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# Eastern Europe, Caucasus and Central Asia

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## EXECUTIVE SUMMARY AND KEY RECOMMENDATIONS

### EXECUTIVE SUMMARY

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Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan (collectively referred to as the countries in Eastern Europe, the Caucasus and Central Asia [EECCA]), cover a large geographic area of approximately 5 million square kilometres across central Eurasia, with a total population of 140 million.

More than two decades after the break-up of the Soviet Union into 15 sovereign states with their declarations of independence, the levels of national sovereignty and the political and economic structures of these countries vary. They all have significant ethnic, historical and economic differences, and vary in size, geopolitical location, energy endowment, economic outlook and developmental milestones and prospects. However, they all share a recent Soviet past, from which they have inherited significant similarities in national economic design, governance structure, public institutions and infrastructure.

The post-Soviet period began with heavily interlinked industries and infrastructures, and fully integrated regional systems, preventing the newly independent states' functioning autonomously from one another. Augmented by the fact that their economies had been centrally governed during the Soviet era, none of these countries had the ability to master the full administrative spectrum of their internal or external affairs and were thus left with sovereign authorities that had no leverage over the neighbouring economies with which they were so strongly linked.

Physical, economic and institutional dependence on Russia, as heir to the Soviet legacy, became stronger and more inevitable for some of these countries, while in others nationalistic movements took a high toll on efforts to secure independence and self-sufficiency. Indeed, the region continues to see numerous conflicts, civil wars and disconnections from neighbouring economies, in addition to the political and economic challenges to building national economies on existing common structures.

With political and economic developments in the region, a diversity of regional preferences continues to emerge, based on each country's political and economic interests and aspirations. The countries east of the Caspian Sea have substantially strengthened economic and trade ties with markets in Asia; Moldova, Ukraine and Georgia signed an EU Association Agreement in June 2014; and Kazakhstan and Belarus opted to establish the Russian Federation-led Eurasian Customs Union in 2010, joined by Armenia from January 2015 and soon to be joined, Kyrgyzstan and possibly Tajikistan.

Throughout these transformations, the energy sector suffered the most of key segments of the economy in all the newly independent states. The energy markets that were originally set up to suit the overall Soviet planning were no longer effective. This was particularly evident for fixed energy infrastructures, designed to serve regional energy markets in the most rational way, which in some cases meant that countries had to cross the boundaries of their neighbouring countries to supply remote parts of their own territories. One of the most illustrative examples is the Central Asian Power Grid, which was built to serve

all five republics in the region and continued functioning after independence, overlooking the new economic and political realities. The former barter-exchange arrangements for operating hydro plants in irrigation mode were no longer economically feasible for countries upstream in the Syr Darya and Amu Darya river basins. Replacement fuels, offered at world market prices, were not feasible options for economically depressed hydro-rich countries, which opted to develop their own natural potential for further growth and prosperity. These developments prompted further political tension in the region and resulted in the Central Asian economies isolating their energy systems, moving away from a regional market set-up by consolidating their domestic power transmission systems in a bid to maintain higher levels of energy supply security. Non-payments and disconnections from the regional system gradually challenged routine operations in the Central Asian Power Grid and caused system disturbances across the region.

Malfunctions in the previously centrally governed system operations at national level also became apparent from the outset. Energy systems became largely disordered in an attempt to nationalise previously commonly held assets. The energy companies were split into two segments: decision-making authorities that became the basis for energy ministries, and commercial operators, which were initially set up as vertically integrated national energy companies. In the region – with the exception of Azerbaijan, Belarus, Tajikistan, Turkmenistan and Uzbekistan – national energy (electricity and natural gas) companies have undergone numerous waves of restructuring, commercialisation and/or privatisation procedures in an attempt to legally and/or commercially unbundle the energy sectors.

