



International  
Energy Agency

# Eastern Europe, Caucasus and Central Asia

Highlights

Energy Policies  
Beyond IEA countries





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## INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA), an autonomous agency, was established in November 1974. Its primary mandate was – and is – two-fold: to promote energy security amongst its member countries through collective response to physical disruptions in oil supply, and provide authoritative research and analysis on ways to ensure reliable, affordable and clean energy for its 29 member countries and beyond. The IEA carries out a comprehensive programme of energy co-operation among its member countries, each of which is obliged to hold oil stocks equivalent to 90 days of its net imports. The Agency's aims include the following objectives:

- Secure member countries' access to reliable and ample supplies of all forms of energy; in particular, through maintaining effective emergency response capabilities in case of oil supply disruptions.
- Promote sustainable energy policies that spur economic growth and environmental protection in a global context – particularly in terms of reducing greenhouse-gas emissions that contribute to climate change.
- Improve transparency of international markets through collection and analysis of energy data.
  - Support global collaboration on energy technology to secure future energy supplies and mitigate their environmental impact, including through improved energy efficiency and development and deployment of low-carbon technologies.
    - Find solutions to global energy challenges through engagement and dialogue with non-member countries, industry, international organisations and other stakeholders.

IEA member countries:

Australia  
Austria  
Belgium  
Canada  
Czech Republic  
Denmark  
Estonia  
Finland  
France  
Germany  
Greece  
Hungary  
Ireland  
Italy  
Japan  
Korea (Republic of)  
Luxembourg  
Netherlands  
New Zealand  
Norway  
Poland  
Portugal  
Slovak Republic  
Spain  
Sweden  
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Turkey  
United Kingdom  
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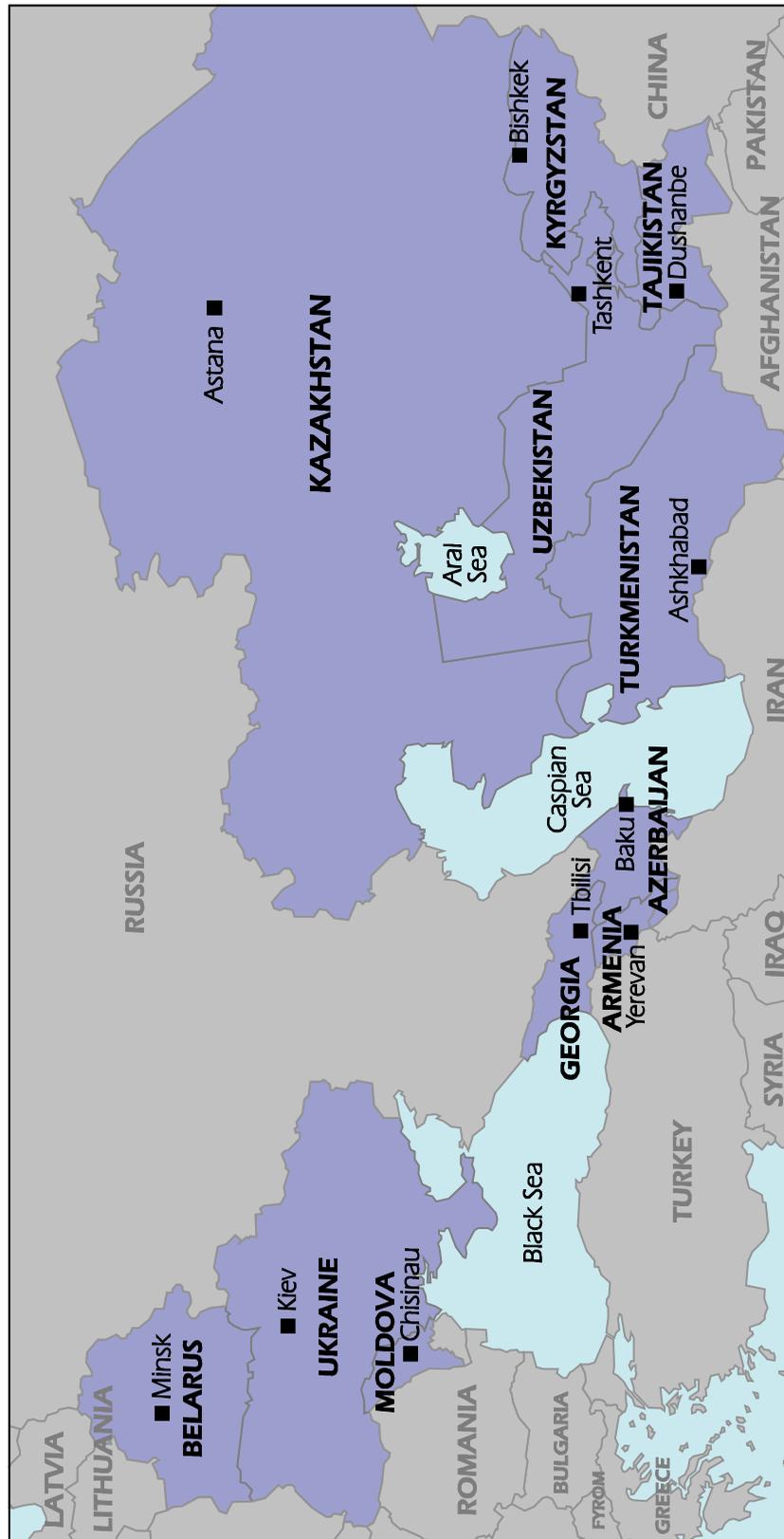
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Figure 1 Map of Eastern Europe, Caucasus and Central Asia



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

## INOGATE PROGRAMME

INOGATE was established in 1996 as the energy co-operation programme between the European Union and the littoral states of the Black and Caspian Seas and their neighbouring economies. After the break-up of the Soviet Union, the centralised system of energy production, transport and distribution became fragmented, putting the whole region at a high risk for energy crises. There was an urgent need to establish new ways of working together and the European Union was well-placed to provide the support and the needed know-how, through the INOGATE programme.

Initially, the programme focused on the energy security of INOGATE Partner Countries and facilitated energy trade between the European Union and INOGATE Partner Countries. Over time, however, the scope of the INOGATE programme has changed and expanded. Nearly two decades on, the INOGATE programme continues to support energy co-operation between the European Union and INOGATE Partner Countries, aimed at enhanced energy security, market convergence, sustainable energy and investment attraction implemented within the framework of the European Neighbourhood Policy. Furthermore, the INOGATE programme supports Eastern objectives under the Energy Security Platform and assists countries that have signed the EU Energy Community Treaty (Ukraine and Moldova: members; Georgia: candidate; Armenia: observer) to integrate into the Energy Community.

The current vision of the programme was shaped at the Energy Ministerial Conference held in Baku on 13 November 2004, in connection with the launch of the European Neighbourhood Policy. The conference was the start of a two-year process of updating the INOGATE programme, known as the “Baku Initiative”.

As a result of the Baku Initiative, the Astana Energy Ministerial Declaration was signed on 30 November 2006, referred to as the “Astana Road Map”. The Astana Road Map formalises the INOGATE programme’s objectives and was adopted by all the countries involved. The programme’s objectives include developments in four main pillars: energy security, market convergence, sustainable energy and investment attraction.

With the launch of the Eastern Partnership initiative in 2008, INOGATE also became the main instrument to support the objectives under the Energy Security Platform. Furthermore, INOGATE is assisting countries who have signed the EU Energy Community Treaty to make the necessary reforms and to integrate into the Energy Community.



