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Deregulating electricity markets in emerging economies

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This thesis was written as a part of the master program at NHH. Neither the institution, the supervisor, nor the censors are - through the approval of this thesis - responsible for neither the theories and methods used, nor results and conclusions drawn in this work.

Preface

This thesis will present difficulties associated with deregulating electricity markets in emerging economies and integrating them into a single power grid. The presentation will focus on a number of former Soviet states (CIS) and the ways these countries are being integrated to a single power grid in order to increase social welfare and energy security. Although many projects have been proposed and partially implemented, there are factors that negatively affect the integration. Based on the progress of, and absences of regulations and implementations, this thesis will argue that integration into a single power grid, although good for the welfare is still too early, and might be detrimental in the short run. While viewing the underlining facts and figures concerning the potential power grid as well as countries surrounding it following topics will be covered:

Need for deregulation

Overview of potential players

Challenges from financial and technological standpoints

Challenges on legislation/governmental levels, due to lack of/or over regulation by the governments

Challenges in integrating to a single grid and harmonizing markets across countries

Suggestions on the integration and deregulation

Throughout the thesis, observations will be presented and compared against the needed performance.

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Introduction

Energy generation and consumption have always been an issue of discussion on national and international levels. A country's energy production capacity is an important component of the economy. It determines the economy's ability for self sufficiency as well as the magnitude of dependency on other economies.

While a single economy might find it difficult to create a fully self-sufficient energy sector, this thesis will argue that harmonizing energy generation and consumption for a set amount of countries is more feasible and further argue that, under certain circumstances an integrated grid can serve to decrease the dependency issues between the mentioned countries.

While an amalgamated power grid may seem acceptable choice for the countries discussed below, the process of the integration, as well as the current state of the energy sector and regulations can be unfavorable and present future difficulties for the potential entrants to the grid. These problems and barriers to integration will be covered by the paper.

Integration into a single grid relies on the idea of full market deregulation for all countries in question, in order to enable efficient allocation of resources, simplified trade and a more effective maximization of the social surplus.

After presenting the prerequisites and challenges for deregulation of electricity markets in the emerging economies, possible solutions to the problems at hand will be offered with analytical overtones on social, legislative, inter and intra governmental levels.

For reasons generated above and discussed in detail throughout the paper, it can be stated that deregulation together with integration into a single grid can lead to improved performance both in generation and consumption.

Methodology

An in depth review of literature was undertaken to understand the challenges arising from the need of deregulation as well as offer the solution to the above. For this thesis, only secondary data was used. The information is drawn from books, journals and the internet. Based on the information from the provided sources, analysis was conducted, and strategies of dealing with the current situation were presented.

Further, it is noteworthy that acquiring data concerning the figures and some statistics has presented difficulty in a sense that the discussed regions carry few available data concerning the electricity industry. This makes the writing admittedly more complicated as lack of information on cost structures, demand on electricity and supply capacity for the countries discussed below complicates the analysis on their position concerning the proposed idea. Moreover, many country reports referenced in the thesis might lack transparency as they may be influenced by political and competitive factors.

The idea behind this thesis is to discuss the historical perspective of the CIS electric grid, after which current standing shall be presented based arguments shall be made on as to how possible the CPM is at the moment.

1. Need for deregulation

- a. The first part of the thesis will argue how market deregulation can aid the CIS countries and how a joined power grid can serve to the end of increased security and welfare. Different deregulation models used worldwide will be used for comparative purposes.

2. Overview of potential players

- a. The CIS countries have made first steps towards deregulation, however these are either inadequate, or face resistance by governments. A number of countries from around the CIS region will be identified as entrants to the grid

- b. The countries in focus will be discussed in detail (General economic analysis and electricity industries considered)
 - c. Discussion will continue on national frameworks on electricity regulation. Effects of regulations in specific electricity markets will be discussed.
 - d. Further, discussion will continue on current vs. future changes in legislations and conclusions will be drawn on the trends towards deregulation in these countries.
- 3. Challenges from financial technological, and legal standpoints
 - a. This part of the thesis will discuss country specific data overview. The scope of the analysis will be limited to, not exclusively, financial and technological limitations and advancements of the countries in question in the electricity generating and distribution sectors.
- 4. Challenges on legislation/governmental levels, due to lack of/or over regulation by the governments
- 5. Challenges in integrating to a single grid and harmonizing markets across countries.
 - a. This will be the central part of the thesis where discussion will take place on the difficulties that the potential entrants might experience on their way to integration into the single power grid
 - b. Hurdles and possible solutions towards a well balanced electricity generation and distribution system after the integration will be discussed
- 6. Suggestions on the integration and deregulation
 - a. The final part of the thesis will be advisory. It will be based on observations in the previous sectors and will state some suggestions on areas of improvement

Some technical terms and use of abbreviations for future references:

CIS countries where mentioned includes Georgia (which has left CIS) and observer countries. Thus the referred to countries are: Russia, Ukraine, Kazakhstan, Belarus, Azerbaijan, Uzbekistan, Turkmenistan, Georgia, Armenia, Tajikistan, Kyrgyzstan, Moldova. Unless otherwise stated.

Former soviet states mentioned in this document include all but Estonia, Latvia and Lithuania as these players are already involved in the creation of Common Baltic Electricity market (CBEM). Provided these countries are included in the discussion it will so be noted.¹

Creation of common electricity market of the CIS member states is underway. At present the integration exists only at formal level. Commercial relations on agreements between set companies and are not unilateral for all players. The framework of the future common CIS market rules - the “Concept” for creating the Common Electricity Market of the CIS was derived by the CIS Electric Power Council in June, 2004, by the CIS Economic Council in May 2005 and submitted for approval to the CIS Heads of Governments Council. The Concept sets general and basic principles providing a sort of program of rearrangement of the CIS member states electricity markets. The Concept mandates the Electric Power Council (EPC) of the CIS to develop and to propose to the CIS governments detailed market rules and co-ordinate creation of the CIS common electricity market.

In most of the CIS states the end price of electricity is determined by the regulation imposed by the government. Although these tariffs most often incorporate cost and investment components, they are affected by State policies introducing non-market components into the calculation of generation tariffs. These premises deter foreign companies’ investment. In order to enable these companies to invest a strong incentive must be enforced. This includes power purchase agreements backed up through multinational large entities which guarantee prices, and thus they guarantee profits for the investor.

While it is a common compliance that reforms are underway in many of the CIS states, they are mostly aimed at separating generating companies from distribution sector as well as “liberating” these from state regulatory agencies. The mentioned undertakings are supported by majority of CIS country governments in an attempt to benchmark EU’s electricity market and thus narrow the gap between the EU and the CIS countries’ electricity industries.²

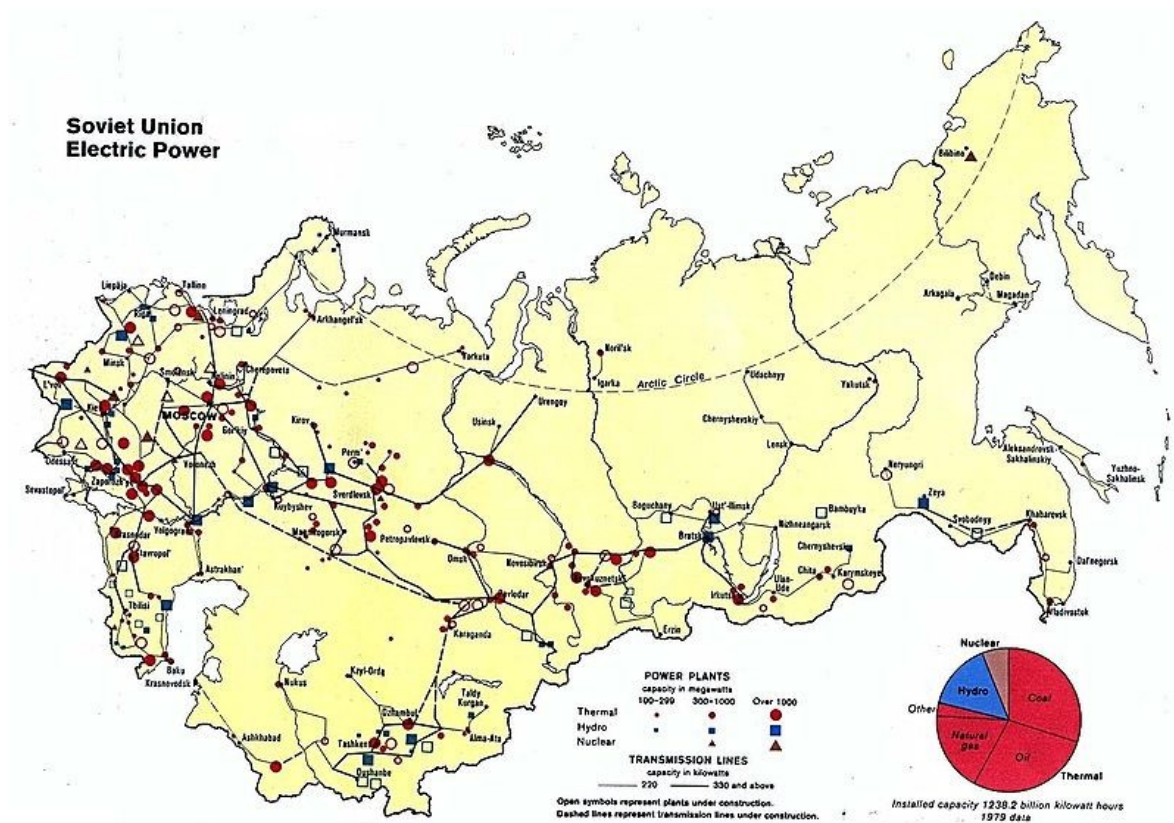
Overview

“Whoever does not miss the Soviet Union has no heart. Whoever wants it back has no brain.”

