabinet of Ministers decided to establish an Energy Development Fund utilizing revenues from import taxes on coal (ECU 1-2/t) and light oil products (15 percent or at least ECU 15/t). The Ministry of Economy will submit proposals for the use of the proceeds of the fund to the Cabinet of Ministers on a monthly basis. After approval by the Cabinet, the Ministry of Finance will control disbursement. General guidelines for the allocation of the proceeds of the fund among the coal, oil, gas and power industries have not been developed yet, however, the bulk of the proceeds of the fund are expected to finance the coal industry. Total revenues of the fund are estimated at US\$ 120-150 million/year.

109. The main problem with this fund is that it might maintain a system of centrally determined and funded investments despite the proven inefficiency of such a system in the coal mining industry in the past. The solution is to liberalize prices and allow financially independent companies to decide about investments and compete for credit from the banking sector. In view of the low efficiency of centrally planned and funded investments, a policy of self-financing (from accumulated funds or credit) of mine development and equipment replacement investments should be followed. The resources that accrue to the fund should be applied to finance the technical and social cost of mine closures and other expenses associated with the restructuring process.

#### **E. Fiscal Impact of the Restructuring**

110. In view of the critical situation of the Ukrainian coal industry, most of the cost of restructuring has to be borne by the budget. However, it is important to channel budgetary support in a way that minimizes the risk of distorting decisions about future production activities and investments. In other words, the market rather than the government should decide about the allocation of resources for coal production. This can be achieved if budgetary support is primarily aimed at relieving the industry of unproductive expenditures such as the cost of mine closures and social protection.

111. Financing the cost of the restructuring program may not be the only burden on the budget. Due to constraints on the speed of the closure process, it is likely that a number of the mines designated for closure will suffer losses by the time the decision to cease production is implemented. In order to avoid the softening of the budget constraints of joint stock companies, the authorities must establish very rigid eligibility requirements for the provision of interim production subsidies. Specifically, any mine that receives a production subsidy should meet the following conditions:

- Other options to reduce costs such as speeding up the transfer of social assets and responsibilities, or the leasing of the mine to the workers collective or other parties have been exhausted;

- The mine is on the closure list with a target date already set for the ceasing of production;
- The preparation of the closure plan has been started, and it is proceeding according to the schedule; and
- The mine has been transferred from the joint stock company to the Ukrainian Coal Company.

112. The various costs of the restructuring program itself can be divided into two categories. The first category includes costs that are unavoidable in the short run, such as disability payments, free coal to pensioners, the operation and maintenance/rehabilitation of social assets, and part of the environmental protection expenditures (e.g., the control of waste dump fires). The second group includes costs that are directly connected to the closure of uneconomic mines such as the technical cost of closure, the remaining part of environmental protection costs, support for the transfer of employees among mines, severance payments, support for re-employment outside the coal industry, retraining, and assistance to local and regional governments for job creation.

113. Budgetary resources that support the operation and maintenance of social assets should initially be provided to the mining companies. Over time, as the assets are divested, more and more support should be channelled to local governments. Assuming that (i) support from the central government budget is gradually reduced over time (see Section C above); and (ii) cost savings from rationalization and privatization proceeds are fully utilized to finance the rehabilitation of remaining assets, about US\$ 130 million support from the central government needs to be budgeted for 1996, US\$ 90 million for 1997, and US\$ 45 million for 1998. Additional resources need to be provided to regions/cities where major job losses occur for the retraining of workers and the establishment of funds that facilitate job creation (credit lines and public employment programs). The necessary budgetary outlay for this purpose is estimated at US\$ 20 million per year.

114. All other budgetary support for restructuring should be channeled through "Ukrainian Coal Enterprise", the organization entrusted with the implementation of mine closures. Assuming that, on average, about 20 mines will be closed annually in the 1996-2000 period, the budget of the Ukrainian Coal Company should be about US\$ 130 million per year, consisting of:

- US\$ 50 million per year to cover technical closure costs;
- US\$ 15 million per year to cover environmental protection costs (including both unavoidable and closure-related costs);
- US\$ 15 million per year for payments to cover the cost of transferring employees from the closing mines to other mines;
- US\$ 25 million per year for severance pay and re-employment support to workers who do not wish (or cannot be) to be transferred; and
- US\$ 25 million per year for disability payments and the provision of coal to pensioners.

115. It will cost substantially less for the budget to pay for the closure of uneconomic mines than to cover their losses indefinitely. This can be seen if, after excluding payments associated with the transfer of social assets, disability, and the coal to pensioners, the remaining US\$ 125 million per year budgetary outlay is compared to the cost savings due to the closure of uneconomic mines. As estimated in Chapter IV, the closure of 80-100 mines, even without taking into account possible gains from the improved capacity utilization of the remaining mines, is expected to reduce the average unit cost of domestically produced coal by 9-12 percent, and save US\$ 200-250 million per year if the production of these mines is replaced with imported coal. Savings will be substantially higher if the remaining mines, after reinvesting profits that they are now allowed to keep, are able to improve the utilization of their capacity making additional imports unnecessary.

UKRAINE COAL INDUSTRY RESTRUCTURING ACTION PLAN										
No.	Text Para. Ref.	AREA/ISSUE	ACTION	RESPONSIBLE	TA	IMPLEMENTATION				
						96	97	98	99	2000
1.		<b>MARKET LIBERALIZATION</b>								
1.1	51 52 66	Coal prices are stipulated in a price list issued by MCI. The price of steam coal, especially washed anthracite, is set too high	In the first step, authorize enterprises to negotiate coal prices with their customers, subject to a temporary declaration requirement when the agreed price is above the world market price. In the second step, completely liberalize coal prices. Gradually decrease and finally eliminate subsidies for household coal consumption	MCI/ MinEcon		*	*			
1.2	56 57 66	Uglesbyt has a monopoly to market most of the coal produced in Ukraine. Also, it is the only company that can export coal. Uglesbyt allocates coal according to a "sector plan" that maintains the perception of state guaranteed payments	Abolish the system of coal distribution by the state	CabMin/ MCI		*				
2.		<b>CORPORATIZATION</b>								
2.1	46 67 68	Mines are organized into 23 associations. The mining associations also include transport, construction, machine building, banking and other enterprises. 12 mines are independent. Separate associations operate washing plants and market the coal	Establish joint stock companies (JSCs) on the basis of coal mines, washing plants and marketing organizations. Separately corporatize or privatize service companies that are currently included in the associations	MCI	X	*				
2.2	68 69	Inclusion of high cost mines in the new JSCs would endanger their financial viability. Mechanism is needed to return uneconomic mines to the state for closure	Exclude the uneconomic mines and washing plants identified for closure from JSCs. Set up "Ukrainian Coal Company" to manage the process of closing these mines. Introduce the possibility of JSCs leasing "marginal" mines with the option to return the mines to "Ukrainian Coal Company" for closure	MCI/ MinEcon	X	*				
2.3	70	Coal mining is a competitive industry, well suited to private ownership. There is a need to attract private capital into the industry in order to stem the decline of investments	Develop a privatization program for those JSCs that demonstrate profitable operation in the completely liberalized coal market	MCI/ MinEcon/ State Prop. Fund	X	*	*			
3.		<b>CLOSING UNECONOMIC MINES</b>								
3.1	73 74	The closure manual prepared by MCI mandates extended closure procedures in order to reduce the potential unemployment. The plans prepared so far recommend 3 years or longer closure processes, making the mine closures very costly	Revise the Closure Manual so that closure plans will aim at minimizing the cost and time needed for closure	MCI	X	*				
3.2	82 83	Environmental impact of mine closures	Include in the Closure Manual guidelines for (i) the handling of waste water; (ii) rehabilitation of the surface area of mines; (iii) rehabilitation of rock waste dumps; and (iv) arrangements for the monitoring of closed mines and dumps	MCI/ Min. of Env. Prot.	X	*				
3.3	75	Implementation of the technical aspects of the closure	Introduce competitive bidding for contracts to close individual mines. Pay contractors according to the completion of specific steps such as underground works, demolition of surface buildings, and capping of shafts, etc.	MCI/ Ukr. Coal Company	X	*	*	*	*	*