As a result, the national electricity generation and distribution companies in Armenia, Georgia, Kazakhstan, Kyrgyzstan, Moldova and Ukraine have been privatised and sold to national or international investors in a bid to safeguard system operability, whereas transmission systems largely remained state-owned commercial operators. As for the natural gas sector, in almost all import-dependent countries the majority of supply, transmission and distribution assets slowly relapsed to the ownership of a single supplier, Russia, which gradually regained the previously owned systems as debt payments for unpaid gas supply across the region. In the case of the transit pipelines, Russia set up majority-owned joint ventures for transit/cross-boundary pipelines with most of the transit pipeline asset-owning countries. Only newly built oil and gas export pipelines fall outside this established pattern and therefore have different ownership structures.

Pricing policies have moved from the ministries of economy either to sector ministries or to the dedicated regulatory agencies. These developments, in countries like Armenia, Georgia, Kazakhstan, Moldova and Ukraine, resulted in independent regulatory agencies in the mid to late 90s, with more elaborated market structures, market rules and tariff-setting methodologies. These early developments, however, did not provide enough footing for these newly established institutions to strengthen the development of energy markets. In the mid to late 2000s (2006-08), a similar pattern was observed in all these countries, where governments interference in directly engaging with the electricity companies jeopardised the independence of the regulators, which were left to merely approve the tariffs dictated by direct contracts between the government and the energy companies. Recently, however, governments have been revising tariff structures, methodologies and set-ups in an attempt to relinquish their direct arrangements with energy companies and restore the independence of the regulatory authorities.

In countries where the government continues to set energy prices, at least one form of energy is subsidised. Pricing structures kept below cost-recovery level therefore do not attract investment to the sector, which in most cases is further encumbered with aged

infrastructure in urgent need of upgrades and/or new, efficient system instalments. The energy subsidies, coupled with heavy public sector indebtedness in most of these economies, resulted in the energy sector inability to generate adequate financial resources to maintain aged infrastructure at the necessary technical standards; most upgrade programmes are carried out as part of government-guaranteed long-term loans from international financial institutions. These practices further prevented energy system self-sufficiency, instead leaving many at the edge of collapse. Urgent and severe structural changes and reforms are required for the robust restructuring and revitalisation of the sector.

New developments in the upstream oil and gas sector in hydrocarbon producing countries, mainly in Azerbaijan and Kazakhstan, are clear exceptions from these practices. In these countries, the interests of the world's major oil and gas companies have resulted in foreign investment in both exploration and production, and in the construction of new transport infrastructure.

## TRENDS IN ENERGY POLICY DESIGN AND GOVERNANCE

More than two decades since gaining independence, most of the reviewed countries continue to focus on current affairs and very little attention is being paid to formulating well-elaborated medium- to long-term overall energy policy directions and related strategies, or policy-implementing mechanisms, in line with the countries' long-term economic outlooks. Setting up fully functional domestic energy markets and maximising full energy potential have proved challenging since independence and continue to remain the key focus for many governments in the region.

The current trends in energy policy design in almost all the countries remain supply side prone, based mostly on segmented sector developmental plans. Some countries, like Kazakhstan and Moldova, have aligned ambitious targets for energy sector development with their general economic outlook and developmental goals. Meanwhile, the long-term energy policy directions of Belarus, Turkmenistan and Uzbekistan continue their paths of planned developments, aimed mainly at the system reliability, planned growth and reduction of energy intensity of their respective economies. Armenia and Kyrgyzstan require further elaboration on their approved energy sector development concepts, whereas Azerbaijan, Georgia and Tajikistan need to replace their dated energy sector strategies with new medium- to long-term strategies to implement their declared sustainable development goals. Ukraine's recently updated energy strategy to 2030, approved in June 2013, also needs to be revised to adapt to new realities, elaborating on the pressing need for swift restructuring and robust energy sector reforms.

In policy design, most countries appear to continue setting their energy policy preferences based on annual GDP growth targets rather than on actual energy statistics-based growth potential or sector performance patterns. This policy design approach neglects the substantial improvements made by all reviewed countries in energy statistics data-gathering in recent years; in fact, most countries have moved to producing their energy balances in an internationally recognised format. Nonetheless, energy statistics are predominantly used for recording historical developments rather than for developing sound energy policies and projections, mainly due to the lack of analytical personnel in the public sector capable of interpreting statistics data for policy makers.