ENERGY COOPERATION BETWEEN THE EU, THE LITTORAL STATES OF THE BLACK & CASPIAN SEAS AND THEIR NEIGHBOURING COUNTRIES



PROGRAMME  
FUNDED BY THE EU

## EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA

### INTRODUCTION

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This paper provides highlights of the energy policy reviews of 11 countries in Eastern Europe, Caucasus and Central Asia (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan), including key recommendations for energy policy makers in each country. The reviews were conducted by the International Energy Agency (IEA) under the European Union (EU)-funded INOGATE programme, in co-operation with the INOGATE Technical Secretariat and governments of the INOGATE Partner Countries.<sup>1</sup> It provides background information on the INOGATE programme and the key findings of two peer review cycles which were conducted in the course of 2013 and 2014. It also highlights common challenges and opportunities shared by the reviewed countries from the region.

The individual country energy policy reviews will be released under a single publication entitled *Eastern Europe, Caucasus and Central Asia*, as part of the Energy Policies Beyond the IEA series, due to be launched in early 2015. These country reviews assess the energy policy directions of the INOGATE Partner Countries and provide country-specific recommendations for local energy policy makers.

Energy policy reviews focus on each country's developments related to improving overall energy security, promoting domestic and regional market convergence, sustainable energy developments and attracting necessary investments.

### STATUS REPORTS

Following the adoption of the Astana Road Map, the INOGATE Technical Secretariat developed review criteria which have been agreed upon by the Partner Countries during the country co-ordinators' meeting held in Tbilisi in October 2010. The review criteria include indicators for all four areas of co-operation, which were set to assess the developments and monitor progress across the region on an annual basis. The INOGATE Technical Secretariat has developed further questionnaires, elaborating on the agreed criteria for an annual review cycle, referred to as "Status Reports". The first Status Report was prepared by the INOGATE Technical Secretariat on the basis of questionnaire submissions from the INOGATE Partner Countries in 2011. This work was undertaken as a desk study, with the active participation of the INOGATE Country Experts.

The INOGATE Technical Secretariat published the "Status Report" for the year 2011, assessing the developments under the agreed review criteria (including the explanation of the criteria). The publication was released in October 2012 and can be found at <http://www.inogate.org>.

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1. For the purpose of this report, reviewed countries will be collectively referred to as INOGATE Partner Countries (or Partner Countries). Partner Countries will be discussed individually, or grouped as Caspian and/or Black Sea regions in geographical terms. Under this grouping, the Caspian Region includes Azerbaijan and the Central Asian republics, while the Black Sea Region refers to Armenia, Belarus and Moldova in addition to Georgia and Ukraine.

**Box 1** IEA-led peer reviews of INOGATE Partner Countries' energy policy developments

From January 2013 to June 2014, energy policy reviews were conducted under the leadership of the IEA and in co-operation with the INOGATE Technical Secretariat and the European Union.

The IEA initiated a number of modifications to the review process for the 2013-14 review cycles, which have encouraged Partner Country governments to further make the INOGATE process their own and to maximise the benefits of energy policy reviews. Major changes to the process include:

- increasing peer support by transforming the review process into a peer review format
- introducing modified and more detailed questionnaires which require active participation of the Partner Country governments in the review process
- co-operating more closely with the Partner Country governments in preparation of peer review team visits and ensuring the review team meets with all key public and private energy stakeholders
- conducting review meetings with private and non-governmental sectors under Chatham House Rules,<sup>2</sup> which ensures open and constructive discussions, as well as soliciting the views of all energy sector players
- presenting the preliminary findings and recommendations to the host country government officials at the end of each peer review mission.

The IEA also introduced an overall assessment of the energy policies with key recommendations, prepared by the peer review teams during their review visits and presented to the government officials at the end of each review visit. The reviews also include analyses of key energy statistics and energy balances of the Partner Countries in the IEA format.

The peer review teams consisted of IEA experts, INOGATE Partner Country government representatives and the INOGATE Technical Secretariat, including Technical Secretariat representatives from the headquarters and in Partner Countries. During the 2013 review cycle, peer reviewers from the INOGATE Partner Countries performed as the Peer Review Team Leaders.

The result of the two review cycles of the energy policies of INOGATE Partner Countries will be published under the title *Eastern Europe, Caucasus and Central Asia* by the IEA in early 2015 as part of the publication series *Energy Policies Beyond IEA Countries*.

Note: Details of the peer review compositions, as well as the organisations met during the peer review missions, are provided in Annex B.

2. "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed." <http://www.chathamhouse.org/about/chatham-house-rule>.

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## EXECUTIVE SUMMARY

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### GENERAL OVERVIEW

The 11 INOGATE Partner Countries in Eastern Europe, Caucasus and Central Asia cover a large geographic area, approximately 5 million square kilometres, stretched across the middle of Eurasia – from the Baltic States, Poland and Romania to the West Chinese border, with Russia at its north and the Middle East and South Asia to its south – encompassing a total population of 140 million.

More than two decades on from the break-up of the Soviet Union and the independence of the INOGATE Partner Countries, the level of national sovereignty and political and economic structures of each country vary. They all have significant ethnic, historical and economic differences, and vary in size, geopolitical location, energy endowment, economic outlook and developmental prospects. However, the single factor they all share is their immediate Soviet past, which has left significant similarities in terms of national economic design, governance structures, public institutions and infrastructure inherited from the previously commonly held system.

At the dawn of independence, the countries woke up to heavily interlinked industries and infrastructure and fully integrated regional systems, with the remotest ability to function independently from one another. Augmented by the fact that these economies were centrally governed during the Soviet era, no country appeared to hold the “know-how” to fully master the entire spectrum of their domestic affairs, and were left with sovereign authorities that had no leverage over their neighbouring economies with whom they were so strongly interlinked.

This physical, economic and institutional dependence on the heir to the Soviet legacy – Russia – became stronger and more inevitable for some countries, while in others nationalistic movements were taking a high toll on the attempt to secure independence and self-sufficiency. The region saw numerous conflicts, civil wars and disconnections from neighbouring economies, in addition to the political and economic challenges for building national economies on existing common structures.

The energy sector suffered the most amongst other 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 infrastructure, designed to serve regional energy markets in the most rational way, and in some cases it meant that countries had to cross the boundaries of their neighbouring economies in order to supply remote parts of their own territories. One of the most illustrative examples is the Central Asian Power Grid, built to serve all five republics in the region, which continued functioning while overlooking new economic and political realities. The former arrangements of barter exchange for operating hydro plants in irrigation mode were no longer economically feasible for countries upstream the Syr Darya and Amu Darya river basins. Replacement fuel, offered at world market prices, prompted further political tensions in the region. Non-payments gradually became a challenge for routine operations, causing system disturbances across Central Asia. This resulted in the Central Asian economies focusing on isolating their energy systems, moving away from a regional market set-up by looping their domestic power transmission systems in a bid to maintain higher levels of energy supply security.

This malfunction of the previously centrally governed system operations at national level also became apparent from the very 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 setting up energy ministries, and commercial operators, which were initially set up as vertically integrated national energy companies. In almost all the countries – with the exception of Belarus, Turkmenistan and Uzbekistan – national energy (electricity and natural gas) companies have undergone numerous waves of privatisation, restructuring and commercialisation in an attempt to legally and/or commercially unbundle the energy sectors.

As a result, the national electricity generation and distribution companies have been privatised and sold to national or international investors in a bid to safeguard system operability, whereas transmission systems largely remained as 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 back to the ownership of a single supplier, Russia, who gradually regained the previously owned systems in debt payments for unpaid gas supply bills 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. It is only the newly built oil and gas export pipelines that fall outside of this established pattern and therefore have different ownership structures.

