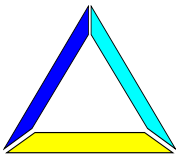
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Ukrainian steam coal: Not competitive or just mismanaged?

Executive summary:
The paper analyses the problems of Ukrainian steam coalmines. We argue that the poor performance of this industry is a direct consequence of severe structural problems of the main consumer of steam coal, Ukraine's power sector. As the main problem, we identify a low willingness and ability to pay for coal by power generators due to various problems in the power sector such as **soft budget constraints**, the **low payment discipline** at all levels of the power sector chain, **state preferences for nuclear fuels** and the **market power of gas** supplies. Accordingly, the so far prevailing strategy of providing state aid to coalmines has failed to improve the situation. We also argue that the recently created wholesale market will not be a panacea for the problems of coalmines. Instead, we demonstrate that those policies even worsen the situation and that only a comprehensive reform program can provide a successful development. Therefore, we recommend the following three objectives with respect to the steam coal industry:

1) **Ensure long-run profitability of the coal industry;**
2) **Reduce social pressures during coalmine restructuring;**
3) **Guarantee coal production to maintain energy security.**

To achieve **objective 1**, the government should…

…with respect to the power sector:

- Harden the budget constraints on all levels of the power chain.
- Improve payment discipline throughout the power chain.
- Make payments from "Energorynok" to power generators depend only on the amount of electricity supplied.
- Ensure full payment by final power consumers.
- Remove distortion in inter-fuel price competition by adjusting power tariffs and regulation.
- Improve regulation for electricity generation

…with respect to coalmines:

- Cancel state aid for covering losses from production and financing investments.
- Speed up privatization and close down those mines that cannot be privatized

To achieve **objective 2 and 3** the government should:

- Provide state aid based on transparent criteria depending only on (historical) production volumes to avoid cross-subsidization of 'unprofitable' mines by 'profitable' ones.
- Let the total amount of provided aid decline over time to be terminated at a pre-specified point of time.

Outline:

1. Introduction
2. Ukraine's power sector environment
   - 2.1 Soft budget constraints and low payment discipline
   - 2.2 Inter-fuel cross-subsidization by unequal enforcement of budget constraints
   - 2.3 Distorted inter-fuel price competition
3. Impact of power sector problems on coal enterprises and recent reform proposals
   - 3.1 State aid and inefficiency of coal mining
   - 3.2 Market structure and profitability in coal mining
   - 3.3 Recent reform steps in the power market
4. Policy recommendations

1. Introduction

Ukraine's coal industry experienced a steep decline in production during the 1990's, from 69,1 m toe in 1991 to almost 43,6 m toe in 2001. However, in contrast to countries like Germany or the UK where coal production came under increasing pressure due to high costs of labor and energy as well as cheaper imports, the decline in coal production in Ukraine parallels the general economic collapse and the corresponding decline in primary energy consumption in the 1990s. Accordingly, the strategy of granting state aid to coal mines as pursued by numerous governments and justified by reasons of energy security as well as the existence of similar practices in countries such as Germany has yet failed to improve the situation in Ukraine, because it essentially only subsidizes the current mismanagement. Instead, sustainable support to Ukraine's coal industry should primarily focus on the creation of a solvent, competition-driven demand.

About 50% of the coal extracted in Ukraine is steam coal, which is used by Thermal Power Plants (TPP) to generate about one third of total power in Ukraine. Therefore, an improved performance of Ukraine's power industry is crucial for a sustainable development of the coal industry. Accordingly, if structural reforms in the power generating sector and more market oriented policies regarding Ukraine's energy mix would be implemented, Ukrainian steam coal could be competitive on domestic and world markets. As the main problems we identify:

- Soft budget constraints at various levels of the energy sector;
- Low payment discipline in the power generation sector, starting from the final consumers (mostly public utilities) and passing on the debt along the chain to the producers, e.g. coalmines and finally the coal miners;
- Unequal enforcement of payment discipline in the power sector putting coal into the back seat in comparison to nuclear power and natural gas;
- Distorted inter-fuel competition in Ukraine's energy mix, which is heavily biased in favor of nuclear power generation.