Vladimir Putin

While the Soviet Union might not have been the most tolerant and efficient of all the unities, one thing is clear: The electricity demand was always well satisfied no matter what the demand. This was partly due to the over imposing regime, poor planning and other factors. The important observation to be made here is how and why the demand was well covered.

A noteworthy contributor to the well balanced electricity system (In terms of supply) was the widely spread distribution system. High capacity power lines provided effective distribution possibilities all over the Soviet Union. Figure 1



Note: Estonia, Lithuania, Latvia are included as participants of the former Soviet Union.

The above picture illustrates how well the power grid was interconnected. A very intensive concentration of power plants and equally importantly- transmission lines can be observed in the western part of the Former Soviet Union. Bordering countries to the west include Finland, Poland, Romania, Serbia, Hungary, Bulgaria, Greece and Turkey. The existing grid while in need of renovation, still shows either an existing connection to the EU power grid, or demonstrates that further connection needs no extreme effort.

Power generation

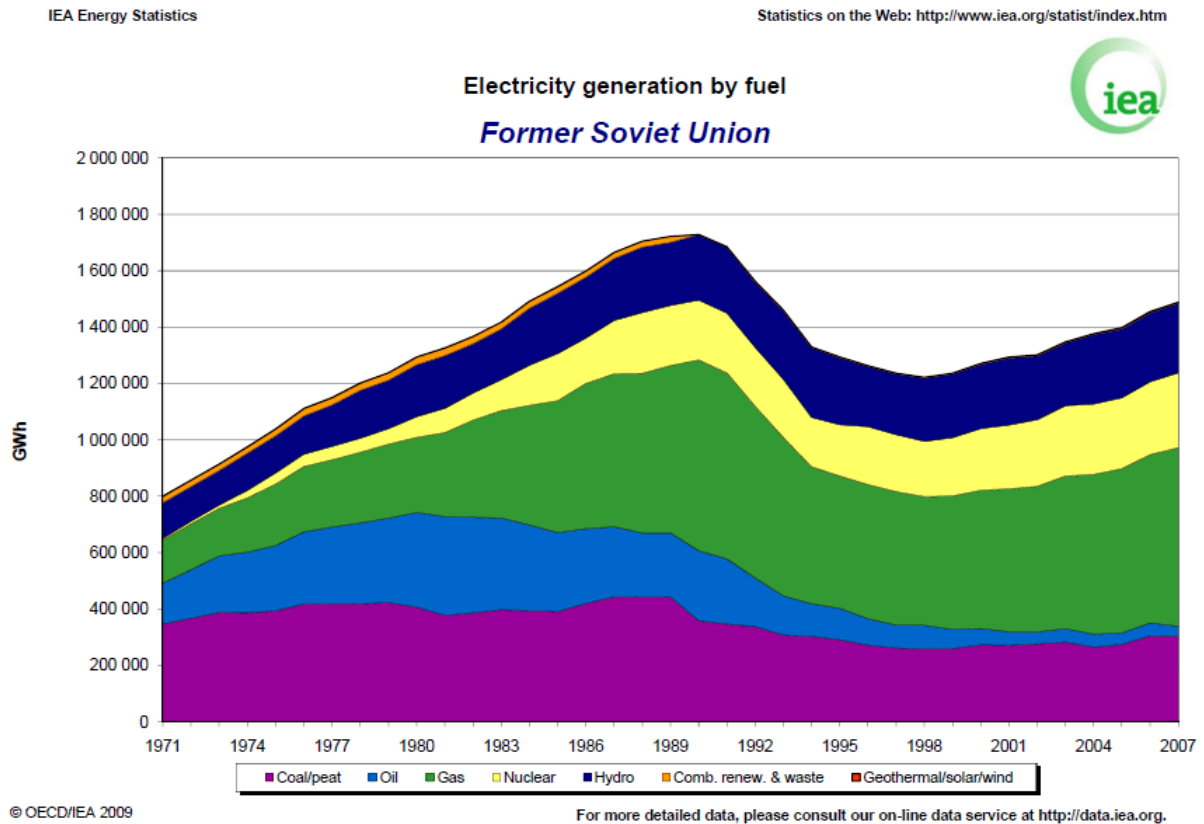
Powering such huge formation needed vast amount of energy. Thus all available sources were over utilized to yield maximum gains. The illustration below reveals interesting information concerning energy production before and after the fall of the Soviet regime.

The prime sources of energy were coal and gas. While coal use was relatively constant, gas use increased exponentially and together with the use of nuclear power was accountable for satisfying the fast increasing demand for electricity. Using gas powered turbines for generation also meant having fast accessible energy on demand. As the illustration shows, oil use for electricity production has been decreasing rapidly, as oil sold as fuel was (and still remains) more profitable and gas has been substituting the decrease of oil use in electricity production. Utilizing oil in electricity production shows an inconsistent trend for further elaborations. As seen below Soviet Union was heavily reliant on fossils. Huge amount of fossil fuels helped in satisfying varying demands over the stretch of a continent.

Use of hydro plants shows an interesting trend. Firstly, their use did not decrease after the decomposition of the regime, as operation carried close to zero costs. However use of hydro power has not been noticed either. This can be explained by lack of investment (Traced to lack of capital after the destructive 90s). Although investment in hydro power is underway in many countries (Discussed further below), long lead times in construction are responsible for the fact that hydro power plants (HPPs) have not yet contributed to the increase in production, as the mentioned plants have not yet been put to use.

Two major countries reliant on gas in electricity generation are Russia and Kazakhstan.

Figure 2



The CIS region does not boast large trade in electricity, investments in the region are not very active and thus the full potential is underutilized. CIS exports more electricity than it imports, however the actual amount of traded electricity is low, and thus the fact that CIS is net exporter has no large financial impact. Main sources of energy in the CIS are coal and gas the resources are running in tremendous numbers, hydropower carries very large amount of potential energy in some of the countries. (Figure 3)

The demand for electricity is growing and increased trade can be observed, however the investments are running low and are a “one sided street”, meaning they flow only towards one direction. For example Russia invests huge amounts into smaller CIS

countries. Thus, despite the fact that the CIS region has a vast potential in electricity generation and trade, small amounts of investment are not enough for the propulsion of a larger trade system. So under utilization of the system's potential is a great lost opportunity. (Figure 4)

CIS EPC and CPM

As per mid 1990's the CIS (Commonwealth of independent states) Electric-Power Council was created (also referred to as EPC). The CIS and Electric-Power Council are the key players, as they try to help and in a way mandate a Common Power Market (CPM). Due to the rapid and destructive fall of the Soviet regime, many countries were left out of the huge grid, and found themselves in a terrifying shortage of electricity.

Different countries in the CIS are in different stages of progression towards what is supposed to be a common electricity market. Although numerous organizations have proposed reports and proposals on the deregulation, amalgamation and liberalization of the markets, these reports only show that creating a common electricity market will serve to a better end purpose. Ways and challenges to get to the state of deregulation are less than elaborated on.³

At this point on the way towards a deregulated electricity market, it is important to overview detailed steps that need to be taken to reach the desired outcomes.

A good indicator of movement towards the integration in the CIS region could be the historical data on electricity transport as well as data on cross-border investment. An analysis of pre Soviet as well as post Soviet production and distribution should give a more less rational picture of what the market looked like while it was operating as a single power grid (Although heavily regulated). A good fosterer of interrelated production and distribution is of course cross investment into power plants and distribution systems.

Current Standings

Provided trade in electricity can point to the level of integration between the aforementioned states, the observation is that trade has fallen almost 4 times⁴ the overall trade of electricity in the CIS states is roughly 5% of internal consumption.

Figure 4 shows trade levels from 2004 to 2007 in the CIS countries and illustrate a sharp drop.

Two preconditions can be accounted for the above. Firstly, the consumption in countries has increased, this has happened due to higher access to electricity, and generally increasing demand in these countries. This fact is aggravated by long investment cycles due to the nature of the industry.

Secondly, the investment and development of new projects is hindered by the regulations of most of the countries. The lack of regulation supplemented by the fact that no strong and established foreign trade mechanisms exist aggravate the problem at hand,

The “leaders” of fostering common market in the CIS are Kazakhstan and Russia. Together these countries account for major increases in electricity trade. 2001 to 2005 saw exports of from 17.1 billion kWh Kazakhstan to Russia. Kazakhstan and Russia have also setup export plans of 3.6 billion kWh over 2003-2005 to Kirgizstan.⁵

The draft of the Concept of the Common Energy Market of the EurAsEC was proposed. The “Concept” based upon which the platform for choosing of a supplier by customers, spot markets, and liberalization of the market will occur has been drafted by member states and it relies on the idea of gradual liberalization of the markets. However there is more to gradual liberalization.

According to the document potential entrants to the common market will provide gradual liberalization and deregulation of the markets. These markets will then be conjoined based upon the principles and regulations in the upcoming documents on CPM.

The “Concept” elaborates on protection of investments as well as developing investment mechanisms in member states. It considers the possibility delegating generation of electricity, creating (regeneration) network and other types of assets on based on the agreement of contractors. The Electric Power Council of CIS resides on the creation and regulation of the forthcoming CPM. Participants and key players of the CPM and the Electric Power Council decide on the body on coordination CPM functioning. The CPM document in Yalta was signed by six countries in Yalta, these were: Russia, Tajikistan, Armenia, Kazakhstan, Belarus and Kyrgyzstan. We can clearly see here that not all countries share an equal goal or vision in the creation of a common market. Fuel and Energy minister of Ukraine abstained from signing the document as long as all countries did not sign.

As long as the current vision goes, participating countries will declare a list of trans-border power lines. As the capacity will be auctioned, the winner will be declared based on best price per MWh. The time span of these auctions is difficult to determine, but estimates state they will run anywhere between months up to several years.

Need for deregulation

The most important question to be asked when deregulating electricity markets is: “how necessary is the deregulation?”

