GERMAN ECONOMIC TEAM IN BELARUS

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PP/03/05

Reforms in the Belarusian electricity sector: how to reduce costs and dependence on imported resources

Summary

The Belarusian electricity sector is highly dependant on imported gas from Russia. The recent price increases for imported gas immediately translated into higher power tariffs. This problem raises the question of how best to structure the sector so that power price increases are as modest at possible, while the sector operates in an economically sustainable manner (i.e. without accumulating losses). Against this background, policy makers are discussing investments in renewable and domestic fuels, building a nuclear station, diversifying fuel imports, and changing the regulatory environment, e.g. pricing policies and/or the size of the profit margins of the power plants. Each solution has its pros and cons. Investing in renewable fuels is sound, but will lead only to partial improvements. Simultaneously, the government is tempted to 'freeze' tariffs by reducing the profits of the generating companies. However, electricity tariffs are already low by international standards and (on average) are also very likely below their respective cost levels. Moreover, the electricity sector already has large investment needs, which do not permit prices or profit margins to be further reduced. Instead, the system needs increased efficiency. This policy paper outlines some possible reforms and discusses how other countries have managed to increase the efficiency of their electricity sectors.

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1. Introduction

The Belarusian power sector faces difficult challenges. The one-sided fuel-mix (95% of all electricity is generated in Belarus by burning gas) together with the high dependence on Russian gas supplies makes it vulnerable to changes in the gas market in general, and to the relationship with Russia in particular. Thus, the recent increase in the price of imported gas from Russia increased gas domestic prices in Belarus, which translated directly into higher electricity prices. Another important fact is, that the sector needs major investments (according to some sources the Belarusian power system will need to change all its equipment by 2009 to 2011; however, current policies make this difficult). Under present conditions of high fixed costs caused by the technologically outdated overcapacities (44-45 bn kWh capacity versus 27-31 bn kWh generation in 2003-2004), the energy enterprises cannot significantly reduce their costs. This raises the question of what could and should be done so that power price increases are as modest at possible, while the sector operates in an economically sustainable manner This policy paper discusses possible solutions and strategies against this background. The second section describes possible solutions for the problems and challenges of the sector. The third section presents some examples of how other countries have managed to increase the efficiency of their power sectors. Based on this discussion, we present some policy recommendations and draw some general conclusions in the forth section.

2. Possible Solutions for the electricity sector

To deal with the challenges facing the Belarusian electricity sector, policy makers and experts discuss several possible solutions, which either contribute to diversifying the fuel mix, lowering costs of electricity generation, or both. In this section we will briefly discuss these solutions.

2.1. Investing in renewable and domestic fuels

In order to diversify the fuel mix, the government intends to increase the use renewable and domestic fuels. Therefore, studies on using more domestic resources were considerably intensified in 2004. The government resolution No. 1680 (December 30, 2004) requires that by 2012 no less than 25% of all electricity and heat generated in Belarus have to be produced using local or alternative energy resources (e.g. wood, peat, biomass, etc.). Investigating these alternatives is very worthwhile, as they could (1) bring significant contributions to the diversification of the energy supply, (2) help remote areas to become independent, and thereby (3) reduce the expensive social burden of providing electricity and heat to those areas by reducing the transmission costs from central suppliers; (4) be associated with significant positive environmental effects (reducing greenhouse gas emission); (5) represent technologies that might be very important in the future; and (6) generate interesting and potentially beneficial new options for agriculture (for example, growing plants with high heat value).

However, *there are also significant drawbacks of this strategy*:

A. Due to technological peculiarities, power generation based on renewable fuels is practical only for small-scale plants in rural areas. For large-scale power generation in city settings, using renewable fuels would be more costly than using gas[1].

[1] In general electricity generation from renewable sources is about twice as expensive as gas-based generation. For example, the lowest cost of generation based on renewable fuels (biomass) in Germany is more than 80 EUR/MWh (see e.g. Bundesinitiative BioEnergie (Gutachten zur Markt- und Kostenentwicklung der Stromerzeugung aus Biomasse. Berlin 2002). On the contrary, gas-fired power plants in Germany generate power for between 25-35 EUR/MWh (see e.g. Ellersdorfer, I. (2004): Auswirkungen von Terminhandel auf potenzielle Marktmacht im Deutschen Elektrizitaetsmarkt. Institut für Energiewirtschaft und Rationelle Energieanwendung (IER), Universität Stuttgart). For more information and statistics about renewable energy see also: www.iea.org/Textbase/subjectqueries/keyresult.asp?KEYWORD_ID=4116www.iea.org.