Pricing policies have moved from the ministries of economy to either sector ministries or to the dedicated regulatory agencies. These developments, in countries such as Georgia, Ukraine, Moldova and Kazakhstan, resulted in setting up independent regulatory agencies in the mid to late 1990s, with more elaborate market structures, market rules and tariff setting methodologies. These early developments, however, did not seem to provide solid enough ground for these newly established institutions to last until satisfactory results could be achieved. In the mid to late 2000s (around 2006-08), a similar pattern was observed in all these countries, where government interference – by directly engaging with the electricity companies – jeopardised the independence of the regulators, which were left to merely approve the tariffs dictated by direct contracts signed between the government and the energy companies.

This trend has reached another turning point most recently: attempts from the governments to relinquish their direct arrangements have been observed in a bid to restore the independence of the regulatory authorities by revisiting tariff structures, methodologies and set-up. In other countries, where government continues to set the energy prices, at least one form of energy is subsidised, which does not allow for required investments to be attracted to the sector – in most cases riddled with aged infrastructure, urgently requiring regular upgrades and/or instalments of new systems. The absence of cost-reflective tariffs and public governance patterns (negative practices of public governance) in most of these economies has resulted in an inability to provide adequate infrastructure funding, and most upgrade programmes are carried out as a part of government-guaranteed long-term loans from international financial institutions.

Conversely, advancements in the oil and gas upstream sector of energy-producing countries such as Kazakhstan and Azerbaijan have been noteworthy due to significant investment from oil and gas majors across the globe.

## ENERGY ENDOWMENT AND DEVELOPMENT POTENTIAL

The reviewed regions 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 amongst the richest worldwide with proven oil and gas reserves. Kazakhstan and Ukraine also possess large coal deposits, while Tajikistan, Kyrgyzstan and Georgia top the list of countries with ample hydro resources, of which only 6%, 12% and 18%, respectively, are utilised to date for power generation.

The Caspian and Black Sea regions are also considered to be rich in unconventional oil and gas reserves, although it is only Ukraine and Uzbekistan that have started exploring their shale oil and gas potential. Ukraine, Kazakhstan, Armenia and Belarus possess nuclear energy infrastructures, inherited from Soviet rule, and are presently considering nuclear capacity expansions to enhance their energy mix.

In addition to sizable 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 sector inability to attract investors due to evident price competition from other sources.

Energy consumption in the region is moderate and growing as the standard of living and economic growth are improving after the post-Soviet trauma and the more recent global financial crisis. Government policies on energy consumption and the energy mix are key to determining 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 diversification, principally Kazakhstan with its goal for a 50% share of alternative and renewable sources in its primary energy mix by 2050. Countries party to the Russian-led Customs Union are increasingly considering adding additional nuclear capacity, while Azerbaijan has achieved a significant decrease of its energy intensity in all sectors of its economy due to the replacement of oil with natural gas and the installation of new energy-efficient technologies in electricity production.

The region is conveniently located close to the world's largest as well as fastest growing energy markets, including those to the west and the east. Past developments in the region's energy exports have leaned towards exporting energy resources from the western shores of the Caspian Sea and those 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 South East Asia. Recent developments related to Russian gas deliveries to Europe via Ukraine have again created momentum for Central Asian gas deliveries to European markets through various Southern Corridor projects, initially considered to come on board at a later stage beyond 2020.

These developments are likely to lead to more investment in up- and midstream oil and gas sectors in the region, despite attempts by local government to attract investments in other sectors of their economies.

## TRENDS IN ENERGY POLICIES AND GOVERNANCE

More than two decades on, most of the reviewed countries are still focusing on resolving their immediate affairs and very little attention has been paid to well-elaborated medium- to long-term energy strategies or policy-setting mechanisms. Setting up fully functional domestic energy markets and maximising their full potential have been key challenges since independence.

General energy policy framework developments have been uneven across the region. All reviewed countries show substantial improvements in energy data gathering over the past decades, yet energy statistics remain predominantly used for recording historical developments rather than as a tool for helping develop sound energy policies and projections. Energy data, as currently collected, is biased towards the supply side and there is a clear need for accurate demand-side data collection and management in order to integrate it into the national energy balances. Another obvious gap in data collection is related to the inability of countries to collect information on the use of conventional and unconventional renewables and off-grid developments. This information is vital for developing comprehensive energy policies which would take into account all current and prospective developments in the energy sector and help design a sound and sustainable strategy with various energy mix options.

Current trends in energy policy designs in almost all countries remain supply-side prone, based mostly on segmented sector developments. Some countries, such as Kazakhstan and Moldova, have set ambitious goals for energy sector developments, incorporating them into their general economic developments. Others are still operating from dated energy sector strategies or working towards setting new medium- to long-term developmental strategies and goals.

## GENERAL ENERGY POLICY HIGHLIGHTS

### Armenia

The Armenian government adopted the National Energy Security Concept in 2013 (in support of its Economic Development Strategy to 2025), outlining strategies for fuel diversification mainly through renewables, nuclear power, building up fuel reserves and increasing its electricity generation capacity. Numerous strategies and action plans have been developed on the basis of the concept, supporting ambitious targets for replacing 1 000 MW nuclear capacity by 2026 and reaching a 26% renewable energy share in the country's energy mix by 2025 (up from 7% in 2012).

Armenia has a well-elaborated renewable energy roadmap, adopted in 2011, largely focused on small hydro plants. However, the country still needs to further develop energy efficiency policies, measures and governance to tap the potential for large energy savings in all sectors of the economy. Its Energy Savings and Renewable Energy law dates back to 2004 and the National Programme on Energy Saving and Renewable Energy of Armenia to 2007; however very little improvements have been observed in optimising the country's assessed 40% energy saving potential.

## Azerbaijan

Rich in fossil fuel deposits, Azerbaijan's energy strategy is primarily centred around the country's successful attainment of investment from world oil and gas majors in its oil and gas upstream sector. Azerbaijan has improved the security of electricity supply over the past decade due to major investment in modernisation of electricity generation and networks as well as replacement of aged infrastructure. The country has also prioritised renewable energy developments in recent years, despite the initial focus of the State Programme on the Development of the Fuel-Energy Complex in Azerbaijan for 2005-2015 (adopted in 2004) being on oil and gas.

Committed to maximising the gains from its significant renewable energy potential (wind, solar, small hydro, biomass and geothermal), the government established the State Agency on Alternative and Renewable Energy Resources (SAARES) in 2009, which was made independent from the Energy Ministry in 2013. It also adopted a legislative package in support of larger-scale renewable developments. The government is currently working on an energy strategy to elaborate the country's 2020 declared goals: reduce greenhouse gas emissions by 20% (from 1990 levels); achieve a 20% share of renewable energy in electricity; and increase energy efficiency by 20%.

Azerbaijan has substantially reduced gas flaring as well as the energy intensity in all areas of the economy, largely due to replacing an ageing energy infrastructure. However, demand-side energy efficiency policies and measures are still absent beyond the declared policies, and there is no public entity in charge of energy efficiency governance. The energy sector remains predominantly state-governed with little transparency as to energy pricing mechanisms.

## Belarus

As a net energy importer, the national energy policy of Belarus is focused on maintaining energy security and stability in the country and reducing energy import dependency through increased energy efficiency measures. The Concept of Energy Security, adopted in 2007, defines the long-term view on the country's energy sector development.

In 2013, the government approved the State Programme of Energy Sector Development for the period up to 2016. Numerous sector development plans have been further elaborated based on these documents, which lay out the country's move towards securing self-sufficiency, including plans for assessing additional nuclear power potential in a bid to improve the country's self-sufficiency in the long term. Belarus also widely promotes renewable energy developments and substantially improved investment legislation to promote its indigenous energy resource developments.