Numerous approaches to determining gains and losses to deregulation have been pointed out. These will be discussed below.

Examples of Power Markets

Nordpool

The drivers of deregulation are also different. Nordpool’s definition of the need for deregulation is as follows: “The benefit of the Nordic power market derives from the opportunity it provides for Finland, Sweden, Denmark and Norway to assist each other when additional electricity supplies are required. If one country is unable to satisfy demand from its own output, it can import the necessary power from a neighbor. The common Nordic market primarily involves electricity generation from such resources as water, nuclear energy and coal. Since the generating modes differ and are distributed differently in the various countries, the need for additional power will vary from country to country and at different times. This makes it possible to share Nordic electricity resources. A common Nordic resource pool for electricity helps to optimize the use of available power and reduce local deficits. That allows the various countries to reap socio-economic gains. Electricity prices would be higher if all the Nordic nations had to build enough generating capacity to be individually self-supporting.”⁶

California power market

Borenstein (2002)⁷ proposes an interesting analysis on motivators of deregulation in the notorious Californian market stating it was motivated by higher prices than the national average 9.7 cents per kilowatt-hour, compared to the national average of 6.9 cents, as well as the benchmarking the UK electricity market. The state’s increasing electricity prices were a somewhat direct of a result of investment and purchase decisions that were

primarily made by the private, investor-owned utilities, with the oversight of the California Public Utilities Commission (CPUC), during the previous 20 years or so, the utility companies that committed to building large nuclear power plants ended up with much higher final costs than they had anticipated, effectively driving their end prices. On top of that, under pressure from the CPUC, these companies signed long-term contracts with small electricity generators effectively obligating themselves to very high wholesale purchase prices.

The choices concerning the investments undertaken in the market could for the most part be regarded as “sunk costs”. Still some of the customers that had supported the change hoped that restructuring of the market could become a tool with which sunk costs could be delegated from ratepayers to the shareholders of the investor-owned utilities—Pacific Gas & Electric (PG&E), Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E). This did not however turn out to be the case, but the result is not as important for this discussion as the focus on as to why deregulation (or restructuring) can be called upon.

In case of the CPM in post soviet or CIS states, there may be different drivers for different players.

Common Power Market in CIS

Of course the primary gains to be received from the deregulated market are those received from the market becoming a competitive one. In theory competitive market should be better able to offer best pricing to the end customer, thus effectively increasing the consumer surplus. Basic underassumption behind this is that deregulation will create a level field for new player

In the case of CIS common market, an important issue is that of energy security and effective allocation. As seen on the map (refer to fig1) the potential power market stretches all over the continent, and integrating such large space can bring large benefits, however might be outweighed by large risks and difficulties. Let us discuss the benefits in detail:

Gains from CPM

Thierer (1995)⁸ identifies several key gains to be received from the deregulation. These are discussed in greater detail below.

Level playing Field

The first identifiable gain from deregulation is the assumption that it will create a “**level playing field**” for future industry rivalry and competition by means that it will ensure that companies who are interested in entering the market will have an equal chance of doing so by means of competition.

The regulators will be deprived of leverage they have over the entrant companies. This leverage is exclusive franchising or creating artificial barriers to entry.

More upside is that regulators will not be able to have “their” firms get fat profit margins while depriving the consumers the right to freedom of choice. So, in other words consumers will be getting more power into their hands, which will create a more demanding customer. Jonathan Marshall (1995)⁹ positions very well the current standings on electricity deregulation and the electricity market: “High-voltage transmission lines, veritable electron superhighways, carry power thousands of miles with low losses, expanding the scope of regional markets. With more computer power and intelligent metering, nothing stands in the way of extending retail competition down to the household level.”

Level Prices

Consumers being able to choose their electricity supplier will be given choice, as the suppliers companies will know this, they will have to deliver more competitive prices

The current system in the CIS countries makes the customer pay prices artificially higher than deliverable. Despite the fact that prices are not very volatile in the general CIS market, deregulation can further decrease these, and deprive the monopolistic competition of the overcharged profits they take away from the households. For example,

Russian market (Surrounding Moscow) carries a current price of 1.5 RUR (0.4USD) per Kilowatt. Thermal power (oil, natural gas, and coal-fired) accounts for roughly 63 percent of Russia's electricity generation, followed by hydropower (21%) and nuclear (16%), on the other hand Georgian market carries a price of roughly 0.09 USD and primarily relies on hydropower plants. We can see that, despite the fact that hydropower can be generated at practically 0 costs; the end customer in Georgia has to pay much higher prices for the product. Competition in a fully deregulated market will eliminate these asymmetries.

Although the above prices may suggest the difference in prices are nominal on a per Kw base, the sum electricity consumption for the CIS currently at 1,500 GwH, gives us a tremendous number. Thus every penny saved per KWH consumption translates to tremendous end results.

For a benchmark, we can use research by Clemson University professors Michael T. Maloney et al. (1996)¹³ - Citizens for a Sound Economy which revealed that “in the long run the average monthly electricity bill for a typical residential customer who now pays \$69 per month could fall by approximately \$30—a 43 percent savings—if consumers had a real choice in who served them. Short-run savings would also be significant. The authors estimate the same customer would experience an average short-term drop of \$18—a 26 percent savings—per month. According to the study, consumers would save almost \$107.6 billion annually if a truly competitive market developed. Apart from huge potential savings in the system, which can be fostered by a level competition we are looking at better service provision in the sector. Wake Forest University Professor of Economics John C. Moorhouse¹⁴ notes, “[T]he variety of generating equipment and the large number of independent producers adds diversity to the system, lowering the probability of widespread equipment failure, and, thereby, reducing the amount of excess capacity required to provide a given level of service reliability

Moorhead also argues that competition, while fostering lower prices will also be able to necessitate more innovation in the field. “Under competitive electricity generation, as he

proposes, “[T]he market will provide an array of service standards that more closely match the mosaic of consumer preferences.”¹⁵

Moreover, “Competition not only leads firms to be more responsive to consumer demands, monitor costs more closely, and compete on the basis of price, it provides an incentive to be innovative because that may be the only way to get a temporary jump on rivals. Developing a new consumer service, a better method of reducing costs or a faster way of dealing with problems promises the innovator a competitive edge.”¹⁶ page 432

Lower prices for commercial businesses, especially small businesses.

Just like individual consumer, businesses will also reap the rewards of deregulation by means of competitive pricing. Electricity costs can be very substantial in some businesses and it represents a substantial portion of a firm’s costs of doing business. The current high costs of electricity are not absorbed by the production process, and they are thus factored into the final price of the goods. This means the cost of electricity is passed on to the end customer. According to the Food Marketing Institute, grocery stores spent approximately 4% of net sales on electricity expenses in 2004. Likewise, roughly \$900 of the sticker price of every new General Motors made automobile purchased in the USA annually is accountable to electricity expenses.¹⁷

Such “pass-through” costs that are transferred directly to customer can be avoided if the industrial sector has a freedom to choose from competitive suppliers.

An important observation can be made here concerning the deregulation and gains to large vs. small firms: Although it is the large firms that try to foster deregulation, and many say that large firms will have the lion’s share of savings, small firms will find competitive pricing more tangible. This can be explained by the fact that the electricity bills of small businesses often represent a much larger portion *as a percentage of overall costs* than those of large businesses. Thus, smaller firms often find it more challenging to pay utility bills than large ones. So, these firms, under competitive pricing will be able to choose best offers and pass the saving onto the customers.

Deregulation will draw prices to average, thus eliminating unjustified price differences in the system.

Wayne Crews, an economist in the Washington based Competitive Enterprise Institute states that despite the fact that the average price of electricity in America is about 7 cents per kilowatt-hour (kWh), the variance in regions is high- from about 5 cents to 10 cents per kWh. He states that “This (price differences) points to extraordinary inefficiencies. If customers could bypass their local utilities and gain access to power generators located elsewhere, billions could be saved.” Consequently, he says, “A mere one-cent-per-kWh drop in the average cost of 7 cents would save industrial, commercial, and residential customers \$28 billion per year.”¹⁸

Some initiatives undertaken by companies after deregulation in an attempt to gain customers set a good example on how players can actively participate in the formation of deregulated market. For example, New Hampshire instituted a project in electricity markets in 1996, this project allowed unlimited number of companies to enter a small market and serve customers. Many companies that took part in the New Hampshire experiment offered customized billing incentives and programs to encourage customers to switch providers, including promotions such as free bird feeders for customers’ yards and the ability to dedicate some portion of their monthly bills to the environmental group or program of their choice.

The campaigns illustrated above can be a good illustrative point for the effects of deregulation in the CIS countries in case open entry to the market is allowed, many new companies will emerge and new and old companies will be challenging each other in getting new customers by traditional or innovative ways and incentives.

It is equally important to remember (based on the above observations) that firms and players of all sizes are prone to gains.

Increased Jobs

Deregulation in the CIS region is very likely to increase jobs and benefit local communities. Large monopolistic companies such as RAO UES prefer not to have their customers exercise larger buyer power and these providers have used different tactics to do so- intense lobbying, campaign donations and moves that can be deemed deceptive to convince the local communities that deregulation will hurt them can be observed.

At this point the industry suffers from factual monopolistic power and employment is heavily affected by the size of the industry. Thus cutbacks (By which, ironically workforces were threatened) have occurred naturally with the reduction of market during recent financial downsizes. In case of full market deregulation, companies will be facing stiff competition and if anything will have to increase, or at the very least level their workforce. Cutbacks will be much less profitable to undertake.

Environmental Impact

The deregulation and the companies in the competitive sector can do more to benefit the environment by empowering electricity consumers to be smarter, more demanding shoppers. Consumers will have to be more responsible for the electricity used; power companies will need to be much more environmentally responsible by means of increased efficiency and cleanliness to ensure communities are provided the power they want without boosting pollution or other negative externalities. Thus, while it may be argued that demand for more efficient generation might increase the costs in the short run, a counter argument can be posted claiming that long run looks more promising in the light of increase effectiveness of the generating companies that will be put to positive use for the environment.