UKRAINE COAL INDUSTRY RESTRUCTURING ACTION PLAN										
No.	Text Para. Ref.	AREA/ISSUE	ACTION	RESPON-SIBLE	TA	IMPLEMENTATION				
						96	97	98	99	2000
4.		<b>MITIGATION OF SOCIAL COSTS</b>								
4.1	76-78	Protection of the employees of the closing mines while avoiding uneconomic projects or accumulation of surplus labor at remaining mines	Offer continuing employment to the employees of closing mines at remaining mines, if possible. Provide a payment per person to the company that re-employs the miners in order to cover the cost of transferring/establishing the workplace. Make the payment conditional on the reduction of new recruitment in mining companies	MinFin/ MCI/ Ukr. Coal Company		*	*	*	*	*
4.2	92-96	Potential large losses of employment in certain regions most affected by mine closures and the rationalization of employment in remaining mines	Provide re-employment support, retraining and establish credit lines to facilitate job creation. Ensure that the programs are demand driven and offer choice. Introduce start-up technical assistance for new ventures. Set up public employment schemes to help the long term unemployed in distressed regions. Strengthen the institutions that will implement retraining and job creation programs	Min. of Soc. Prot/ oblasts/ local gov.	X	*	*	*	*	*
4.3	79	Mines distribute free coal to pensioners who don't have district heating	Place the liability for distributing free coal to pensioners of closing mines in the "Ukrainian Coal Company". In the medium term, phase out free coal distribution parallel with the elimination of district heating subsidy	MCI/Min. Soc. Prot/ St. Com. of Housing	X	*	*	*		
4.4	79	Mines are responsible for paying disability benefits to workers with occupational disability	Place the liability to provide disability benefits to workers in closing mines in the "Ukrainian Coal Company". In the medium term, introduce a disability insurance system	MCI/Min. Soc. Prot	X	*	*	*		
5.		<b>DIVESTITURE OF SOCIAL ASSETS</b>								
5.1	80	Mines have waiting list for the provision of housing to employees	Transfer the waiting lists together with employees from closing mines to other mines or municipalities	MCI/St. Com. of Housing	X	*	*	*	*	
5.2	97-99	Coal industry owns and operates a wide range of social assets creating a financial and managerial burden. The utilization of some of these assets is low	Transfer kindergartens, summer camps, resthouses, vacation facilities, sport and cultural facilities to local governments and consider the possibility of their future privatization. Place profilactoria and sanatoria under existing local medical facilities. Transfer housing stock and maintenance organizations to local governments and privatize housing later	MCI/ St.Prop. Fund/ oblasts/ local gov.	X	*	*	*	*	*
5.3	81 113	Maintenance of some of the social assets have been neglected and the assets need major capital repairs	Do not delay divestiture until assets are rehabilitated. Local governments may use revenues from rationalizing the utilization of some of these assets (by leasing, privatization, etc.) to fund the repairs of remaining assets	St.Prop. Fund/ local gov.	X	*	*	*	*	*
6.		<b>INVESTMENTS</b>								
6.1	26 102 104	Current investment plans are based on a previously expected major expansion of domestic coal demand. Most of the centrally planned investments to open new mines and increase the capacity of existing mines are uneconomic	Adopt realistic demand forecasts. Review the economic viability of the investments stipulated in the previously adopted "Coal Program 2005". The review should properly take into account the opportunity cost of capital	MinEcon/ MCI/ mining companies	X	*				

UKRAINE COAL INDUSTRY RESTRUCTURING ACTION PLAN										
No.	Text Para. Ref.	AREA/ISSUE	ACTION	RESPON-SIBLE	TA	IMPLEMENTATION				
						96	97	98	99	2000
6.2	102-105	Decreasing investments and maintenance of capital assets threaten the ability of even low cost mines to continue production	Focus financial resources at the utilization of the full production capacity of low cost mines	mining companies		*	*	*	*	*
6.3	107-109	The government decided to establish an extra-budgetary fund to support the coal industry drawing on revenues from import taxes, and "rents" (royalties) on coal deposits	Develop and publish a methodology for calculating "rents". Limit "rents" to no more than 5% of the sales price of coal from the best deposits. Use the proceeds in the extra-budgetary fund to cover the technical and social costs of restructuring	CabMin/MinEcon/MinFin/MCI/	X	*	*	*	*	*
7.		<b>SOURCES OF FINANCIAL SUPPORT</b>								
7.1	110-114	Coal mines are unable to cover the cost of restructuring. The support from the budget should be provided in a way that does not distort decisions about production and investments	Allocate funds to cover (i) technical and environment related closure costs; (ii) lump sum payments related to the cost of transferring employees and workplaces; (iii) severance payments and re-employment support to employees; and (iv) disability benefits	MinFin/MCI/Min. of Labor/Min. of Soc. Prot	X	*	*	*	*	*
7.2	100-113	Local governments lack the funds to finance the operation and maintenance of the social assets	Provide financial assistance to local governments covering a share of the costs of operating and maintaining the transferred social assets. Later, cover these costs from local budgets and payments from beneficiaries	MinFin/St. Com. of Housing/local gov.	X	*	*	*		
7.3	113	Funding and implementation of retraining and job creation programs	Develop criteria and mechanism to support the generation of employment in regions/cities where major job losses occur due to mine closures and reduction of employment in remaining mines	MinFin/MCI/Min. of Soc.Prot./regional gov.	X	*	*	*	*	*

Table 1: Coal Industry Associations

<u>Association</u>	<u>Main activity</u>	<u>Number of enterprises</u>
Antracite	Anthracite production	5
Antraciteugleobogashcheniye	Anthracite washing	1
Artiomovskugol	Coal production	5
Communications	Production and technical	1
Dneproschachtstroy	Mine construction	8
Dobropolyeugol	Coal production	7
Donbasantracite	Anthracite production	5
Donetskobogashcheniye	Coal washing	1
Donetskschachtstroy	Mine construction	17
Donetskugleautomatika	Mine automation	8
Donetskugleremont	Mining equipment repair	1
Donetskugol	Coal production	21
Dzerzhinskugol	Coal production	4
Krasnoarmeyskugol	Coal production	11
Krasnodonugol	Coal production	17
Lisichanskugol	Coal production	4
Luganskobogashcheniye	Coal washing	1
Luganskschachtstroy	Mine construction	10
Luganskugleautomatika	Mine automation	1
Luganskugleremont	Mining equipment repair	4
Luganskugol	Coal production	16
Makeyevkugol	Coal production	8
Oleksandriyugol	Coal production	50
Ordinshonikidzeugol	Coal production	3
Pavlogradugol	Coal production	50
Pershotravenskugol	Coal production	5
Rovenkiantracite	Anthracite production	1
Schachterskugol	Coal production	7
Selidovskugol	Coal production	12
Spetschachtobureniye	Shaft design and sinking	7
Spetstamponazhgeologiya	Geological research	1
Stakhanovugol	Coal production	3
Sverdlovskantracite	Anthracite production	8
Torezskugol	Coal production	5
Uglemechanizatsiya	Experimental equipment	1
Ukrgeologiya	Mining geology	3
Ukrugleekologiya	Ecological research	5
Ukrzapadugol	Coal production	4
Oktiabrugol	Coal production	95
<b>Sub-total</b>		<b>416</b>
<b>Independent enterprises</b>		<b>88</b>
<b>Total</b>		<b>504</b>

TABLE 2: COAL INDUSTRY ENTERPRISES

<u>Activity</u>	<u>Association</u>	<u>Enterprise Name</u>	<u>Type</u>	<u>Status</u>	<u>Oblast</u>
Anthracite production	Antracite			Association	Lugansk
Mine	Antracite	Komsomolskaya			Lugansk
Transport	Antracite				Lugansk
Procurement	Antracite				Lugansk
Unspecified	Antracite	Paritet			Lugansk
Anthracite washing	Antraciteugleobogashcheniye			Association	Lugansk
Coal production	Artiomovskugol			Association	Donetsk
Mechanical	Artiomovskugol	Gorlovka	Repair		Donetsk
Construction	Artiomovskugol	Gorlovsketroy			Donetsk
Transport	Artiomovskugol	Artemgruztrans			Donetsk
Design & engineering	Artiomovskugol	Gorlovskaya			Donetsk
Communications	Communications	Central Communication Point		Association	Lugansk
Mining construction	Dneproschachtstroy			Association	Dnipropetrovsk
Construction components	Dneproschachtstroy	Stroydetal	Plant		Dnipropetrovsk
Construction	Dneproschachtstroy	Department 2			Dnipropetrovsk
Construction	Dneproschachtstroy	Department 3			Dnipropetrovsk
Construction	Dneproschachtstroy	Department 4			Dnipropetrovsk
Construction	Dneproschachtstroy	Department 6			Dnipropetrovsk
Mine mechanisation	Dneproschachtstroy	Pavlograd Department			Dnipropetrovsk
Car depot	Dneproschachtstroy	Dneprovskaya			Dnipropetrovsk
Coal production	Dobropolyeugol			Association	Donetsk
Construction	Dobropolyeugol	Dobropolyeuglestroy			Donetsk
Procurement	Dobropolyeugol				Donetsk
Transport	Dobropolyeugol				Donetsk
Mine	Dobropolyeugol	Red Army			Donetsk
Mine	Dobropolyeugol	Novodonetskaya			Donetsk
Mine	Dobropolyeugol	Dobropolskaya			Donetsk
Anthracite production	Donbasantracite			Association	Lugansk
Transport	Donbasantracite	Donbasgruztrans			Lugansk
Procurement	Donbasantracite				Lugansk
Construction	Donbasantracite	Krasnoluchuglestroy			Lugansk
New enterprises	Donbasantracite				Lugansk
Coal washing	Donetskobogashcheniye			Association	Donetsk
Mining construction	Donetskschachtstroy			Association	Donetsk
Unspecified	Donetskschachtstroy	Krasnoarmysk		OJSC	Donetsk
Reinforced concrete	Donetskschachtstroy	Dokuchaev	Plant	OJSC	Donetsk
Construction	Donetskschachtstroy	Makeevka		OJSC	Donetsk
Construction	Donetskschachtstroy	Donetskschakhtostroy			Donetsk
Construction	Donetskschachtstroy	Artyomshakhtostroy			Donetsk
Shaft sinking	Donetskschachtstroy	Donetskschakhtoprokhodka			Donetsk
Construction	Donetskschachtstroy	Donetskschakhtostroy montazh			Donetsk
Mining excavation	Donetskschachtstroy	Gorlovka			Donetsk
Reinforced concrete roofing	Donetskschachtstroy	Torez	Plant		Donetsk
Sand quarry	Donetskschachtstroy	Krasnaya Polyana			Donetsk
Experimental & mechanical	Donetskschachtstroy	Donetsk	Repair		Donetsk
Transport	Donetskschachtstroy	Donetskschakhtostroytrans			Donetsk
Engineering	Donetskschachtstroy	Orgtechshakhtostroy			Donetsk
Computer center	Donetskschachtstroy				Donetsk
Coal mining machinery	Donetskschachtstroy	Donuglemash	Plant		Donetsk
Construction management	Donetskschachtstroy	Gorlovka settlement			Donetsk
Mining equipment installation	Donetskugleautomatika			Association	Donetsk
Adjustment operations	Donetskugleautomatika	Pavlograd Department			Dnipropetrovsk
Mining equipment installation	Donetskugleautomatika	Donetsk			Donetsk

