



# Renewable Energies in Central Asia

Regional Report on Potentials and Marktes – 8 Country Analyses

Energy-policy Framework Papers,  
Section »Energy and Transport«

# IMPRINT

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# FOREWORD

## Background

In recent years a large number of developing and emerging countries have changed the structure of their energy sectors, often accompanied by a liberalization of their markets. In many cases, **Renewable Energies (RE)** are a more and more important strategic component for the countries' diversification of their national energy supply.

A growing energy demand deriving from the increasing energy consumption of growing economies worldwide, accompanied by volatile prices for fossil fuels and by increasing environmental and climate challenges, boosts the demand for RE technologies. RE have a **competitive advantage** because they provide a long-term energy supply (for electricity, heating or cooling) based on locally available RE sources and thus help to reduce dependency on energy imports. In addition, RE provide appropriate technological solutions for the electrification of rural or semi-urban areas where they can be used independently from grid-connection. RE are a key for the provision of modern energy services in these areas and contribute to the local economic and social development.

While the technical potential for RE resources such as wind, solar, hydropower, biomass or geothermal energy is considered high in most developing and emerging countries, these regions are still faced with significant barriers for the development of commercially driven and sustainable RE markets. The lack of appropriate policies and the respective business environment are constraints that restrict the dissemination of RE in these countries. The success of comprehensive policy frameworks for the promotion of RE – such as RE feed-in-tariffs or incentive instruments like tax relieves – can be observed in more and more countries, for example Germany or France. However today, also developing countries and emerging markets such as South Africa, Kenya or the Philippines reveal the **significance of adequate policy frameworks for favorable market conditions**. Investments in RE markets, in particular by the private sector, very much depend on the existence of these national or regional framework conditions, incentives and financing options on the one hand, but also on sufficient **transparency and knowledge about these conditions**, which are thus part of the bottleneck for the deployment of RE.

## Objective

Current and accurate information and data availability are – as stated above – important prerequisites for the development of RE energy markets and a broader dissemination of commercial activities – particularly in markets where information is scarce and where framework conditions are under transition. **The Regional Reports on Renewable Energies comprising 30 country analyses on RE potentials and markets in West Africa, East Africa and Central Asia** are a substantial contribution to the dissemination of comprehensive and precise knowl-

edge on RE markets and related investment options and thus help to further pave the way for the promotion of RE in these regions.

As such the publication **addresses potential businesses and investors** – including manufacturers, technology providers, wholesalers, suppliers, project developers, operators, services companies, planning offices, consultancy firms, as well as financing institutions. The Regional Reports are both meant for those who are already active in the assessed RE markets, but also for those exploring new markets for their business activities. Of course, the publication also serves as a database with country-specific insights into the assessed African and Central Asian regions for interested actors from the public and civil sector.

The **geographical scope** of this publication is twofold: the **Regional Reports on Renewable Energies** focus on **West Africa and East Africa** which are mainly represented by developing countries and economies, and on **Central Asia** as a region predominantly characterized by **countries in transition**. All of these regions are promising markets for the RE industry and for potential investors as they offer remarkable, but still largely untapped RE potentials. Although market conditions which spur the promising RE potentials still need to be improved in almost all of the assessed countries, positive trends for the promotion and deployment of RE can be observed in many cases. Even in those countries, where the policy level still needs to be convinced of RE, political reformers more and more commit to take action for RE on the rise.

## Deliverables

The **Regional Reports on Renewable Energies** showcase comprehensive, but still selective information on the specific characteristics of the energy sectors of the **30 assessed countries** – **17 in West Africa, 5 in East Africa and 8 in Central Asia**. Key facts and figures on these energy markets and their RE potential is given in the **executive summary** of each regional report.

Each country analysis comprises an **introduction to the socio-economic, geographical and political background** of the country. It also includes an **overview on the national energy sectors**, including figures on power generation capacities, energy consumption and price levels as well as information on relevant market structures. This is followed by a presentation of the respective energy policy framework conditions. The chapter on **the status quo of RE** presents data on country-specific technical and economic RE potentials, as well as and on current RE investment projects and possible **RE business opportunities**. In addition, the report gives information on market challenges and risks. A snapshot of the **relevant actors of the energy sector** (private, as well as public, civil and scientific) is also included and serves as a source for identifying potential (business) partners for RE projects. Finally, each country analysis includes a **bibliography** and an **annex** containing additional graphs and figures on RE sources and technologies.

The presented regional reports series is part of the Energy-policy Framework Papers of the “Energy and Transport” section of Deutsche Gesellschaft für Technische Zusammenarbeit (gtz) GmbH.