Instead of tackling those issues, various governments tried to solve the problem by providing state aid to the coalmines, further softening budget constraints. This policy set the wrong incentives for the coalmines, preventing a market consolidation by keeping alive unviable production, undermining the profitable and competitive producers of steam coal. Recently the government proposed to solve the problems in the coal sector through privatization of coalmines and the creation of a wholesale market for steam coal. However, we argue below that current distortions make a successful privatization quite unlikely and that the creation of a wholesale market under current conditions bears the danger of loosing competitiveness of even the few well performing mine holdings.

We conclude our paper with policy recommendations, aiming at hardening budget constraints, enforcing payment discipline in all parts of the power chain, and adjusting tariffs and regulation of the power generation sector. The Ukrainian government should proceed with the privatization of the coalmines. For a transition period state aid could be provided, but only under the condition of sectoral aid and not as it is done now on a individual firm basis. This means all coalmines shall be treated equally and aid shall be provided on a basis of historic production volumes. Even more important is the decrease of state aid over a previously announced certain period of time followed by complete termination of state aid.

2. Ukraine's power sector environment

So far, reforms of the energy sector in Ukraine have led to some considerable improvements. However, reforms have yet not succeeded in the creation of a workable competition in a soundly functioning and sustainable power production chain. Attempts to alleviate problems in a particular part of the chain, say improving payment rates of regional power distributors ('oblenergos') to the wholesale market ("Energorynok"), are necessary, but cannot solve the built-in anti-market inconsistencies of the whole power sector. In this respect, we are convinced, that solving the problems of steam coalmines is impossible without a broader look at the overall power sector. In particular, the power sector suffers from the following problems:

2.1 Soft budget constraints and low payment discipline

The anti-market inconsistencies in Ukraine's power sector start with soft budget constraints at almost all levels of the power chain. The state is promising to cover some of the losses for coalmines, while responsibility for the losses of power generators and especially public utilities is not yet specified. This results in wrong incentives for the enforcement of payment discipline. The relaxed payment discipline leads to losses on all levels to be covered by the state. But the state is rarely able to keep all its promises. The results of such policies are ever increasing intra-industry debts.
Figure 1 presents a scheme of the power industry in Ukraine with special emphasis on the intra-industry debts and their respective changes. While in 2003 most payment rates have been increasing to levels of above 90%, debts are still accumulating. The indebtedness chain starts with the final consumers and their total outstanding debt of UAH 10,5 bn. The biggest debtors in this group are public utilities that account for a quarter of total debt (25.6%). Other large debtors include the population (20%), the cocking and steam coalmines (17.2 %), the chemical and metallurgic industry (together 8,6 %), and agriculture (8,0 %). Therefore, the unreformed public utility sector, mainly water-supply enterprises, and the coal industry itself are contributing to the instability in the power industry.