TABLE 2: COAL INDUSTRY ENTERPRISES

Activity	Association	Enterprise Name	Type	Status	Oblast
Mining equipment installation	Donetskugleautomatika	Gorlovka			Donetsk
Mining equipment set-up	Donetskugleautomatika	Donetsk			Donetsk
Mining equipment set-up	Donetskugleautomatika	Gorlovka			Donetsk
Mining equipment set-up	Donetskugleautomatika	Teploenergoautomatika			Donetsk
Isotope centre	Donetskugleautomatika	Ugleizotop			Donetsk
Equipment repair	Donetskugleremont			Association	Donetsk
Coal production	Donetskugol			Association	Donetsk
Mine	Donetskugol	Yuzhnodonbasskaya 1			Donetsk
Mine	Donetskugol	Yuzhnodonbasskaya 3			Donetsk
Mine	Donetskugol	A Sorochynsky			Donetsk
Mining management	Donetskugol	Kuibishev			Donetsk
Mine	Donetskugol	M Gorky			Donetsk
Mining management	Donetskugol	Oktiabrskaya			Donetsk
Mine	Donetskugol	Butivka-Donetska			Donetsk
Mine	Donetskugol	M I Kalinin			Donetsk
Mining management	Donetskugol	Donbas			Donetsk
Procurement	Donetskugol				Donetsk
New enterprises	Donetskugol				Donetsk
Marketing	Donetskugol				Donetsk
Design	Donetskugol	Donetsk			Donetsk
Computer center	Donetskugol				Donetsk
Construction	Donetskugol	Donetskuglestroy			Donetsk
Housing privatisation agency	Donetskugol				Donetsk
Small state enterprise	Donetskugol	Puteets			Donetsk
Small state enterprise	Donetskugol	Norator			Donetsk
Metal & reinforced concrete	Donetskugol				Donetsk
Foreign trade bureau	Donetskugol	Donvuglintur			Donetsk
Coal production	Dzerzhinskugol			Association	Donetsk
Mine	Dzerzhinskugol	Dzerzhinsky			Donetsk
Mine	Dzerzhinskugol	Toretskaya			Donetsk
Procurement	Dzerzhinskugol				Donetsk
Coal production	Krasnoarmeyskugol			Association	Donetsk
Mine	Krasnoarmeyskugol	Tsentralnaya			Donetsk
Mine	Krasnoarmeyskugol	A Stakhanov			Donetsk
Mine	Krasnoarmeyskugol	F Dimitrov			Donetsk
Mine	Krasnoarmeyskugol	Rodinskaya			Donetsk
Mine	Krasnoarmeyskugol	Krasnoarmeyskaya-Zapadnaya 1			Donetsk
Mine	Krasnoarmeyskugol	Krasnolimanskaya			Donetsk
Construction	Krasnoarmeyskugol	Krasnoarmeyuglestroy			Donetsk
Transport	Krasnoarmeyskugol				Donetsk
Procurement	Krasnoarmeyskugol				Donetsk
New enterprises	Krasnoarmeyskugol				Donetsk
Coal production	Krasnodonugol			Association	Lugansk
Construction	Krasnodonugol				Lugansk
Mine	Krasnodonugol	Molodogvardeyskaya			Lugansk
Mine	Krasnodonugol	Severnaya			Lugansk
Mine	Krasnodonugol	Orechovskaya			Lugansk
Mine	Krasnodonugol	Talovskaya			Lugansk
Mine	Krasnodonugol	F Liutikov			Lugansk
Mine	Krasnodonugol	Peremoga			Lugansk
Mine	Krasnodonugol	N Barakova			Lugansk
Mine	Krasnodonugol	50th Anniversary of the USSR			Lugansk
Mine	Krasnodonugol	Sukhodolskaya-Vostochnaya			Lugansk

TABLE 2: COAL INDUSTRY ENTERPRISES

<u>Activity</u>	<u>Association</u>	<u>Enterprise Name</u>	<u>Type</u>	<u>Status</u>	<u>Oblast</u>
Transport	Krasnodonugol	Krasnodongruztrans			Lugansk
Procurement	Krasnodonugol				Lugansk
New enterprises	Krasnodonugol				Lugansk
Transport	Krasnodonugol				Lugansk
Trade & public catering	Krasnodonugol		Trading		Lugansk
Medical care & diagnostics	Krasnodonugol	Ultramed			Lugansk
Coal production	Lisichanskugol			Association	Lugansk
Construction	Lisichanskugol				Lugansk
Shaft sinking	Lisichanskugol				Lugansk
Mine	Lisichanskugol	Chernomorka			Lugansk
Mining construction	Luganskschachtstroy	Antracitschachtstroy		Association	Lugansk
Construction	Luganskschachtstroy	Department 2		CJSC	Lugansk
Construction	Luganskschachtstroy	Department 1		CJSC	Lugansk
Mining machinery	Luganskschachtstroy		Repair	OJSC	Lugansk
Shaft sinking	Luganskschachtstroy	Sverdlovsk Department 10			Lugansk
Construction	Luganskschachtstroy				Lugansk
Construction	Luganskschachtstroy	Krasnadanshachtstroy			Lugansk
Construction	Luganskschachtstroy	Sverdlovskshachtstroy			Lugansk
Shaft sinking	Luganskschachtstroy	Luganskschachtstroy			Lugansk
Construction	Luganskschachtstroy	Department 3			Lugansk
Special installation works	Luganskugleautomatika			Association	Lugansk
Coal washing	Luganskobogashcheniye			Association	Lugansk
Equipment repair	Luganskugleremont			Association	Donetsk
Repair plant	Luganskugleremont	Briankovsky	Repair		Lugansk
Technical ribbon products	Luganskugleremont	Stakhanovsky			Lugansk
Energy plant	Luganskugleremont	Lugansky			Lugansk
Coal production	Luganskugol			Association	Lugansk
Transport	Luganskugol				Lugansk
Procurement	Luganskugol				Lugansk
Construction	Luganskugol	Luganskugolstroy			Lugansk
Construction	Luganskugol	Stroyindustriya			Lugansk
Transport	Luganskugol				Lugansk
Shaft sinking	Luganskugol				Lugansk
Construction	Luganskugol	Lease Mining construction			Lugansk
Construction	Luganskugol	Perevalskoye			Lugansk
Construction	Luganskugol	Lutuginskoye			Lugansk
Construction	Luganskugol	Chernuchinskoye			Lugansk
Construction	Luganskugol	Perevalskoye			Lugansk
Shaft sinking	Luganskugol				Lugansk
Unspecified	Luganskugol	Kedr			Lugansk
Small enterprise	Luganskugol	Tanais			Lugansk
Scientific & production	Luganskugol	Impuls			Lugansk
Coal production	Makeyevkaugol			Association	Donetsk
Transport	Makeyevkaugol	Makeyevgruztrans			Donetsk
Transport	Makeyevkaugol	Krasnogvardeyskgruztrans			Donetsk
Procurement	Makeyevkaugol	Input Supplies Dept			Donetsk
Construction	Makeyevkaugol	Makeyevuglestroy			Donetsk
Marketing	Makeyevkaugol	Makuglekoks			Donetsk
Small state enterprise	Makeyevkaugol	Kemelia			Donetsk
Research & production	Makeyevkaugol	Begap	Research		Donetsk
Coal production	Oktiabrugol			Association	Donetsk
Mine	Oktiabrugol	Kommunist		OJSC	Donetsk
Mining management	Oktiabrugol	Komsomolskoye			Donetsk