Further, the emphasis in energy data collection remains on the supply side even though there is a strong need for accurate demand-side data collection, management and integration in the national energy balances. The other obvious gap in data collection is

countries' inability to collect comprehensive and all-inclusive information on the use of renewable energy sources and off-grid developments. This information is vital to comprehensive energy policies which would take into account all current and prospective developments in the energy sector and lead to sound and sustainable strategies with various energy mix options. To collect demand-side and renewable energy data in these countries, the combined efforts of central and local government authorities is needed to design surveys and organise data collection efforts. This co-ordination is currently impossible due mainly to scarce human and financial resources at the national statistics agencies. Placing higher priority on this important and long-needed endeavour would maximise energy efficiency gains, boost renewable energy developments and move sustainable energy development agendas forward.

Most of the countries appear to have a large body of energy sector legislation in place, but its implementation remains challenging. This is due in most cases to a lack of well-elaborated secondary legislation, detailing rules and procedures for sector governance alongside concerns for rule of law. In addition, legal acts appear to be regularly amended without subsequent changes being made to other related acts, leaving them vulnerable to multiple interpretations and shadow practices.

Sector governance is often spread across multiple authorities, and the lack of a clear division of power, the presence of hybrid regulatory practices and monopolistic market participants are often cited as factors in non-performance or delayed developments. Countries like Georgia and Moldova, using one-stop-shop structures for investment-related permits and operational matters have clearly benefited from simplified procedures.

## ENERGY ENDOWMENT AND DEVELOPMENT POTENTIAL

The reviewed countries in Eastern Europe, the Caucasus and Central Asia share abundant hydrocarbon, hydro and renewable energy-resource wealth, concentrated around the Caspian and Black Sea basins. Giant oil and gas fields – such as Absheron, Azeri-Chirag-Guneshli and Shah Deniz in Azerbaijan; Karachaganak, Kashagan and Tengiz in Kazakhstan; Galkynysh, Shatlyk, South Gutliyak and South Iolotan in Turkmenistan; and Gazli, Kokdumalak, Shakhpakhty and Shurtan in Uzbekistan – place the Caspian region among the richest worldwide with proven oil and gas reserves. Kazakhstan and Ukraine also possess large coal deposits and Belarus is rich in peat, while Tajikistan, Kyrgyzstan and Georgia top the list of countries with ample hydro resources, of which only 6%, 12% and 18% respectively are utilised for power generation.

These regions are also considered rich in unconventional oil and gas reserves, although only Ukraine and Uzbekistan have started exploring their shale oil and gas potentials. Kazakhstan and Uzbekistan also have large uranium and rare earth deposits and remain among the largest uranium suppliers to world markets. The exact potential for renewable resources in these regions has yet to be fully assessed; however, current projections and renewables mapping, put in place by number of these economies, provide promising forecasts.

In addition to sizeable alternative and renewable sources of energy, the region's potential for energy efficiency gains is vast and remains largely untapped in all the reviewed countries. The contribution of modern renewables also remains marginal across the regions, hindered mainly by the energy sector's inability to attract investors due to evident price competition from other energy sources and conventional fuel industry resilience. Raising public awareness on the tangible benefits of energy efficiency and renewable energy would boost the deployment of modern energy-efficient and renewable energy technologies and spur the penetration of variable renewables in the power systems.

Energy consumption in the region is moderate and growing, as standards of living and economic growth improve after the post-Soviet trauma and the more recent global financial crisis. Government policies on energy consumption and the energy mix determine the volumes available for export and energy export policies. The primary energy mix is unlikely to change drastically in the near to long term as little progress has been achieved towards more sustainable energy use. However, some countries in the region have set ambitious goals for renewable energy and primary source diversification, principally Kazakhstan with its goal of having a 50% share of alternative and renewable sources in its primary energy mix by 2050, while Azerbaijan, Georgia, Moldova and Ukraine are aiming at their declared energy efficiency and renewable targets for 2020. Azerbaijan has achieved a significant decrease in energy intensity in all sectors of its economy thanks to the replacement of oil with natural gas and the installation of new energy-efficient technologies in electricity production. Meanwhile, those countries party to the Russian-led Customs Union are increasingly considering installing new,<sup>1</sup> or expanding existing,<sup>2</sup> nuclear capacity to enhance their primary energy mix.