B. It is doubtful that domestic renewable energy sources are available in sufficiently large quantities to satisfy the ambitious goals set.

C. This scenario requires considerable investments. But, the ability of the state or the energy enterprises (innovation fund) to fund these investments is limited and it is doubtful that the necessary funds can be obtained on international capital markets.

D. The desired significant increase in use of some domestic/renewable resources in electricity and power generation could also create negative ecological consequences. The burning of wood, peat, masut, condensed gas, etc. causes large carbon dioxide and particulate emissions. The specialized scrubbing facilities required cost money, which neither the Ministry of Finance, nor the energy enterprises have. Besides, massively using wood for energy generation might lead to ecological damage of forest areas. As for peat, it could lead to a further deterioration of the situation in the Belarusian Polessje, an area where the swamps are already badly damaged.

Hence, using domestic and renewable fuels is a good step in the right direction. But, the intended goal of satisfying 25% of the consumption appears unrealistic[2], comes at a high opportunity cost, and might create new fuel shortages if the domestic renewables are not available in sufficiently large quantities. As far as the modest as possible price increase is concerned this scenario does not give appropriate solution, as renewable resources are more expensive.

2.2. Building a nuclear power station

As an alternative step to diversify the fuel mix and lowering costs of generation, the possibility of building a Belarusian nuclear station is widely discussed in the mass media. It has both positive and negative consequences. On the one hand, it could lower electricity prices by more than 20% and considerably reduce the need for Russian gas. On the other hand, building a nuclear station requires high investments over a long period of time (10-15 years). Besides, it would create a new energy dependency on other countries (Russia or EU) in terms of technology, uranium imports, etc. And, there are ecological and political concerns, since supplying nuclear technology to Belarus is likely to create strong international tensions.

2.3. Electricity imports

Another possibility for achieving a more diversified fuel mix is to increase imports of electricity. Up to now Belarus imports electricity only from Russia. To import Ukrainian nuclear power could be very beneficial, because of its low generating costs. A further partial solution could be to participate in the nuclear projects of Belarus' neighbors (Russia or Ukraine). For example, participating in the reconstruction of the nuclear station in Smolensk oblast in return for permission to import a certain production quota of cheap electricity could be a profitable project.

Nevertheless, imported electricity also cannot be the universal solution for the sector which must produce electricity and heat, and, therefore, buy Russian gas. Rather, it can only contribute to reducing the problem. Besides, imports will not be much

[2] In Belarus the share of domestic and renewable fuel in electricity and heat generation in 2004 was 14% (the share of renewable fuel is less than 2%, all other fuel is so called domestic, i.e. peat, wood, associated gas). However, even this figure appears to be already relatively large. For example, in countries such as Germany, where the use of renewable fuels in electricity generation has been already subsidized for several years, renewable fuels account for less than 15% of total electricity generation (http://www.bmu.de/erneuerbare_energien/kurzinfo/doc/3988.php). In CEE countries renewable energy targets (% in total energy demand, excluding large hydro) are considerably more modest: Poland – 7.5% in 2010, Czech Republic – 5-6% in 2010, Lithuania – 12% in 2010, Latvia – 6% in 2010 (Economies in Transition, the IEA and Renewable Energy, http://www.iea.org/dbtw-wpd/Textbase/work/2003/budapest/background.pdf).

cheaper than e.g. own, gas-based generation, especially taking into account costs of voltage reduction and transmission at the border.