TABLE 2: COAL INDUSTRY ENTERPRISES

<u>Activity</u>	<u>Association</u>	<u>Enterprise Name</u>	<u>Type</u>	<u>Status</u>	<u>Oblast</u>
Mine	Oktiabrugol	Ternopolskaya			Donetsk
Mine	Oktiabrugol	Rassvet			Donetsk
Mining management	Oktiabrugol	October Revolution			Donetsk
Mining management	Oktiabrugol	Zuyevskeye			Donetsk
Mine	Oktiabrugol	Kirovskaya			Donetsk
Mining management	Oktiabrugol	Khartsizskoye			Donetsk
Mechanical plant	Oktiabrugol	Khartsizsk	Repair		Donetsk
Procurement	Oktiabrugol				Donetsk
Transport	Oktiabrugol	Oktiabruguztrans			Donetsk
Construction	Oktiabrugol	Department 3			Donetsk
Construction	Oktiabrugol	Department 8			Donetsk
Coal production	Oleksandriyaugol			Association	Kirovograd
Production	Oleksandriyaugol	Korostyshivsky			Zhitomir
Mining management	Oleksandriyaugol	Konstantinivsky			Kirovograd
Transport	Oleksandriyaugol				Kirovograd
Procurement	Oleksandriyaugol				Kirovograd
Construction	Oleksandriyaugol	Olex&ryarozrstroy			Kirovograd
Unspecified	Oleksandriyaugol		Repair		Kirovograd
Geological survey	Oleksandriyaugol				Kirovograd
Trading enterprise	Oleksandriyaugol	Girnik	Trading		Kirovograd
Shop	Oleksandriyaugol	Universam	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Progress	Trading		Kirovograd
Trading enterprise - industrial	Oleksandriyaugol	Yerbichenka	Trading		Kirovograd
Trading enterprise - foodstuffs	Oleksandriyaugol	Yatran	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Zavodske	Trading		Kirovograd
Shop	Oleksandriyaugol	Sophia	Trading		Kirovograd
Restaurant	Oleksandriyaugol	Ingulets	Trading		Kirovograd
Catering	Oleksandriyaugol	Troy&a	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Shakhtar	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Use dia domu	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Prodtovari	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Lastivka	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Temp-2	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Prodtovari	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Uyut	Trading		Kirovograd
Catering	Oleksandriyaugol	Ukraina	Trading		Kirovograd
Shop	Oleksandriyaugol	Veseika	Trading		Kirovograd
Shop	Oleksandriyaugol	Ukrainolka	Trading		Kirovograd
Trading enterprise	Oleksandriyaugol	Barvinok	Trading		Kirovograd
Mining management	Oleksandriyaugol	Verbolozovsky			Kirovograd
Mining management	Oleksandriyaugol	B&urovsky			Kirovograd
Mining management	Oleksandriyaugol	Morozovsky			Kirovograd
Mine	Oleksandriyaugol	Medvezheyarska			Kirovograd
Mine	Oleksandriyaugol	Verbolozovska			Kirovograd
Briquette plant	Oleksandriyaugol	Baidakovska			Kirovograd
Briquette plant	Oleksandriyaugol	Dimitrovska			Kirovograd
Power management	Oleksandriyaugol				Kirovograd
Mining machinery	Oleksandriyaugol		Repair		Kirovograd
Automobile centre	Oleksandriyaugol				Kirovograd
Land reclamation	Oleksandriyaugol				Kirovograd
Management	Oleksandriyaugol		Repair		Kirovograd
Data collection & calculation	Oleksandriyaugol				Kirovograd
Agriculture	Oleksandriyaugol	Girvik			Kirovograd

TABLE 2: COAL INDUSTRY ENTERPRISES

<u>Activity</u>	<u>Association</u>	<u>Enterprise Name</u>	<u>Type</u>	<u>Status</u>	<u>Oblast</u>
Agriculture	Oleksandriyaugol	Shakhtar			Kirovograd
Project management	Oleksandriyaugol				Kirovograd
District heating	Oleksandriyaugol	N1-2			Kirovograd
Mine	Oleksandriyaugol	Novomirgorodskaya			Kirovograd
Bricks	Oleksandriyaugol		Plant		Kirovograd
Marketing	Oleksandriyaugol				Kirovograd
Mining management	Oleksandriyaugol	Vatutinske			Cherkasskaya
Unspecified	Oleksandriyaugol	Vatutone settlement	Repair		Cherkasskaya
Coal production	Ordinshonikidzeugol			Association	Donetsk
Procurement	Ordinshonikidzeugol	Input Supplies Department			Donetsk
Transport	Ordinshonikidzeugol	Transport Department			Donetsk
Coal production	Pavlogradugol			Association	Dnipropetrovsk
Mine	Pavlogradugol	Ternovskaya			Dnipropetrovsk
Mine	Pavlogradugol	Stepnaya			Dnipropetrovsk
Mine	Pavlogradugol	Yubileinaya			Dnipropetrovsk
Mine	Pavlogradugol	Pavlogradskaya			Dnipropetrovsk
Mine	Pavlogradugol	Samarskaya			Dnipropetrovsk
Mine	Pavlogradugol	Dneprovskaya			Dnipropetrovsk
Mine	Pavlogradugol	Zapadno-Donbaskaya			Dnipropetrovsk
Mine	Pavlogradugol	S Stashkov			Dnipropetrovsk
Coal washing plant	Pavlogradugol	Pavlogradskaya			Dnipropetrovsk
Mechanical equipment	Pavlogradugol		Repair		Dnipropetrovsk
Energy	Pavlogradugol				Dnipropetrovsk
Coal depot	Pavlogradugol				Dnipropetrovsk
Installation & dismantling	Pavlogradugol		Repair		Dnipropetrovsk
Water & sewage services	Pavlogradugol				Dnipropetrovsk
Transport	Pavlogradugol	Pavlogradgruztrans			Dnipropetrovsk
Construction	Pavlogradugol	Department 2			Dnipropetrovsk
Shaft-sinking	Pavlogradugol				Dnipropetrovsk
Agri-industrial trade	Pavlogradugol	Pervomaiskoye	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Cheremshina	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Grono	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Orel	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Malvina	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Iziuminka	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Kosmos	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Lav&a	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Svitoch	Trading		Dnipropetrovsk
Supermarket	Pavlogradugol	Dneprovsky	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Konvaliya	Trading		Dnipropetrovsk
Shop	Pavlogradugol		Trading		Dnipropetrovsk
Shop	Pavlogradugol	Lebed	Trading		Dnipropetrovsk
Supermarket	Pavlogradugol	Pavlogradsky	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Ramashka	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Ternivchanka	Trading		Dnipropetrovsk
Supermarket	Pavlogradugol	Mayak	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Myr	Trading		Dnipropetrovsk
Pig feeding	Pavlogradugol				Dnipropetrovsk
Shop	Pavlogradugol	Wine-Vodka	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Pivdenny	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Edelweis	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Kulinariya	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Beriozka	Trading		Dnipropetrovsk

TABLE 2: COAL INDUSTRY ENTERPRISES

<u>Activity</u>	<u>Association</u>	<u>Enterprise Name</u>	<u>Type</u>	<u>Status</u>	<u>Oblast</u>
Shop	Pavlogradugol	Zoriya	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Effect	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Verba	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Merkury	Trading		Dnipropetrovsk
Restaurant	Pavlogradugol	Ukraina	Trading		Dnipropetrovsk
Shop	Pavlogradugol	Burenvestnik	Trading		Dnipropetrovsk
Department store	Pavlogradugol	Yubileiny	Trading		Dnipropetrovsk
Marketing	Pavlogradugol				Dnipropetrovsk
Coal production	Pershotravenskugol			Association	Lugansk
Mine	Pershotravenskugol	Zolote			Lugansk
Procurement	Pershotravenskugol				Lugansk
Transport	Pershotravenskugol				Lugansk
Construction	Pershotravenskugol				Lugansk
Antracite production	Rovenkiantracite			Association	Lugansk
Coal production	Selidovskugol			Association	Donetsk
Mine	Selidovskugol	Norogrodovskaya 1-3			Donetsk
Mine	Selidovskugol	Novogrodovskaya 2			Donetsk
Mine	Selidovskugol	D Korotchenko			Donetsk
Mine	Selidovskugol	Rosiya			Donetsk
Mine	Selidovskugol	Ukraina			Donetsk
Mine	Selidovskugol	Kurachovskaya			Donetsk
Mine	Selidovskugol	Gornysk			Donetsk
Procurement	Selidovskugol				Donetsk
Construction	Selidovskugol	Selidovuglestroy			Donetsk
Mine	Selidovskugol	Selidovskaya			Donetsk
Concrete construction products	Selidovskugol		Plant		Donetsk
Coal production	Schachterskugol			Association	Donetsk
Mine	Schachterskugol	Shachterskaya-Glubokaya			Donetsk
Procurement	Schachterskugol				Donetsk
Transport	Schachterskugol				Donetsk
New enterprises	Schachterskugol				Donetsk
Construction	Schachterskugol	Department 5			Donetsk
Small state enterprise	Schachterskugol	Antracite			Donetsk
Design of mine shafts	Spetschachtobureniye			Association	Donetsk
Shaft sinking	Spetschachtobureniye	Sverdlovskoye			Lugansk
Shaft sinking	Spetschachtobureniye	Perevomayskoye			Lugansk
Scientific & production	Spetschachtobureniye	Uglemechanizatsiya			Lugansk
Shaft sinking	Spetschachtobureniye	Torez			Donetsk
Shaft sinking	Spetschachtobureniye	Donetsk			Donetsk
Construction	Spetschachtobureniye				Donetsk
Geological services	Spetsstamonazhgeologiya			Association	Donetsk
Coal production	Stakhanovugol			Association	Lugansk
Construction	Stakhanovugol	Stakhanovugolstroy			Lugansk
Transport	Stakhanovugol				Lugansk
Antracite production	Sverdlovskantracite			Association	Lugansk
Mine	Sverdlovskantracite	Dolzkanskaya Kapitalnaya			Lugansk
Mine	Sverdlovskantracite	Krasny Partizan			Lugansk
Procurement	Sverdlovskantracite				Lugansk
Transport	Sverdlovskantracite	Sverdlovgruztrans			Lugansk
Construction	Sverdlovskantracite	Department 5			Lugansk
Construction	Sverdlovskantracite	Department 1			Lugansk
New enterprises	Sverdlovskantracite				Lugansk
Coal production	Torezskugol			Association	Donetsk