Increased efficiency

When generating companies are held responsible for their action, they will (as argued above) need to increase their efficiency and decrease the environmental footprint, thus, the innovations in the generation and distribution field will also foster a paramount increase in service reliability. Performance is also more strongly correlated to profitability. Provided there is a monopolistic model in the market, consumers will not be able to switch to a new supplier if there is failure in the reliability of supplies. Under competitive market, disruptions are related to customer dissatisfaction, and possible switches to competition. Fear of loss of customer base, while strengthening the incentive to keep ahead by means of high service standards, will also push companies to focus more on innovations and long term competitiveness (Which in part is made up of increased efficiency and green generation).

Claims are made that competition will foster higher transmission levels and cause power outages. While this claim may have some truth to it, it only stands in the short term and will easily be outweighed by the long term benefits.

Overview of Players

When considering the common electricity market for the CIS states it is important to have a general idea of these markets, their structures, and their host countries, below is presented some data on these countries, as well as the state of electricity markets. The data in case will include size of the population, some economic figures, geophysical traits, electricity market data etc.

As mentioned above, 12 potential players can be included in the CIS common electricity market. However these countries differ vastly in terms of population, GDP, state of deregulation of their electricity and other markets. However all these states have one thing in common, these are all post soviet states and share an already setup transmission grid (Although in need of major rehabilitation, the grid has proven to be very successful in past years).

We shall start discussing these countries in alphabetical order:

Armenia

The government started the initial reforms in the republic in the beginning of 1998. The following structure has been derived:

- Electricity producer companies (five large and more than 20 small companies),
- One transmission company,
- One distribution company
- A single wholesale buyer/seller of electricity and power,
- A single operator of power system,
- A single calculation center,
- Building, mounting, adjustment and other companies,
- R&D institutes.

One of the primary goals of the deregulation has been the focused on the ability to attract foreign direct investments to the economy. Almost all small HPPs as well as the distribution companies, as well as building organizations and their subdivisions were privatized.

The central decision and legal framework in the market relations in Republic Armenia are regulated by Law “On power engineering”. The mentioned law was adopted in 2001.

It is noteworthy that close to 80% of Armenia’s electricity generation is under the control of Russian owned companies.¹⁹

In 2006, generated a total of 5,940.9 million KWh of electricity, out of these 5,566.7 million KWh were delivered (the difference accrued to use by generators)²⁰. Overall, in 2006, Armenia's power plants generated 678.2 MWs, while the country's electricity consumption was 635.5 MW.

Azerbaijan

JSC “Azerenergy” is responsible for electricity production, transmission, distribution and planning of power system research and development. The company sets the R&D plans and framework, plans delivery of constructions etc. The long term existence of this company is currently being debated. According to “The Decree of President of Azerbaijan Republic” electric networks of Baku, Gaingy, and others (and constitute the major part of the entire network), which belonged before to the city authorities, were passed on into the joint stock companies for their subsequent privatization.

The Ministry of Fuel and Energy of Azerbaijan Republic was established in 2001, also based on “the Presidential Decree”.

- *production*: 23,80 billion kWh (2007)
- *consumption*: 27,50 billion kWh (2007)

In 2003, net electricity generation was estimated at 19.5 billion kWh. In 2003, consumption of electricity was estimated at 19.8 million kWh. Total installed capacity at the beginning of 2001 was 5.1 million kW.

Eight thermal plants supply more than 80% of capacity, and the rest comes from 5 hydroelectric plants. The main power plants (both are thermal) were near Ali-Bayramy (1,100 MW) and Mingechar (2,100MW).²¹

Belarus

The Ministry of Energy, Republic Belarus was created in 2001 and carries out the management of electric power industry in the country. The State Company named “Belenergo” undertakes on the activity of electric power industry.

The concern includes six unitary national electric power enterprises and the enterprises of construction-mounting complex, the so called adjusting enterprises, R&D organizations etc. The Republican unitary electric power enterprises are vertically integrated companies with State property. That includes the electric power stations, electricity transmission networks, as well as heating systems.

Belarus electric power industry deregulation has been proposed and has been considered at the Board of Ministry of Energy. The project is comprised of three stages of reforms in national electric power industry.

The three stages are made up of- electricity production, transmission and distribution, the end goal of the process is to organize a wholesale market in the economy. In the process larger companies (Now state-owned and regulated) will be mandated out to private firms. The intention also stands to separate generation from transmission.

The process is very unclear at the moment however still carries on the idea of government kept transmission system. However and independent body is to be created which will then be able to institute rules and observe how these rules are followed.

Total electricity generated in Belarus (2007) 31200GwH.²²

Georgia

In Georgia Ministry of Energy carries regulation/management of the industry. At the first stage of Georgian electric power industry deregulation, separation of electricity production from transmission and distribution was undertaken. Some small scales HPPs were privatized. Joint stock companies were created on the basis of types of plants (Such as thermal power plants vs. hydroelectric stations) at the second stage of deregulation. Privatization of any type of plant is possible based on agreements with the government. Nine Regional distribution companies are operating the power grid.

Regulation is carried out based on the size of electricity production. Plants with a capacity in the excess of 90MwH are under government regulation. However small plants are free to sell based on bilateral contracting. Private use is based on 3 stage regulated price (derived from consumption levels).

Kazakhstan.

Kazakhstan started going structural changes in electricity markets starting 1996. As a result of these transformations:

- Large electricity producing power stations (excluding those in the category of “Combined Heat and Power Plants (CHP) not exceeding 100 MW capacity) were set apart as independent entities.

The CHP were stock held, and the most of them had been privatized;

- CHP of mid-range capacity (less than 100 Megawatts) combined with heat distribution systems were given into the communal property of so called local management entities;

- Regional TSO companies were formed on the basis of regional electric networks with voltage capacity of 110-35 kV and local networks with voltage capacity 6-10 and 0.4 kV. Their functions are comprised of the full cycle of electricity purchase, distribution and realization;

- National Company KEGOG for the electric network control and operation was established on the basis of assets of the 220 kV and above transmission networks. Main focus of the mentioned company is the transmission of electricity to the wholesale market. Functions of the TSO of electricity wholesale market were levied on this company. The market operates based on multilateral agreements between consumers, power producers and the National Company;
- All other enterprises transformed to joint stock companies and were privatized.

The National Company is under the control of Ministry of Energy and Mineral Resources, the mentioned services in electricity transmission and distribution are regulated under the Republic Kazakhstan Agency on regulation of natural monopolies, protection of private business.

The process of creating wholesale electricity markets has created numbers of problems along the way, and yielded valuable lessons for further reference.

“Law on electric power industry” was adopted in 1999, while in 2000 the Decree of Government, envisaging additional measures on increasing the efficiency of electricity wholesale market was accepted; it also mandated creation of new market subject – or a market operator – a noncommercial organization with 100% State ownership. In future the participants of market are expected to establish it themselves. At the moment a market of bilateral contracting is prevalent in Kazakhstan. The day ahead market operates from February 2002.

Kyrghizstan

“National Electric Network of Kirghizstan” (OJSC “NEN Kirghizstan”), OJSC “Electric Power Stations of Kirghizstan”, another four electricity distribution companies - JSC “Electro” and one heating system company JSC “Bishkek Teploset” were established on the basis of JSC “Kyrghizenergo” in September 2001.

Transmission lines and substations with 110 kV and higher also functions of system operator are delegated to the OJSC “NEN Kyrghizstan”. Networks and substations with 35 kV capacity and lower are under the spread of JSC “Electro”.

A paramount share (namely 93.7%) of OJSC “NEN Kirghizstan” and OJSC “Electric Power Stations of Kirghizstan” was kept in the State ownership, and thus a somewhat special status of these JSCs was determined. Up to 70% of shares in large, controlling blocks of the companies in electricity distribution is envisaged. Bilateral contracting is prevalent in all levels of electricity trade: namely agreements for electricity purchase and sale, and for electricity transmission networks and rendering services on frequency control and others.

The Law in Kyrghyzstan “On electric power industry”, as well as “The rules of electricity market”, combined with “The rules of using NEN” and the Kirghiz Republic Law “On electricity market” signed by parliament Parliament in the end of January 2003 and create the baseline for the electricity markets.

Moldova

The Energy Ministry carries out the management of electricity industry. The “Law on electric power industry” adopted in 1998 foresees the development of competition for the electricity production and power supply as well as the privatization of electric power enterprises in the aforementioned two areas. Based on the above “National Agency of Regulation in Power Industry” (NARE) was created. The unbundling of activities in electricity production, transmission, dispatch control and distribution were taken. The State entity “Moldelectrica” was created to fulfill tasks in electricity transmission and operate as a Dispatch centre. Parliament of Moldova adopted the “Law on individual plan of privatization for the electric power industry” in December 1998, which foresees a two-stage privatization of electric power producing objects. Foreign companies were enabled to buy 100% shares of given transmission companies. At stage 2, companies were allowed to purchase up to 70% of energy generating entities’ shares. By 2003 out of 5 major electricity producers were sold out to foreign companies. The “Law on electric

power industry” defined framework of organizing the wholesale electricity market in Moldova. Distribution companies are allowed to form bilateral contracts with generators and importers of electricity.

A project called “Electricity Market Rules” was developed by NARE in order to provide legal framework for the efficient functioning of electricity markets in Moldova.

Russian Federation

Decrees of President of Russian Federation started the propulsion of restructuration of Russian market in 1992.