2.4. Energy consumption reduction

Besides the possibilities described above aimed at diversifying fuels, there is another important measure that could contribute the problem of high-energy dependency. It is the need and possibility to reduce the energy intensity of the Belarusian economy. A lot of work has already been done in this direction. So, during the last 9 years energy intensity of Belarusian economy reduced by 38% while GDP grew by 63%. During this period the consumption of coal was reduced by 4 times, masut – by 3 times and the share of gas increased from 40 to 65%. However, there is much potential for further work. For example, production of one dollar of GDP takes in Belarus 4-5 times more energy resources than in the Western countries[3]. Besides, the country uses more than 30 m tons of fuel equivalent, i.e. 3 tons for every citizen while in the world this average indicator is 1 ton. In 2004 every citizen of Belarus used 2000 m^3 of gas and 3400 kWh of electricity, which is twice the average European level.

The first issue is the importance of implementation incentives for energy saving by households and the beginning of reforms in the utility sector and in housing. Households use 20% of all the electricity generated in the country and 60% of heat. But the price for households is relatively low and does not stimulate reduction of energy consumption. Besides, there are a lot of subsidies for some groups of households. Thus, reforms in this field, especially in heating and utility services (tariff reform, metering, promotion of energy saving ideas among households) would also considerably reduce energy consumption and energy losses in the network. The same applies to enterprises as some benefit from preferential tariffs which do not encourage efficient consumption and energy saving. The state could also encourage and motivate enterprises to invest them more in energy saving equipment and technologies. In general, saving even a small amount of energy would be more beneficial for Belarus than a relatively bigger switch to the new types of energy resources.

2.5. Adjusting prices and profit margins

2.5.1. Tariff Policy

The possible solutions mentioned so far all suggest using alternative sources for electricity in order to diversify Belarusian's fuel mix or reducing energy consumption. In addition, policy makers also discuss the possibility of direct intervention in electricity price setting, whose recent increases are seen as the most dramatic outcome that apparently is caused by high gas-dependency and higher import prices for gas. Supporters of this strategy argue that the current, low electricity price for household consumption can and must be guaranteed by adjusting the existing cross-subsidization by industry. At the root of this notion lies the argument that low household tariffs are of high social importance. But since a secure, long-term oriented electricity supply to the households is also of great social importance, this argument needs to be considered carefully on all sides:

<u>How high are the electricity tariffs?</u>

Due to the new VAT regime with Russia, prices for Russian gas actually rose by 18% in 2005. However, domestic prices were not increased in January, and the higher costs for gas import were compensated by a loan from Russia (received in 2004). Then, starting on February 1, the domestic gas price was increased, but only by 8% (the remaining 10% are to be covered by lower margins for Beltransgas and Beltopgas).

3 See http://web.worldbank.org/wbsite/external/extrussianhome/extrussiancountries/ecainrussianext/belarusinrussianextn/0,,contentMDK:20236330~pagePK:141137~piPK:141127~theSitePK:446752,00.html

To reflect the higher cost of gas, electricity prices were raised on February 1 as well. The prices for industrial consumers were raised by 15%[4] to 6.7 US cent per kWh (up from 4.15 US cents two years ago). Hence, industrial prices became more than twice as high as households prices (at 3.3 US cents in January). Also, starting on February 10, household tariffs are being raised by 1.8-2.0% per month (to reach approximately 4.0 US cents by the end of the year).

Within both user groups, electricity prices are not uniform either. Rather, numerous exemptions for specific industries and even individual companies create serious distortions. For household tariffs, privileges for certain consumer groups such as veterans or large families, who pay only 50% of the general tariffs, reduce the effective price level. Since privileged consumers account for about 11% of the total household power consumption, the effective household tariff for February is 3.2 US cents instead of the nominal 3.4 US cents (3.4*0.89 + 1.7*0.11 = 3.2).

Approximately 50% of all electricity produced in Belarus is generated in combined heating and power plants (CHP). In order to lower the cost for heat, the producers overcharge the electricity production since the rules for price calculations are not clearly defined in the legislation. The resulting cross-subsidization of heating tariffs by power tariffs further deteriorates the transparency of power pricing.

Are these prices economically sufficient?

Following economic intuition, tariffs should be high enough to cover the long-run marginal costs of power supply (LRMC)[5]. Such costs are not reported in Belarus (the costs that are reported officially are far below reasonable full-cost levels that include investments).