**TABLE 2: COAL INDUSTRY ENTERPRISES**

<b>Activity</b>	<b>Association</b>	<b>Enterprise Name</b>	<b>Type</b>	<b>Status</b>	<b>Oblast</b>
Coal washing plant	Torezskugol	Donetskaya			Donetsk
Computer center	Torezskugol				Donetsk
Transport	Torezskugol	Torezgruztrans			Donetsk
Procurement	Torezskugol				Donetsk
Experimental equipment	Uglemechizatsiya			Association	Lugansk
Mining geology & drilling	Ukrgeologiya			Association	Donetsk
Geological despatch	Ukrgeologiya				Lugansk
Regional production	Ukrgeologiya				Lugansk
Ecology management	Ukrugleekologiya	Selidovo settlement		Association	Donetsk
Transport	Ukrugleekologiya	Krasgolychskoye			Lugansk
Procurement	Ukrugleekologiya				Lugansk
Environmental protection	Ukrugleekologiya				Lugansk
New enterprises	Ukrugleekologiya				Lugansk
Coal production	Ukrzapadugol			Association	Volyn
Construction	Ukrzapadugol	Ukrzakiduglestroy			Volyn
Sanitorium	Ukrzapadugol	Shakhtar			Volyn
Marketing	Ukrzapadugol				Volyn
Automatic equipment		Makeevka City	Plant		Donetsk
Automation			Institute		Lugansk
Calculation centre				OJSC	Donetsk
Coal		DonUGI	Research		Donetsk
Coal industry safety		MakNII	Research		Donetsk
Coal washing & briquetting			Institute		Lugansk
Communications					Donetsk
Construction		Luganskshachtomontazh		OJSC	Lugansk
Materials		Efkon	Research		Kiev
Data collection & control		Insistemshacht	Institute		Donetsk
Design		Dneprogyproshacht	Institute		Dnipropetrovsk
Economics		Stakhanov Regional Center	Research		Lugansk
Engineering			Research		Donetsk
Engineering		Lugansk Engineering Institute	Institute		Lugansk
Experimental plant		Gorlovsky			Donetsk
Geology		Ukrugolgeologia	Research		Volyn
Hydroequipment		Tepigorsk	Plant	OJSC	Lugansk
Transport		Ukruglepromtrans			Donetsk
Labour organisation			Research		Donetsk
Machine-building		Gorlovka Kirov	Plant	OJSC	Donetsk
Machine-building		Experiment	Plant	OJSC	Donetsk
Machine-building		Drushkovka	Plant	OJSC	Donetsk
Machine-building		Novgorodsky Petrovsky	Plant	OJSC	Donetsk
Machine-building		Chervonoarmeisk	Plant	OJSC	Donetsk
Machine-building		Artemovsk Pobeda Truda	Plant	OJSC	Donetsk
Machine-building		Novogorlovka	Plant		Donetsk
Machine-building		Leninsky Komsomol	Plant		Donetsk
Machine-building		Svitlo Shaktaria	Plant	OJSC	Kharkiv
Machine-building		Krasnoluchsky	Plant		Lugansk
Machine-building		Sverdlovsk	Plant		Lugansk
Machine-building		Krasna Gvardia	Plant		Odessa
Marketing		Donetskuglezbit			Donetsk
Marketing		Ukruglezbyt			Kiev
Marketing		Luzanskuglesbyt			Lugansk
Mine		Blagodetnaya			Dnipropetrovsk
Mine		Heroes of space exploration			Dnipropetrovsk

**TABLE 2: COAL INDUSTRY ENTERPRISES**

<b>Activity</b>	<b>Association</b>	<b>Enterprise Name</b>	<b>Type</b>	<b>Status</b>	<b>Oblast</b>
Mine		Komsomolets Donbassa			Donetsk
Mine		Zhdanov			Donetsk
Mine		Gaevogo			Donetsk
Mine		Zasiadko			Donetsk
Mine		50 years of Soviet Ukraine			Lugansk
Mine		Menshinsky			Lugansk
Mine		Vergiliovskaya			Lugansk
Mine		Industriya Mine No. 71			Lugansk
Mining automation		Dnepropetrovsk	Plant	OJSC	Dnipropetrovsk
Construction		DIOS	Institute		Donetsk
Construction		NDIONShB	Institute		Kharkiv
Construction		Krasnoday Stroydetal		CJSC	Lugansk
Construction		Luganskshachtostroyindustriya		CJSC	Lugansk
Construction		Briankovsk		CJSC	Lugansk
Construction		Stakhanovskachtstroy			Lugansk
Construction		Lugansk Mining construction			Lugansk
Mining design		Luganskgyproshacht	Institute		Lugansk
Mining geology & surveying		UkrNIMI	Research		Donetsk
Mining equipment		SpetsGShOobsluzhivaniye	Repair		Donetsk
Mining equipment automation		Ukrzapadugol	Research		Donetsk
Mining mechanics		Fyodorov	Research		Donetsk
Mining projects			Institute	OJSC	Donetsk
Mining rescue		NIIGS	Research		Donetsk
Mining rescue equipment			Plant	OJSC	Donetsk
Peat production		Chernigivtorf			Chernigiv
Peat production		Podilliatorf			Khmelnit
Peat production		Kiev			Kiev
Peat production		Ukrtorf			Kiev
Peat production		Rivnetorf			Rivne
Peat production		Sumitorf			Sumy
Peat production		Volyntorf peat			Volyn
Peat production		Zhitomirtorf			Zhitomir
Peat quarry machines		Remmashtorf	Repair		Zhitomir
Procurement					Donetsk
Procurement		Dzorzhinsk			Donetsk
Production		Tervoniy Metallist		OJSC	Konotop
Project design & testing			Institute	OJSC	Donetsk
Recreation centre		Donbass			Crimea
Rescue equipment		Gorizont	Plant	OJSC	Lugansk
Research & design		Ukr NDI Project	Research		Kiev
Research & testing		Vugillia	Research		Kiev
Scientific			Research		Lugansk
Scientific & technical information		CBNTI			Donetsk
Shaft sinking		Sverdlovsk Department 10			Lugansk
Special fitting & adjustment		Asugleautomatica			Donetsk
Special services					Kiev
Switches		Makeyevka Uglepromtrans	Plant		Donetsk
Technology		PKTI	Research		Donetsk
Mobile equipment			Repair	OJSC	Donetsk
Unspecified		Makeevka (Fakel)	Plant	OJSC	Donetsk
Unspecified		Pivdengiproshakht	Institute		Kharkiv
Unspecified		Ugleprisvad			Lugansk

TABLE 3: THE COAL PRICE LIST , 1995

Coal Type	Size (mm)	Description	Ash %	Moisture %	Sulphur %	Price US \$/t	Net CV (kcal/kg)	Price US \$/tce
<b>Donetsk</b>								
KR	0-200		31.8	5.8	2.3	32	4805	43.29
KOR	0-200		36.0	6.5	0.8	29	4428	42.57
KSR	0-200		32.1	5.5	2.7	28	4805	37.88
KZhR	0-200		29.5	5.0	3.1	35	5044	45.11
ZhR	0-200		30.7	5.7	3.1	30	4897	39.82
GR	0-200	Coking	32.6	7.4	1.9	25	4620	35.17
GR	0-200	Steam	32.2	8.9		24	4535	34.40
GKOM	13-100		9.4	9.0		53	6283	54.83
GSSh	0-13		23.3	10.2		32	5121	40.62
GZhOR	0-200	Coking	30.4	6.7	2.1	31	4843	41.60
GZhOR	0-200	Steam	29.4	6.4		31	4943	40.76
GZhOKO	25-100		6.2	4.2		62	6899	58.41
GZhOKOM	13-100		9.2	3.4		55	6730	53.12
GZhOSSh	0-13		14.0	12.0		45	5698	51.33
GZhR	0-200		42.9	6.3	2.6	32	3912	53.18
GZhKO	25-100		6.0	3.0		63	7007	58.44
OSR	0-200		29.4	5.4	2.3	30	5020	38.84
DR	0-200		31.1	11.8		24	4397	35.48
DKOM	13-100		10.0	10.1		53	6152	56.00
DM	13-25		9.0	10.7		55	6183	57.82
DMSSh	0-25		41.0	12.5		25	3581	45.38
DSSh	0-13		36.5	12.2		23	3950	37.85
DSSh	0-13	Washed	28.4	11.8		27	4605	38.11
DGR	0-200	Coking	26.2	8.1	2.1	25	5059	32.12
DGSSh	0-13	Coking	28.5	10.3	2.6	23	4712	31.72
DGR	0-200	Steam	36.5	11.5		23	4004	37.34
DGK	50-100		6.0	14.6		57	6114	60.60
DGKO	25-100		5.2	6.5		60	6799	57.36
DGKOM	13-100		8.9	8.9		55	6329	56.48
DGO	25-50		7.3	15.0		57	5983	61.93
DGOM	13-50		8.7	9.5		54	6299	55.73
DGM	13-25		7.5	15.2		56	5952	61.15
DGSSh	0-13		28.0	8.6		22	4882	29.29
DGSSh	0-13	Washed	29.6	11.2		36	4558	51.33
TR	0-200		28.8	5.4		26	5067	33.36
TSR	0-200		30.9	5.3	1.8	27	4913	35.72
ARSh	0-200		30.6	6.4		31	4851	41.54
AK	50-100		6.0	4.7		69	6876	65.23
AKO	25-100		7.1	4.5		67	6807	63.98
AO	25-50		7.2	4.8		67	6776	64.27
AM	13-25		8.8	5.0		66	6637	64.63
AS	6-13		11.5	5.7		59	6376	60.15
ASh	0-6		28.6	8.1		33	4874	44.01
ASh	0-6	Washed	20.3	7.6		46	5552	53.86
A	70-120	Electrode	4.3	4.2		78	7046	71.96
A	25-70	Electrode	4.3	4.2		73	7046	67.35

