Power Sector Reform in Transition Economies

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Since the mid 1990's, countries around the world have begun to embark on radical power sector reform with a view to increasing efficiency and thus reducing prices. Reforms that have been undertaken typically involve industry restructuring to separate potentially competitive activities (generation and supply) from natural monopolies (transmission and distribution), setting up of an independent regulator, privatisation, and market liberalisation (see, for example the EBRD Transition Report 1996). England and Wales pioneered power sector reform starting in 1993, where privatisation and liberalisation has resulted in substantial efficiency gains and price reductions (see, for example, Newbery and Pollit). Following this positive experience, the European Union Power Directive was introduced to provide a framework for liberalisation in member countries; this has now largely been implemented. Industry liberalisation recently took place in the United States, though the full benefits of reform here are yet to ensue (see Box 1). Power markets have also been set up in Scandanavia, Australia and New Zealand, Latin America, Asia and Africa (ref. to literature on power sector reform around the World).

Box 1: America

In the pre-reform electricity sector, ¾ of the state's consumption was supplied by three large vertically privately owned utilities regulated under a traditional US style cost of service regulatory system. Under the reform, the integrated utilities sold off their generating capacity. Tariffs were frozen at 90% of their pre restructuring level. A spot market was set up together with a grid company. It was envisaged that competition would drive down the power price sufficiently that under the capped tariffs power companies would make sufficient profits to offset any stranded costs.

During the first two years (1996-8) the wholesale markets worked reasonably well (wholesale prices fell), but as a consequence of a substantial increase in the demand, accompanied by reduced availability of hydropower and big increases in the price of gas and pollution permits, wholesale prices increased in 1999 and skyrocketed in 2000. In light of the tariff freeze, and without any hedging through forward contracts, this left the two largest companies on the verge of bankruptcy. Resulting payment difficulties exacerbated the problem, with generators unwilling to supply power and hence frequent blackouts.

These problems reflect in part factors exogenous to the liberalisation (e.g. increased demand), and thus price increases or system security reductions would have happened even if the industry had not been liberalised. The impact of exogenous factors would however have been less if: cost pass through were allowed; forward contracting were allowed; impediments to building of new capacity were removed.

In the case of transition economies, it is likely that power sector reform would result in substantial efficiency gains, more so than have been witnessed in other countries which started out with part commercialised power sectors, both through changing incentives – breaking the cycle of vested interests that ensued from the communist era - and introducing new commercial know how (ref. to transition literature on privatisation generally). Whereas generally reforms would be expected to result in price reductions, in the case of transition economies, where prices are below the level of long run costs, reforms should limit the price increases necessary to sustain a good quality power supply.

In defining a reform path for power sectors in transition economies, the standard model of unbundling, privatising must be refined to account for the transition context. Of particular importance in transition economy power sector reform are issues relating to sequencing and institutional capacity.

The starting point for reform is the heritage of monolithic state owned companies, run as part of government ministries along engineering rather commercial lines. The first step forward is to distance power sector management from political interference through corporatisation of the state owned power company (ref to Newbery, Economics of Transition). The corporatised company can then be commercialised through the introduction of International Accounting Standards and Management Information Systems, through sharpening management incentives (e.g. by introducing a market for managers), and hardening budget constraints; most EBRD countries of operations have passed this reform stage (ref. to infrastructure transition indicators).

Having corporatised the power company, the next standard reform step (both in and outside transition countries) is to vertically unbundle it into generation, transmission and distribution / supply components with separate accounts, possibly as subsidiaries within a holding company structure, or as separate legal entities.

Whereas in general the next step (assuming that regulatory arrangements are in place, see below) might be to privatise generation, transmission and distribution simultaneously, in transition economies there is often a strong case for privatising distribution first, namely when payments discipline is a problem. At the theoretical level, privatisation of power distribution would be expected to result in increased payments collection through strengthened incentives associated with profit maximisation. Furthermore, the private sector has the know how and the finance required (for re-metering programmes, computerisation of billing, etc.) to improve payments performance. At the practical level, where the private sector has entered distribution in transition economies, payments collection has gone up (see Boxes 2, 3 and 4).