A comparison with other countries gives us some indication of what price levels are reasonable:

- The LRMC of power supplied to industry in the USA and Europe ranges about 8-9 US cents. In Belarus, the cost of fuel (mainly gas) is still relatively cheap (even after the recent price increases). On the other hand, the Belarusian power sector suffers from substantial under-investment and accumulated arrears, which is not the case in the US or Western Europe. Hence, we judge that the current industry price of 6.7 US cents is just high enough to cover the LRMC. It would be unreasonable to assume that the LRMC is considerably below this level.
- The LRMC for power supplied to a large numbers of households at low voltage levels is significantly higher. Hence, household prices should be higher than industry prices. While this is the case in most European countries (e.g. about 20% higher in Poland and Hungary, see Table 1) and on average even twice as high for OECD Europe (*Transition Report* EBRD, var. iss.), the current household tariffs in Belarus are only half of the industry tariffs, and the difference becomes even greater if we recall that due to social privileges the effective household prices are lower yet (see above). Hence, we judge that prices for households certainly do not cover their relevant costs and accordingly fail to stimulate new investment or increased efficiency.

[4] The electricity price increase for industrial consumers exceeded the gas price increase in order to offset the larger amount of different kinds of cross-subsidies in the electricity sector and its lower profitability.

[5] The LRMC (Long Run Marginal Costs) includes all cost components plus investments (in the long run, also currently fixed infrastructure must be installed). If power tariffs are above the LRMC, providers receive a monopoly rent at the expense of general welfare. At tariffs below the LRMC, power will not be efficiently used and there will be a lack of investment. Thus, prices at the LRMC level are efficient (high enough to cover all costs, but not allowing for excessive profits). If prices for electricity supply to households are below the LRMC, then no investment will take place, since the costs of such investments are not covered.

Table 1. Prices for electricity in 2003 in selected CEE and CIS countries, in US cents per kWh

Country	Residential tariffs	Industrial tariffs	Residential to non-residential tariff ratio (%)
Czech Republic	8.0	8.5	94
Lithuania	7.2	7.1	102
Poland	7.8	6.4	122
Hungary	9.2	7.8	118
Ukraine	2.3	3.1	75
Belarus	**3.1**	**4.0**	**78**

Source: Transition Report, EBRD, 2004.
Note: The ratio for residential to non-residential tariffs reduced from 78% to 50% in Belarus in 2005.

In summary, Belarusian electricity prices are too low with respect to long run marginal costs and in international comparison, and current electricity tariff policy fails to provide incentives for efficient use of electricity and a sustainable and progressive development of the electricity generation sector.

2.4.2. Implementation of administrative mechanisms to reduce profits in the energy sector

Despite this discussion of price levels, some policy makers nevertheless believe that energy enterprises in the current economic environment generate high or even excessive profits. They consider that another way to reduce tariffs might be to reduce the profit margins of the energy companies. According to this logic, lower electricity prices for households and industry under current circumstances is more important than large profits for the energy sector.

But does 'squeezing' the profit margins make sense? In our opinion not, since many problems exist in the sector that would be further aggravated by reducing margins:

- Assets in the sector are depleted and there is a need for new investment in the next 3 to 5 years. According to some estimates 80% of all power plants will need full modernization by 2009/2011. If profit margins are reduced further, no such investments will be possible;
- Delays in payments by final consumers have considerable negative effects on Belenergo's[6] (and hence the oblenergo's) financial results and solvencies (note that the main non-payers are agricultural enterprises and communal heating enterprises);
- Due to present conditions of high fixed costs caused by the technologically outdated overcapacities (44-45 bn kWh capacity versus 27-31 bn kWh generation in 2003-2004), the energy enterprises cannot significantly reduce their costs. Besides, 'politically' fixed costs[7] make up a considerable part of Belenergo's costs as the oblenergos are non-corporatized, state-owned firms which are limited in their ability to take independent, profit-oriented decisions[8]. Therefore, in current economic and organization conditions electricity enterprises can't considerably reduce costs and 'squeezing' the profit margins could considerably deteriorate their financial results.