TABLE 3: THE COAL PRICE LIST , 1995

Coal Type	Size (mm)	Description	Ash %	Moisture %	Sulphur %	Price US \$/t	Net CV (kcal/kg)	Price US \$/tce
ASh	0-6	Concentrate	15.6	7.5		60	5921	65.86
K		Concentrate	8.2	9.8	1.7	54	6314	55.59
GKO	25-100		6.5	6.6		59	6691	57.31
KO		Concentrate	8.3	9.7	1.4	50	6314	51.47
KS		Concentrate	7.7	9.0	2.0	41	6414	41.55
KZh		Concentrate	8.5	10.5	2.2	56	6237	58.36
Zh		Coking	9.0	10.0	2.8	48	6237	50.02
Zh	>13	Concentrate	9.2	3.4		61	6730	58.92
G		Coking	6.9	9.2	2.0	44	6460	44.27
G		Steam	11.0	8.7		42	6183	44.15
G	>13	Concentrate	9.3	8.3		52	6345	53.27
GZhO		Coking	7.3	10.4	1.6	47	6337	48.21
GZh		Concentrate	8.6	10.7	2.6	50	6214	52.30
OS		Concentrate	8.2	9.9	1.6	50	6306	51.54
D		Concentrate	11.4	11.7		42	5921	46.10
D	>13	Concentrate	8.5	12.5		49	6083	52.36
DG		Coking	6.8	9.7	2.2	43	6430	43.47
DG		Steam	16.8	11.8		42	5498	49.66
DG	0-13	Steam	14.4	15.7		41	5382	49.51
T		Coking	8.0	9.0	2.0	36	6391	36.61
T		Steam	20.5	8.5		32	5467	38.05
TS		Concentrate	8.5	10.9	1.7	35	6206	36.66
Industrial			39.0	7.2		15	4143	23.54
Slurry			39.9	17.5		7	3280	13.87
<b>Lvov-Volyn</b>								
DGR	0-200	Steam	30.8	8.7		28	4659	39.07
GZhOR	0-200	Steam	41.4	5.3		27	4104	42.76
GZhR	0-200	Steam	41.4	5.2		26	4112	41.10
GZhOKOM	>10	Steam	21.0	5.0		42	5698	47.91
GZhOSSh	0-10	Steam	28.0	8.5		27	4890	35.89
GZhOSh	0-10	Coking	28.0	8.3	3.0	27	4905	35.78
Dry screen			38.5	8.0		24	4120	37.87
<b>Pridnipro</b>								
IER	0-200		25.5	55.3		4	1478	17.59
IER	0-200	Technical	25.0	55.3		5	1517	21.43
Brown coal briquettes			23.1			29	5921	31.83
Briquette screenings			23.1			6	5921	6.59
Coking blend			7.8	10.0	2.0	64	6329	65.73

Notes:

- (1) Net CV refers to the net calorific value.  
(2) Price US \$/tce refers to the price per tonne of coal equivalent, assuming a standard calorific value of 7000kcal/kg.

UKRAINE  
ESTIMATED CONSOLIDATED CASHFLOW - FIRST QUARTER 1995  
(Krb million)

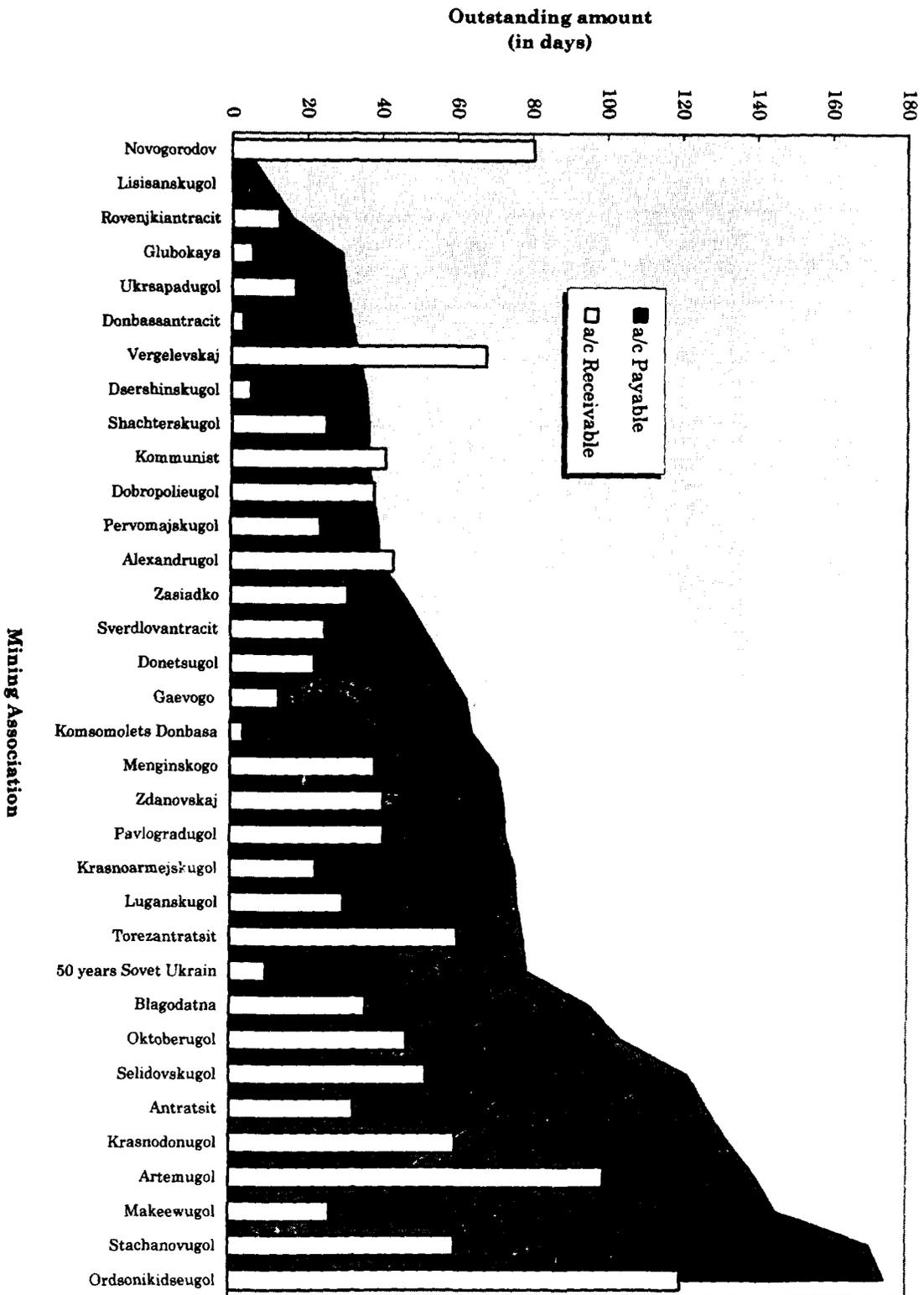
	Profit	Less Alloc. to Social Sphere	Adjusted Profit	Add Depreciation	Less Taxation	Less Capital Exp.	Working Capital Movements			Net Cash Flow
							Coal Stocks and Stores	Accounts Receivable	Short-term Credits. <sup>1/</sup>	
Mine: Blagodatna	84,885	44,777	40,108	5,258	25,466	30,260	101,867	116,925	212,663	-16,489
Association: Pavlogradugol	1,716,086	695,776	1,020,310	46,988	515,376	620,343	865,683	2,405,430	3,170,407	-169,127
Association Donetsugol	2,147,069	1,206,558	940,511	71,374	639,926	444,920	1,312,351	5,091,695	5,356,180	-1,120,827
Mine: Zasiadko	653,124	197,633	455,491	9,890	192,810	80,273	210,972	169,451	188,127	2
Association: Torezantratsit	1,331,103	669,224	661,879	29,787	398,645	618,653	430,463	3,402,197	4,329,721	171,429
Mine: Komsomolets Donbasa	201,240	81,390	119,850	18,897	60,450	0	185,238	60,290	237,570	70,339
Association: Oktoberugol	508,126	318,089	190,037	29,514	152,663	116,511	253,981	1,081,872	1,069,156	-316,320
Mine: Zdanovskaj	241,556	72,126	169,430	2,965	72,322	56,532	74,222	145,642	212,046	35,723
Mine: Shachter Glubokaya	-134,092	1,921	-136,013	9,443	0	38,902	121,541	255,236	537,679	-4,570
Association Shachterskugol	657,741	267,317	390,424	11,888	169,814	92,876	339,003	650,424	893,789	43,984
Association Dsershinskugol	323,512	217,731	105,781	8,243	93,575	90,378	102,093	389,324	393,300	-168,046
Association Selidovskugol	416,458	62,865	353,593	27,992	124,873	222,911	304,401	1,155,941	1,025,968	-400,573
Mine Novogorodov	141,323	17,179	124,144	9,329	42,377	68,718	62,118	361,360	328,866	-72,234
Association Makeewugol	2,324,948	542,319	1,782,629	42,188	697,689	609,323	972,624	4,307,701	4,493,972	-268,548
Association Alexandrugol	146,239	107,033	39,206	8,351	62,298	36,788	239,951	1,133,353	1,211,842	-212,991
Association: Antratsit	10,088	59,658	-49,570	8,170	4,824	112,849	126,038	889,702	883,706	-291,107
Association Donbassantracit	621,759	231,904	389,855	23,526	188,618	159,277	594,463	624,847	911,622	-242,202
Assoc. Sverdlovantracit	827,268	368,220	459,048	47,626	249,279	68,037	151,410	1,557,944	1,384,392	-135,604
Association Luganskugol	1,055,958	394,194	661,764	65,932	315,779	627,836	583,164	1,833,799	1,952,498	-680,384
Mine Vergelevskaj	59,326	17,911	41,415	2,279	25,778	16,317	-3,176	82,733	69,448	-8,510
Mine Menginskogo	63,389	27,133	36,256	1,599	0	0	34,826	134,164	96,015	-35,120
Association Stachanovugol	326,008	188,041	137,967	17,698	96,716	211,476	283,358	1,873,398	2,176,644	-132,639
Association Pervomajskugol	208,410	127,189	81,221	16,790	52,857	122,013	142,954	590,763	635,968	-174,608
Assoc. Lisisanskugol	404,306	187,710	216,596	12,295	122,739	68,027	146,644	1,250,318	1,184,673	-174,164
Assoc. Krasnoarmejskugol	1,045,915	753,921	291,994	52,787	241,807	279,952	612,408	1,774,575	1,710,772	-853,189
Mine 50 years Sovet Ukrain	107,010	43,614	63,396	1,302	32,100	8,357	35,921	107,696	148,156	28,780
Mine Gaevogo	103,539	46,138	57,401	1,859	31,062	11,414	-572	139,278	159,173	37,251
Mine Kommunist	49,176	25,557	23,619	1,766	14,843	14,400	50,275	221,718	131,706	-144,145
Association: Dobropolieugol	243,000	84,047	158,953	0	109,167	226,023	315,131	1,238,902	1,053,888	-676,382
Association: Artemugol	16,550	127,553	-111,003	11,950	5,316	132,890	56,871	1,383,281	1,589,327	-88,084
Association: Ukrsapadugol	550,266	114,510	435,756	0	166,278	25,650	488,799	1,288,123	1,881,142	348,048
Association: Rovenkiantracit	1,624,980	553,386	1,071,594	25,646	459,306	344,936	578,531	1,175,035	1,080,296	-380,272
Association: Krasnodonugol	101,314	73,014	28,300	35,380	30,122	92,949	408,388	814,954	867,027	-415,706
Assoc. Ordsonikidseugol	283,255	195,231	88,024	12,965	81,753	152,059	244,122	1,237,681	1,246,594	-368,032
<b>Total</b>	<b>18,460,835</b>	<b>8,120,869</b>	<b>10,339,966</b>	<b>671,677</b>	<b>5,476,628</b>	<b>5,801,850</b>	<b>10,426,063</b>	<b>38,945,752</b>	<b>42,824,333</b>	<b>-6,814,317</b>
<b>-(Krb Millions)</b>										
<b>-(US\$ Millions)</b>	<b>151.44</b>	<b>66.62</b>	<b>85</b>	<b>5.51</b>	<b>44.93</b>	<b>47.60</b>	<b>85.53</b>	<b>319.49</b>	<b>351.31</b>	<b>-55.90</b>