The Regional Reports are also available for free of charge download on the GTZ website:

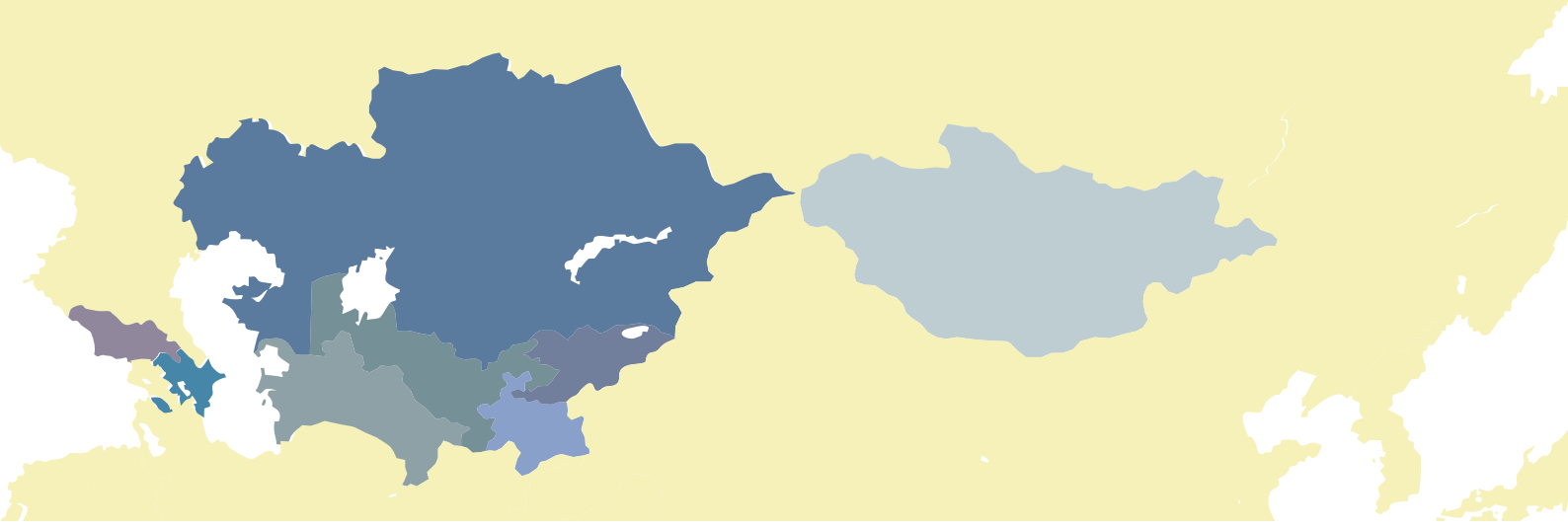
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The editorial team – Eschborn, December 2009

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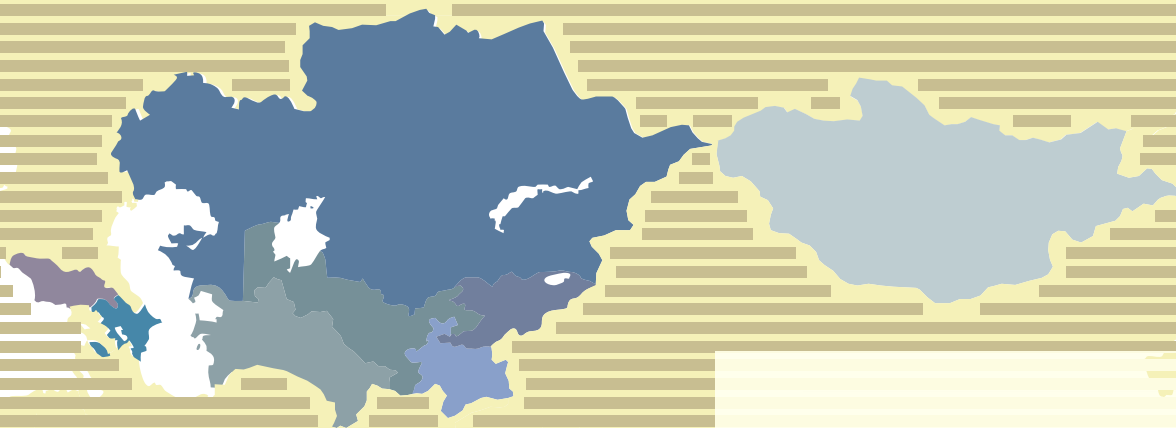


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### NOTE:

Main references/indications of sources are provided in the respective country chapters and not in this summary of the country chapters.