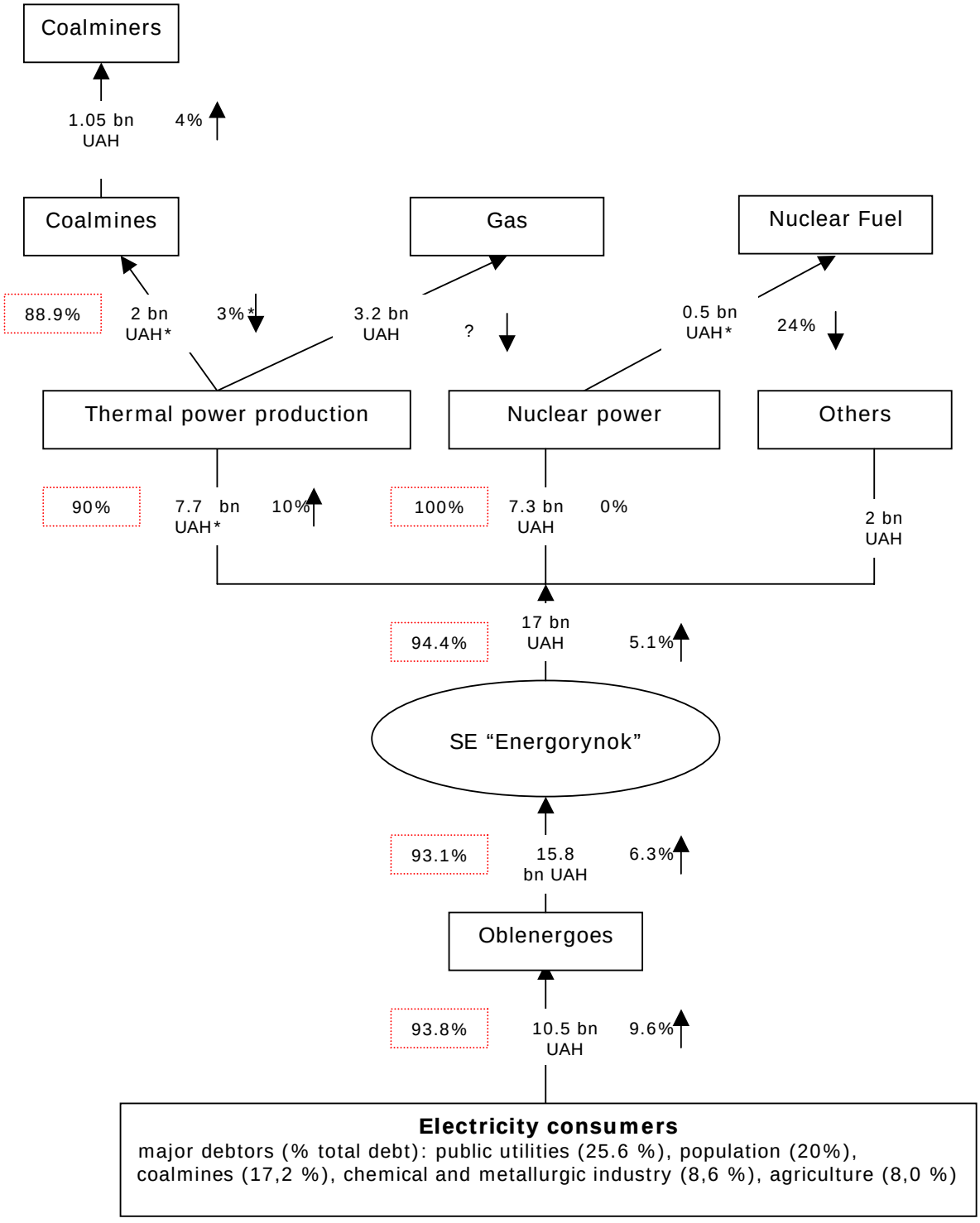
Next, incomplete payments by final consumers are passed on along the power sector chain and are finally transferred to the suppliers of primary energy fuels, e.g. coalmines. The coalmines then pass on the debt first of all to the coalminers by not paying the wages and salaries in full amount, creating social strain and an additional burden on the state budget. At the same time coalmines reduce their investments below safety levels, causing each year many accidents and deaths in Ukrainian coal industry. In other words, the non-payment of the public utilities, often justified with below cost tariffs as misunderstood social policy, is causing extreme social problems for the coal miners. Last but not least, the mutual non-payments – coal enterprises don't pay for electricity and energy generators don't pay for steam coal – are built-in factors of financial instability in the power sector.

2.2 Inter-fuel cross-subsidization by unequal enforcement of budget constraints

Besides the already critical level of outstanding payments as such, also different bargaining power and political preferences concerning the enforcement of hard budget constraints are creating distortions with a particularly negative impact on coal.