The Russian JSC of power and electricity transmission (RAO “EES Rossii”) was established same year. Large electric power stations with capacity of 1000 MW and more in thermal, 300 MW capacity and above HPPs, the main High Voltage transmission lines forming Russian UPS, also the central and regional dispatching control centers, R&D organizations, part of shares of each regional JSC “AO-energo”, which were established on the basis of regional power systems, were transferred to RAO “EES Rossii” capital. The branch joint stock companies were formed on the basis of electric power stations, property of those was transferred to RAO “EES Rossii”. The nuclear power plants are under the control of State concern "Rosenergoatom", which is responsible for their development and safe functioning. The Federal and regional energy commissions being the regulating bodies have been formed.

At present two levels of electricity market are functioning in Russia: wholesale and retail. The Federal (generally Russian) wholesale market of electric energy (power) (FOREM) is functioning within the frameworks of Federal law no. 41-F3 “On State regulation of tariffs for electricity and heat in Russian Federation” adopted in April 14, 1995, by Statement of RF Government no.793 “On Federal (General Russian) wholesale market of electric energy (power)” adopted in July 12, 1996 and recently – in the frameworks of Federal laws “On power engineering”, no 35-F3 adopted in March 26, 2003 and “On special features of Electricity industry functioning in the transient period”. N 36-F3 adopted in March 26, 2003.

Accordingly to the existing legislation FOREM was created as “A sphere of purchase/sale of electric energy (power) carried out by its subjects within the limits of “Unified power system of Russia”.

Tariffs and planning volume of electricity purchase and sale at FOREM are established by statement of Federal energy commission (FEC) of Russia, while a list of subjects – by statement of RF Government after presentation by FEC of Russia. At time being there are more than 130 subjects of wholesale market including the regional vertically integrated companies (VIC), the large thermal and hydroelectric stations (federal power plants – FPP), nuclear power plants (APP of SE “Rosenergoatom”), OJSC RAO “EES Rossii”, OJSC “SO-CDU EES”, CJSC “CDR FOREM”, large industrial consumers and independent producers.

The functions of System Operator “SO CDU EES” concern mainly the control of parallel operation of technological schemes of UPS of Russia by means of centralized operative-dispatching control of UPS and carrying out the regimes of UPS operation in real time at the territory covering 9 time zones.

The main functions of Operator of FOREM trade system CJSC “CDR FOREM” are: organization of concluding agreements at FOREM, carrying out of financial settlements for electric energy (power) between FOREM participants, participation in the instruction agreement, agent agreements and agreements of delivery.

OJSC RAO “EES Rossii” has a special status and is an organizer of functioning and development of FOREM, coordination of production and investment processes, fuel supply, organization (carrying out) of electricity export and import.

There is a special order at FOREM for formation of production/consumption volumes and tariffs for electricity that was fixed in normative acts. Producers and buyers of FOREM represent their application for annual (quarterly, monthly) production/consumption of electric energy (power) in FEC of Russia. These applications go through the procedure of coordination between Regional energy commission of RF

subjects, SO-CDU EES, OJSC RAO “EES Rossii”, CJSC “CDR FOREM”. After it FEC of Russia approved the Planning balance.

Tariff regulation at FOREM is carried out by FEC of Russia by means of establishing the economically based and/or limiting tariffs for electric energy (power) and rendered services. The tariff regulation at retail markets is carried out by Regional energy commission or by other bodies of regional executive power.

The Statement of Government of Russian Federation no. 526 adopted in July 11, 2001 determined the directions of further reformation of Russian electric power industry.

These directions include: the transformation of Federal wholesale electricity market into Federal competitive electricity market, the formation of retail electricity markets, the establishment of Federal Network Company, a series of generating companies, system operator, and administrator of trade system. It is intended to carry out the reforms of regional joint stock companies by means of separating the functions of electricity production, transmission, supply and service and not profiled directions.

The organizational infrastructure of future market (Federal network company (OJSC “FSC-EES” – EES), System Operator (OJSC “CDU EES Rossii”), Administrator of trade system (ATS) was created in 2001-2002. Since October 2002 the imitating electricity auctions are carried out for preparing infrastructure organizations and participants for startup of competitive sector of wholesale market. More than 130 participants – regional VIC, FPP and skilled customers are taking part in these auctions at European part of Russian Federation and in the energy zone of Siberia.

Realization of pilot projects of regional VIC reformation was begun in 2003. By initiative of RF Government the packet from 6 laws was prepared, went through all stages of coordination and was adopted in March 2003. These laws establish the legal bases of relations in the sphere of electricity industry under conditions of further reformation of this industry.

The Council of Directors of OJSC PAO “EES Rossii” approved the “5+5” strategy of company development for 2003-2008 based on the adopted laws.

Tajikistan

Ministry of Energy was established in Tajikistan in accordance with Decree of President. It includes electric power industry (the open holding company “Barki Tochik) and the gas-oil industry (the State enterprises “Tajikneftegaz”, “Tadjikgaz”, Tajiknefteproduct”). The Ministry of Energy is responsible for power engineering policy and the development of standards.

The program of electric power industry reforms was developed. The consumers will receive a possibility to choose among the competitive power suppliers. The stockholding of twenty-four power objects has been recently carried out. Ten of them are distribution companies, and fourteen are repairing-building ones. The preparatory work was fulfilled for the beginning of investment process by means of realization of the shares of newly established joint stock companies.

Turkmenistan

Ministry of Energy and Industry carries out the management of electric power industry. “Turkmen Energotechnological Corporation”, or “Kuvvat” carries out the power supply of consumers. The corporation includes 5 regional production associations, electric power stations as well as repairing, designing and some other enterprises.

Uzbekistan

In 2001 the Decree of President transformed the Republican Ministry of Energy and Electrification into the State joint stock company “Uzbekenergo”, which includes coal and electric power industries.

The reforms of economy and financial system in Republic Uzbekistan concerned greatly the electric power industry. The reforms in this industry and the improvements of managing structure of this many-functional industry are carried out since 2001 in order to

realize the Republic Uzbekistan President's Decree. The shareholding of 4 thermal power plants including the largest Syrdaryanskay TPP, 9 regional distribution-supplying enterprises of electrical networks, 18 enterprises fulfilling the designing, construction mounting, repairing and other works has been made in electric power industry.

The transformation of property's forms for enterprises of electric networks will be complete within the frameworks of restructuring up to the end of 2003 and for the thermal power plants – up to the end of 2005.

Ukraine

Ministry of Fuel and Energy carries out the management of electric power industry. The reforms in Ukrainian electric power industry begun in 1994 in accordance with the Decrees of President that foresaw the unbundling of 8 vertically integrated territorial power systems into several generating power companies (4 – with thermal power plants, 1 – nuclear power plants, 2 – with hydroelectric stations), the formation of 27 regional distribution power supply companies, the creation of National Dispatching Centre and State Enterprise “Ukrelectroperedacha”; the creation of National commission on regulations.

Agreement between the participants of wholesale market that determined its organizational structure was signed in 1996. In 1999 the amalgamation of National Dispatching Centre with the state enterprise “Ukrelectroperedacha” and the creation of a single company “Ukrenergo” took place. “Ukrenergo” provides the functions of dispatching control, organization of wholesale electricity market and electricity transmission through the HV line. The state enterprise “Energorinok” was set apart from “Ukrenergo” in 2000.

The functions of this enterprise include: organization of wholesale market work, wholesale electricity sale and purchase, economic dispatching control, fulfillment of settlements between the wholesale market participants and import of electricity. The privatization program developed in Ukraine foresees the privatization of power supply companies and the privatization of energy production companies. The concept of three

stage reforms of current wholesale electricity market was developed. It foresees the introduction of free competition at the third stage.

CHALLENGES

Financial (System) challenges

While it is an agreed upon principle that the CIS Common Power Market will increase the stability of supply and promote higher trade, it is important to understand that potential players in the market are not on the same level of either financial, or technological development. A term asymmetry could be introduced to refer to differences in the system,

Let us start with discussing the financial part of the markets first.

Most of the participants in the upcoming market simply do not have a substantial financial market at hands. Thus, it can be stated that “financial system asymmetries” are prevalent in the potential CIS’ CPM.

Overview

The asymmetries in the system can be traced back to the beginning of 1990s, when the post Soviet states started transforming their financial sectors in an attempt to meet the needs of the emerging markets. External funding in the socialist economies was acquired exclusively through banks. State entities had no budget constraints and central planning bodies would have banks finance industries that were underperforming. Because banks had no control of allocated resources after the issuance, their functions were simply limited to issuing the ordered amount of finances to the protected industries.

Banking

Post soviet transition hit these banks very hard, as they had to learn (often on their own mistakes) and derive the mechanisms for financial control and implementation. Financial institutions had to learn how to assess, pool, and spread risks, also control the issued amount, and exert power on their clients.

Apart from the difficulties that the banks were experiencing, policy makers had equally challenging problems. These included the need of deriving market-oriented regulatory institutions and sequentially policies needed to protect the rights of creditors as well as shareholders, as well as implementing control mechanisms while maintaining a level playing field in terms of tax policies and privatizing state banks.

Policy

Furthermore, governments had to learn to carry out the mentioned policies in a way that would be equally “friendly” to the financial sector and the civil sectors. All of this had to happen on a back tune of grave financial and microeconomic conditions in these states.

Following two decades of harsh economic conditions, the outcome in the CIS states now differ. Baltic countries have been successful in developing somewhat successful financial systems, however the rest of CIS countries find underdeveloped financial systems to be a majorly negative influence on the sustainable economic growth.

A major negative externality of these conditions was very high real interest rates, and subsequently low financing for small and medium size businesses. With a few exceptions, double standard regulation, non transparent systems, and weak protection of shareholders rights continue to limit investor activity in these regions.

In the early stages of development proportion of “bad loans” (as a % of portfolio) ranged from 2.4%¹ in Georgia to 72% in Kyrgyzstan. The actual situation was even worse, but was unaccounted for as a result of poor Accounting standards, or lack of authority.