The energy sector in Belarus has remained in full government ownership since independence, as part of the Belarusian government's pursued strategy of cautious reforms, with emphasised concerns for social welfare and stability (internally referred to as a "socially oriented market economy" or "market socialism"). The vertically integrated national energy companies have kept the energy infrastructure intact and well-maintained; according to the latest government decisions, these will soon be restructured to financially unbundle the systems. There are no immediate plans for the legal unbundling of national energy companies, further modifying the energy markets or changing price-setting mechanisms, which is set to remain under government authority.

## Georgia

Georgia's current energy policy – the Parliamentary Resolution on Main Directions of State Policy in Power Sector – dates back to 2006, and the current State Programme for Renewable Energy was adopted in 2008. In 2013, the government launched procedures for setting up a working group to develop a medium to long-term energy strategy, but very little progress has been observed in incorporating all parts of the energy sector into the country's energy policy directions.

Its energy sector is predominantly occupied with developing its hydro energy potential, overlooking that for developing other renewables or maximising energy efficiency gains. The government is committed to substantially expanding hydropower generation capacity in the coming years; consequently the construction of new hydropower plants and electric transmission lines remains the country's top priority. However, it lacks energy efficiency policies and measures, with no authority in place for setting up energy efficiency strategies and targets.

Georgia has been a reliable transit partner for Caspian energy exports to the world markets and it has managed to diversify natural gas supply sources through these developments. Georgia also has a liberalised regulatory framework, with simplified one-stop shop access to all investment-related matters, including permits for large hydropower projects, and it has minimal requirements for small hydro developments.

In 2013, Georgia applied for a full membership to the Energy Community and in June 2014 signed the Association Agreement with the European Union. These developments are expected to significantly deepen political and economic ties with the European Union, with a long-term perspective of closer political association and economic integration.

## Kazakhstan

Kazakhstan adopted the Green Energy Concept in 2013, derived from the country's declared course for long-term economic development under the Kazakhstan 2050 Strategy, launched in December 2011. It sets an ambitious target for reaching 50% of alternative and renewable energy in the country's energy mix by 2050 by phasing out ageing infrastructure, increasing the use of alternative fuels and installing efficient and environmentally sound energy technologies.

In order to promote renewable energy and energy efficiency, recent developments include:

- feed-in tariffs for wind and solar energy, approved in August 2013 under a new Law on Supporting the Use of Renewable Energy Sources, with a target of achieving 3% of alternative energy sources in their energy mix by 2015 (up from around 1% in 2012)
- the Energy Efficiency 2020 programme, aimed at reducing the energy intensity of its economy by 25% by 2030
- the Programme of Wind Power Development by 2030, which defines wind power development as one of the priority directions for the country.

Kazakhstan is also considering the installation of additional nuclear generation capacity in a bid to meet growing energy demand and targets for developing a green economy.

The government has also approved the comprehensive Strategic Development Plan to 2020, which aims at sustained economic growth by accelerated diversification through industrialisation and infrastructure development. The government's goal is to position itself amongst the top 30 global economies by 2050.

Kazakhstan has also pioneered a regional initiative, the Green Bridges Partnership Programme, improving access to green technology and investment, as well as to transfer practical and successful management experiences to interested countries and organisations. Additionally, it has launched regional schemes for a water energy nexus, which, in addition to environmental benefits, aims at saving Lake Balkhash and conserving the region's fresh water resources, currently under threat due to water losses as a result of existing aged irrigation systems.

Kazakhstan will host Expo 2017, Future Energy, which is set to serve as a showcase to demonstrate the interoperability of modern energy technologies and to raise awareness of sustainable development prospects.

## **Kyrgyzstan**

Kyrgyzstan adopted its current Medium-Term Development Programme for 2012-2014 in 2010, and in 2013 it adopted the National Sustainable Development Strategy for 2013-2017 and its implementing programme. These programmes set out policies for the country's political, economic and social development. The National Energy Programme and the Strategy for the Fuel and Energy Sector Development for 2008-2010, with an outlook to 2025, are the country's key long-term policies for the energy sector. These programmes aim at improving the budget deficit by fast-tracking large energy projects, improving state asset management and increasing the effectiveness of social policies for poverty alleviation.

The government's declared priorities in the energy sector are improved energy security, energy savings and sustainable development. However, seasonal volatility of hydropower production, reliance on hydrocarbon import and high losses in aged infrastructure remain key challenges. The Energy Ministry is currently working towards the completion of a longer-term energy sector strategy, with plans to introduce a new legislative package to support revitalising the energy sector with stricter measures on energy tariffs and reforming its electricity, natural gas and coal industries.

Energy tariffs in Kyrgyzstan remain below cost, and the government has put in place a medium-term tariff strategy to raise tariffs to the cost-reflective level, targeting subsidies to only the most vulnerable customers. However, tariff increases have not been implemented amid the fear of social unrest. Further changes in tariff setting methodology are in the making and are expected to be presented to the government for approval by the end of 2014. New energy tariffs will provide incentives for minimising the wasteful use of energy in all sectors of the economy and give another impetus to the government to adopt the Energy Saving Programme under the Energy Savings Law, the implementation of which has been hindered by existing "social" tariff policies. These developments are also set to prompt industry's ability to improve system maintenance and upgrades, which should lead to up to 25% savings in electricity and 15% in heat sectors.

## **Moldova**

Moldova has a well-elaborated National Energy Strategy to 2030, updated in 2013. It also approved the National Energy Efficiency Action Plan (NEEAP) 2013-2015 and the National Renewable Energy Action Plan (NREA) 2013-2020 in the same year. Moldova is currently transposing the EU Acquis into its national legislation, as it prepares its integration into the European energy market as a member of the Energy Community Treaty. As a net energy importer, Moldova focuses on reducing import dependency by increasing generation

capacity, promoting energy efficiency and renewable energy, and integrating with regional markets in an attempt to diversify energy supply sources.

The NEEAP was designed in accordance with Moldova's commitments under the Energy Community Treaty to reduce final energy consumption in all sectors by 1.8% per year in the period 2013-15, compared to 2009, while the NREAP is linked to the EU Directive on the promotion of renewable energy. Moldova's energy targets to 2020 are closely aligned to the requirements under the Energy Community Treaty.

Moldova became a contracting party to the Energy Community Treaty in 2009, and it launched negotiations on a Deep and Comprehensive Free Trade Area (DCFTA) with the European Union in 2012. In June 2014, Moldova signed the Association Agreement with the European Union.

## Tajikistan

The National Development Strategy of Tajikistan to 2015 was adopted in 2007, while the energy sector remains governed by the Concept of the Fuel and Energy Complex Development for 2003-2015. This concept outlines full access to energy for its population as a key objective, followed by the rehabilitation and modernisation of the existing energy infrastructure in order to increase efficiency and reduce losses. The government also emphasises the importance of reducing its hydrocarbon import dependency and supports the large-scale development of its abundant hydropower potential, both for internal energy security and for exporting to the growing energy markets to its south. Recent policy directions promote the development of other sources of renewable energy; however energy efficiency measures are still heavily focused on supply side, with very little improvement in demand-side management. Energy subsidies and socially determined pricing mechanisms have failed to promote sound energy efficiency policies and measures.

## Turkmenistan

Energy sector governance in Turkmenistan is carried out by the executive branch of the government, overseen by the president of the country. The General Energy Policy of Turkmenistan is part of Turkmenistan's 2030 Socio-economic Strategy, aiming at increasing the country's power generation capacity by a third from 2011 to 2020, and 100% by 2030, which it aims to achieve by the complete modernisation of its major power generation units.

