Authorities in the EBRD’s countries of operations are increasingly taking steps to open their electricity and gas sectors to competition and trade, promote renewable energy sources and improve energy efficiency. These sectors are transforming in response to concerns about supply and demand, energy security and environmental sustainability. As a consequence, policies and regulatory frameworks in the EBRD region are evolving, although at different speeds and with varying degrees of success. To measure the transformation of the sector and the evolution of regulatory practices the EBRD recently published the results of its first in-depth assessment of the electricity and gas sectors in its countries of operations, conducted during 2009. This article summarises the findings of that assessment.
Since the EBRD’s establishment in 1991, power and energy sector operations have been a key constituent of the Bank’s portfolio. Energy is an essential commodity that holds the key to economic development in the EBRD’s countries of operations. As both a significant investor and provider of technical assistance in the sector (and indeed in overall economic development), the EBRD is an avid observer of the status and development of the energy sector throughout its countries of operations. More particularly, the Bank is concerned as to the extensiveness and effectiveness of sector reform and the implications thereof for both its investment and technical cooperation activities. On the investment side, the Bank wishes to be in a position to more accurately assess the regulatory risks inherent in a given investment opportunity. While on the reform side, the Bank endeavours to assess the effectiveness of its technical cooperation efforts as well as to pinpoint elements the Bank could assist with in furtherance of its mandate.

Accordingly, the EBRD conducted its first in-depth assessment of the electricity and gas sectors in its countries of operations in 2009, publishing the results of the assessment in 2010. The assessment aims to encourage continued reform and liberalisation of the electricity and gas sectors, as well as improvements in the security of supply and promotion of the use of renewable energy sources (RES) and energy efficiency (EE) in the participating countries.

Assessment model and methodology

The assessment was conducted through questionnaires and supplemented with research and analysis. Three questionnaires were developed, one each for: (i) electricity; (ii) gas; and (iii) environmental energy issues related to promoting renewable energy sources and energy efficiency. Because the assessment focuses on energy regulation, the questionnaires were sent first to the regulators.
The assessment model was designed to apply across the wide range of political, economic and regulatory environments in the EBRD region.

The assessment model

The assessment model was designed to apply across the wide range of political, economic and regulatory environments in the EBRD region. It uses internationally recognised criteria and principles, but endeavours to adapt to regional differences wherever possible, offering a quantitative as well as a qualitative analysis to accommodate developing frameworks.

Internationally, we are aware of no multilateral standard embodying generally accepted best practices for the energy sector (unlike, for example, the telecommunications sector). The EBRD has therefore encouraged public comment, consultation and high-level negotiation among stakeholders to promote detailed core principles for effective energy sector regulation developed in a multilateral forum.

EBRD core principles for effective energy sector regulation

- clear, coherent and targeted policy, supported by primary legislation that sets out the rights and obligations of different sector participants and is supplemented by consistent secondary legislation (all publicly accessible)
- solid institutional framework for regulation in the form of an energy regulator, ideally independent but at a minimum sufficiently separated from industry actors and the policy-making authority
- liberalised electricity market, or a framework that supports a steady movement towards such a market, and a framework in the gas sector that supports a wholesale market
- non-discriminatory, third-party access to existing network elements
- effective separation of the network business from (commercial) generation and supply activities
- elimination of cross-subsidies and promotion of cost-reflective tariffs
- fair, equitable and transparent licensing procedure
- dispute resolution and appeal process that is efficient and accessible
- transparent framework that holds the regulatory authority accountable
- public service obligations that are carefully targeted to support vulnerable customers, rural or outlying customers, environmental protection and security of supply, while not impeding liberalisation.

For the analysis, the assessment divides the EBRD’s countries of operations into three separate groups based on their commitment to existing regional agreements and ensuing obligations affecting the power sector.

2. Regulatory authority (maximum score 15 points) This indicator considers the degree of division of responsibility between policy-making, industry and regulation to avoid overlap. The more autonomy the regulatory authority has to decide the framework tariffs, the higher the level of development of a market economy that supports competition and cost-reflective prices.

3. Market framework (maximum score 14 points) This indicator assesses the degree to which competition is possible, as well as the actual level of competition. This indicator includes a number of subcomponents such as the type of market model, the eligibility thresholds for operators to enter the market, the level of unbundling in the industry, and the retail options accessible to customers who wish to switch suppliers.

4. Network access (maximum score 12 points) This indicator assesses the network options available to new market entrants. Without access to a stable network that is able to handle increases in capacity, new producers cannot sell their product (within or beyond a country’s borders) and new customers may be restricted.

5. Tariff structure (maximum score 12 points) A liberalised market entails that the energy enterprises receive a fair price for the energy produced, distributed and supplied. International best practices, including ex ante publication of and public consultation on the regulated tariffs, elimination of cross-subsidies and introduction of incentive components to regulated tariffs have been taken into account in assessing the tariff structure.

6. Public service obligations (maximum score 10 points) It is widely accepted that some energy services (particularly transmission) are monopolies and therefore require regulation that includes public service and public protection components. For this indicator, the specific focus areas are provisions relating to supplier of last resort, quality of service, network maintenance and protection of vulnerable customers.

7. Transparency and accountability (maximum score 12 points) Without transparency and accountability, any regulatory and policy framework can be abused, misinterpreted or disregarded. This indicator is composed of subcomponents that consider the level at which the legal and regulatory framework is publicly available and accessible and subject to public consultation and comment.

8. Private sector participation (maximum score 10 points) This indicator is concerned with the viability of the existing framework for attracting investment in the form of:
   - incentives for new investment
   - provisions that facilitate cross-border trade
   - third-party access exemptions for new investment
   - framework to monitor market abuses that allows new entrants to the market and reduces incumbent priorities or manipulation of the market.

Although these eight indicators are the same for electricity and gas, several subcomponents are varied to accurately reflect the differences between the two sectors.