First, since the beginning of 2003 overall debts for supplied electricity of TPPs have been growing at substantially higher rates than for "Energoatom", Ukraine's sole producer of nuclear power (figure 2). This affects the payment discipline for supplied steam coal in a negative way.
Second, thermal power is generated from both, steam coal and natural gas (approximately 75% coal and 25% gas). The tariff of gas for the TPPs is set at the general industry level (only public utilities receive gas at significantly lower prices). However, until recently gas has been supplied to TPPs under soft budget constraints, so that the effective price of gas was lower in the short-term and huge debts (3.2 bn UAH) where accumulated by the TPPs. In the past, the ability of TPPs to draw on effectively cheap gas has created instabilities in the demand for steam coal and depressed the price of steam coal. Recently, "Gas Ukraine", the monopoly supplier of gas, has started to use its market power by cutting supplies to non-paying heat generators and TPPs. Although this will lead to an increase in the effective price for gas, the coal industry with its numerous suppliers is unlikely to benefit from this price increase. Rather, they are now facing mounting problems in enforcing payments from non-paying customers.
Finally, even across TPPs the somewhat 'administrative' allocation of debts is rather different contributing further to instability. For example, while payments to the TPP Donbassenergo were at 100% in 2003, the payment rate to the TPP Centerenergo was only at 88%.

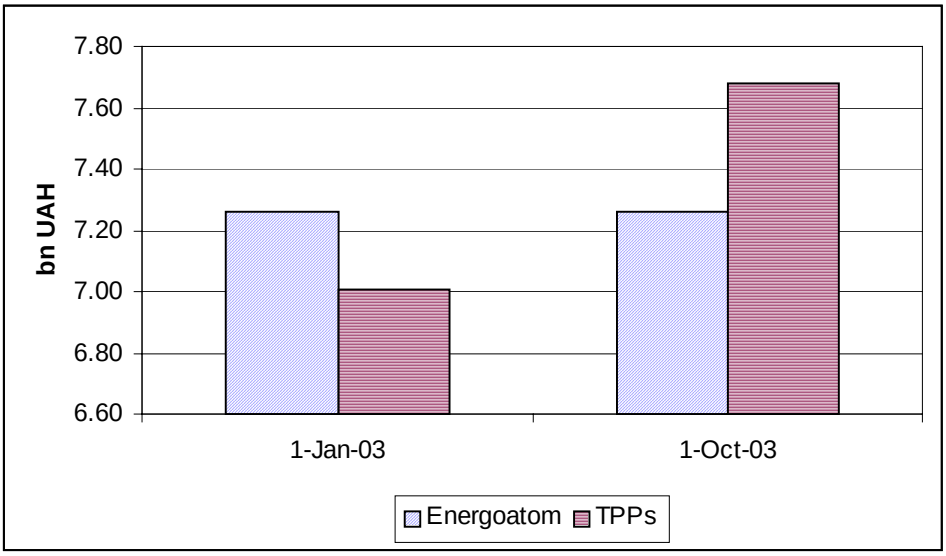
Figure 1. Payments and debts in the energy sector Jan-Sept, 2003[1]



[1] Numbers on arrows -- stocks of debts on Oct 1, 2003. Percentages in boxes – payment ratios for Jan-Sept 2003. Percentages with arrows – change in debts during Jan-Sept 2003. Source: Ministry of Fuel and Energy of Ukraine.

* Data for percentages for Jan-Jul 2003. Stock of debt – on Aug 1 2003. Source: Scientific-technical Association of Energetics and Electrotechnicians of Ukraine.

Figure 2. Overall debt for electricity supplied by Energoatom and TPPs, bn UAH



2.3 Distorted inter-fuel price competition

Nuclear and thermal fuels are Ukraine's primary sources for power generation, supplying to the market approximately the same shares. However, the price of nuclear power is much lower than the price of thermal power (see table 1). But the low tariff for nuclear power does not include the full costs of production. In particular, no funds are accumulated for the closure of nuclear stations, which is expected to be necessary in less then 10 years, as well as for financing the final storage of nuclear waste. Ignoring these substantial costs artificially reduces both the price of nuclear power and the overall price of electricity on the wholesale market while leaving those substantial costs to the future without specifying any financial responsibility. In addition, it also leaves less room for thermal energy production, with the corresponding negative effects on suppliers of primary energy fuel to thermal power generation.