Source: Derived by World Bank staff from the official balance sheet of each Mining Association as at end March 1995.

Notes: <sup>1/</sup> Short term credits include trade creditors, wages arrear, short-term loans, taxes payable and other short term credits.

THE FINANCIAL POSITION OF MINING COMPANIES  
ASSUMING NO CROSS-SUBSIDIES, FIRST QUARTER 1995

	Profit	Notional Taxation	Net Profit	less Actual Net Profit	Cross Contribution	Subsidy Receipt
Mine: Blagodatna	620,558	186,167	434,391	59,419	374,972	0
Association: Pavlogradugol	3,729,268	1,118,780	2,610,487	1,200,710	1,409,777	0
Association Donetsugol	-1,922,985	0	-1,922,985	1,507,143	0	3,430,128
Mine: Zasiadko	513,045	153,914	359,132	460,314	0	101,182
Association: Torezantratsit	-817,501	0	-817,501	932,458	0	1,749,959
Mine: Komsomolets Donbasa	499,024	149,707	349,317	140,790	208,527	0
Association: Oktoberugol	1,306,247	391,874	914,373	355,463	558,910	0
Mine: Zdanovskaj	511,872	153,562	358,311	169,234	189,077	0
Mine: Shachter Glubokaya	-539,090	0	-539,090	-134,092	0	404,998
Association Shachterskugol	-980,038	0	-980,038	487,927	0	1,467,965
Association Dsershinskugol	232,843	69,853	162,990	229,937	0	66,947
Association Selidovskugol	511,675	153,502	358,172	291,585	66,587	0
Mine Novogorodov	676,797	203,039	473,758	98,946	374,812	0
Association Makeewugol	1,123,739	337,122	786,617	1,627,259	0	840,642
Association Alexandrugol	936,145	280,843	655,301	83,941	571,360	0
Association: Antratsit	29,896	8,969	20,927	5,264	15,663	0
Association Donbassantracit	-197,859	0	-197,859	433,141	0	631,000
Assoc. Sverdlovantracit	1,625,773	487,732	1,138,041	577,989	560,052	0
Association Luganskugol	1,899,310	569,793	1,329,517	740,179	589,338	0
Mine Vergelevskaj	205,125	61,538	143,588	33,548	110,040	0
Mine Menginskogo	622,057	186,617	435,440	63,389	372,051	0
Association Stachanovugol	549,331	164,799	384,531	229,292	155,239	0
Association Pervomajskugol	195,663	58,699	136,964	155,553	0	18,589
Assoc. Lisisanskugol	122,001	36,600	85,401	281,567	0	196,166
Assoc. Krasnoarmejskugol	2,121,629	636,489	1,485,141	804,108	681,033	0
Mine 50 years Sovet Ukrain	9,344	2,803	6,541	74,910	0	68,369
Mine Gaevogo	186,771	56,031	130,740	72,477	58,263	0
Mine Kommunist	179,555	53,866	125,688	34,333	91,355	0
Association: Dobropolieugol	754,657	226,397	528,260	133,833	394,427	0
Association: Artemugol	301,051	90,315	210,736	11,234	199,502	0
Association: Ukrspadugol						
Association: Rovenkiantracit	-504,583	0	-504,583	1,165,674	0	1,670,257
Association: Krasnodonugol	1,180,159	354,048	826,111	71,192	754,919	0
Assoc. Ordsonikidseugol	2,229,091	668,727	1,560,364	201,502	1,358,862	0
<b>Total</b>						
-(Krb Million)	17,910,569	6,861,788	11,048,781	12,600,219	9,094,765	10,646,202
-(US\$ Millions)	146.93	56.29	90.64	103.37	74.61	87.34



**Figure 1: Industrial Liquidity**

**UKRAINE**  
**COAL INDUSTRY RESTRUCTURING**

**Mine Closure Costs in Britain**

Over recent years, the market for coal in the UK has declined rapidly. As a result, since 1992, British Coal ceased operations at 35 of the 51 underground mines then in existence, and proposed their closure. Details of these mines are given in Table 1.

The physical closure costs vary with the mine conditions, e.g. number and depth of shafts, type and condition of the surface buildings, size of tip etc. A breakdown of these costs on a mine-by-mine basis is given in Table 2.

The cost given in the table exclude the following costs which were also incurred as a result of the mines closures.

Social costs. These include:

- compensation payment for voluntary redundancy and early retirement; and
- retraining and job creation schemes.

Care and maintenance costs.

Because of the consultation procedures which had to be followed in Britain before a mine could be closed, it was necessary for many mines to be placed on "care and maintenance" for a period of time before closure.

It should be noted that British Coal was required to offer the mines proposed for closure to be independent mining sector for leasing and licensing. As shown in Table 1, some of these mines proved to be attractive to the independent sector and remain open, at least for the time being, under license to private mining companies.

As shown in Table 2, a simple average of the closure costs (estimated final costs and actual costs) for the 35 mines is £2.2 million, broken down as follows:

- Shaft filling - £1.1 million
- Tip restoration - £0.9 million
- Surface demolition - £0.2 million

**Table 1: Mines Ceasing Production in Britain - Oct 1992 to Jan 1995**

Mine	Output (kt/y)	Number of men	Operating Cost (£/GJ)	Ceased Production	Current Status
Cotgrave	902	570	1.72	Oct-92	Closed
Grimethorpe	947	970	1.77	Oct-92	Closed
Houghton Main	380	360	2.10	Oct-92	Closed
Markham Main	832	780	1.89	Oct-92	Licensed
Parkside	871	760	1.74	Oct-92	Closed
Silverhill	932	770	1.72	Oct-92	Closed
Taff Merthyr	634	890	1.88	Oct-92	Closed
Trentham	2336	1760	1.68	Oct-92	Licensed
Vane Tempest	832	950	1.63	Oct-92	Closed
Betws	126	100	2.16	Jan-93	Licensed
Easington	1269	1290	1.62	Apr-93	Closed
Rossington	697	700	1.94	Apr-93	Licensed
Bevercotes	806	860	1.98	May-93	Closed
Bolsover	666	420	1.44	May-93	Closed
Clipstone	822	850	1.88	May-93	Licensed
Shirebrook	1161	850	1.76	May-93	Closed
Westoe	1139	1160	1.75	May-93	Closed
Sharlston	935	690	1.49	Jun-93	Closed
Markham	1478	1000	1.81	Jul-93	Closed
Calverton	1005	660	1.67	Nov-93	Licensed
Frickley	879	800	1.72	Nov-93	Closed
Rufford	1130	710	1.63	Nov-93	Closed
Wearmouth	730	780	2.94	Nov-93	Closed
Bentley	1068	530	1.51	Dec-93	Closed
Hatfield	696	280	1.60	Dec-93	Licensed
Littleton	1280	630	1.77	Dec-93	Closed
Silverdale	1030	540	1.69	Dec-93	Licensed
Annesley	1676	800	1.22	Feb-94	Sold
Ellington	2286	1450	1.35	Feb-94	Sold
Goldthorpe	1379	470	1.12	Feb-94	Closed
Manton	1400	500	1.32	Feb-94	Closed
Ollerton	1818	850	1.34	Feb-94	Closed
Tower	870	400	1.38	Apr-94	Sold
Kiveton Park	945	510	1.28	Sep-94	Closed
Silverwood	1117	300	1.40	Dec-94	Closed
<b>Total</b>	<b>37075</b>	<b>25940</b>	<b>58.90</b>		
<b>Average</b>			<b>1.68</b>		