Country/regional groupings
For the analysis, the assessment divides the EBRD’s countries of operations into three separate groups based on their commitment to existing regional agreements and ensuing obligations affecting the power sector.

Group A – the EBRD’s countries of operations that are member states of the European Union (EU).

Group B – the Energy Community Treaty (EnC Treaty) signatories, which include the south-eastern European (SEE) countries (with the exception of Bulgaria and Romania, which are included in Group A), along with the observers to the Energy Community Treaty, that is Georgia, Moldova, Turkey and Ukraine. These countries are grouped together to reflect the common rules under which each of the signatories to the EnC Treaty is bound and the common objectives to which each of the observers has committed.

Group C – the remaining EBRD countries in eastern Europe, the Caucasus and Central Asia: Armenia, Azerbaijan, Belarus, Kazakhstan, the Kyrgyz Republic, Mongolia, Russia, Tajikistan, Turkmenistan and Uzbekistan.
The energy regulatory regime’s strengths and weaknesses vary from country to country – there is no path of development uniformly followed by the new EU member states.

Results – the electricity sector

Analysis of the results
For the purposes of the charts, “institutional framework” represents indicators 1 and 2 and comprises 30 per cent of the point-scoring potential; “market structure and access” represents indicators 3 and 4 and comprises 26 per cent; “tariffs and public service obligations” represents indicators 5 and 6 and comprises 22 per cent; and “transparency and private sector participation” represents indicators 7 and 8 and comprises 22 per cent.

Group A: EBRD countries of operations that are EU member states
For the EBRD’s countries of operations that are EU member states, compliance with energy market liberalisation requirements and the EU acquis communautaire is mandatory and has been so for many years. The result is that certain core best practices, such as an independent regulatory authority, a transmission service operator and related market unbundling, non-discriminatory network access and a published, transparent tariff structure, are required; thus, compliance in these areas is, as expected, extremely high. Each country achieved a score of more than 90 per cent, which is the minimum level of performance expected for this group, although room for improvement remains, particularly in the Baltic countries which lag behind the other of the EBRD’s EU member states (see Chart 1).

It is interesting to note that the energy regulatory regime’s strengths and weaknesses vary from country to country – there is no path of development uniformly followed by the new EU member states. The institutional framework in Hungary, for example, appears relatively weak and lacks independence and autonomy, particularly in its pricing authority. In practice, however, the Hungarian Energy Office: benefits from a market structure and network access conditions that are consistent with best practices; has greater enforcement powers than most regulators; and is a very active and knowledgeable agency. Bulgaria, one of the newer entrants to the European Union, suffers from some limitations with respect to tariffs and public service obligations, a weakness shared, to a somewhat lesser extent by the Czech Republic, Poland, the Slovak Republic and Slovenia.

Group B: Energy Community treaty signatories and observers
Obligations of the Energy Community Treaty contracting parties are less demanding than those imposed by EU membership (for example, the environmental and competition requirements), and for observer countries, commitment is entirely voluntary. Nonetheless, the Energy Community Treaty draws on the principles embodied in the EU legal framework, which justifies the 80 per cent score that the assessment has set as a minimum performance bar for the member countries (see Chart 2). Observer countries, which are not bound but are voluntarily moving towards implementation of the Treaty obligations, show more diversity, with Turkey scoring on a par with the contracting parties and Georgia and Moldova falling short.13 Ukraine is the only country that falls below the 70 per cent mark.

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Chart 1
Quality of electricity regulatory frameworks, by indicator group
(Group A. EBRD countries of operations that are EU member states)

<table>
<thead>
<tr>
<th>Per cent</th>
<th>High performance</th>
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<tr>
<td>100</td>
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<td>80</td>
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<td>60</td>
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Low performance

<table>
<thead>
<tr>
<th>Country</th>
<th>Institutional framework</th>
<th>Tariffs and public service obligations</th>
<th>Market structure and access</th>
<th>Transparency and private participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia</td>
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<tr>
<td>Bulgaria</td>
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<td>Latvia</td>
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<td>Slovak Republic</td>
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<td>Romania</td>
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<td>Lithuania</td>
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<td>Poland</td>
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<td>Hungary</td>
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<td>Slovenia</td>
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<tr>
<td>Czech Republic</td>
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</tbody>
</table>

Note: The chart shows the score for each country in the region for quality of institutional framework, market structure and access, tariffs and public service obligations and transparency and private sector participation. Combined scores are presented as a percentage, with 100 per cent representing optimum quality.

largely due to the low independence of its regulatory authority and the limited openness of the market. However, a reform to set up a liquid wholesale market based on bilateral contracts and balancing services to help open the market is under way (the Ukrainian government has estimated completion for 2014).

In the Energy Community – contracting parties and even more so for the observers – training as to regulatory development and best practices is relatively recent, with many regulatory agencies and accompanying frameworks formed (or significantly reformed) in the last five to 10 years. Moreover, most members of the Energy Community are smaller countries, with limited national market potential, and are primarily concerned about security of supply and the impact of new players on their economies. Thus, many of these countries protect state energy companies, creating some barriers for new entrants in the overall context of progress towards liberalisation. The situation in observer countries varies widely. Although Georgia, Turkey and Ukraine are noteworthy for their relatively larger size and energy strategic positions, Moldova has limited indigenous supply.14 The findings reflect this difference and also the varied obligations within the group.

Looking at the climate for private sector investment, Albania suffers some limitations, although the country will soon privatisate distribution. In addition, Albania has the advantage of strong transparency and accountability frameworks and thus less regulatory risk for the investor. FYR Macedonia has had recent privatisation success, due in no small part to concerted reform of its energy sector framework directed at reducing regulatory risk. Turkey offers a favourable environment for foreign investment, most notably in the distribution sector. As of 2000, regional divisions of TEDAS, the former Turkish distribution monopoly, have been progressively privatised, such that the private sector’s share in distribution is now around 25 per cent, with large participation of foreign capital.