Table 1.: Electricity prices at Energorynok (21-31 Oct. 2003)

Type of electricity	Share in electricity production	Price*, UAH/MWth
Wholesale Market of Electricity	n.a.	96.83
- Nuclear Power	48.15%	64.80
- Thermal Power Plants	40.27%	133.75
- Hydro Power Plants	6.94%	45.87
- Co-generation Heating Plants	4.60%	127.21
- Wind power plants	0.04%	166.61

* For more information on the specific price regulation in the power sector see e.g. Dodonov, Opitz and Pfaffenberger (2001): How Much Do Electricity Tariff Increases in Ukraine Hurt the Poor? IER Working paper No. 7 (www.ier.kiev.ua).

Source: NERC

3. Impact on coal enterprises and recent reform proposals

All those problems are negatively affecting the coal industry. Continuously growing debts result in less than full coverage of the costs for coal extraction. Indebtedness for steam coal and low payment rates on the one side and indebtedness for the electricity by the coalmines contribute to the destabilization of the whole power sector and undermine the financial viability and development of the coal mining enterprises. Lack of payment discipline on the part of final consumers is also partially transferred to the coal industry. The coal industry is substantially hit by those problems because of low payment rates and low (because implicitly subsidized) effective prices for competing fuels (gas, nuclear fuel). However, in contrast to Energoatom or "Gas Ukraine" it has so far been lacking any coordinated effort to enforce outstanding payments. Instead, the coal industry is targeted by state aid. This is widely accepted by the population and lobbied for by interest groups within the energy sector who all benefit from the current situation: it creates incentive for other power market participants to push debts through the whole production chain to the coalmines, which will then get the compensation of production losses from the state budget.

3.1 State aid and inefficiency of coal mining

Previously, the state support of Ukrainian coal enterprises intended to help the industry by setting "indicative" prices on coal and compensating the generated losses from production. This system of *ex post* state aid, however, has proven to be unsuccessful because it perverted incentives for the management that did not strive to sell at the highest possible price (instead, since losses were covered by the state, sales at a price between the low official price and the higher level of cost was still profitable for managers and especially for intermediaries) and essentially put larger and better-performing mines (due to both, better management and natural cost advantages) in a worse position vis-à-vis poor performers who received proportionally larger amounts of subsidies. Although indicative prices are not officially used any more, production losses are effectively still compensated for in a similar manner. This still perverts incentives away from cost minimization. As a result, Ukraine's steam coal industry currently operates far away from rational economic considerations. In 2003, coalmines have sold steam coal at prices that cover only around 70% of total costs.[2] Even more astonishing, the World Bank estimates the current world market price for Ukrainian coal in 2002 at about USD 42/t. With production costs set at around USD 30/t this implies a potential profit of USD 12/t of steam coal. Nevertheless, coalmines