The existence of all these problems demonstrates that the current government strategy of governing a complex energy system from a central planning position is most unlikely

[6] The Belarusian energy system is a vertically integrated company and consists of six independent regional companies, "oblenergos", one for each oblast (region). The system is administered by the concern Belenergo, which reports to the Ministry of Energy.
[7] We refer to 'politically' fixed costs, because these costs could be reduced if there is a political will to do so.
[8] Enterprises cannot reduce the number of employees, because of an informal ban; many social objects or ancillary businesses cannot be separated, corporatized or privatized, etc.

to succeed. Against this background, to further reduce profits would not represent an adequate solution. Instead, it is likely to be even more harmful to the sector.

2.6. Preliminary assessment

In summary, the discussions in this section demonstrate that an increased use of domestic and renewable fuels as well as additional electricity imports could contribute to a diversification of Belarus' energy supply. Nevertheless, none of these solutions will be sufficient to substantially reduce the dependency on gas as the main fuel. Furthermore, use of more renewable and domestic fuels, building a nuclear power station and increased imports would not significantly contribute to the government attempt to keep price increases as modest as possible and could even lead to the opposite result (the case with renewable/local fuel).

However, in the final analysis the real problem is not the high dependency on gas as such (with the corresponding direct price transmission if gas prices increase), but that the electricity sector lacks a profit-oriented perspective, so that prices are unable to sufficiently balance supply and demand. The sector's economic situation, especially the need for more investment demonstrates that the sector lacks a profit-oriented perspective. Hence, we suggest that in addition to diversifying the fuel mix and measures for energy intensity reduction, the economic organization should be changed in order to increase efficiency. In search for ideas and principles of how this could be achieved, we will discuss the two dominant international models of market economic organization for the power sector in the next section.

3. International experience with measures to encourage the effective functioning of the electricity sector

3.1. Organizational structure of the sector

Electricity sector reforms in most countries started in the early 1990s through implementation of competition in electricity generation. The main goals of the reforms were the reduction of prices due to higher efficiency (Great Britain, Argentina, Austria); attraction of foreign investments (Brazil, Argentina), implementation of competition in order to provide consumers with a right to choose a supplier; and smoothing of price differences between different regions of a country (Norway, USA).

In most OECD countries, electricity is distributed through a wholesale market, to which generating companies supply power and on which distributors draw. This is basically realized through two different organizational settings[9].

Pool

In the 1980s, Great Britain became known as the pioneer in the electricity sector deregulation and vertical restructuring (unbundling) with the creation of its *Electricity Pool*. The overall power sector was vertically separated into 3 generating companies, the national grid operator, and 12 distribution companies.

The wholesale market operates as a Pool into which generating companies sell electricity and from which suppliers purchase capacity. A single price is set according to the price offered by the last generating companies whose power is called up to meet demand. All generating companies on the market are paid the same price irrespective of the price offered during the course of the day. The price for electricity changes according to demand levels at different load periods. Thus, when demand and prices are high during peak periods, generating companies with relatively high costs can also supply the pool. During the remaining periods, when demand is flat and prices are low, only

[9] More information about electricity sector deregulation and its organization structures one can find in the following sites: http://www.libertarium.ru/libertarium/energy, www.iea.org, http://www.powermarketers.com/drg-lnk.htm.

low-cost generators produce and supply electricity. The Pool's role is to facilitate the competitive bidding process between the generating companies that set the wholesale price for electricity for each half hour period of each day. In this way, market forces are responsible for ensuring that supply and demand are matched, while the state-owned national grid operator ensures that supply and demand can technically be matched. Hence, the pool model gives an incentive for generating companies to reduce their costs, ensures an efficient generation of energy and an optimal use of available capacities because it smoothes demand levels during different periods, as consumers have an incentive to consume at out-of-peak times whenever possible.

One decade after introducing this pool structure, electricity prices were 10% lower than before the reforms. Following the successful implementation of the pool model in the UK, it was adopted in numerous developed and developing countries. In principle, results of the pool model have been positive. A drawback of the system, however, is that generating companies might try to limit competition between themselves by collusion. In particular, they might try to reduce the available supply by coordinated reductions of power generation, so that prices increase. To lower this incentive, several pro-competition measures (bilateral contracts between generating companies and power retailers, or allowing for advance sales of capacity to the pool for daily, weekly or even monthly consumption) have proven to be capable of further supporting the efficiency-oriented organization of the pool system.