In contrast, Georgia and Ukraine suffer from less transparent application of regulations, and less reliable, available information for potential investors (and banks) regarding the predictability of the regulatory regime. In Georgia, the market rules (which are adopted by the Ministry of Energy, not the energy regulator) have undergone numerous revisions in the past several years, which makes keeping pace with the changes challenging for a new entrant to the market and particularly for one with language barriers. Georgia and Ukraine require additional attention to improve the non-discriminatory and transparent allocation of capacity at borders and procedures for cross-border exchanges. This is of particular consequence for both countries, which have significant strategic importance and unrealised renewable energy source potential.

Group C: Armenia, Azerbaijan, Belarus, Mongolia, Russia and the Central Asian republics
Unlike Groups A and B above, the Group C countries have no external pressure towards the modernisation and liberalisation of their energy regulatory sector. It is thus particularly interesting to observe the progress they may

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**Chart 2**

*Quality of electricity regulatory frameworks, by indicator (Group B. Energy Community Treaty signatories and observers)*

<table>
<thead>
<tr>
<th>Country</th>
<th>Institutional framework</th>
<th>Market structure and access</th>
<th>Tariffs and public service obligations</th>
<th>Transparency and private participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
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<td>High performance</td>
<td>High performance</td>
<td>High performance</td>
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<tr>
<td>Croatia</td>
<td>High performance</td>
<td>High performance</td>
<td>High performance</td>
<td>High performance</td>
</tr>
<tr>
<td>FYR Macedonia</td>
<td>High performance</td>
<td>High performance</td>
<td>High performance</td>
<td>High performance</td>
</tr>
<tr>
<td>Ukraine (O)</td>
<td>Low performance</td>
<td>Low performance</td>
<td>Low performance</td>
<td>Low performance</td>
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<tr>
<td>Georgia (O)</td>
<td>Low performance</td>
<td>Low performance</td>
<td>Low performance</td>
<td>Low performance</td>
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<tr>
<td>Moldova (O)</td>
<td>Low performance</td>
<td>Low performance</td>
<td>Low performance</td>
<td>Low performance</td>
</tr>
<tr>
<td>Turkey (O)</td>
<td>Low performance</td>
<td>Low performance</td>
<td>Low performance</td>
<td>Low performance</td>
</tr>
</tbody>
</table>

Notes: (O) stands for observers of the Energy Community Treaty. The chart shows the score for each country in the region for quality of institutional framework, market structure and access, tariffs and public service obligations and transparency and private sector participation. Combined scores are presented as a percentage, with 100 per cent representing optimum quality.

Group A comprises the EBRD’s countries of operations which are also EU member states, plus the Czech Republic. These countries must comply with energy market liberalisation requirements and the EU acquis communautaire.

Group B comprises Energy Community Treaty signatories and observers.

Group C comprises the remaining countries of operations: Armenia, Azerbaijan, Belarus, Mongolia, Russia and the Central Asian republics.
Note: The diagrams present the electricity sector results of the assessment, in accordance with the benchmarks and indicators identified in the assessment model. The extremity of each axis represents an optimum score of 1.0, that is, full compliance with international best practices. The fuller the “web”, the closer the overall electricity regulatory framework approximates international best practices.

Recognising the importance of regional energy market trade to its security of supply, FYR Macedonia has taken an active role in the Energy Community.

FYR Macedonia was part of the former Yugoslav energy system until 1991. Since then, it has worked steadily to develop a national energy policy and regulatory framework and to liberalise its sector, including the privatisation of distribution companies. The country suffers from limited energy resources; only about 75 per cent of its electricity consumption is produced domestically (the majority from inefficient low-caloric lignite resources and the remainder from hydropower) and its gas supply is imported from Russia. Demand and import prices are increasing while domestic supply is not.

To address these issues, the country has taken steps to reform its institutional, market and investment environment, unbundling its electricity sector and privatising distribution in 2005. It has a regulated market and a wholesale market for eligible customers, with a phased market liberalisation plan (with 42 per cent opening up on 1 January 2008 and staggered thereafter until full liberalisation in 2015). A gas law was passed in 2006, introducing a similar timetable for market opening. There has been some history of political pressure with regard to end-user pricing, and investors have balked at inadequate tariff levels and the absence of institutional policing and legal assistance to address commercial losses. However, a credible regulator has been in place since 2004, with an independent structure and financing and a commitment to adopting and implementing a clear, predictable and cost-reflective regulatory framework.

Recognising the importance of regional energy market trade to its security of supply, FYR Macedonia has taken an active role in the Energy Community. In 2009 the country signed with the Energy Community a Memorandum of Understanding on the establishment of the Coordinated Auction Office, which is intended to function as a supranational auction office for capacity allocation on interconnections in the south-east European region.

Additional institutional reform, particularly on the policy side, is still needed. This includes the creation of a separate energy ministry (rather than – as is the case in much of south-eastern Europe – diluted responsibility within the Ministry of Economy). A dedicated ministry could develop greater domestic resources, including improvements to the gas infrastructure (and particularly the development of gas-fired power plants) and a more investment-friendly environment for new renewable energy source producers, such as favourable licensing conditions and priority access to the grid. Although it passed an Energy Efficiency Strategy in 2004, FYR Macedonia still uses electricity for heating (a downfall in the energy efficiency efforts, also observed in Albania and Montenegro).

Critically, FYR Macedonia’s energy sector would benefit from broad legislative reform that distances parliamentary rule-making from political upheaval; such reform would prevent the delays and deadlocks that have plagued otherwise laudable legislative efforts in support of energy reform over the last decade.