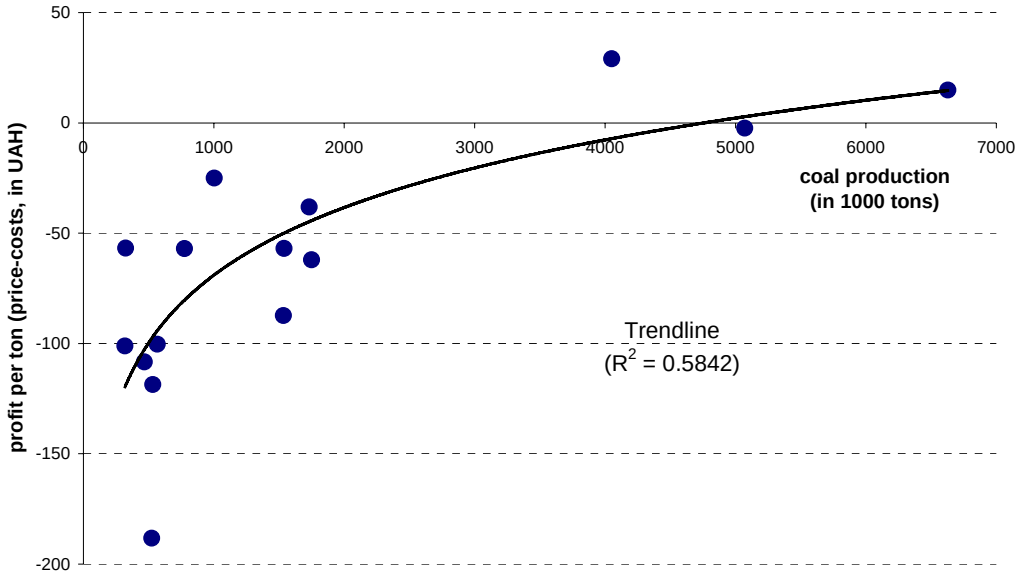
[2] Weekly informational-analytical bulletin "Energobusiness".

have sold their output at an average price of around USD 24/t, clearly below their production costs.[3]

3.2 Market structure and profitability in coal mining

Unprofitable mines that receive production subsidies do not only consume state aid, but also harm the market leaders by dumping their coal into the market. The fitted line in Figure 3 shows the correlation between output quantity and profit per ton of coal sold. Obviously, only firms with high production volumes sell their output at prices above their costs,[4] while those with small output make losses. This relationship is due to natural cost advantages that allow for higher production volumes, technical differences, managerial expertise, etc. However, with about 50% of steam coal sold at prices below cost levels (with corresponding losses covered by subsidies, accumulation of wage arrears and other non-payments), average market prices are biased downwards with corresponding negative feedback effects for still profitable mines. This also undermines the prospects for privatization of the three profitable state holdings.

Figure 3. Profits/losses per ton of steam coal by enterprise (2002)



Source: "Energobusiness"

3.3 Recent reform steps in the power market

[3] The World Bank: The Major Problems of Development of the Coal Sector and the Donbasss Region. Concise Report. Kiev, April 1, 2003.

[4] In particular, these are the three State Holding Companies, "Rovenkiantratzyt", "Pavlohradvuhillia", and "Sverdlovantratzyt", which together account for about 50% of steam coal production in Ukraine.

Recently the government of Ukraine announced its intention to introduce a wholesale market for steam coal similar to the wholesale market for electricity. Participation in the market is voluntary for both, mines and electricity generators. The market is intended to operate on the basis of full pre-payment for the supplied coal and to provide an indicative price for steam coal that will be revealed in the market and balance demand and supply. The intended benefits are reduced risk of unexpected shortages of steam coal for electricity generators as well as increased bargaining position of coalmines vis-à-vis power generators in order to reduce distortions from unequal enforcement of budget constraints. However, under present conditions the creation of this wholesale market is more likely to deteriorate rather than to improve the situation since only three out of the 18 state holdings sell their output at cost-covering prices while all others finance their losses through subsidies, accumulation of wage arrears and non-payments to oblenergos. Consequently, sustaining such practices will create considerable downward pressure on the average wholesale price. If this price will be close to the current average price for steam coal in Ukraine (about UAH 122 per ton[5]), not even one of the three currently cost-covering holdings will be able to finance their costs (UAH 130, 130 and 122, respectively) any more.

The government has also started to move in the direction of privatising some coalmines. However, the privatization of the big coal enterprises, such as “Pavlohradvuhillia” could generate problems in the first tender, since the price of the enterprise of UAH 1.28 bn is rather high for the history of privatisation in Ukraine, especially taking into account the financial state of the enterprise. Although “Pavlohradvuhillia” is a potentially attractive object, the required investment program, indebtedness, loss-making performance, and the small number of potential buyers are likely to make the first tender go void.