REGIONAL REPORT SUMMARY –  
BASED ON THE 8 COUNTRY CHAPTERS  
**AZERBAIJAN, GEORGIA, KAZAKHSTAN,**  
**KYRGYZSTAN, MONGOLIA, TAJIKISTAN,**  
**TURKMENISTAN, UZBEKISTAN**

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## ACRONYMS AND ABBREVIATIONS

### REGIONAL REPORT SUMMARY

DB	DOING BUSINESS
CPI	CORRUPTION PERCEPTIONS INDEX
MW	MEGAWATT
RE	RENEWABLE ENERGY
PV	PHOTOVOLTAIC
US CENT	UNITED STATES CENT

## 1 INTRODUCTION AND GENERAL OVERVIEW

The potential for using Renewable Energies (RE) differs strongly among the eight Central Asian countries. Some of them have huge oil and gas reserves while others are endowed with large hydro power, wind or solar resources depending on their climatic and topographical conditions. The common feature shared by all of them is that their political and economic development was influenced by the former Soviet Union to a large extent. Azerbaijan, Georgia, Kyrgyzstan, Kazakhstan, Uzbekistan, Tajikistan and Turkmenistan are former Soviet Republics. Mongolia was the only independent state, although it had very close ties to the Soviet Union as well.

All economies were affected by painful transitions from centrally planned to market economies. The eight countries are recent members of the Commonwealth of Independent states, except Mongolia and Georgia, which has withdrawn in 2008, and Turkmenistan, which is not a full member.

As a result of their political and economic history, the energy systems of these countries were mainly developed to serve the energy needs of the united energy system of the Soviet Union. They are often not ideal for the energy needs of their present economies. A related result is that their occasionally vast potential of renewable energy sources remains largely untapped, with the exception of large hydro power. The majority of the existing energy infrastructure including generation facilities and transmission networks is in disrepair or inefficiently operated causing huge energy and financial losses.

Meanwhile, after almost twenty years of transition, these countries have overcome the economic trough and are now back to a robust growth pattern going along with increasing political stability. There is a growing awareness in the region of the potential of renewable energy sources and most Governments have formulated policies for the increased development of RE. However, apart from smaller initiatives, there is still little initiative from the private sector to invest in RE projects. The key findings of each country are given below.

## 2 OVERVIEW OF THE ENERGY SITUATION AND RENEWABLE ENERGY POTENTIAL OF EACH COUNTRY

### Georgia

The Government of the Republic of Georgia has enacted a renewable energy promotion program for power plants up to 100 MW offering long-term purchasing agreements, favorable feed-in-tariffs and license-free electricity genera-

tion for power plants up to 10 MW. Under the program, the Government is tendering 91 potential new hydro power sites with capacities ranging from 0.6 MW to 99 MW. Second on the hit list are small- and medium-scale wind energy plants. Feasibility studies are available. Georgia has the best investment climate of the eight countries. However, investor confidence has suffered after the armed conflict with Russia in 2008. Rankings with regards to the Ease of Doing Business Index (DB)<sup>1</sup> and the Corruption Perceptions Index (CPI)<sup>2</sup> are: DB 11/CPI 66.

### Mongolia

The Republic of Mongolia strives to reduce its heavy dependence on imports of Russian petroleum and electricity and has recently passed a renewable energy law. Private investors are offered pre-defined feed-in-tariffs ranging from 5 US Cent for hydro power to 18 US Cent for PV electricity. Stand-alone renewable energy supply systems are attractive for nomadic households. There are also numerous isolated grids in rural centers where small hydro power or wind could replace diesel generators. The investment climate is fair to good, although corruption remains a risk factor. Rankings for Mongolia are: DB 60/CPI 120.

### Azerbaijan

The Republic of Azerbaijan is richly endowed with oil and gas resources, but these resources will be depleted within a few decades. The country is therefore diversifying its energy sector. A renewable energy law was introduced in 2004 with no market development impact so far due to a lack of funding and political will to enforce the provisions of the law, as well as very low feed-in-tariffs. Small hydro power is the most promising field for RE with hundreds of sites that potentially could be developed. Unfortunately, only few feasibility studies exist. Second most promising is the development of wind power plants at the Caspian Sea border. The investment climate is fairly good, but corruption is also rather high. Consequently, Azerbaijan's rankings are: DB 38/CPI 143.