Case study FYR Macedonia

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In the six lowest-performing countries, the least-developed indicator is the absence (or low level) of a wholesale market, while limited transparency and the absence or limited independence of the regulator are other critical factors. There are, however, exceptions: in Kazakhstan, for instance, a wholesale market has been active since 1996, an electric power exchange has been in place since 2001 and a grid code was adopted in the same year. In addition, wholesale market participants have established the Pool of Electric Capacity Reserves (Pool ECR), which supports a reservation mechanism to cover emergency deficiencies in contributors’ contractual obligations.

The institutional frameworks are weaker in this region, with lower levels of independence and scope of authority among regulators (or their ministry equivalents) than in Groups A and B. Armenia stands out for the breadth of power and independence of its energy authority, the Public Services Regulatory Commission of the Republic of Armenia (PSRC). The PSRC, established in April 1997, is responsible for
Part I

Russia’s efforts in the last decade to reform its electricity market offer a useful model for its neighbours. The monopoly RAO UES (Unified Energy System of Russia) has been unbundled, and 20 of the resulting companies were privatised in 2008 – several with foreign investor participation. The reforms created six wholesale thermal power-generating companies (OGKs – which remain separate from hydro and nuclear assets) and 14 territorial generating companies (TGKs – which provide district heating as well as power). Foreign investors include E.ON and RWE of Germany (in OGK 4 and TGK 2, respectively), ENEL of Italy (in OGK 5) and Fortum of Finland (in TGK 10, plus a minority share in TGK 1). The (60 per cent) state-owned RusHydro JSC manages the vast majority of the Russian hydropower plants. The operation of the country’s transmission grid remains under state control through the Federal Grid Company.

At the wholesale level, a power exchange was established in 2006. The share of electricity that is sold at non-regulated prices is increasing in stages, from 5 per cent of the forecast balance prepared by the Federal Tariffs Service of Russia for 1 January 2007 to full liberalisation of the wholesale electricity (capacity) market in 2011. In the interim phase, the non-liberalised volumes are exchanged and paid for at regulated prices under regulated bilateral contracts.

The power exchange is made up of:

- the day-ahead market (DAM) – based on the mechanism of competitive price formulation or auction of electricity buyers’ and sellers’ bids. Auctioning is conducted daily, one day ahead of real time, and simultaneously for each hour of the day in question. Based on its results, balanced planned hourly output/consumption volumes are formed and equilibrium prices are determined, taking into account system constraints and electricity transmission losses. A major bid selection criterion is the maximisation of total benefit to DAM participants.

- free bilateral contracts – the execution of free bilateral electricity contracts by market participants, offering a complementary trade mechanism (in addition to the auction) by which contractual prices and supply volumes are defined by the parties. For the preservation of the day-ahead market financial balance, the contract parties pay the cost of electricity load losses and system constraints associated with the corresponding contract (that is, the parties pay the nodal price difference).

The power exchange is complemented by a balancing market. Volumes of actual output/consumption deviation from planned amounts for each participant are sold/purchased in the balancing market. The calculations are performed one hour ahead.
Since gaining independence, Kazakhstan has undergone dramatic economic reform and has some of the largest oil, gas, coal and uranium reserves in the world. It is a partner country of the EU INOGATE programme, which is directed at enhancing energy security, developing state energy markets in line with EU internal energy market principles, supporting sustainable energy development, and attracting investment to energy projects of common and regional interest. On 4 December 2006 Kazakhstan and the European Union signed a Memorandum of Understanding enhancing these commitments.

The Ministry of Energy and Mineral Resources (MEMR) is responsible for energy policy. An anti-monopoly entity was originally established in 1991 but in 2004 its functions and powers were split between the Agency for Protection of Competition (APK) and the Agency for Regulation of the Natural Monopolies (AREM), with primary responsibility for setting tariffs and tariff methodology for gas, electricity, oil products and heat generation. The two agencies are central executive bodies, separate from the government in terms of organisation, personnel and budget; but limited in autonomy, particularly with respect to the ability to dismiss the agencies’ management and overrule regulatory decisions.

The Unified Electric Power System of the Republic of Kazakhstan (UEPS) is a complex that includes 60 power plants, transmission lines and substations that provide energy supply to consumers. A wholesale market, despite its imperfections (most notably in balancing and ancillary services markets) has been operative since 1996. Electric power exchange functions have been in place since 2001 and a grid code was adopted in the same year. The Kazakhstan Wholesale Electric Power Market Operator (KOREM) acts as the operator for centralised trade of electric energy.15

Currently, only traders and consumers with a daily capacity of at least 1 MW have the right to purchase electricity on the wholesale market. An amendment to the Law On Energy Sector adopted in December 2008 provides for a radical change of wholesale price formation. In particular, a price cap for each of the 13 groups of power producers (depending on technology and distance from the source) has been established, marking a shift from a competitive price formation to a regulated one. Competitive retail markets are functioning nominally. Although technically unbundled, the retail markets are affiliated with the regional electricity companies and each has a monopoly over the corresponding retail markets, with the price of electricity approved by AREM. Although Kazakhstan’s proven reserves are the 11th largest in the world, almost all of the gas produced is associated with oil production from the Tengiz and Karachaganak projects in the west of the country and much of it is re-injected in order to maintain reservoir pressure and enhance oil output. Gas-flaring has also been prevalent, although this has decreased since 2005 as a result of government regulation. The relatively slow growth of gas production is caused by a lack of transport infrastructure. The country’s most populous southern region is not connected to the western fields and relies on imports. This is a legacy of the Soviet system, which created links based on proximity and Soviet-defined needs, not internal borders.16

regulating the electricity, gas, telecommunications and district heating sectors. PSRC’s financing is provided in full by fees paid by regulated entities. However, Armenia does suffer from some limitations on market access and transparency. While Mongolian market access is also suffering some limitations, the country should be applauded for efforts by its regulator to institutionalise clarity in the roles and responsibilities of sector participants and introduction of transparent decision-making processes. Azerbaijan’s sector is heavily dominated by the state, with minimal market access. The absence of public consultation resulted in low transparency scores for Tajikistan and Uzbekistan. In Mongolia the regulator launched an operational model for the national grid starting in September 2002, whereby the generation companies sell electricity at regulated prices to a single buyer. To complement the single-buyer model, a spot market was introduced in 2006 and an auction market has been operating since 2007. The Mongolian electricity industry has been unbundled since 2001, and comprises five generation, one transmission and eight distribution companies. With the exception of one private distribution company, all are state joint-stock companies.
Part I