Notes:

(1) Output and operating cost refer to the last full year of production

(2) Number of men refers to the date of closure

Table 2: Physical Closure Costs in Britain

Mine	Physical Closure (£ million)			Total
	Shaft Fill	Tip Restoration	Surface Demolition	
Cotgrave	0.9	1.6	0.2	2.7
Grimethorpe	1.2	1.4	0.2	2.8
Houghton Main	1.2	1.4	0.2	2.8
Markham Main	1.4	0.6	0.2	2.2
Parkside	1.5	0.1	0.2	1.8
Silverhill	0.5	0.8	0.0	1.3
Taff Merthyr	1.3	1.0	0.2	2.5
Trentham	2.7	1.4	0.2	4.3
Vane Tempest	1.3	0.0	0.0	1.3
Betws	0.6	0.2	0.2	1.0
Easington	0.8	0.2	0.2	1.2
Rossington	1.4	0.5	0.2	2.1
Bevercotes	1.2	1.2	0.2	2.6
Bolsover	0.9	0.3	0.2	1.4
Clipstone	1.0	0.3	0.2	1.5
Shirebrook	1.3	1.4	0.2	2.9
Westoe	1.0	0.0	0.2	1.2
Sharlston	0.8	1.2	0.2	2.2
Markham	2.0	0.8	0.2	3.0
Calverton	0.7	1.9	0.2	2.8
Frickley	0.9	1.1	0.2	2.2
Rufford	0.8	1.4	0.2	2.4
Wearmouth	1.4	0.0	0.2	1.6
Bentley	0.9	1.0	0.2	2.1
Hatfield	0.8	0.8	0.2	1.8
Littleton	0.9	0.8	0.2	1.9
Silverdale	0.9	0.8	0.2	1.9
Annesley	1.0	2.1	0.2	3.3
Ellington	1.3	0.0	0.2	1.5
Goldthorpe	0.5	1.0	0.2	1.7
Manton	2.3	1.1	0.4	3.8
Ollerton	1.0	0.9	0.4	2.3
Tower	0.6	0.4	0.0	1.0
Kiveton Park	1.5	1.2	0.2	2.9
Silverwood	1.1	0.9	0.2	2.2
<b>Total</b>	<b>39.6</b>	<b>29.8</b>	<b>6.8</b>	<b>76.2</b>
Average per mine	1.1	0.9	0.2	2.2

Notes:

(1) The above are final estimated costs

(2) Grimethorpe and Houghton Main shared Southside tip, the cost of restoration for which has been divided equally between these two collieries

## UKRAINE

## COAL INDUSTRY RESTRUCTURING

## Divestiture of Social Assets and Liabilities

Table 1

<b>Social Safety Net</b>	<b>Current Financing</b>	<b>Proposal</b>	<b>Short Term Objective</b>	<b>Medium Term Objective</b>
Disability payments	Mining associations	Finance from budget through Ukrainian Coal Company	Ensure continuing funding even when mines close	Introduce nationwide disability insurance scheme
Severance payments	Mining associations	Finance from budget through Ukrainian Coal Company	Reduce financing burden on coal industry	Increase labor productivity

Table 2

<b>Social Commitment</b>	<b>Current Financing</b>	<b>Proposal</b>	<b>Short Term Objective</b>	<b>Medium Term Objective</b>
Free coal distribution to pensioners	Mining Associations	Finance from budget through Ukrainian Coal Company	Maintain benefit when mine close	Phase out this benefit parallel with the elimination of district heating subsidy
Waiting list for housing	Mining Associations (greatly reduced financing)	Transfer waiting lists together with employees from closing mines to other mines. Place employees who do not want to transfer to other mines on municipal waiting lists	Avoid the construction of houses in distressed regions and increase mobility	Phase out employer owned/subsidized housing and create a housing market

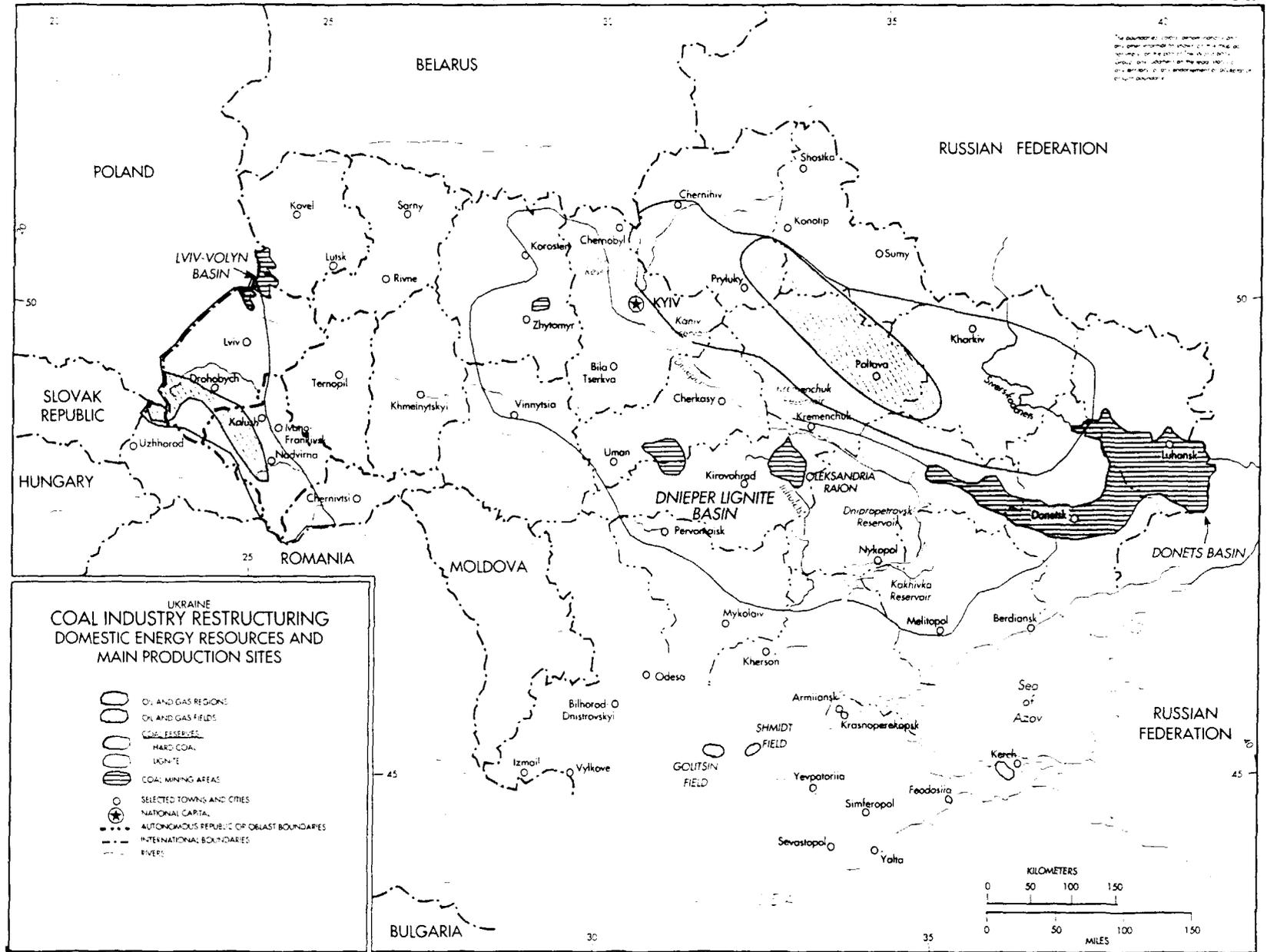
## UKRAINE

## COAL INDUSTRY RESTRUCTURING

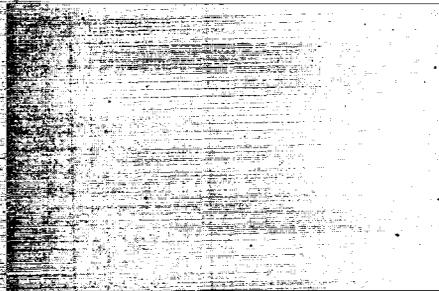
## Divestiture of Social Assets and Liabilities

Table 3

Social Assets	Ownership and Current Financing of O&M	Proposal	Short Term Objective	Medium Term Objective
Housing	Mining Associations	Transfer to municipalities/ privatization	Part of recurring cost financed by national budget	Full cost recovery and privatization
Infrastructure and maintenance organizations	Mining Associations	Transfer to municipalities	Part of recurring cost financed by national budget	Full cost recovery and corporatization/ privatization
Kindergartens	Mining Associations	Transfer to municipalities with rationalization	Part of recurring cost financed by national budget/cost reduction	Increased cost recovery
Cultural & sport facilities	Mining Associations	Transfer to municipalities	Part of recurring cost financed by national budget	Privatization
Rest houses/summer camp	Mining Associations	Transfer to municipalities/ privatization	Rationalization/ full cost recovery	Privatization
Profilactoria/ sanatoria	Mining associations	Merger and rationalization with local medical facilities	Part of recurring cost financed by national budget	Financed by nationwide social/disability insurance
Social assets rehabilitation	Mining Associations	Utilization of privatization proceeds and savings from rationalization	Only unavoidable rehabilitation due to limited resources	Full cost recovery of rehabilitation projects aimed at energy efficiency, comfort, etc.



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