In October 2006, Turkmenistan adopted the Oil and Gas Development Plan for 2007-2030, aiming for a significant increase in oil and gas production and exports. Over the last decade Turkmenistan has diversified its natural gas output and export routes, diminishing its reliance on transit through Russia. It is currently negotiating further diversification of natural gas exports to the South Asian and European markets in addition to its large export undertakings to China.

## Ukraine

Ukraine updated its Energy Strategy for the Period to 2030 in 2013, which is aimed at developing an integrated and effective regulatory framework to facilitate more competition, deregulation and diversity in energy supply sources; increased development of domestic energy resources; measures to drive energy efficiency; cost-reflective pricing; and improved conditions to attract private investment. The strategy, however, remains

dominated by supply-side policies, and more emphasis is required to address energy efficiency and demand-side measures, where potential savings are large and could be achieved at relatively low cost.

In view of recent developments, the Ukrainian government has stepped up its efforts to intensify its indigenous energy production and improve energy efficiency policies and measures to tap the vast potential for energy efficiency gains in order to reduce import dependence and mitigate the impact of rising energy prices. It has also increased efforts to diversify gas supplies via interconnections with European markets and reverse pipeline flows and pledges to modernise its gas transmission system in co-operation with its European partners.

The government signed the Association Agreement with the European Union in June 2014 and has accelerated its work in transposing the Energy Community Treaty provisions into the national legislation in order to revitalise the electricity and natural gas sectors, foster competition, and strengthen the role of the National Commission for the State Regulation of Energy Markets.

## Uzbekistan

Energy sector management in Uzbekistan differs from all other countries in the reviewed regions. There is no dedicated energy ministry in Uzbekistan, and energy policies are set by the Cabinet of Ministers as part of the country's overall economic development directions. Sector management is carried out by the vertically integrated national holding companies UzbekNefteGas (the national oil and gas company) and UzbekEnergo (the national electricity company), which both have decision-making authority and act as commercial operators. Energy tariffs are set by the Ministry of Finance, based on proposals submitted by the national energy companies, and remain heavily subsidised.

Uzbekistan is the most populous country in Central Asia and has a well-developed industry sector, which makes it the largest energy consumer in the region. The country is self-sufficient in energy terms; however, its economy remains one of the most energy-intensive in the region. A steady rise in domestic consumption suggests that Uzbekistan could face gas supply shortages after 2020 given the current rate of growth in energy consumption. Uzbekistan is also interested in increasing exports to China and neighbours through the Central Asia-China pipeline system, which will pose a further challenge under the existing consumption patterns and projections. The government is therefore committed to increasing energy efficiency in all sectors of the economy and to accelerating developments in alternative energy sources, particularly wind and solar energy where potential is large.

The government aims to reduce the share of hydrocarbons in its energy mix by 50% by 2050, which it plans to achieve by utilising its vast renewable and alternative energy potential and by maximising energy efficiency gains. The government is committed to expanding and modernising its power systems, improving efficiency through the entire chain of power delivery from generation to distribution, reducing greenhouse gases, and developing further exporting opportunities.

## ENERGY SECURITY

Endowed with abundant hydrocarbon, hydro and renewable energy resources, the Caspian and Black Sea regions have emerged as an important contributor to global energy supplies and to world energy security. The region has significantly expanded its oil and

gas exports to international markets since the beginning of the 1990s, and Azerbaijan, Kazakhstan, Turkmenistan and – to a lesser extent – Uzbekistan all have the potential to increase hydrocarbon production in the coming years, while the region’s hydropower export potential still remains largely untapped. The increases in output are associated and encouraged by an emerging diversity of export routes and markets, first for oil and more recently for gas, reducing reliance on export routes through Russia.

Domestically, however, some reviewed countries have faced increasing difficulty in securing energy supplies to their internal markets. Access to energy, i.e. electricity, according to the standard indicator measuring electrification rate, is very high in the Caspian and Black Sea region (above 99%) – this electrification rate was put in place during Soviet times when the system attached utmost importance to electrification. However, there is strong evidence to suggest that, despite such a high electrification rate, access to modern energy services is limited in some countries, particularly outside the 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, particularly in the South Caucasus and Central Asia, of load-shedding and brownouts. Striking examples include low reservoir levels and poor hydrological conditions in Kyrgyzstan and Tajikistan, provoking electricity shortages and cut-offs during winter months.

There are two major barriers to energy access observed in the reviewed regions: the reliability of energy supply and affordability. Poorly maintained Soviet-era infrastructure is the major constraint on the reliability of supply, and funds for investment are limited in many cases 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 the 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 reviews show a considerable increase in the installation of individual meters, which provides 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 level across the region, which also suggests the decrease of illegal connections to the grids.

Many low-income rural households across the reviewed regions still lack access to affordable clean fuels for cooking and heating, and they often rely on traditional biomass (straw, wood) or coal, with many of them cooking over an open fire. Countries with traditional biomass potential are still on their way towards developing forest cadastres and management systems, without which these developments will lead to the degradation of local biomass resources.

A similar situation is observed in accurately accounting for other renewable energy use, which makes it difficult to assess the need for the decentralised deployment of renewable energy technologies, which in many cases could be a way forward to alleviate energy poverty and to support the provision of (or access to) a modern energy infrastructure.

## MARKET CONVERGENCE

The energy policy reviews of the Caspian and Black Sea region have demonstrated that homogeneity amongst the countries, often implied for these regions, does not exist in

practice. In assessing the regional markets, the review teams observed the inverted trends over two decades of disconnecting from the previously existing regional markets and securing self-sufficiency of domestic energy networks to the extent possible.

Regional support is only observed in developing new energy export infrastructures, also comprising transit countries by providing them with the possibilities of energy offtakes at a discounted price. Earlier developments related to Kazakh and Azeri oil and gas exports to the world energy markets have seen exceptional regional co-operation and solidarity. The Baku-Supsa, Baku-Ceyhan and South Caucasus pipelines have paved the way for Caspian resources to the world energy markets. An 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. The development of this extensive oil and gas export infrastructure to China has now encompassed 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 from these sizable infrastructure developments.

## SUSTAINABLE DEVELOPMENT

The reviewed region remains highly energy-intensive, reflecting the continuing gross inefficiencies in the way energy is used, as well as climatic and structural economic factors. There is a considerable potential for energy savings in all sectors, particularly in industry, district heating and buildings. If the region were to use energy as efficiently as OECD countries, the consumption of primary energy in the Caspian 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 raising levels of energy consumption, large untapped potential for energy efficiency gains and related benefits for energy security and economic growth, governments would need to elevate emphasis on energy efficiency improvements. 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 stable sources of financing for required energy efficiency investments. Energy pricing across the region remains a barrier to energy efficiency investments.

There is a tendency to focus on energy intensity targets across the reviewed regions. Energy efficiency targets should be based on solid statistical data at a sufficient level of disaggregation and modelling. In order to develop effective policies and track progress, efforts should be made to establish and maintain energy supply and demand databases, covering all sectors and subsectors of economy and establish baselines to track progress.

Energy efficiency governance remains vague in almost all reviewed countries. Clear definition of the role of local governments in energy efficiency policy implementation is of a prime importance. Placement of a dedicated public authority in charge of energy efficiency policies and measures, with the authority to oversee the implementation of government policies, could greatly contribute to ensuring that energy efficiency is a strategic priority and provide for a need for greater co-ordination.