Results – the gas sector

In addition to the electricity sector, the assessment included a comprehensive analysis of the legal and regulatory regimes of the gas sector across the EBRD region following the same methodology and country groupings (Groups A, B and C). Because of characteristics specific to the gas sector (see below), the results are presented separately from the electricity sector assessment. A number of the EBRD’s countries of operations have a fragmented or undeveloped gas sector, with some countries in the assessment lacking an active gas system (that is, Albania, Mongolia and Montenegro) or a gas system that is not sufficiently developed to allow a full assessment (Bosnia and Herzegovina, FYR Macedonia, the Kyrgyz Republic and Tajikistan); as a consequence gas graphs are not provided for these countries (see Chart 5).

Chart 5
Quality of gas sector regulatory frameworks – selected countries

Group B comprises Energy Community Treaty signatories and observers.
Group C comprises Armenia, Azerbaijan, Belarus, Mongolia, Russia and the Central Asian republics.

Note: The diagrams present selected results of the gas sector assessment, in accordance with the benchmarks and indicators identified in the assessment model. The extremity of each axis represents an optimum score of 1.0, that is, full compliance with international best practices. The fuller the “web”, the closer the overall gas regulatory framework approximates international best practices. Full results of the gas sector assessment are included in the final report, www.ebrd.com/law/irc/power/assess/report.pdf.

Considerations specific to the gas sector

An important regional consideration for the natural gas sector in the EBRD EU member states is security of supply. The gas supply disruption of January 2009, which resulted from the Russia-Ukraine transit crisis, revealed weaknesses in the existing import arrangements and, in particular, the high level of risk exposure of the eastern part of the internal EU gas market. This disruption of supply has prompted renewed national and internationally coordinated efforts across the region to enhance security of supply. Additional measures that need to be addressed in central and south-eastern Europe are strengthening of interconnections, network harmonisation, reverse-flow capability and market flexibility through storage, liquid natural gas (LNG) and hub trading.

The gas markets across the signatories of the EnC Treaty are small and fractured. Albania and Montenegro lack a gas market, and the gas markets in Bosnia and Herzegovina and most of FYR Macedonia are only at the initial stage of gasification. As a consequence, there is a pressing need for further gasification in much of southern and western Serbia and southern Croatia. The gasification of the region requires large up-front investments, both in the form of new pipelines and construction of new capacity for the markets.

As an observer to the EnC Treaty, Ukraine plays a critical role as an intermediary connecting Russia with eastern European and western European markets. The Ukrainian gas transport is one of the largest in the world: it has an annual nameplate input capacity of 280 bcm (billion cubic metres) and output capacity of 175 bcm. UkrTransGaz, the national gas transmission company, estimates that in 2007 approximately 4.5 Tcf (128.4 bcm) of Russian natural gas transited Ukraine (en route to Europe and for domestic consumption). Currently, the gas sector of Ukraine is dominated by the vertically integrated state-owned Naftogaz which, inter alia, controls UkrTransGaz and the vast majority of distribution companies. Only large and medium-sized industrial consumers can choose their supplier, which is de facto limited to the duopoly Naftogaz-Gazprom-sbyt, while the retail sector (households, district heating, public organisations and small industry) is supplied under monopoly conditions by regional gas companies. At the time of writing no timeframe for gas market opening was formally established. However, the government has recently committed to a full-scale reform of the gas sector, consistent with the objective of membership in the Energy Community, which would require harmonising market rules with the EU Electricity Directive.

The countries belonging to the third group (Group C) have various sources of gas supply and show different levels of development of their gas markets. As a general characteristic, the markets of the region are energy-intensive. While natural gas reserves in Russia and Central Asia are among the largest in the world, at the same time, Russia and Central Asia are also large gas consumers. The aggregate consumption in the CIS and Georgia is greater than that of the European Union.

Russia’s exports to Europe are vital energy policy considerations for Europe and influence much of the policy and regulatory framework of neighbouring countries.

Russia’s exports to Europe are vital energy policy considerations for Europe and influence much of the policy and regulatory framework of neighbouring countries. In addition, Turkmenistan is a major gas exporter with ambitious plans to increase production and exports. Uzbekistan is also a large gas producer but with output dedicated largely to meeting domestic demand and the demand in Azerbaijan and Kazakhstan. The increase in Caspian and Caucasus natural gas production and exports has led to the development of a number of proposals on the international scene to strengthen and expand the existing pipeline network (flowing towards western European and Asian markets). Further development of these networks would be of substantial importance to the western and central European markets.

At the domestic level, the gas sectors in the Group C countries largely consist of vertically integrated monopolies (or near-monopolies). In contrast with the electricity sector, there are few signs of effective market opening and the legislative framework, even at its most developed, provides for limited or no unbundling of the sector. In a few countries though, most notably Russia and Ukraine, market reforms that could substantially transform their respective (and regional) gas sectors are in their infancy.
Since 2006 Russia has had a policy to address price increases and requires that by 2011 domestic prices will be at “parity” with export prices (less transportation and excise duty), resulting in a domestic price that is 60 to 70 per cent of export prices.