Further, governments did not enjoy the institutional capacity or political ability and will that was needed to stop “soft” lending. To illustrate: “forgiving” accounting standards allowed banks to report bad loans be reported as overdue loans, thus the number of bad loans never rose to more than 20% average in the CIS. Obviously the reality could not have been any further.

Human capital was in tremendous shortage as executives lacked the operating knowledge needed to run and reform a modern financial institution.

Companies lacked modern infrastructure and IT, and corporate cultures were lacking on such fundamental values as confidentiality, client privacy, and mutual trust.

The first reform stage in the CIS countries introduced accounting systems and practices compatible with international standards. Despite the fact that these efforts were fragmented, uncoordinated, and lacked strict and uniform enforcement still brought on a somewhat similarised system that could be identified by all players in the different countries.²³

*(1 here and further the figures are taken from statistics of the central banks of respective countries unless other source is explicitly cited)

These changes meant undergoing vast economic changes for these countries. For example during 1993-1996 Kirgizstan strengthened bank licensing procedures and minimum capital requirements. This action led to loss of several banks on the market, however also excluded nonviable banks from existence. The end of year 1997 witnessed a share of nonperforming assets decrease to 7% from 75% in 1994 (Bokros, 2001).²⁴

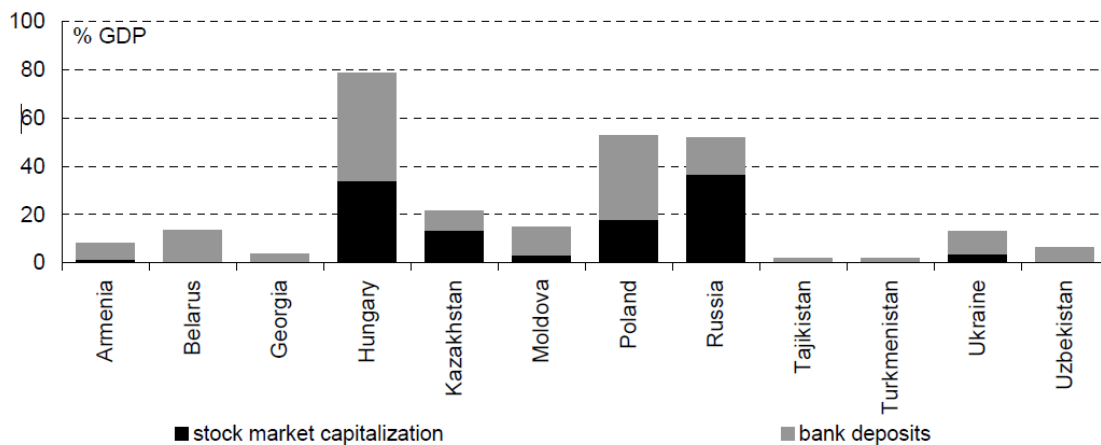
There is a widely accepted principal agreement (De Nicolo et. al., 2003)²⁵ that the central causes of high banking risks are common for CIS economies. These are generally weak legal and judicial frameworks. This results in weak protection of creditor, investor, and taxpayer rights.

An important observation can be made concerning capital market and financial institutions.: So that, while CIS countries have capital market and creditor rights legislation that can be compared to those in the EU, these laws are not well implemented, and capital markets are not utilized any efficient level. In his paper Claessens (2001)²⁶ points out that Armenia, Kazakhstan, Russia, Kyrgyzstan, Moldova, Ukraine, and Uzbekistan have received assistance from the US in creating their capital market legislation, so that ideally, the mentioned economies have the same level of legislation

complexity as the United States. However, compliance with these laws is one quarter of the US level for Uzbekistan, Kyrgyzstan, Armenia and Azerbaijan, Kazakhstan, Moldova, Russia and Ukraine concur at a 50% level (*ibid.*)²⁷. In all of the mentioned countries: corruption, weak legal systems, limited information availability are the prevalent reasons that make legal implementation of systems difficult.

Stock Markets

Fundraising on stock markets remains very difficult up until today, as even larger and established entities find stock trading very difficult. Just like banking systems, the stock markets were negatively affected by weak *de facto* protection of investors, substantial interest rates, underdeveloped infrastructure, commercial environment that carries high risk. Stock markets in CIS countries (except Russia and Kazakhstan) are very small compared to their banking sectors.



Source: WDI World Bank, IMF International Financial Statistics.

From above observations, conclusion can be drawn that CIS countries are on different levels in their development of financial systems. Some countries have been more successful in developing financial (and legal) sectors than others. Asymmetries in the mentioned systems between these countries make it more difficult to push events towards a common market.

During coming years, governments should push more towards creating financial systems that can share somewhat similar platforms. Making reporting systems and laws more similar can aid in understanding market intentions and standings.

Powering a deregulated common grid, will require countries to either develop further, or in some cases build from the ground up a new financial system for electricity trading. The creation will need a Greenfield investment in terms of tangible (Assets) and intangible (System development) commodities. It is obvious that countries without the aforementioned platforms will be facing longer lead times while trying to implement themselves into the amalgamated power grid.

To sum up, main challenges for the potential CPM players are as follows:

- Unstable banking sectors
- Highly unstructured stock markets
- Lack of legal implementation
- Nonexistent (or inexperienced) trading platforms
- Asymmetric reporting/accounting standards

Tables (5 and 6) Illustrate very good idea on how differently the development in these countries is going

CPM post Crisis

It is further important to observe these economies after the 2008 crisis hit. The CIS economies were hit with different severity across borders. Figure 7 below illustrates the severity, and the spread of crisis related halt in the CIS (And surrounding regions)

A “crisis index” was constructed for each country (figure 7) in order to track the severity of crisis and three points in time were considered: March 2008, end of 2008 and March 2009. The index ranges between 1 and 4 and is a derivative of the following four sub-indicators:

- 25 % (or more) depreciation of the exchange rate in relation to the USD
- Nominal property price decline of 20 % or more since the pre-crisis peak
- 2 (or more) months of declining production within the previous six months observed
- 2 (or more) back-to-back months of decreasing net credit within the previous six months.

According to the figure, we can see that there were signs of crisis by the first quarter of 2008 but only in select number of few countries, namely Kazakhstan, the Baltic States and some SEE countries. Following the end of 2008 as seen on the map the crisis started aggravating in the whole region.

International policy response

Post crisis international policy response was coordinated. The International Monetary Fund (IMF)'s resources constituted US\$ 750 billion, in for the needs of countries in transition economies, and the EC's resources for balance of payments support were raised to €50 billion. IMF also agreed action plans with Armenia, Belarus, Bosnia and Herzegovina, Georgia, Serbia and Ukraine. Conditionality of the "loan" was secured only by the idea of strengthening financial markets. Countries aided by the programme received aid roughly 4-30% of their GDP.

A significant element in the international policy response for the mentioned crisis has been "conditional multinational development bank" (MDB) support to the private financial sector. Under the Joint IFI Initiative, the EBRD, the European Investment Bank (EIB) and the World Bank coordinated the provision of up to €25 billion of financing to financial institutions operating in the transition region.²⁸

Future perspectives

For future outlook, two timeframes can be considered

- Recovery from short term effects of crisis
- The long term has outlook at recovery as well as future integration into the EU

Growth for the economies in the CIS region as was expected to be -6.2 per cent in 2009, this was caused by the large output declines recorded in the first half of the year, followed by 2.5 per cent growth in 2010 (see Table A.1.1.9). However, average year-on-year growth in 2010 is in part driven by rebounds in late 2009. Cumulative quarterly growth in 2010 itself is likely to be lower, in the order of 1-2 per cent. Growth in 2010 is expected to be challenged due to the slow recovery of export markets (with the IMF expecting lower than 1 per cent growth in the EU) and a continuing credit crunch.²⁹ The latter, reflects the expectation that: international banking groups will continue to decrease their assets in the region as they write down and provide for loan losses. Loan markets are still remaining slow, prolonging the difficulties of large corporate borrowers seeking to roll over loans.

To sum up the current trends in the mentioned economies and the general region, we can state that, there are likely to be major cross-country differences regarding the speed and outcomes of the post crisis recovery.

The fastest growth of course, is expected in internationally competitive economies with consistent banking and financial systems, as well as some producing countries, whose financial systems are smaller and were subdued less by the crisis. Countries with nonperforming loans are still under risk of high impact credit crunch. Weaker institutional frameworks for debt restructuring further augments the risks.

In countries with hard currency pegs, real exchange rates through prices and wages still require adjustments and could stop the growth in 2010. Finally, fiscal adjustment can weigh on aggregate demand in some of the mentioned countries.³⁰

Challenges in Sustainability

A very important part of forming a common electricity market is how sustainable this market can be. This relies on the selection of workable selection schemes, as well as the structure and size of the integrated region

Projects concerned with integration occur by means of multilateral agreements on both governmental and nongovernmental levels. The question of whether the increased size of integration means increased sustainability can be thereby raised.

In order for a unity to be sustainable it needs to reach a certain size in terms of members or power or some other relevant factor. An overly large market is under constant threat of losing members, and a very small market is susceptible to takeovers, or leverage from larger players.

When discussing sustainability of the power market at hand, two approaches can be outlined. From the standpoint of creation of a union between countries (integration as an international union), we can correlate on the sustainability of the unity to the number of countries, or people or GDP. From another point of view we can look at the integration as a mix of bilateral or multilateral agreements on different levels leading to larger structural integration, here it is possible to look at sub-level integration(s) and decided on which form and what number of agreements better lead to a sustainable unity.

When considering **integration as an international union**, the sustainable size of the unity is affected by the agreements on state and economical levels. Let us consider the market of institutions and economic policies, in which private structures (such as corporations and citizens co-operate and thus creating demand for institutional schemes which states offer or need to develop. These mechanisms include variables as participation in political life, lobbying and “voting with feet” etc. Under these circumstances, a sustainable integration group needs to meet two requirements: it needs to be satisfying to the states involved and it must generate economic benefits to private structures.