The region is conveniently located for the world's largest and fastest-growing energy markets to its west, east and south. Past developments in the region's energy exports have favoured exporting energy resources from the western shores of the Caspian Sea and of the Black Sea region to markets in the West, while the eastern part of the Caspian Sea is expanding its exports to East and Southeast Asia.

Recent developments in Ukraine, including the reduction of Russian gas deliveries to Europe via Ukraine, have created a renewed interest and momentum for Central Asian gas deliveries to European markets through various potential Southern Corridor "projects of common interest" (PCI), initially considered to come on board at a later stage, beyond 2020. The advantages of Turkmen gas deliveries to Europe have been long anticipated, the multiple benefits of which include the potential for sizeable gas deliveries to European markets as well as a potentially different pricing structure, should construction of the transport infrastructure be developed as an open-access independent business venture, non-contingent to upstream investments with clear and transparent capacity booking mechanisms.

Another noteworthy development, observed initially in Uzbekistan and later in Turkmenistan, is the advanced growth of a downstream petroleum sector where natural gas is used as a direct feedstock for fertiliser and petrochemical ventures, end-product exports aimed at the fastest growing Asian markets. These developments are likely to lead to more direct foreign investment in the region, further aiding regional development and growth.

## ENERGY SECURITY

Energy resource-rich countries in Eastern Europe, the Caucasus and Central Asia are emerging as important contributors to global energy supplies and to world energy security. The region has significantly expanded its oil and gas exports to international markets since the early 1990s, and Azerbaijan, Kazakhstan, Turkmenistan and, to a lesser extent, Uzbekistan all have the potential to increase hydrocarbon production, while the region's hydropower export potential is largely untapped. Increases in output are encouraged by an increasing range of export routes and markets, first for oil and more recently for gas, reducing reliance on export routes through Russia. Central Asian oil and gas exports to China are delivered by multiple pipelines, while exports to markets in the south (Afghanistan, Pakistan and India) as well as to the west, towards European markets, are currently under consideration.

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1. Kazakhstan and Belarus.
  2. Armenia.

In the region's import-dependent countries, diversifying import sources and routes to minimise dependence on one single source has become a priority. Supply shortages in these countries follow distinctive cycles, in most cases occurring during the winter months when heating needs increase or when the water levels in large hydro dams are low. Although these recurrent supply shortages indicate a need for reliable primary or alternative fuel storage structures, this costly option has not yet been considered as a measure for enhanced energy security. Stored fuel would inevitably ease the strain by offering an easily accessible fuel-switching alternative to meet regular supply shortages. The most import-dependent countries could store their indigenous energy resources (i.e. domestically produced coal, natural gas or refined heavy fuel) for use in times of imported-fuel shortages, but the absence of regulatory mechanisms and pricing structures impede putting necessary arrangements in place. The previous Soviet regime imposed compulsory fuel storage requirements for thermal power generation enterprises, which in some countries were kept until recently but then relinquished for either technical or financial reasons related to accumulated storage debt.

Recent developments in Ukraine have drawn attention to the importance of sound emergency response procedures, with well-elaborated demand restraint programmes for import-dependent countries. Although industry is able to deal with wide-ranging, short, technical faults in the system, backed by reliable technical procedures, a larger supply-disruption response mechanism is yet to be put in place in most import-dependent countries in the region.