In Russia, one state-controlled company, OAO Gazprom, dominates the gas sector, accounting for more than 60 per cent of Russian reserves (almost 30 tcm according to IEA 2008) and almost 85 per cent of Russian production. Gazprom owns the Russian gas transmission system and has a legal monopoly on gas exports. Oil companies and independent gas producers each account for another 20 per cent of Russian gas reserves and produce the balance of the production. Since 2006 Russia has had a policy to address price increases and requires that by 2011 domestic prices will be at “parity” with export prices (less transportation and excise duty), resulting in a domestic price that is 60 to 70 per cent of export prices. This is the culmination of steady progress during the past two to three years to bring domestic gas prices to more cost-reflective levels. In 2008, prices were slightly more than half of the European level. The price reform envisaged by the policy is expected to have a very positive effect on energy efficiency.

In Azerbaijan, a wholesale market exists, organised as a single-buyer model, with wholesale prices determined by the regulator, the Tariff Council of the Azerbaijan Republic. The main sources of gas in Azerbaijan are offshore. The main gas export route is the South Caucasus Pipeline, completed in 2006, which leads from Baku through Tbilisi to join with the Turkish gas grid in Erzurum.

The Kyrgyz Republic is not represented in the spider graphs because its gas sector is limited, with a total consumption of less than 1 bcm, although nascent plans for development are taking hold. Domestic reserves are negligible and the country depends on imports from Uzbekistan. The vertically integrated state-owned companies Kyrgyznetftegas and JSC Kyrgyzgaz are responsible, respectively, for production and transmission and distribution of natural gas. Recently, as a consequence of joining the World Trade Organization (WTO), the Kyrgyz Republic has developed plans to privatise and restructure Kyrgyzgaz JSC and begin sectoral liberalisation. In June 2009 Kyrgyz authorities approved a draft of an intergovernmental agreement with Russia which includes the acquisition by Gazprom of a controlling stake in Kyrgyzgaz.

Renewable energy sources and energy efficiency – status and considerations

Energy efficiency (EE) and renewable energy sources (RES) deserve targeted attention separate from the analysis and approach offered for conventional energy, because they are characterised on a geopolitical level by the need for environmental and supply security, and on an operational and regulatory level by unique characteristics such as grid access and cost. So, for example, the importance of EE and RES has resulted in the development of specific targets regionally in the European Union and the United States, as well as in individual states and countries, along with changes in the governing legal frameworks and guiding principles to remove barriers to EE and RES use. Initial support mechanisms are viewed as spurring technology development and reducing expensive up-front costs that often come with new renewable energy initiatives.

Increased concern about climate change resulting from emissions, growing energy use around the world and energy security, means that any evaluation of electricity and gas sectors must also address whether the existing policy and legal frameworks promote renewable energy sources and energy efficiency. In 2006 the EBRD launched the Sustainable Energy Initiative, focusing on enhancing energy efficiency in the industrial power and municipal infrastructure sectors, promoting RES, and supporting the development of the carbon credit market. In 2008 the EBRD adopted a new Environmental and Social Policy, which articulates its policies on sustainability, emphasising that the EBRD’s mandate to foster transition to market-based economies and promote private entrepreneurship is inextricably linked to its commitment to sustainable development. So too, the European Commission has adopted new directives and regulations to promote sustainable energy initiatives.
International and regional energy regulatory and policy meetings and strategies are focusing on renewable energy sources and energy efficiency issues, looking in particular at how these intersect with existing sector principles and frameworks, with an objective of addressing climate change.

Energy efficient measures attempt to reduce energy consumption and conserve energy, while the promotion of RES is directed at reducing carbon emissions and, optimally, finding new, indigenous and sustainable ways to produce energy. For the most part, EE policy is set through national legislation and supported by standards and codes that affect the demand-side (lighting and housing standards, for example). Efficiency standards are also often incorporated into existing regulatory and policy approaches, through tariff structures that credit industry for increasing efficiency, or penalise utilities for failing to do so. RES, on the other hand, is often a separate but additional part of the existing policy and regulatory framework. The regulators are therefore implicated, often because the energy ministries handle RES policy, but also because the regulator may be charged with the responsibility to develop or implement RES policy or rules.

The integrity of this assessment therefore depends on including consideration of how RES incentives are incorporated into the individual regulatory and policy frameworks and how energy efficiency is integrated into the sector operation.

Regional considerations for RES and EE

In Group A, which comprises those EBRD’s countries of operations which are EU member states and the Czech Republic, the energy frameworks have been recently, or are in the process of being, adjusted to incorporate RES and EE incentive structures. The major forms of RES support are renewable electricity production support via an obligatory feed-in system, investment subsidies for different RES from domestic sources, and EU funds and tax allowances for biofuels. In Hungary, for example, RES policies were established as part of the country’s accession to the
In Turkey, energy efficiency policy and renewable energy policy are both framed in terms of security of supply, with a sector strategy paper for the electricity market and security of supply recently approved.

European Union in 2004, with significant harmonisation with EU legislation in this area occurring as recently as 2008 (although Hungary, unlike many other countries in Group A, has no specific RES or EE legislation, but instead incorporates incentivising principles into electricity legislation amendments).

For the vast majority of Group A countries, a ministry rather than an energy regulator adopts and implements policy for RES and EE. The incentive structure, subsidy level and national target tend to be policy decisions by ministries. In some instances, however, regulators are responsible for determining the supporting secondary legislation or decisions, such as the quantity of electricity to be produced by specific producers at fixed tariffs to assure return on an RES investment or the implementation of a guarantee of origin system.

Among the EnC Treaty signatories (Group B), RES and EE are receiving policy attention, but supporting secondary frameworks are still limited. In Montenegro, for example, much recent activity has involved the development of policy, strategy and assessments for EE and RES, although in practice implementation is slow, and the legislative framework lags behind. No national laws on energy efficiency and combined heat and power exist. The Energy Law of 2003 covers basic aspects of renewable energy sources, but secondary legislation in the area of efficiency or RES is minimal and the support scheme for renewable energy is limited to the possibility of government incentives, which are not yet in force, and to priority dispatching (that is, the concept that when dispatching installations, transmission system operators shall give priority to generating installations using renewable energy resources insofar as the operation of the national electricity system permits).