Box 2: Georgia

In Georgia the Telasi power distribution company serving the capital Tbilisi was sold to the American Utility AES, which since bought the Gardabarni power station. Cash collection by Telasi has improved since privatisation as a result of a re-metering programme, a public education campaign about the relationship between higher effective tariffs and better security of supply, and threats / cutting off of some large non payers. The fact that collections are low elsewhere in the country is problematic for AES because revenues for its power station do not cover costs; incentives for AES to maintain supply in this situation are undermined. For this reason, and due to difficulties obtaining Russian gas, and a drought, security of supply in early 2001 was low; should this be repeated in winter this year, it is likely that reforms would be discredited. In a bid to improve payments performance, the national transmission company will shortly be privatised under a management contract, as will market operation, this with a view to ensuring transparency in the allocation of revenues to generators. Remaining state owned distribution companies are slated for privatisation at the end of 2001. Given that earlier attempts to privatise these companies failed due to lack of investor interest, it is likely that they will now be bundled together, and privatised under a management contract (at least for an interim period until collections have improved) rather than sold outright.

Box 3: Kazakhstan

Radical power sector reform began in Kazakhstan in 1996, when the industry was partially unbundled and some assets were privatised. The national electricity transmission network is owned and operated by state-owned Kazakhstan Energy Grid Operating Company (KEGOC). Power generation assets have largely been separated from transmission facilities and privatised. Only five of the regional distribution companies had been privatised as of mid 2001, with the majority remaining in state ownership and under the management of KEGOC.

In Almaty (the largest city and former capital) power and heat assets were privatised in 1996 to a subsidiary of the Belgian power company Tractebel. The privatisation deal involved a twenty five year concession over the Almaty power and heat distribution networks, and five heat and power plants, purchased for $7 million. At a later stage, Tractebel was awarded a fifteen year concession on gas transmission for a price of $30 million. Tractebel believed it had contractual commitments over tariff increases which were not honoured and began legal proceedings against the Government of Kazakhstan early in 2000. In April 2000, a deal was reached under which Tractebel left the country with compensation of $100 million, and privatised assets reverted to public ownership.

In Karaganda (Kazakhstan's second largest city) power generation and distribution facilities are controlled by a holding company owned by Great Britain's National Power together with a subsidiary of the Israeli company Ormat. In the Altai (northeastern Kazakhstan) region, which encompasses approximately one-quarter of all land in Kazakhstan, virtually all power generation facilities are owned (or managed under long-term concessions) by subsidiaries of AES Corporation, and some power distribution facilities in the region are managed by AES. Both Ormat and AES continue to experience problems gaining approval for tariffs sufficient to cover investment cost.

Difficulties encountered by private investors in the sector stem from the regulatory framework. Though the regulator is separate from any government department, it is not independent from the political process; the regulator is subject to politically imposed budget constraints, is frequently replaced during a government reshuffle, and is reluctant to approve tariff increases on the grounds that they may be politically unpopular. Regulatory rules support political interference in the tariff setting process. For example, the tariff formula allows an unspecified (in the legislation) margin rather than a rate of return on capital; in practice the margin is squeezed to prevent tariff increases. Regarding commercial losses, these can be substantial in Kazakhstan, but are assumed by the regulator to be zero, thus the regulated company does not realise the full amount of its allowed revenue and cannot therefore cover its cost.

Despite difficulties, the private sector has been successful in improving payments performance. In Almaty, Tractebel was successful in pursuing high profile debtors and achieved a substantial increases in both cash and revenue collection. As Tractebel left the country, collections quickly declined by 30%. In Karaganda, prior to privatisation (in 1997) collections were 20%, rising to 93% (either cash or offsets for fuel inputs and taxes but not other forms of barter) in May 2001. Whether the present private sector participants choose to remain in the country will probably depend on the extent of regulatory reform to be undertaken.

The wholesale market in Kazakhstan is organized along principles of competition: generators have, at least in theory if not always in practice, open access to transmission and distribution networks and can enter into bilateral contracts with large users and electricity distribution companies for the sale or purchase of power. This system has sustained over a number of years and seems to function well despite poor payments discipline in the sector.

Privatisation of generation is not a solution to the problem of payments collection because there is typically limited (if any) interaction between generators and consumers. Privatisation of generation without improving collection could well fail due to lack of investor interest. Alternatively, privatisation revenues would be low, and post privatisation investment finance would likely not be forthcoming. In each of these scenarios, there would likely be political resistance, with the possibility of

reputational damage to the government and its reform effort both in the sector and more generally. In countries where payments discipline is not a problem, there is not reason to proceed with privatisation of distribution first; this was the case in Hungary, where generation and distribution where privatised simultaneously (see box 5 on Hungary).