Bilateral contracts

Although the pool model allows for the most efficient allocation of resources, it has two disadvantages. The first is that the short-term sales of electricity lead to frequent price fluctuations. Hedging, i.e. forward financial contracting has proven to be only a partial solution. The second problem is that producers play a dominant role in the market while buyers do not participate in the process of price determination in a significant way. The alternative organizational form, *bilateral contracts* between generators and consumers as used in EU countries such as Germany, France, and Italy, does not have these shortcomings.

In order to achieve efficient results, the bilateral trade system also requires vertical unbundling and the existence of a wholesale market. Market and system operations are often conducted by separate organizations. While a power exchange organizes direct trade among private or corporatized generating companies and consumers), the system operator ensures the technical functioning of the system. This dual structure reduces the concern that both structures could discriminate against traders engaging in bilateral transactions.

3.2. EU requirements and reforms

Before making a decision in favor of one of the two systems, several general preconditions need to be met. They are, for example, listed in a 1996 EU Directive, which can be regarded as a starting point for reforms towards more efficiency through competition on the EU power markets. This directive establishes the right of consumers to choose the cheapest supplier. Reforms also enforce unlimited access for third party companies to transmission networks at equal tariffs; the unbundling of generation, transmission and distribution activities (to reduce the scope for cross-subsidization); full or partial privatization of generation; establishment of an independent regulatory body; and improvement of pricing policies to adequately reflect the energy costs of all enterprises of the sector, etc.

End-user choice and competition among private generating companies are two key forces in the functioning of wholesale markets. The necessity to compete and the possibility to attract private investment leads to effective resource allocation, proper motivation of management, and permanent work on cost reduction in order to make genera-

tion more and more effective and profitable. The same motivation concerns private distribution companies, while the network operator typically remains state-owned. As a result, the market brings lower prices and a higher quality of service to consumers.

However, due to complexity of the electricity reform in general and high level of protectionism on the national markets in European Union, it goes with many difficulties and delays. Up to now many requirements of the EU Electricity Directive have not been met. Nevertheless, there is very little disagreement that (1) EU principles of energy market liberalization go in the right direction (i.e. towards more efficiency); (2) energy sectors in both 'old' and 'new' EU member states have become more liberal and efficient (some more, some less); (3) no EU state has seen its energy markets deteriorating (i.e. becoming less efficient).

All countries in the CEE region and most of the CIS countries have already started reforms in their electricity sectors for the same reasons the developed countries did. As a basic model of reform, the CEE countries have followed EU directives and requirements. However, due to the complexity of the task, the levels of success and the speeds of implementation in the various CEE countries vary widely. For example, according to EBRD reports about the progress of implementing structural reforms in the electricity sector, the Czech Republic, Poland and the Baltic countries still fail to comply with the typical standards of a market economy. After the first years of reforms, their experience shows that the most important issues for transition countries are stiffening and tightening payment discipline, setting prices at levels that reflect costs, and creating an independent regulator which will balance all interests. An effective regulatory system is of crucial importance. In particular, such a system requires coherence, predictability, capacity, independence, accountability and transparency. Lessons learned by CEE countries during electricity reform could be very important for CIS countries, as most of them have failed in its implementation up to now (see appendix 1). The issue of electricity reforms in Belarus according to the international (market) standards remains of crucial importance. The state, progress and prospects of such reforms are detailed analyzed in Belarus Infrastructure Monitoring, annually publishing within GET project.[10]

4. Policy recommendations and conclusions

The high dependency on Russian gas and its further price growth are challenges for the Belarusian economy, which strengthen the already strong case for reform in the electricity sector. Increasing the use of domestic/renewable energy sources is a useful and efficient measure, but can only be a partial solution. Improving the efficiency of the sector is a much more promising approach to keeping price increases as moderate as possible, while ensuring a sustainable functioning of the sector. To achieve this goal, the system needs to be given the appropriate incentives for increasing its efficiency (lowering costs). International experience shows several ways of how this goal can be achieved by using competition as the main driving force. However, before this can be done, the government needs to establish appropriate rules for an effective functioning of the sector. The main policy focuses should be the following:

1. Tariff policy

Electricity tariffs in Belarus are low by international standards and (on average) are also very likely below the LRMC of electricity generation and distribution. Hence, the electricity sector operates rather inefficiently with large investment needs. Against this background, neither prices nor profit margins should be further reduced. Furthermore, the practice of cross-subsidization of households by industry makes the tariff policy unpredictable and subject to political influence. This creates numerous distortions,

[10] See http://ipm.by/index.pl?topicid=a6f6cc8e.

leading to misallocation of resources and inconsistent information for future planning. Hence, we recommend the following measures:

a) Gradual price increases for households up to the LRMC level;

b) No further cross-subsidies from industry to households (industrial tariffs are now approximately at the LRMC level; any further increases would amount to an economically inefficient level of taxation of the industries that could lead to efficiency reductions and hence, welfare losses).

2. Social support

The present system of consumer privileges has two significant drawbacks: First, it reduces the effective household tariff, which we already found to be below its relevant cost level (LRMC, see the discussion above). Second, selling power at low prices stimulates excessive consumption and fails to give incentives for saving energy.

To avoid these problems, we recommend that privileges and targeted aid to poor households should be financed by the society as a whole, because this is really a responsibility of the society as a whole. In practice, this could be done in two ways:

a) The state (the Ministry of Finance) reimburses the oblenergos for the difference between the preferential price and the normal tariff. The disadvantage of this scheme is that the oblenergos would be given incentives for various forms of misuse such as over-reporting of privileged consumption.

b) The state pays the difference between the preferential price and normal tariff for a predetermined consumption norm directly to the consumers. The advantage of this scheme is that consumers can directly decide if they prefer to consume the proposed amount of energy, or consume less and save some funds. Hence, consumers will be given an incentive to reduce their energy consumption.

If the introduction of targeted social support is not possible due to practical problems such as budget shortfalls or missing consumption meters, a lifeline consumption scheme might be a temporary solution. In this case, prices for consumption up to a 'minimum' threshold are kept at low levels and are essentially subsidized by higher prices for consumption in excess of this threshold. In this way, poor consumers will still receive a reasonable amount of power at low prices, while incentives to reduce consumption are maintained.

Nevertheless, a lifeline consumption scheme should not be seen as a long-run solution, since the prevalence of cross-subsidization lowers transparency in the sector (hence, makes financial planning more difficult). Direct transfers are a better targeted form of social support.

3. Sector operation

To enable profitable and sustainable operation of the sector, the following measures are due:

- Missing meters must be installed wherever necessary, and accurate and strict control must be assured;
- The policy for disconnecting non-paying consumers, including public utilities, etc. should be allowed and extended;
- Independent regulation that utilizes incentives for cost-cutting should be established. The system should be changed from a centrally planned and controlled one into a self-governing organizational structure, where the state only guarantees that no market power is misused;

- Third party access to the Belenergo network should be gradually opened up on a clear non-discriminatory basis;
- Corporatization and restructuring of all oblenergos and all ancillary businesses should gradually start. This will allow the current 'politically fixed costs' to be reduced, and the management motivation for general cost reductions to be increased.

4. Further recommendations

In addition, the following recommendations, though only indirectly connected to the electricity sector, will help to insure the success of the sector's reform:

- Deregulation of electricity prices should be combined with the deregulation of gas prices as the main fuel source, and with termination of all administrative and other limitations on the markets for other types of fuel;
- Reforms in the electricity sector can only succeed if the structural problems of the biggest electricity-consuming sectors such as utilities and housing are also solved.

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Minsk, March 2005

Appendix

Progress of electricity reform in selected CEE and CIS countries in 2004

Countries	Index	Independent regulator
Poland	3.3	yes
Lithuania	3.3	yes
Czech Republic	3.3	yes
Estonia	3.0	yes
Azerbaijan	2.3	no
Armenia	3.3	yes
Belarus	**1.0**	**no**
Georgia	3.0	yes
Kazakhstan	3.2	yes
Kyrgyzstan	2.3	yes
Moldova	3.0	yes
Russia	2.5	yes
Tajikistan	1.7	no
Turkmenistan	1.0	no
Uzbekistan	2.0	no
Ukraine	3.0	yes

*Source***:** Transition Report, EBRD, 2004.
Note: score 1 means the slowest progress in implementation of reform, 4 means the standard of market economy.