Similarly, in Bosnia and Herzegovina, no national policy or law promotes combined heat and power, energy efficiency or renewable energy sources. The Ministry of Foreign and Economic Relations is responsible at the state level, and the energy regulator does not directly address RES or EE issues. On the entity levels (for the Federation of Bosnia and Herzegovina and the Republic of Srpska), renewable energy sources policy is regulated by government decision for both entities. Specifically, public utilities are obliged to off-take all electricity produced from renewable energy sources; the public utilities cover this additional cost and RES generators are not permitted to sell electricity at the wholesale market.

In Turkey, energy efficiency policy and renewable energy policy are both framed in terms of security of supply, with a sector strategy paper for the electricity market and security of supply recently approved by the Higher Planning Council in May 2009. Primary legislation in the area of energy efficiency and a separate law on renewable energy resources were passed in mid-2007. At present, renewable energy sources are supported by feed-in tariffs, for a 10-year term, with a purchasing obligation for retail licensees. The same feed-in price is applied to all renewables, but amendment of this system is pending before Parliament. Moldova enacted a Renewable Energy Law in 2007 and is just defining the secondary legislation required to implement it; although significant work has to be done to bring the law in line with supply and economic conditions. Moldova’s lead in this area is impressive.

The Group C countries have little binding regional stimulus for the development of RES/EE legislation. In the Kyrgyz Republic, Tajikistan and Uzbekistan, hydropower accounts for much of the total generating capacity (in Uzbekistan, it is 13 per cent; in Tajikistan, it is 98 per cent; and in the Kyrgyz Republic it is about 90 per cent) and is the primary renewable energy resource in the region, with some (largely unrealised) potential for wind, particularly in the Kyrgyz Republic. Although some environmentalists argue that large-scale hydropower carries excessive risks to land and biodiversity and should be excluded from classification as renewable energy (and from inclusion in accompanying support schemes), the prevailing view (and practice in the European Union and the United States) is to treat large hydropower as RES. In Central Asia, however, issues surrounding hydropower development are particularly controversial. Most of the water flow in Central Asia comes
Across all of the EBRD’s countries of operations, the assessment demonstrates that the regulators either lack access to or comfort with renewable energy sources and energy efficiency policies.

From the Kyrgyz Republic and Tajikistan, Kazakhstan, Turkmenistan and Uzbekistan are all dependent on this water flow. The result is that actions by the Kyrgyz Republic and Tajikistan that affect or potentially affect the water supply are of political interest. In particular, investor efforts to build hydropower plants in both countries have encountered protests from the downstream Central Asian countries, particularly Uzbekistan.

In Kazakhstan, RES electricity production (excluding hydropower generation) is minimal, although legislation has recently been enacted to promote RES and energy efficiency technologies. Significant progress in these sectors is expected following the recent passage of the Act “On supporting the use of Renewable Energy Sources” (June 2009) and the amendment of the Act “On Energy Savings” (which is in the process of approval at the writing of this article). The government of Kazakhstan and the EBRD signed a sustainable energy action plan in June 2008, which is a main platform for energy efficiency investments. This plan is part of a wider effort to put the country’s economy on the right path for sustainable growth, economic diversification and competitiveness. In Mongolia, efforts in the RES field have concentrated on providing rural electricity access for those herders and rural communities lacking access to the main power grid. A legal framework to support these efforts is in its infancy, with a new strategy in 2005 and a law on renewable energy passed in 2007, which seeks to eliminate barriers to new investment. In particular, it empowers the regulator to review contracts between new RES power producers and the transmission or distribution company and it sets a feed-in tariff range for different types of renewable energy. Significantly, implementation has begun; the regulator has issued a licence for construction of a 50-MW capacity wind farm and approved a power purchase agreement for the same between the investor and the transmission company.

Across all of the EBRD’s countries of operations, the assessment demonstrates that the regulators either lack access to or comfort with RES and EE policies. Possibly due to the new and evolving nature of these policies, some information is not transferred or gathered easily. In addition, many regulators lack direct competencies in these areas, and thus do not focus on them, despite the important role that regulators always play as leading sector experts. Given the importance of sustainability and the increasing attention being given to international agreements and actions directed at promoting sustainability, the absence of active involvement by many regulators is a cause for concern. Most of the EBRD’s countries of operations have ratified Kyoto, and most have at least national strategies that promote RES and EE and have implications for sector activity. Indeed, as noted above, most regulators do have some form of implementing role with respect to RES (and EE with respect to efficiency incentives as part of the tariff methodologies). It is critical that, as regulators develop their skills and learn new ways to address their tasks to the benefit of the sector, they also develop strategies to promote sustainability, regardless of whether their role is policy-setting, implementation, or indirect and advisory. Additional training of regulators on RES and EE best practices, sector impact and integration, as well as regional harmonisation, is essential.
Conclusion

The assessment’s results contain a good deal of information that is difficult to convey in the context of a short piece. Readers with an interest in the subject are encouraged to refer to the full report for detailed scoring and data. However, a few words may be useful to summarise the assessment’s main findings.

The assessment model implies that transition countries are moving towards an internationally agreed set of principles, and its objective is to provide an overview of the energy sector from this perspective. Concerns about security of energy supply, together with economic pressures, have led various countries to explore regional market frameworks. Such markets require that regulatory environments are somewhat harmonised and that market participants can operate within predictable, transparent and non-discriminatory frameworks.

Across the EBRD’s countries of operations, regulatory progress is visible, although the degree differs greatly among and within the regions. The EU members have achieved a high threshold of compliance with their legal obligations. The Energy Community Treaty countries (the signatories in particular, but increasingly the observers too) are catching up steadily; the adoption of the EU energy acquis and the implementation of acknowledged best practices are viewed as a defining step towards EU integration and the greater economic security that comes with EU membership.