Access to energy, according to the standard indicator measuring electrification rate (i.e. access to electricity), is very high in the reviewed countries in Eastern Europe, the Caucasus and Central Asia. Their rating of above 99% dates to Soviet times when electrification was of the utmost importance. However, there is strong evidence that, despite such a high electrification rate, access to modern energy services is limited in some countries, particularly outside large cities and in the remote regions where incomes are generally lowest. Average electricity consumption per capita in the residential sector in the region is low and there are regular incidents of load-shedding and brownouts, particularly in the South Caucasus and Central Asia. These incidents in import-dependent countries are due mostly to generating-fuel shortages in the supply countries. For example, low reservoir levels and poor hydrological conditions in Kyrgyzstan and Tajikistan provoke electricity shortages and cut-offs during the winter months.

There are two major barriers to energy access observed in the reviewed regions: reliability of energy supply and affordability. Poorly maintained Soviet-era infrastructure is the main obstruction to supply reliability, and investment funds are limited by prices that are below cost-recovery levels in some Central Asian economies. Yet even these subsidised prices can create difficulties for consumers, resulting in increased non-payment for electricity. While collection rates for household customers have increased substantially with widely metered energy supplies, they have dropped just as significantly for the public sector, especially in Central Asia where state-owned enterprises remain the largest debtors.

The energy policy reviews show a considerable increase in the installation of individual meters, which allows for individual disconnections and a rise in collection rates. There are substantial improvements in keeping technical and commercial losses to a minimum within the technically allowable standards across the region, which also suggests a decrease in illegal connections to the grids.

Many low-income rural households across the reviewed regions still lack access to clean, affordable fuels for cooking and heating, and they often rely on traditional biomass (straw, wood or coal) for open-fire cooking. Countries with traditional biomass potential

are developing forest cadastres and management systems to prevent the degradation of local biomass resources.

The use of other renewables for energy similarly suffers from inaccurate accounting. This makes it difficult to assess the need for the decentralised deployment of renewable energy technologies, which in many cases could be a way to alleviate energy poverty and to support the provision of (or access to) modern energy infrastructure.

Although levels of electrification and access are high, the energy infrastructure itself is aging and requires a high level of maintenance, modernisation or rehabilitation throughout the energy supply chain. The large capital investments required are particularly difficult to mobilise under the current pricing and regulatory structures in countries where prices remain below cost recovery levels. Fixed energy infrastructures, including centralised district heating systems and natural gas and power transmission and distribution networks, are most at risk: lack of investments resulting in further inefficiencies and loss of capacity over time could put energy security in further jeopardy.

## MARKET CONVERGENCE

The energy policy reviews have demonstrated that the homogeneity often implied among the countries in these regions does not exist in practice. In assessing the regional markets, the review teams observed inverted trends over the two decades of disconnecting from the previously existing regional markets and securing self-sufficiency of domestic energy networks to the extent possible. The trends for each country are dictated by political situation, type of centralised/decentralised economy, and political and economic ties to neighbouring countries. Many countries in the region have little or no co-operation with their immediate neighbours, which has forced them to either internalise their markets or consider harmonising with previously unexplored markets (like Europe, China or the Middle East).

Regional support and co-operation is primarily observed in newly developed energy export infrastructures, which also include transit countries by offering them energy offtakes at a discounted price. Earlier developments in Kazakh and Azeri oil and gas exports to world energy markets have shown exceptional regional co-operation and solidarity. The Baku-Supsa, Baku-Ceyhan and South Caucasus pipelines have provided the way for Caspian resources to reach the world energy markets. Equally remarkable regional co-operation has been observed in moving energy resources of the Caspian from its eastern shores to the Chinese markets. The unprecedented speed in developing an oil and gas export infrastructure from Central Asia to China has dismantled longstanding prejudices over the region's ability to negotiate feasible and mutually beneficial large energy infrastructure projects. This extensive oil and gas export infrastructure to China now encompasses all the countries of Central Asia, offering record export openings to producer countries and offtake potential to the transit countries in the region, in addition to generous economic and social benefits.