**Box 2** Potential for saving energy in district heating

In most reviewed countries, a significant share of energy used in buildings takes the form of district heat. In many cases, 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 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 that, especially in the residential sector, end users are often not billed for the actual amount of heat they use because supplies to individual dwellings are not metered. Thus, 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. As a result, simply raising prices for heat would make no difference to consumption: people would still need to heat their apartments, so 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, in most cases, it remains under the local governance structures.

Considerable progress has been observed in promoting renewable energy developments in the reviewed regions. Most of these countries have put in place well-elaborated strategies and financial support mechanisms, including green tariffs in some cases, and relaxed investment procedure for developing renewable energy. However, common barriers impeding policy implementations include the absence of secondary legislation setting up the legal and regulatory mechanisms and technical rules for grid integration. Going forward, governments could greatly benefit from cost-benefit analysis, considering all renewable resources and available technologies with competitive advantages.

## INVESTMENT CLIMATE

Investment attraction has been the key focus for the governments in the region since their independence. One of the most successful changes in national legislations is attributed to liberalising fiscal structures for attracting much-needed investment. While initially based on project-by-project incentives, most of the countries have gradually moved to more widespread reforms, removing lengthy licensing and permitting procedures, and allowing various types of fiscal holidays for energy-related investments aimed at maintaining existing systems or installing new energy infrastructures.

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

The impediments for attracting investments in upgrading and maintaining these existing systems were due mainly to tariff structures, where energy tariffs remained below cost-recovery levels, and to energy subsidies, which do not provide any investor with the chance of recouping their investment. Those who have undergone a number of cycles of commercialisation and privatisation of their national companies have opted for restructuring and selling parts of their energy infrastructures to potential investors in an exchange for system rehabilitation and system reliability. Those countries that have opted for regulatory reforms, in addition to privatising their energy sectors, have seen greater benefits to the population and industry at large.

## KEY RECOMMENDATIONS

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

### General energy policy

- *Continue sustainable energy policy reforms/development; ensure transparent implementation/enforcement of the energy legislative frameworks; strengthen the rule of law and improve transparency.*
- *Prepare 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.*
- *Promote research and development activities on 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. Improve energy security by increasing conventional/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 and mobilise 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.*
- *Set clear goals and allocate public support resources for power sector modernisation to address both greenhouse gas and local pollution emissions reduction and to increase overall efficiency. Set a realistic retirement schedule for old inefficient power plants and equipment; retrofit suitable power generation facilities; for coal based generation, ensure that new coal-fired power plants are equipped with the most efficient (supercritical, ultra-supercritical and CO<sub>2</sub>-capture-ready) technologies available.*
- *Design staged rehabilitation of district heating and gas distribution networks, starting with most critical areas; consider reinvesting income from rehabilitated areas in subsequent stages of the system upgrade/rehabilitation.*
- *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.*

### **Market convergence**

- *Continue developing the most efficient energy market model(s) and support it (them) with adequate legal and regulatory regimes.*
- *In the context of the new market design, strengthen the competencies and the independence of the national regulatory authority and reinforce its role to safeguard 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 a basis of affordability, with most vulnerable customers receiving the most support until the phase-out is complete.*
- *Initiate and lead or participate in the multilateral framework for regional market integration. Develop clear rules for cross-border energy export and trade and agree on technical rules for efficient grid integration.*
- *With the objective of fostering regional integration of the energy markets and interconnection, actively discuss the set-up of a regional market with neighbouring countries and at international level to improve energy security and overcome isolation of the national energy markets.*
- *Review the market model as new interconnections develop, and adapt market rules in line with EU legislation to remove regulatory and trade barriers.*

### **Sustainable development**

- *Move towards a low carbon future. Introduce a balanced framework for promoting renewable energy sources; attract more carbon investments and take steps to implement the EU Large Combustion Plant Directive.*

- *Boost implementation of the energy efficiency plan with legislative measures to encourage energy savings across all sectors of the economy, importantly in buildings and transport sectors. Introduce adequate tariff structures to incentivise energy savings and building codes for renovation and construction.*
- *Strengthen initiatives at local and city levels on energy savings and the use of renewable energies, and increase awareness on essential energy efficiency measures.*
- *Take a lead in co-ordinating the implementation of energy efficiency measures across the government, e.g. by increasing the role and functions of the energy saving/efficiency agencies (for countries that already have such public bodies; for others recommendations suggest creating a dedicated public entity in charge of energy efficiency policy implementation).*
- *Maximise energy efficiency gains by co-ordinating effective implementation of demand-side policies, especially in the energy efficiency and district heating segments. Scale-up efforts to raise public awareness of available mechanisms and incentives for energy savings with particular emphasis on the buildings, residential and transport sectors.*
- *Consider incentive schemes for energy efficiency improvements on both demand and supply sides.*
- *Elaborate on a building code for new constructions and with tangible requirements for retrofitting old buildings.*
- *Continue promoting energy efficiency in the transport sector for further reducing energy consumption.*
- *Improve the collection, compilation and use of energy demand-side data and encourage the development of energy efficiency indicators to be used as a tool for the demand-side management and long-term energy policy planning.*

### **Investment attraction**

- *Ensure stable, predictable, fair and transparent investment procedures, with clear steps for energy sector investment developments to encourage the public and private investments required for effective energy markets.*
- *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 are further conditions.*
- *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.*

## ANNEXES



## ANNEX A: REVIEW CRITERIA

The review has been conducted according to the Benchmarking Criteria (Indicators), agreed between the European Commission and the INOGATE Partner Countries under the Astana Road Map.

First priority area: energy market convergence

- Third Party Access as defined by the EU Acquis.
- Unbundling as defined by the EU Acquis.
- Independent energy regulators as defined by the EU Acquis.
- Harmonisation of energy standards with those of the European Union.
- Integrated Regional Market: this includes any action plan for the creation of an integrated energy market that is under implementation or preparation, or any potential governmental decision to facilitate the preparation of such action plan.

Second priority area: energy security

- Development of Maintenance strategy, guidelines, training programmes and recording systems.
- Adoption and implementation of long- and medium-term energy infrastructure rehabilitation/upgrading programmes, including appropriate financial provision, as well as the development of outage and loss reporting systems and statistics.
- Development of new energy infrastructures: this includes the status of negotiations with neighbouring countries for future development of energy infrastructures; legislative framework; any actual or potential co-operation with relevant EU agencies; incentives for energy infrastructure investment; and any co-operation agreements with Partner Countries for energy transit protocols and cross-border metering.
- Metering and billing (use of end-user metering facilities).

Third priority area: sustainable development

- Policy commitment to promote sustainable energy development or adopted strategies or policies that support such development.
- Energy efficiency/renewable energy systems (EE/RES) framework: development of legal, institutional and financial frameworks which will promote and foster energy efficiency and renewable energy in the country.
- EE/RES action plans and measures: existence of any programme and/or action plans, including information campaigns, and training and awareness rising on best practices (including measures to promote convergence with EU standards and norms).
- Creation of energy agencies: information on the establishment and the operation of energy agencies including set-up, efficient operation, training programmes and other measures that support their efficient and independent operation.

- Environmental assessments and environmental standards: implementation of environmental assessments, assessments of renewable sources potential by relevant industries/institutions and environmental standards for energy utilities approaching progressively closer to EU levels.
- Energy auditing: including records on the of such audit results.
- Kyoto Protocol mechanisms: development of the Kyoto Protocol mechanisms (Clean Development Mechanism [CDM], joint implementation projects [JIPs], emissions trading) and realisation or planning of projects under this framework.
- Gas flaring reduction: gas flaring reduction measures, as well as “methane-to-market” measures.