4. Policy recommendations

The government’s policy with respect to the coal industry should be focused on three objectives:

1) Ensure long-run profitability of the coal industry;
2) Reduce social pressures during coalmine restructuring;
3) Guarantee a sufficient level of coal production to maintain energy security.

From the logic of a sustainable power production chain, the first requirement necessary to achieve those goals is the ability of power generators to pay a sufficient price for steam coal. To meet this requirement, the following steps are necessary:

[5] Energobusiness, various issues.

- **Hardening of budget constraints** on all levels of the power chain.
- **Cancellation of all ex-post state aid** to cover losses from production.
- **Improve payment discipline** throughout the chain by allowing for appropriate legal procedures. Furthermore, the regulator (NERC) should make all payments from "Energorynok" to different power generators depend only on the amount of electricity supplied.
- **Ensure full payment by power consumers**. This requires metering of consumed electricity and the allowance to cut supply to non-paying customers. At the same time, households with an income below a certain threshold should receive targeted social support, and public consumers such as utilities should be guaranteed full cost-coverage of their services. This requires that either tariffs are high enough to cover all costs, or losses of operation are covered by those who set tariffs at below-cost levels, i.e., the local administration.
- **Remove distortions in inter-fuel price competition by adjusting power tariffs and regulation.** Therefore, several steps are necessary. First, the wholesale price for nuclear power must include all costs involved, including funds necessary for future closure. This will stimulate inter-fuel competition and increase the demand for power generated by TPPs. Second, final electricity tariffs should be set at a level that covers all necessary expenditure including maintenance and investments. This is in particular necessary for covering full costs of electricity distribution to households. Third, the appropriate use of public funds for investments etc. should be guaranteed by using incentive regulation (price-cap or profit-cap) rather than the control-driven type of cost-plus regulation.

Within the coal sector, reforms should focus on **privatization** in order to stimulate right incentives. The owner of a private mine should only benefit from positive financial results, if at the same time he is also responsible for all losses. Only under this condition, asset stripping of (state owned) mines can be prevented. In principle, Ukraine's current privatization strategy follows this direction. However, if during a tender procedure the possible price for a generally interesting object (e.g. the "Pavlohradvuhillia" mine) decreases by too much, the state should also think about using **public-private partnerships**, where the state rents out a coalmine under long-term, detailed contracts, and the private owner pays a pre-specified amount for every ton of produced coal. In this way, investors do not have to pay a very high price for a potentially risky asset, and the state still has the guarantee of not giving away the asset for too low a price.

The measures listed so far are already sufficient for ensuring objective 1, the long-run profitability of the coal industry. However, achieving the two other objectives – a reduction of social pressures during coalmine restructuring and a sufficient level of coal production to maintain energy security – both might also require the use of state aid. While we do not condemn this in general, the following two principles are crucial to guarantee that the two objectives

are met at the lowest economic costs and with creating the least incentives for potential misuse of state funds:

First, state aid to coalmines should not be granted based on firm specific criteria such as sales prices and costs, and state aid should not be designed for explicit purposes such as financing losses from production or investments. Instead, **all mines should be treated equally** and aid should be pre-defined *ex ante* depending only on the amount of current or – preferably – historic production in order to decouple expected amounts of subsidies from current production decisions. This scheme will allow to allocate enough funds to the coalmines so that the politically determined amount of coal production can be realized. At the same time, it reduces the currently existing distortions where better performing mines have received less aid and have to compete against coal dumped on the market at low prices by weak-performing mines whose losses are covered by public budgets.

Second, the total amount of aid granted has to **decrease over time**. This is necessary for keeping the budgetary burden on acceptable levels, or to prevent that loss-making entities are kept in operation for longer than necessary due to expectations on future support. Nevertheless, granting state aid that decreases over time can still contribute to ease social tensions of coalmine restructuring and is thus sufficient to achieve objective 2.

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December 2003