Electricity, heat and gas providers in almost all the countries are state-owned, vertically integrated companies dating back to the Soviet era. The transition to a liberal market has been a slow one even for countries with strong policy decisions favouring a free market (e.g. Moldova, Ukraine and Georgia), mainly due to legislative hurdles, poor capacity building and financing problems. Other countries (mainly in Central Asia) have expressed little interest in market convergence and are mostly concerned with tariff subsidies and energy affordability. Energy regulation is most often conducted by the ministries and, as such, consumer protection and tariff methodology are not independently reviewed. Transparency is also weak, with most end-users and investors unaware of the tariff structure and the level of government subsidies.

Overall, the progression to a free market and market-set pricing in the region is still in an early stage, with the exception of the few countries which have signed the EU Accession Agreement and are likely to work towards integration into the EU market.

## SUSTAINABLE DEVELOPMENT

The reviewed region remains highly energy-intensive, reflecting continued gross inefficiency in energy use, as well as climatic and structural economic factors. There is considerable potential for energy savings in all sectors, particularly in district heating, electricity generation and networks, and industry and buildings. If the region were to use energy as efficiently as OECD countries do, primary energy consumption in the Caspian region as a whole would be cut by one-half. How quickly this energy efficiency potential might be exploited hinges largely on government policies, especially on energy pricing (most countries subsidise at least one form of energy), market reform and improved access to financing for energy projects.

With rising energy consumption, governments need to place more emphasis on energy efficiency improvements to benefit from the large untapped potential for improved energy security and economic growth. It is essential that energy efficiency strategies be well integrated into the broader policy framework of economic development. Energy efficiency strategies and related action plans need to ensure a stable source of financing, but energy pricing across the region remains a barrier to investment.

There is a tendency to focus on lower energy intensity targets across the reviewed regions. Energy efficiency targets should be aligned with energy efficiency gains potential, based on solid statistical data on both the supply and demand sides at a sufficient level of disaggregation and modelling. To develop effective policies and to establish baselines for tracking progress, energy supply- and demand-side data should be established and maintained, covering all the sectors and subsectors of the economy.

Energy efficiency governance remains vague in almost all the reviewed countries; a clear definition of the role of local governments in energy efficiency policy implementation is therefore of prime importance. The placement of a dedicated public authority in charge of energy efficiency policies and measures, with licence to oversee the implementation of those policies, could ensure that energy efficiency is a strategic priority and could provide greater co-ordination.

There is also an obvious gap in energy efficiency governance in the transport sector, as it is difficult to establish a government department to oversee energy efficiency policies and measures in this sector. Vehicle markets in these regions are rapidly growing and are often dominated by imported second-hand cars, with a sizeable share being large-engine and fuel-inefficient vehicles. The exceptions to this trend are Uzbekistan, which has well-developed vehicle production, supplying local and neighbouring markets, and Azerbaijan, which has put in place strict fuel efficiency standards that prohibit the use of old and inefficient vehicles. A number of other countries are in the process of implementing higher fuel efficiency standards, resulting in the replacement of dated vehicle fleets from these markets.

Considerable progress in promoting renewable energy in the reviewed regions has been observed. Most countries have put in place detailed strategies and financial support mechanisms (including green tariffs in some cases), and have relaxed investment procedures for renewable energy development. However, these measures did not prove sufficient to reach the expected level of renewable technology deployment. One common barrier to

policy implementation is the absence of secondary legislation which would elaborate on legal, regulatory and financial mechanisms and on clear and enforceable technical rules for grid integration. Policy development could also greatly benefit from cost-benefit analysis, considering all renewable resources and available technologies with competitive advantages. This would help governments further develop renewable energy strategies and promote sector development.

#### **Box ES.1** Potential for saving energy in district heating

The energy savings potential in district heating sectors across the region is one of the highest. In most of the reviewed countries, a significant share of energy used in buildings comes from district heat, and in many cases the heat is produced, distributed and consumed very inefficiently.