Forth priority area: investment attraction

- Investment framework: status of legal and regulatory framework development; stability, transparency and adequacy of this framework, progress of the privatisation process, and relevant institutional reforms are the criteria for determining the development of a favourable investment framework.
- Investment climate: development of a taxation system (adequacy, simplification, transparency, corruption), a financial and banking system (privatisation, transparency, stability) and a disputes settlement system (adequacy, bureaucracy, corruption); and also the extent to which production tariffs and energy pricing system favour investments.
- Investment planning: development of investment strategy and planning (either existing or in preparation), any negotiations with neighbouring countries for future development of common projects, agreements of intent and/or co-operation with other countries.

## ANNEX B: PEER REVIEW SET-UP AND ORGANISATIONS MET

The International Energy Agency and the INOGATE Technical Secretariat thank the INOGATE country experts in each Partner Country for their excellent co-operation in supporting the questionnaire submissions by their respective countries and in organising the review visits, during which the peer review teams met with all key energy stakeholders, including the responsible ministry/government structures for energy; relevant public and private energy enterprises; regulatory structures/authorities; non-governmental sector and donor communities. The review cycles for both years have had an active participation from the governments of Armenia, Belarus, Moldova, Kazakhstan, Kyrgyzstan and Tajikistan, with the representatives from these countries acting as the Team Leaders for the 2013 review cycle.

### REVIEW TEAM

#### Composition of the review teams

The peer review team members were:

- Thea Khitarishvili, International Energy Agency
- Sonja Lekovic, International Energy Agency
- Sylvia Elisabeth Beyer, International Energy Agency
- Andrii Mitsai, INOGATE Technical Secretariat
- Lem Lem Issaa, INOGATE Technical Secretariat
- Vladimir Ternytskyi, INOGATE Technical Secretariat
- Anna Petrus, INOGATE Technical Secretariat
- Sergey Abrahamyan, Peer Reviewer Ministry of Energy of Armenia
- Zaur Mamadov, Peer Reviewer, Ministry of Energy of Azerbaijan
- Andrew Molochko, Peer Reviewer, Ministry of Energy of Belarus
- Galyna Parsian, Peer Reviewer, Ministry of Economy of Moldova
- Maryash Zhakupova, Peer Reviewer, Kazakhstan
- Ruslan Orozaliev, Peer Reviewer, Ministry of Energy of Kyrgyzstan
- Timur Valamat-Zade, Peer Reviewer, Ministry of Energy of Tajikistan
- Levon Vardanyan, INOGATE Country Expert, Armenia
- Zaur Mamadov, INOGATE Country Expert, Azerbaijan
- Andrew Molochko, INOGATE Country Expert, Belarus
- Irakli Vardigoreli, INOGATE Country Expert, Georgia

- Ludmila Burlui, INOGATE Country Expert, Moldova
- Maryash Zhakupova, INOGATE Country Expert, Kazakhstan
- Maigul Kuanyshkaliyeva, INOGATE Country Expert, Kazakhstan
- Gulsara Kasymova, INOGATE Country Expert, Kyrgyzstan
- Timur Gafarovich Valamat-Zade, INOGATE Country Expert, Tajikistan
- Larisa Tashkhodzhaeva, INOGATE Country Expert, Uzbekistan

## **ORGANISATIONS MET**

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### **Armenia**

- Ministry of Energy and Natural Resources of the Republic of Armenia
- Ministry of Energy and Natural Resources
- Ministry of Environmental Protection
- Commission for Regulation of Public Services
- National Statistic Services of Armenia
- National Statistics Service of the Republic of Armenia
- Armenian Renewable Resources and Energy Efficiency Fund
- Technical Standards Laboratory, Scientific and Research Institute for Power Engineering
- National Standards Institute (SARM)
- National Renewables and Energy Efficiency Fund
- CJSC Electric Grids of Armenia
- Public Services Regulatory Commission
- CJSC Power Grid Operator
- CJSC High Voltage Power Grids
- JSC Armenian Electricity Networks
- JSC Gazprom-Armenia
- ARMESCO Association
- TechnoEco LLC
- SPARE Coordinator in Armenia/NGO Eco Club TAPAN
- Eco Team/Energy and Environment NGO
- NGO Eco Club TAPAN
- Contact-A LLC
- JSC Billing Centre
- INCR IPT LLC (IT consulting service)

- EU Delegation
- EBRD
- USAID
- KfW
- German-American Fund

## **Azerbaijan**

- Ministry of Industry and Energy
- Energy, Household and Water Supply Services Division, Tariff Council
- Ministry of Ecology and Natural Resources
- Ministry of Taxes
- Ministry of Economic Development
- EU Delegation
- UNDP
- NGO Climate Change
- International Energy Academy
- NGO Ecological Union of Azerbaijan
- Energy Efficiency Center
- International Environmental Academy
- National Academy of Science
- Ministry of Energy
- Ministry of Economy and Industry
- Committee on Statistics
- JSC AzerEnergy
- JSC Azerustilikmahizat
- Agency on Alternative Energy Sources
- Azerenergy OSC
- Azerigas Production Union
- State Committee on Statistics
- State Committee on Standardization, Metrology and Patent
- State Agency on Alternative and Renewable Energy Resources
- ACE Consultants
- Caspian Technology
- Recycling Company

- Delegation of the European Union to Azerbaijan
- Learning of Economic Resources Social Union
- Azerbaijan Republic Energy and Ecology Public Union
- Towards Healthy Life Ecology Social Union
- Center of Local Economic Development Social Union
- Sustainable Development Social Union
- Clean Production and Energy Efficiency Center
- Fund on Assistance to Ownership and Development of Market Economy
- International Ecoenergy Academy
- Ecological Stability Social Union
- Association Fovghal
- Ecolite Social Union on Ecology
- Enlightenment and protection of Consumers Social Union
- Eco Life Social Union
- Ecological Enlightenment and Monitoring Social Union

### **Belarus**

- Ministry of Energy
- Ministry of Environment
- State Standards Agency
- SPA Beltopgaz
- OJSC Beltransgas
- SPA Belenergo
- Central Dispatch Unit (RUE ODU)
- Belarusian State Statistics Agency
- International Energy Company
- EBRD
- EU Delegation

### **Georgia**

- Ministry of Energy and Natural Resources of Georgia/Ministry of Energy
- Ministry of Environment
- State Agency of Natural Resources
- Georgian National Investment Agency

- Georgian National Energy and Water Supply Regulatory Commission
- National Statistics Office of Georgia (GEOSTAT)
- Georgian Oil and Gas Corporation (GOGC)
- Georgian Gas Transportation Company (GGTC)
- Georgian State Electric System (GSE)
- Electricity System Commercial Operator, JSC (ESCO)
- Engury Hydropower Company Engurhesi
- Energy Efficiency Centre
- Centre for Energy Efficiency and Environmental Protection (VAP Georgia)
- NGO International Center for Environmental Research
- NGO Energy Efficiency Center Georgia
- Caucasus Environmental NGO Network (CENN)
- Energy Studies, World Experience for Georgia (WEG)
- Caucasus Environmental NGO Network (CENN)
- The Greens Movement of Georgia/ Friends of the Earth Georgia
- Georgian Society of Nature Explorers Orchis
- International Financial Institutions Monitoring Programme, Green Alternative
- Energy and Environment Associates
- Blake Oil and Gas Company
- EU Delegation
- KfW
- EBRD
- UNDP