Diversity

The biggest threat identifiable to the stability of this unity can be considered the diversity of its members (pointed out above). If members of a target integration group are similar in views and opinions while their populations display certain homogeneity, these structures can be considered to be less susceptible to disintegration.

Excessive diversity can on the other hand, undermine agreements among members of a group on the integration conditions and thus increase the time spent in negotiation and coordination.³¹

In other words, diversity among members and participants increases the “cost” of deals on the “interstate market”; thereby the attractiveness of integration can also be decreased. We can define diversity by several traits such as ethno-linguistic traits; conditions of historical development and specificity of institutional systems, differences in standards of life, the education of population; and levels of urbanization (Considered above). Where there is too large of a diversity in preferences, efficient integration groupings (in this case structures where the well-being of member countries is improved through integration) can become unsustainable.³²

Policy and Efficiency

We can further increase the definition of sustainability in a given union through parameters such as *efficiency of institutional environment and coordination of public welfare*. I.E., *increasing the effectiveness of integration grouping increases it's sustainable (or maximum allowed) size*. Important to note here is the fact that above statement is especially true, when discussing mutually beneficial goods. The measures for satisfying above conditions influence the “market of institutions and economic policies”, improving ability of states offer higher benefits to private structures and thus thereby increasing their Willingness-to-pay for these. All other things held constant, the *efficient coordination of CIS CPM* is directly related to the *efficiency of governance* within member countries.

It is important to notice that higher quality of governance in the CPM does not directly increase the well being of states as much as it does so for bodies directly involved in the transaction. However, provided the absence of countries (And institutions such as legal frameworks etc), it is impossible for partners to create efficient interstate regulation. Indeed, the more efficient the government the more it reduces the “technical” costs of undertaking international negotiations, which is extremely important.

When we talk about grouping potential member states, a problem arises because influences and different scales of efficiencies in production and governance in different states as stated above, select number of states will have more volatile members and institutions, and thus carry smaller optimal size.

However these very states can be shown that their very diversity and inability to form into larger coalition leaves them with large losses.

An evolutionary approach to economic policy (*Herrmann, 2006*)³³ states that diversity in integration is in itself a form of “capital” and states the conditions for the evolutionary, competitive processes of knowledge acquisition, innovation and development. Moreover, this diversity of preferences is not a static phenomenon but is generated by a dynamic development process in which transactions on the “interstate political market” play an important role.

Governance

General level of governance within the group will define the evaluation framework of the situation. Advanced economies with advanced institution, have the ability to cope with *diversity issues* and then exploit their energy. As comparative economic theory would state, they are can be found on a higher “curve of institutional possibilities”).

Undeveloped institutional systems are more susceptible to this problem and are obliged to find a compromise between diversity and the advantages of integration. Based on the above, importance of efficient decision-making to the sustainability of a regional structure becomes undeniably important. As the case of EU expansion, the diversity of

preferences, though very important, plays much lower of a role than the ability of EU entities to adopt decisions at low cost. *Apolte (2006)*³⁴.

While considering the time spent on decision making, the ability for unilateral obstacles to be positioned before a potential integration group's member states and non-egalitarian access to information from various regions become much more significant. In the case of non-egalitarian access to information, the method of its collection is also tremendously important. (Behm, 2002)³⁵

Economic Development

Sustainability also depends on its member countries' *level of economic development*. Economic development is directly responsible for the development of (markets of) institutions and economic policies, defining the behavior of participants. In economy however, there is no evidenced link between economic well being and sustainable size for a mentioned type of unity. According to (Casella et. Al. 2002)³⁶ the link between economic development and integration trends around a U-shaped curve: at the early stage, integration formations encourage dynamic economic growth, however, at a certain point of development, countries become capable of achieving similar advantages without the need for formal integration created at the expense of their own so-called "coping strategy".

Liberal Frameworks

The results of negotiation between states (on the "interstate political market") may significantly influence results. The *scale of economic liberalization in the global economy* plays a significant role. In order to be sustainable, integration grouping should maintain an optimum size of its market, and take advantage of *economies of scale*.

Still, given that the regulations in global trade are relatively liberal, (on behalf of the WTO and other world organizations) the *sustainable size of groups is getting smaller* (Alesina et. Al., 1999)³⁷.

Thus, domestic economic entities must benefit from access to each other's markets without the necessitated difficult inter-governmental negotiations. So, reduction in the sustainable size of an integration group is brought by changes in the "market of institutions and economic policies", whose players refuse to pay the costs mandated by the "interstate political market".

However, there are much more complex factors at work. In particular, global trade environment and structure taken by regional groups are defined by the same processes (Etro, 2006)³⁸; it is thus extremely difficult, to establish cause-and-effect.

Conflict of Laws

A majorly important variable which influences "the sustainable size" is *the conflict of laws*, or competition between member states for mobile means of production.

The conflict of laws affects the size and structure of the potential integration in three ways.

For starters, according to Whincop and Keyes, 2001³⁹, it (conflict of laws) stipulates the desire for harmonized economic policy as a tool for alleviating competitive pressures in the tax and legal regimes. It also encourages the "joy-rider" occurrence, where the violation of established harmonization agreements creates a disproportionate effect on the competition in the jurisdictions. Further, conflict of laws at the expense of ex-post harmonization can reduce transaction costs on the interstate political market, thus creating the optimum conditions for negotiations to occur.

Finally, (Olofsgard, 2003)⁴⁰ from the point of view of generating demand for the integration projects in "market of institutions and economic policies", the conflict of laws makes "voting with feet" relatively more attractive and reduces opposition to the creation of an integration group, thus preempting the impact of the diversity of preferences.

Regionalization

Discussing *corporate integration (regionalization)* is important in the analysis. I.e. cooperation between states without formal international unions.

There are numerous examples of regional cooperation, where formal integration follows in some distance behind the creation of informal economic cooperation.

E.g. Asia-Pacific, where in the absence of formal cooperation, Japanese MNC production chains and informal networks in the Chinese diasporas have become vectors of regionalization.

Approaches to regionalization may differ vastly and can depend on the extent to which a “shared identity” exists in the region’s countries and on the extent of their economic interdependence. *Mattlin, 2005⁴¹*

Regionalization can go far to reduce costs of coordinating a common policy and encourage the creation of integration associations (based on eruption of shared identity and of the conflict of laws).

Cox, 1999⁴² suggests that a clear, positive link between regionalization and integration (NAFTA and projects involving the USA and Central America).

Similarities in the System

Homogeneity or symmetry of countries finds lots of attention in academic literature.

According to Feng and Genna (2004)⁴³ sustainable formations, are most likely created by similar countries, with similarities mainly in their institutional systems.

Similarity of institutional environment decreases transaction costs, making business transactions in such countries attractive to commercial entities. Also, similarity of *institutional systems* necessitates the generation of policies which are shared by group’s member countries, reducing the effort needed to unveil “shared” rules and institutions and create national policy for common standards.

An important distinction need to be observed between *economic structure* and diversity of economic institutions – the former allows governments and economies to complement each other, while the latter, complicates integration.

However, it is the *economic institutions* that define a country's economic structure, and it is very likely, that states with similar institutional systems coordinate similar economic structures. Empirical studies undertaken Feng and Gemma 2004, *ibid*⁴⁴, by have in fact confirmed the link between sustainability, institutional similarity and successful integration.

Complementarity

The notion of “*complementarity*” of foreign trade structures must also be used in analysis of the sustainability of integration networks. Empirical derivations in this field have been carried out for CIS countries by Plekhanov, 2005⁴⁵. From the point of view of integration, it is the similarity, or the Homogeneity of *institutional systems* that is definitive, rather than individual institutions. Institutions themselves look for complementarity, creating sustainable systems in which rules and norms, both official as well as unofficial, are linked. This tendency can pose further problems for quantitative analysis.

It is also important to stress that, in many cases; sustainability is not same as efficiency. Often, the existence of an integration group cannot be linked to its movement towards integration.

Outlook of the integration

Thus there are numerous barriers and semi-solvable challenges to the creation of the CPM.

In general, there are several models of markets for electric power with different degrees of liberalization. The creation of the CPM is possible only through liberalization of prices. Liberalization of prices for electric power is expected by 2011. It represents the basic precondition of the *CPM*.

However, in the light of above observations and facts, the idea behind the CPM, although correct, is heading in the wrong direction, and going faster will not help. What this means is that there are many more challenges to solve before the massive process of integration begins.

Once the process of integration begins, it will need vast amounts of financing and commitment, so the process is prohibitively expensive to reverse, making it “irreversible”.

Starting liberalization with the mentioned problems at hand is a premature move and might lead the CPM countries to majorly negative outcomes. Numerous power markets have been unsuccessful at least in the inception stage due to lack of solid groundwork.

Legal

Without proper framework results will be more aggravated. Player in the market (Rao UEs of Russia) are too powerful, and dominate the vertical integration in the power market, thus deregulation might actually give them a bigger more dominating monopoly. Also if a state owns transmission networks and small generation capacities, it will not be inclined to import cheap power while domestic power stations are idling – no matter how competitive. Thus, development of regional trade in electric power requires separation of commercial interests of generators and distributors.

Still, the example of NORDPOOL and the integrated electric power market of the three Scandinavian countries show that more dominant national companies need not be an insurmountable obstacle. Scandinavian electricity market is classified as the most efficient integrated regional energy market, dealing with both spot and future trades.

Nordpool experience goes to prove that, if regulation is efficient, common market may be created even with public companies dominating in both: generation and distribution.

Membership of the WTO also seems to be a forward step to facilitate the creation of a CPM, and it provides a legal foundation for member states. The accession of Russia and Kazakhstan to the WTO will be a positive indicator for the process. Kyrgyzstan, Ukraine and Georgia are already members of the WTO. However, Belarus, Tajikistan and Uzbekistan have been less than successful. This introduces more asymmetries into the system.