Modernising district heating plants and rehabilitating or replacing inefficient combined heat and power (CHP) plants alone could substantially reduce overall primary energy consumption. Further energy savings could be realised by reducing heat-distribution losses, by insulating buildings and by installing metering and thermostats in buildings to discourage waste. Heat is priced at well below the true cost of supply in most countries, but the inefficient use of district heat is only partly due to low prices. Another reason is, especially in the residential sector, end-users not being billed for the actual amount of heat they use because supplies to individual dwellings are not metered. Hence there is little incentive to use heat efficiently or conserve it. Heating tariffs for residential buildings are often based on the size of the apartment, so there is no incentive to limit consumption.

In addition, in large housing blocks it is often not possible to adjust the amount of heat supplied to each apartment. Simply raising prices for heat would therefore make no difference to consumption: people would still need to heat their apartments and higher prices would simply result in many households being unable or unwilling to pay – a common problem in many parts of the region in recent years.

Experience has shown that policies to remove heat subsidies are generally effective only when accompanied by investments in metering and heat-control systems, and by the introduction of billing systems based on the actual consumption of individual households. District heating infrastructure in the region is aged and current pricing policies fail to provide sufficient funds for regular system maintenance and required upgrades. Sector management has also become fragmented, as it remains under the local governance structures in most cases.

The key to maximising energy savings potential in the district heating sector therefore lies in fundamental and all-embracing sector reforms, which should address at least the following: moving tariffs to full cost-recovery levels; installing metering and heat control systems; removing all forms of subsidies from this sector (moving to targeted social subsidy schemes for the most vulnerable); and requiring the system operator to perform system upgrades and rehabilitation.

## INVESTMENT CLIMATE

Investment attraction has been the key focus of governments in the region since gaining their independence. One of the most successful changes in national legislation has been to liberalise fiscal structures to attract much-needed investment. While initially based on

project-by-project incentives, most of the countries have gradually moved to more widespread reforms. Lengthy licensing and permitting procedures have been removed, and various types of fiscal holidays are granted for energy-related investments that maintain existing systems or install new energy infrastructures.

Most of the countries in the region have been moving up the World Bank's rankings for "Ease of Doing Business" (in the case of Georgia, improvement has been outstanding); however, foreign direct investment has only been in the upstream and midstream sectors, mainly from oil and gas majors. Investment in fixed energy infrastructure, including upgrades and maintenance, is attained with the help of donor agencies and international financial institutions.

The main impediments to attracting investments for upgrading and maintaining existing systems were tariff structures, where energy tariffs remained below cost-recovery levels, and energy subsidies, which do not provide investors with the opportunity to recoup their investment. Those countries that have undergone a number of cycles of commercialisation and privatisation of their national companies have opted to restructure and sell parts of their energy infrastructures to potential investors in exchange for system rehabilitation and system reliability. Those countries that have opted for regulatory reforms, in addition to privatising their energy sectors, have generated greater benefits for their populations and industry at large.

The other notable pattern across these regions is the absence of government policies on national research and development (R&D). Dedicated scientific and research centres for energy, present in all reviewed countries, remain under the academies of sciences or as part of the technical university frameworks, with very little or no funding for technology research and development. Neglecting this important area also discourages the growth of a new generation of scientists and researchers, and further impedes the scientific and technological research potential of these countries. To invest in R&D is to invest in the future; this untapped potential should therefore be prioritised and scaled up in government policies.

## KEY RECOMMENDATIONS

*The recommendations, shared to different degrees with the reviewed countries, include advice to governments to:*

### **General energy policy**

- *Prepare a comprehensive sustainable energy strategy for the horizon beyond 2015. Revise/develop medium-to-long-term energy scenarios (to 2030, with the view to 2050) on the basis of a robust assessment of energy supply and demand trends accounting for different energy futures including the potential of renewables and energy efficiency, to strengthen the implementation and frequent update of the energy strategy.*
- *Maximise the use of existing energy data, identify additional data requirements, take steps to acquire and keep up-to-date the data necessary to develop tools for strategic planning and monitoring the supply, demand and consumption of energy throughout the economy. Consider establishing an analytical centre to interpret statistics and provide modelling for improved policy-making.*