### **Kazakhstan**

- Ministry of Energy and New Technologies
- Ministry of Environmental Protection
- Ministry of Oil and Gas
- National Chamber of Housing and Communal Services of Kazakhstan
- Market Regulator (KOREM)
- Energy Regulator (AREM)
- Antimonopoly Committee
- National Statistics Agency of Kazakhstan
- Kazakhstan Electricity Grid Operating Company (KEGOC)

- Regional Energy Company REC Mangistau
- Samrukenergo
- Kazenergyexpertise
- ThermalElectroStation
- Astana Energy Distribution Company (Astanaenergosit)
- Ekibastus Thermal Power Station
- Akmolyn regional (Oblast) distribution company (Akmolynskaya REC)
- Association Atamiken
- Samruk-Energo
- Astanaenergosit (electricity DSO)
- National Oil and Gas Company (KazMunaiGas)
- Kaztransgas
- Intergas Central Asia
- EU Delegation
- Kazakhstan Oil and Gas Industry Association (KazEnergy)
- Kazakhstan Electric Power Energy Association
- Representatives of the bilateral embassies and representations of the following EU member states: Hungary, Spain, Germany, Romania, and Bulgaria
- UNDP
- USAID
- OSCE
- WB

### **Kyrgyzstan**

- Ministry of Energy and Industry
- Environmental Protection Agency
- Ministry of Finance
- Kyrgyz Scientific and Technical Centre for Energy (KSTC Energy)
- State Agency on Environment Protection and Forestry
- Coordination Commission for Climate Change Issues
- State Department on Tariff Regulation
- Kyrgyz Institute of Earthquake-Resistant Construction
- Kyrgyz Scientific & Research Centre “Energy”
- National Statistics Committee

- State Technical Inspection
- KSTC Energy
- JSC National Electrical Grid of Kyrgyzstan
- State Enterprise Kyrgyzzhilkommunsoyuz
- Kant PTS
- JSC KyrgyzNefteGas
- JSC Jalalabat Electro
- OJSC KyrgyzGas
- OJSC SeverElectro
- Utility Company BishkekTeploEnergo
- OJSC VostokElectro
- OJSC BishkekTeploSet
- Kyrgyzstandart
- JSC Bishkekteploset
- JSC Kommunsouz
- JSC Dzhalalabadelectro
- JSC Vostokelectro
- JSC Oshelectro
- JSC Bishkekelectro
- JSC Kyrgyzcomyr (Kyrgyz Coal)
- JSC Kyrgyzneftegas
- Electrosila LLC
- Dordoy Energy LLC
- Jogorku Kenesh Executive Office
- Association of Entrepreneurs of the Energy Complex
- Ecological Movement BIOM
- EU Delegation
- EU-funded CASEP Project
- ADB
- KfW
- WB
- IMF
- JICA
- USAID

- Swiss Embassy
- Tetrattech
- UNDP

## **Moldova**

- Ministry of Economy
- Ministry of Environment
- Climate Change Office, Ministry of Environment
- Ministry of Regional Development and Construction
- National Bureau of Statistic
- National Energy Regulatory Agency (ANRE)
- Moldovan National Institute of Standardisation and Metrology
- Energy Efficiency Agency (EEA)
- Energy Efficiency Fund (EEF)
- TA-SPSP Energy Project
- SA Moldovagaz
- SRL Moldovatransgaz
- SE Moldelectrica
- RED GasNatural Fenosa
- SRL Chişinau-gaz
- Red-Nord Electrica
- SA RED-NORD
- SA RED NORD-VEST
- S.A. Horus
- SRL Moldcablu
- ICS Euroterm Group SRL
- Yedina Kuchka
- Solartech Energy
- Saryly Garmagroup
- NGO DINA
- Sudzucker Moldova
- Green Farm Ltd.
- NGO Pro-Energy
- NGO Gutta-Club

- NGO Expert-Group
- BEMOL SRL
- Petrom SA
- Import Competrol
- SRL Laiola
- SRL Polimer Gaz Conducte
- NGO Cleaner Production and Energy Efficiency Centre
- NGO Gutta-Club (Republican Children and Youth Centre)
- NGO Alliance for Energy Efficiency and Renewables
- EU Delegation
- Embassy of Sweden to Moldova
- USAID Moldova
- WB
- GIZ
- UNDP

### **Tajikistan**

- Ministry of Energy and Industry/Ministry of Energy and Water Resources
- Ministry of Industry and New Technologies
- State Committee of Environmental Protection
- State Committee on Standardisation (TajikStandart)
- National Statistics Agency
- Antimonopoly Agency
- Production Scheduling Department, CJSC (EnergoRemont)
- Department of the State Unitary Enterprise (Naftugas va Angisht)
- RES Centre of the Academy of Sciences of the Tajik Republic
- Tajik Technical University
- Association of Power Engineers
- Environmental Specialist Association
- National Energy Company Barki Tojik (TSO and DSO)
- JSC Pamirenergo (DSO)
- JSC Tajiktransgas (TSO and DSO)
- Shirkati Tizorati Soyod (coal company)
- Petroleum Sugd LLC

- Private oil and gas company
- LLC “Silovsin” Law Firm (energy sector)
- CJSC Khasan and C
- Gaffor Aliev LLC
- TajHydro (Tajik-Norwegian Fund)
- EU Delegation
- UNDP
- JICA
- ADB
- EBRD
- USAID
- Tetrattech

### **Ukraine**

- Ministry of Energy and Coal Industry
- Institute of Energy Efficiency and energy Management
- Wind association

### **Uzbekistan**

- EU Coordination Centre
- National Statistics Committee
- UzbekEnergO
- UzbekNefteGas

### **Turkmenistan**

There were no review missions to Turkmenistan.

## ANNEX C: GLOSSARY AND LIST OF ABBREVIATIONS

In this report, abbreviations and acronyms are substituted for a number of terms used within the International Energy Agency. While these terms generally have been written out on first mention, this glossary provides a quick and central reference for the abbreviations used.

ADB	Asian Development Bank
DSO	distribution system operator
EBRD	European Bank for Reconstruction and Development
EEA	European Economic Area
EIA	environmental impact assessment
EU	European Union
GIZ	German Gesellschaft für Internationale Zusammenarbeit GmbH
IFI	international financial institutions
IMF	International Monetary Fund
INOGATE	EU-funded energy co-operation programme for countries in Eastern Europe, Caucasus and Central Asia
JICA	Japanese International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau, German Development Bank
OSCE	Organization for Security and Cooperation
UNDP	United Nation Development Programme
USAID	United States Agency for International Development
WB	World Bank





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## Eastern Europe, Caucasus and Central Asia

Conveniently located near the world's fastest growing energy markets, the resource-rich and transit countries of Eastern Europe, Caucasus and Central Asia contribute significantly to world energy security. However, shared challenges across the region include aged infrastructure, high energy intensity, low energy efficiency, untapped alternative energy potential and poorly functioning regional energy markets.

This publication highlights the energy policies and sector developments of Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan during 2012-13 and provides a summary of key recommendations for policy makers in the region.

Energy policy analysis is conducted in line with the INOGATE programme's four main pillars of energy development: energy market convergence, energy security, sustainable development and investment attraction. Started in 1996, the INOGATE programme is one of the longest running energy technical assistance programmes funded by the European Union and works within the policy frameworks of the Baku Initiative and the Eastern Partnership. The INOGATE programme co-operates with 11 INOGATE Partner Countries to support reduction in their dependency on fossil fuels and imports, to improve the security of their energy supply and to mitigate overall climate change. It also supports the Eastern Partnership, a joint initiative between the European Union, EU member states, and the Eastern European and Caucasus countries. Launched in 2009, the Eastern Partnership aims at advancing political association and economic integration.

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