Countries outside any international framework have been slower to implement reforms, which largely reflect political, economic and infrastructure limitations (although Russia stands out for its noteworthy reform efforts among the countries in Group C).

The EBRD will support positive regulatory reforms in the transition countries where they are most needed. The target for these countries should be the achievement of greater regulatory independence (or the establishment of an energy regulator in some Central Asian republics), as well as competition safeguards, supported by transparency, non-discrimination and accountability. In RES and EE, future reforms should place priority on raising awareness of the need for promoting sustainable energy at the policy and regulatory level (in particular within Group C countries) and strengthening the local authorities’ knowledge and capacity. The challenges the Group C region faces in this respect are immense, but so is its potential.

Implementation of best practices should lead to greater energy security, access to energy and public confidence in the sector, and in turn promote economic development, growth and long-term sustainability.
Notes and authors

1. The EBRD has 29 countries of operations in which it invests. For a full list of these countries see www.ebrd.com/country/index.htm.

2. The full assessment report, country-by-country analyses and regional comparative assessments for the electricity and gas sectors as well as information about national policy targets for energy efficiency and renewable energy sources can be found at www.ebrd.com/law/irc/power/assess/report.pdf.

3. If the regulatory authority had no competency in renewable energy or energy efficiency issues, the questionnaire was then sent to the governmental institution designated with responsibility.

4. To ensure impartiality and facilitate dialogue between the EBRD and energy sector authorities, all relevant national authorities received a copy of the draft final case summary applying to their country and were provided with the opportunity to comment on that summary before conclusions being drawn therefrom and publication of the final results.

5. For instance, the World Trade Organization Reference Paper on Basic Telecommunications Services defines a set of regulatory principles for the establishment of fair market conditions in the telecommunications sector, and by 2008 around 75 countries had formally accepted the Reference Paper.

6. See the Energy Charter Treaty. Signed in 1994, the Treaty entered into force in 1998. All EBRD countries of operations have signed the Treaty, except for Serbia and Montenegro. Belarus and Russia have signed but have yet to ratify it.

7. These include, inter alia, the EU Electricity and Gas Directives.


12. The EBRD’s countries of operations which are also EU member states are Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia. The Czech Republic is included in Group A, although it graduated from the EBRD’s operations at the end of 2007.

13. Taking into account the fact that the observer countries are not yet members of the binding Energy Community Treaty, the assessment expects them to meet the 75+ per cent target, with rapid progress towards the 80+ per cent mark in the next year or two.

14. Participation of Moldova and Ukraine (and countries to their east) in the energy markets to their west is challenged by infrastructure limitations. Western Moldova borders Romania but Moldova’s network is not synchronous with the European network.

15. The Pool of Electric Capacity Reserves (Pool ECR) is the organisation established by wholesale market participants, supporting a mechanism of reservation of electric capacity, which is necessary in order to cover emergency deficiencies of market participants versus their contractual obligations.

16. The natural gas trunk pipeline system stretches 10,140 kilometres. The major transit pipelines are the Central Asia-Center gas pipeline system and the Bukhara-Urals pipeline, which transport natural gas from Turkmenistan and Uzbekistan to Russia, and the Orenburg-Novopskov pipeline and Soyuz pipeline from the Orenburg processing plant to Europe.

17. The countries of Group C and the observers of the EnC Treaty (except Turkey) are those for which the differences between the electricity sector and the gas sector, in terms of market structure and regulatory framework, are most noticeable. Thus, those with a sizeable gas sector are represented in this section. The assessment results measuring the level of development of the gas sector for each of the EBRD’s countries of operations are presented in the final report.

18. Europe’s dependency on natural gas exports from Russia drew worldwide attention in January 2006 when a longstanding dispute over price and payment mechanisms in the in-kind agreements caused Gazprom to shut off gas supplies to Ukraine. Supplies to Europe were also affected.

19. The pipeline system built in the Soviet era was intended to take advantage of two sources of natural gas reserves – the major fields of West Siberia and those of the Central Asian states (Kazakhstan, Turkmenistan and Uzbekistan) – and to supply the largely populated European regions of the Union. This structure still affects the international flows of gas, with Russian export pipelines the dominant outlet for Turkmen and Kazakh supplies.


The new RES Directive was published on 26 March 2009. The full text is available at: register.consilium.europa.eu/pdf/en/08/st03/st03736.en08.pdf. Importantly, it makes clear that the development of renewable energy sources is a core priority for the internal market in the European Union. With this in mind, the new RES Directive creates various legal structures to encourage investment in renewable energy, such as making renewable energy exempt from the existing EU energy acquis requiring nondiscriminatory access to the grid and thus prohibiting priority access or reservation of capacity. The RES Directive holds that renewable energy is an exception to the standard rule. Article 16 provides that Member States shall take steps to enhance their networks to accommodate the development of new renewable energy sources and ensure that when dispatching electricity-generating installations, transmission system operators give priority to generating installations using renewable energy sources as permitted by the secure operation of the national electricity system and based on transparent and non-discriminatory criteria. A similar effort underpins energy efficiency measures.


The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. As of writing, 184 parties of the Convention have ratified its Protocol. The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh in 2001, and are called the “Marrakesh Accords”.

The 2009 World Forum on Energy Regulation, held in Athens in October 2009, which included regulators from around the world, made sustainable energy a focal point for discussion. This initiative is the outgrowth of the Heiligendamm G-8 Process of 6-8 June 2007, which launched a dialogue of the G-8 countries with the main emerging economies on energy issues, recognising the importance of secure, stable and competitive energy supplies for achieving sustainable development.

An Energy Efficiency Strategy was adopted in October 2005, a Strategy for Small Hydro Power Plans was adopted in April 2006, an Assessment of Renewable Energy Resources in April 2007 and a National Energy Development Strategy to 2025 was passed in December 2007, including provisions on identifying investment opportunities in Montenegro, and focusing particularly on RES.

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