- *Continue sustainable energy policy reforms/development; ensure transparent implementation/enforcement of the energy legislative frameworks; strengthen the rule of law and improve transparency.*
- *Promote research and development activities in most pertinent aspects of conventional, alternative or unconventional energy resources, for smart investments for the country's conventional and alternative energy developments.*

### **Energy security**

- *Enhance energy security by increasing both conventional and unconventional production outputs, utilising renewable energy potential and maximising energy efficiency gains; upgrade the energy infrastructure and diversify supplies via interconnections with neighbouring markets.*
- *Modernise the energy supply chain. Encourage investments in infrastructure necessary to improve the sector performance and efficiency of the energy supply chain. Ensure an attractive business climate, a competitive and fair regulatory framework and market-price incentives to mobilise necessary investments.*
- *Develop emergency response mechanisms for oil, gas and electricity supply shortages, with clear indication of the priorities for demand restraint management and authorities in charge for overseeing the process. Consider compulsory alternative fuel storage buildups for import dependent countries for the length of the most critical supply shortage periods.*

### **Market convergence**

- *Continue developing an efficient energy market model and support it with an adequate legal and regulatory regime. Review regional market setups as new interconnections develop, and adapt market rules (in line with EU legislation where applicable) to enhance system interoperability and to remove regulatory and trade barriers.*
- *With the objective of fostering regional integration of the energy markets and interconnection, actively discuss the setup of a regional market with neighbouring countries and at international level to improve energy security and overcome isolation of the national energy markets.*
- *In the context of the new market design, strengthen the competencies and the independence of the national regulatory authority and reinforce its role in safeguarding consumer interests, e.g. by creating a consumer board at the regulator and implementing quality of supply regulation with a focus on natural gas distribution.*
- *Develop a comprehensive tariff methodology for electricity and heat tariffs. (Where applicable) consider the gradual phase-out of subsidies over a set medium-term period, with a view to reaching fully cost-reflective tariffs that also allow for planned capital investment. The phase-out of tariff subsidies should be done on the basis of affordability, in conjunction with well elaborated social schemes, targeting support for the most vulnerable customers only until the phase-out is complete.*

### **Sustainable development**

- *Introduce a balanced regulatory framework for promoting renewable energy sector development; assess and work towards removing barriers to renewable energy*

*technology deployment; ensure a sound, transparent and well-integrated regulatory framework and procedures for grid integration of variable renewables. Broaden public awareness campaigns for tangible, long-term benefits of renewable energy use.*

- *Elaborate and/or boost implementation of the energy efficiency plans with regulatory measures to encourage energy savings across all sectors of the economy, particularly in buildings and transport sectors. Introduce adequate tariff structures to incentivise energy savings and building codes for renovation and construction. Scale up efforts for raising public awareness of the benefits of energy efficiency gains and incentive mechanisms and schemes for residential and transport sectors.*
- *Take a lead in coordinating the implementation of energy efficiency measures across the government, e.g. by increasing the role and functions of the energy saving/efficiency agencies (where applicable) or work towards creating a dedicated public entity in charge of energy efficiency policy implementation. Strengthen initiatives at local and city levels on energy savings and the use of renewable energies and increase awareness of essential energy efficiency measures.*
- *Improve demand side data collection, compilation and use, and encourage the development of energy efficiency indicators to support long-term energy policy planning and monitor progress.*

#### **Investment attraction**

- *Maintain and/or enhance open, stable, predictable, fair and transparent investment frameworks, with clear procurement rules and procedures and well-defined steps to facilitate investment undertakings and boost effective access to markets. Consider creation of a One-Stop-Shop public entity for managing all investment related affairs.*
- *Encourage and mobilise the investments in infrastructure necessary to improve the performance and efficiency of the energy supply chain. This will require an attractive business climate, a competitive and fair regulatory framework, and market price incentives. Strengthening the rule of law and improving transparency as well as implementing the Energy Community Treaty provisions will further promote investments.*
- *Continue the application of the latest technologies for enhanced oil and gas recovery, opening up new fields for oil and gas exploration and production, assess the country's shale oil and gas potential, and encourage foreign direct investments in country's upstream oil and gas sectors.*