Box 4: Moldova

Though there were significant price increases in 1997, at which time differentials between customer classes were eroded, costs were still not covered. On top of this cash collections were 25% and commercial losses (largely due to illegal connections and tampering with meters) were around 25%. This situation was not sustainable given Moldova's dependence on imported energy together with tight fiscal constraints; external arrears grew and supplies were interrupted. In response, the industry restructuring and privatisation was undertaken in a bid to improve payments discipline. A regulator was set up in 1997, an energy law passed in 1998, and privatisation started in 1999. Of particular regard in Moldova is the regulatory framework for power distribution companies, which provides both incentives for efficient performance and security for investors. Features of the tariff setting mechanism, written into the privatisation contract, are: a 23% return on all investments; inflation and exchange rate indexing, according to whether costs are local or foreign; schedules for loss reduction; targets for operating cost, partial generating cost pass through (to provide incentives for efficient purchase);indexed on inflation and exchange rate, target loss reduction, retained benefits of outperformance, partial generation cost pass through. Parameters in this mechanism are fixed until 2006, when tariffs will be reviewed and benefits passed on to customers. In February 2000, the Spanish utility Union Fenosa acquired three distribution companies, and have since been successful in reducing commercial losses and increasing collections beyond what was envisaged when tariffs were first set. Two companies were not sold due to lack of commercial interest and will be retendered later this year.

Box 5: Hungary

The Hungarian power sector was reformed under the Act on the Production, Transport and Supply of Electric Energy of 1995. A regulator – the Hungarian Energy Office – was set up, the industry vertically and horizontally unbundled, and minority controlling stakes in six distribution companies and two generation companies sold. The regulatory framework is such that there is scope for political input to decision making through a requirement that the government – rather than just the regulator - approves tariffs. In the years after privatisation, tariffs were insufficient to provide the target 8% return on assets.

Since privatisation the industry has operated on the basis of a single buyer model such that the state owned transmission company (MVM) has long term purchase agreements with generating companies and sale agreement s with distribution companies. Market opening is planned to start in 2002, at which time 25% of the market will operate on the basis of bilateral contracts between generators and large consumers. Stranded costs should not be a problem in the case of Hungarian liberalisation: though PPA's are in place, the capacity secured under these contracts is reviewed each year and can be reduced in line with market opening.

Privatisation (of both distribution and generation) is more likely to be successful if transparent and predictable regulation of distribution companies is in place. Though assets were sold in Kazakhstan in the absence of a strong regulatory framework, privatisation revenues were very low and funds for post privatisation investment have been limited (discussed in box 3). The recent failure of Armenian power distribution privatisation due to lack of investor suggests the need to make assets more attractive, improving the sector investment climate by strengthening regulation.

Regarding governance, the standard prescription is that a regulator should be independent (separate from any government department, funded by the industry,

appointed for fixed terms (ref to Jon Stern)) in order to reduce uncertainties associated with the possibility of political interference (for example in the tariff setting process). In transition economies, some countries have set up regulators that appear to be independent on paper, for example, Armenia, Bulgaria, Romania, Moldova. It is not clear however, even in these countries, that regulation is free from political interference. This makes the standard requirement for investor recourse to third parties even more important in transition economies. Whereas recourse may typically be to the judiciary or to a competition commission, in transition economies, where legal institutional capacity is not always high, investors have often been given recourse to international arbitration through privatisation contracts; in the case of Kazakhstan, this recourse proved to be a successful means of protecting the investor in the context of a regulatory dispute (discussed in box 3).

Regarding regulatory rules, these should be well specified to reduce uncertainty; the case of Kazakhstan illustrates the difficulties that investors may face when rules are not well specified (discussed in box 3). In recognition of the need to provide a predictable environment for investment, the regulatory rules in Georgia and Moldova are such that tariffs are largely fixed in real dollar terms for seven years, after which time they will be revised according to clearly stated principles, for example, prices will be set to cover all (operating and capital) costs of an efficient firm (discussed in box 2 and 4 respectively for Georgia and Moldova); the mechanism for fixing the tariffs here is an agreement written in to the privatisation contract (see Kennedy, *Regulatory Reform and Development in Power Sectors of Transition Economies: The Case of Kazakhstan*, EBRD Working Paper 53, June 2000).