### Kazakhstan

Kazakhstan has enormous gas and oil resources, which have largely prevented the development of a market for renewable energy so far. Nevertheless, the country has embarked on a strategy and passed legislation to promote RE resources targeting a 5% share of RE in the energy balance by 2024. Wind energy is the most promising renewable resource in Kazakhstan but all other renewable energy sources have an interesting potential as well. RE projects could be particularly attractive in isolated rural areas, which often suffer from energy shortage. Doing business in Kazakhstan is considered less easy, and foreign investors usually require support from local law experts. Corresponding rankings are: DB 63/CPI 120.

### Kyrgyzstan

Kyrgyzstan generates most of its electricity from abundant hydro power resources. However, the country is suffering from a serious energy crisis due to decreasing inflows into the large reservoirs. There is still a huge unutilized hydro

<sup>1</sup> WORLD BANK, DB 2010 ([WWW.DOINGBUSINESS.ORG/FEATURES/HIGHLIGHTS2010.ASPX](http://WWW.DOINGBUSINESS.ORG/FEATURES/HIGHLIGHTS2010.ASPX)), RANKINGS FROM 1-183, WITH FIRST PLACE BEING THE EASIEST.

<sup>2</sup> TRANSPARENCY INTERNATIONAL, CPI 2009 ([WWW.TRANSPARENCY.ORG/POLICY\\_RESEARCH/SURVEYS\\_INDICES/CPI/2009](http://WWW.TRANSPARENCY.ORG/POLICY_RESEARCH/SURVEYS_INDICES/CPI/2009)), RANKINGS FROM 1-18, WITH FIRST PLACE BEING THE LEAST CORRUPT.

power potential and also a considerable solar energy potential. While Kyrgyzstan is officially promoting the increased development of renewable energies, it could not yet attract the interest of private investors to develop smaller potentials. This is caused by the lack of a clear legal and regulatory framework and poor data on the existing potentials. The general business climate is fairly good, but corruption is still rampant. Thus, rankings for Kyrgyzstan are: DB 41/CPI 162.

#### Tajikistan

Tajikistan has an enormous hydro power potential of which a small part is being exploited by large hydro power plants. There are also plenty of opportunities for small hydro power development including isolated grids to supply energy to rural communities who often suffer from fuel shortages. While Tajikistan generally acknowledges the need for developing RE sources, the lack of official power purchase tariffs and a poor regulatory framework are strong disincentives for private investors to enter the RE market. The general conditions for small foreign investors in Tajikistan are rather difficult. Enterprises can be fully foreign owned, but obtaining and extending business licenses can be complicated and expensive. Tajikistan's rankings are: DB 152/CPI 152.

#### Uzbekistan

Uzbekistan is richly endowed with fossil energy sources, and the development of renewable energy does not yet enjoy high priority on the Government's agenda with the exception of hydro power. Climatic conditions are especially favorable for utilizing solar energy. The promotion of RE is only rudimentarily addressed in the existing legislation providing virtually no real incentive for small investors. The difficult business environment is a further disincentive. Extensive state controls and rampant corruption hinder the functioning of markets and the development of the private sector. Rankings for Uzbekistan are: DB 150/CPI 174.

#### Turkmenistan

Turkmenistan has tremendous wind power potential and high solar potential as well, but this is overshadowed by the well-known wealth coming from oil and gas. Currently, electricity generated in thermal power plants is supplied free-of-charge to domestic consumers, which is virtually a knockout criterion for any RE solutions. This is particularly unfortunate as the wind potential is so large that it could even rival the republic's natural gas reserves. There are energy efficiency and energy saving programs in place, and the Government is officially supporting the development of RE technologies. The development of a market for RE would, however, require much more commitment from the Government. The business environment of Turkmenistan is one of the worst in the world. Without having a close relationship to a high-ranking Government official, it is very difficult to do business. Thus, Turkmenistan's rankings comprise: DB not ranked yet/CPI 168.

## 3 CONCLUSION

The experiences with renewable energy technology are still very limited across all countries in Central Asia, with the exception of large hydro power. The countries with a conducive business environment have a more or less clear legislation regarding the promotion of RE technology. The lack of experience in applying these legislative prerequisites for concrete investment projects, however, adds to the investment risks particularly for small investors, who may not have the resources to fight through legal uncertainties. Besides the domestic promotion programs in the countries, supportive risk-reducing measures from donor countries may be required to trigger the utilization of RE sources by small foreign investors. Moreover, donor support will also be required to review and support the improvement of existing renewable energy legislation and regulatory frameworks in these countries.