Legal framework is a key factor for creating a CPM. The incident below illustrates illustrates the danger and losses, which will occur when rules are not observed. In June 2007, Ukraine declared its intent to build a new transmission line around Moldova to provide energy to (Ukrainian) Odessa region. This decision was caused by the 2002 conflict with MoldElektrika, which, as UkrEnergo states, used Ukrainian energy without sanction and did not acquire energy at new prices. UkrEnergo stated that these were charges for failing to follow schedules for transfer of energy to Odessa region, refusal to regulate the rest of the energy flow and reluctance to follow the instructions of the dispatch of the Ukrainian company during accidents.

- *www.fin.org.ua/news.php&i=508492, available as of July 2008.*

The draft of the Concept of the Common Energy Market of the EurAsEC shows the following “extra” obstacles:

- Use of agreements for the division of production to a process where regional integration should be coordinated with foreign power companies;
- Regional disagreements of political nature, particularly, on the problem of the Caspian Sea Coast;
- Discrepancies concerning national energy security and sovereign energy policies (as a rule of thumb, national energy security prevails over integration goals).

As illustrated throughout the paper, there is a plethora of hindering obstacles to the CPM at the moment, thus making the effort towards the creation of Common Power Market in the CIS states excessive.

Creation of a CPM does not mundanely require the signing of a uniform agreement covering the whole region. Alternatively, *network of agreements* between the region’s states could be equally plausible. This network would be made using two kinds of arrangements: bilateral contracts and multilateral arrangements covering sub-regions, based on size, efficiency, and preferences.

Conclusions

Concerns over security of energy supply, together with economic pressures, have led various countries to look towards regional market frameworks. Such markets require that regulatory environments are reasonably harmonized and that market participants can operate within predictable, transparent and non-discriminatory frameworks.

Although steps have been taken towards regional integration, these steps as illustrated, lack either legal framework, or outlook on the future. Although countries have realized that integration will take more elaboration and effort on their side, not much is done to anticipate problems that arise from common power market despite the fact that abundant resources are available to show the problems associated with the initial stages of deregulation.

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Figures and tables

Figure 1 - http://www.iea.org/stats/pdf_graphs/16ELEC.pdf

Fig3

	2004	2005	2006	2007
Export, total	35235	34390	32073	28643
Export, CIS	21890	20112	15974	15509
Import, total	26302	24288	19546	18040
Import, CIS	18976	20765	18343	16582

Source, CIS factbook

Fig4, (IBID)

Acquirer	Acquired entity	Share, %	Amount, \$ mln	Year	Notes
Inter RAO UES	Distribution company Telasi (75%), AES Mtcari (100%), AES Transenergy (50%) (Georgia)		57	2003	
JSC Ekibastuz Centre (RK) and Inter RAO EES	JSC Ekibastuz NPP-2, Kazakhstan	JV (50/50)	90	2003	
Inter RAO UES	Sevano-Razdan cascade of 7 HPPs, "Armenian electric networks" (Armenia)			2003	
JSC International Energy corporation, EMFESZ (Hungary)	Moldova thermal power station ((Moldova, Transnistria)		39.2 + 163	2003	In July 2008, INTER RAO acquired further 49% from the Hungarian EMFESZ, thus consolidating 100% of shares.
JSC RAO UES and Government of Tajik Republic	JSC Sangtudin HPP-1, Tajikistan	JV (50/50)	500	2005	2007 - 142 million USD, planned for 2008 - 164.3 million USD. Total amount of investment in the project - 720 million USD.
JSC Tekhsnabeksport, JSC Atomstroyexport, JSC NAK Kazatomprom	JSC Centre of Uranium enrichment	JV (50/50)		2006	In 2008, Armenia entered the project
JSC Tekhsnabeksport, JSC Atomstroyexport, JSC NAK Kazatomprom	JV Nuclear Power Plants	JV (50/50)		2006	Development and marketing of the nuclear reactor VBER-300

Fig 5, 6 *transition indicators

Transition indicator scores, 2009												
Country	Population mid-2009 (million)	Private sector share of GDP mid-2009 (EBRD estimate in per cent)	Enterprises			Markets and trade			Financial institutions		Infrastructure	
			Large-scale privatisation	Small-scale privatisation	Governance and enterprise restructuring	Price liberalisation	Trade and foreign exchange system	Competition policy	Banking reform and interest rate liberalisation	Securities markets and non-bank financial institutions	Overall infrastructure reform	
Albania	3.2	75	4-↑	4	2+	4+	4+	2	3	2-	2+	
Armenia	3.2	75	4-	4	2+	4+	4+	2+	3-	2+	3-	
Azerbaijan	8.4	75	2	4-	2	4	4	2	2+	2-	2	
Belarus	9.7	30	2-	2+	2-	3↑	2+	2	2+↑	2	1	
Bosnia and Herzegovina	3.8	60	3	3	2	4	4	2	3	2-	2+	
Bulgaria	7.6	75	4	4	3-	4+	4+	3	4-	3	3	
Croatia	4.4	70	3+	4+	3	4	4+	3↑	4	3	3	
Estonia	1.3	80	4	4+	4-	4+	4+	4-	4	4-	3+	
FYR Macedonia	2.0	70	3+	4	3-	4+	4+	2+	3	3-↑	3-↑	
Georgia	4.5	75	4	4	2+	4+	4+	2	3-	2-	3-↑	
Hungary	10.0	80	4	4+	4-	4+	4+	3+	4	4	4-	
Kazakhstan	15.7	65↓	3	4	2	4	4-	2	3-↓	3-	3-	
Kyrgyz Republic	5.1	75	4-	4	2	4+	4+	2	2+	2	2-	
Latvia	2.3	70	4-	4+	3	4+	4+	3+↑	4-↓	3	3	
Lithuania	3.4	75	4	4+	3	4+	4+	3+	4-	3+	3	
Moldova	3.4	65	3	4	2	4	4+	2+	3	2	2+	
Mongolia	2.8	75	3+	4	2	4+	4+	2+	3-	2+	2+	
Montenegro	0.7	65	3↓	4-	2	4	4	2↑	3	2-	2+↑	
Poland	38.0	75	3+	4+	4-	4+	4+	3+	4-	4-	3+	
Romania	21.7	70	4-	4-	3-	4+	4+	3-	3+	3	3+	
Russia	142.2	65	3	4	2+	4	3+	2+	3-	3	3-	
Serbia	9.9	60	3-	4-	2+	4	4↑	2	3	2	2+	
Slovak Republic	5.4	80	4	4+	4-	4+	4+	3+	4-	3	3+↑	
Slovenia	2.0	70	3	4+	3	4	4+	3-	3+	3	3	
Tajikistan	6.8	55	2+	4	2↑	4-	3+	2-	2+	1	1	
Turkey	69.7	70	3+	4	3-	4	4+	3-	3	3-	3-	
Turkmenistan	6.5	25	1	2+	1	3-	2	1	1	1	1	
Ukraine	46.6	65	3	4	2+↑	4	4↓	2+	3	3-	2+	
Uzbekistan	26.0	45	3-	3+	2-	3-	2	2-	2-	2	2-	

Infrastructure transition scores, 2009

Country	Electric power	Railways	Roads	Telecommunications	Water and wastewater	Overall infrastructure reform
Albania	3↑	2	2+↑	3+	2-	2+
Armenia	3+	2+	2+	3	2+	3-
Azerbaijan	2+	2+	2+	2-	2-	2
Belarus	1	1	2	2	1	1
Bosnia and Herzegovina	3	3	3-	2+	2	2+
Bulgaria	4-	3+	3-	4-	3	3
Croatia	3	3-	3	4	3+	3
Estonia	3+	4	2+	4	4	3+
FYR Macedonia	3	2	2+	4-↑	2+	3-↑
Georgia	3+	3	2	3-	2+↑	3-↑
Hungary	4	4-	4-	4	4	4-
Kazakhstan	3+	3	2+	3	2	3-
Kyrgyz Republic	2+	1	2-	3	2-	2-
Latvia	3+	4-	2+	3+	3+	3
Lithuania	3+	3-	2+	4-	3+	3
Moldova	3	2	2	3	2	2+
Mongolia	3-	2+	2-	3	2	2+
Montenegro	2+	2↑	2+↑	3+	2	2+↑
Poland	3+	4	3	4	3+	3+
Romania	4-	4	3	3+	3+	3+
Russia	3+	3	2+	3+	3-	3-
Serbia	2+	2+	3-	3-	2-	2+
Slovak Republic	4	3	3-↑	4-	3+	3+↑
Slovenia	3	3	3	3+	3+	3
Tajikistan	2	1	1	2+	2-	1
Turkey	3+	2	2+	3+	3-	3-
Turkmenistan	1	1	1	2-	1	1
Ukraine	3	2	2	3-	2	2+
Uzbekistan	2+	3-	1	2	2-	2-

Changes in infrastructure transition scores

Country	Transition indicator	Change in score	Reason for upgrade
Albania	Electric power	3- to 3	Significant progress in unbundling, commercialisation and privatisation.
	Roads	2 to 2+	Cumulative improvements over several years in road sector financing and in open tendering of maintenance contracts.
FYR Macedonia	Telecommunications	3+ to 4-	Introduction of fixed and mobile number portability and greater competition in the market.
Georgia	Water and wastewater	2 to 2+	Introduction of an independent regulator and consolidation of water companies.
Montenegro	Railways	2- to 2	Adoption of a restructuring plan in line with EU directives.
	Roads	2 to 2+	Signing of the first public-private partnership (PPP) in the roads sector (a 30-year concession for maintenance and management of the motorway).
Slovak Republic	Roads	2+ to 3-	Signing of a number of PPP projects for the first time in the country.

crisis spread