Given that a regulatory framework is in place and distribution assets are ready for privatisation, there is a question over whether these should be bundled. From an economic point of view, assets should be bundled to create companies consistent with the minimum efficient scale for the industry. Ideally the industry structure will include a number of companies to allow for the possibility of regulation based on benchmarking ("yardstick competition"). Experience in transition economies ha s shown that in certain small countries, stand alone regional distribution companies are too small to be attractive to investors, and these must be bundled together if they are to be sold (see box 2 on Georgia and box 4 on Moldova). The evidence suggests that in these small countries, bundling distribution companies into two packages can result in sale. Bundling into two packages allows for some benchmarking; to the extent that more comparators are required, there are opportunities for international benchmarking across transition economies, though these have not been exploited to date.

Ideally the structure of generation will be such that there are a number of market players, none of which has the ability to manipulate prices. This is feasible in larger countries with substantial generating capacity, less so in smaller countries. Where there is not scope for a number of generating companies in one country, there should be regulation of generation to prevent abuse of market power. Going forward, dominant domestic generators may be disciplined through opening of markets to international competition; scope for competition between generators in small countries exists for example in the Baltics, the Caucasus, and Central Asia. When

generating assets are sold these would ideally not be to owners of distribution companies. The market reality is that sometimes there is such limited interest that the only bid for a generating company comes from the owner of a distribution company (see box 2 on Georgia). In this situation, there is a clear need for regulation of generation, to prevent monopoly pricing, and to ensure that competitors have equal access to distribution networks. Regarding transmission, where this to be integrated with generation, the danger would be that the transmission company could try to distort dispatch in favour of its own generators; for this reason, all countries in the region (except Georgia) have opted to maintain transmission as a state owned company.

Of the alternative models for liberalisation, pools (footnote defining pool: centralised arrangement with demand and supply curves formed on the basis of bids from generators and customers determining market price and dispatch) have yet to be shown to succeed in transition economies whereas bilateral contracting (definition of bilateral contracting: large consumers, including distribution companies, freely contract with each other) has been successful in at least one country (see boxes 3 and 6 discussing Kazakhstan and Ukraine respectively). If the chosen market model is such that revenues flow through a central clearing mechanism (e.g. a pool) prior to allocation amongst generators, then experience from Georgia and Ukraine (see boxes 2 and 6 respectively) suggests that this process should be transparent and predictable, achieved through having well defined rules and regular external audit.

Box 6: Ukraine

Radical power sector reform started in Ukraine in 19994 following advice to the government from the World Bank. Reforms included industry unbundling both vertically (generation, transmission and distribution) and horizontally (separate companies within generation and distribution), setting up of a regulator, and introduction of a market in the form of a pool; there was however no privatisation at this time.

Both tariffs and collections have remained low since the end of the communist era, with the result that sector cash flows are inadequate to finance costs. Of the funds flowing into the pool, these were until recently allocated to generators on an arbitrary basis. Compounding this is the fact that Ukraine lacks toe metering and communication technology required to run a pool. As a result of these three factors, the market in Ukraine, which was set up at great expense, has not functioned. Instead prices have been determined by the regulator, and dispatch has been on a quota basis. System security is low both because funds within the sector are insufficient to cover fuel purchase costs, and available (as opposed to installed) capacity is low. Though there are various generation investment projects in the pipeline, these are not feasible on a project finance basis.

More recently progress in reform has been made. Some improvements in cash collection were achieved following the implementation of measures agreed by a working group Comprising the Government of Ukraine and the IFI's. A new tariff mechanism has been adopted, with incentives for performance improvements (targets for improvement in collection and reduction in commercial and technical losses), strengthened by the five year review period, which also provides stability. In xxx 2001, five distribution companies were privatised, two to the American utility AES, and three to a utility from the Slovak Republic.

The transition to a competitive market requires that limited capacity is contracted under Power Purchase Agreements prior to liberalisation. In other words, private investment in generation (through IPP's) prior to full privatisation should be

restricted, and companies should not be privatised with off-take agreements (reference to my working paper). Stranded costs should be less of a problem in most transition economies given that assets are typically fully depreciated. Where there are stranded cost problems (for example, Poland), system levies (as implemented in the United States and some western European countries) would seem to provide the way forward, though there are no mechanisms in place at the moment. Clearly liberalisation will have implications for tariffs as cross subsidies become unsustainable following market opening; this should be recognised, and consumer tariffs should be allowed through the regulatory rules to rise accordingly. To the extent that increases are not feasible immediately, market opening should be delayed.

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