



# Energy-policy Framework Conditions for Electricity Markets and Renewable Energies

## 21 Country Analyses

Eschborn, June 2004

**Part Albania**



Deutsche Gesellschaft für  
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## Background to the New Edition

Structural changes in the energy sector, accompanied by liberalisation of the relevant markets, have been continuing in many developing and transition countries in recent years. Growing demand for electricity and the ongoing climate debate are increasing the level of interest in technologies for generating electricity from renewable energy sources in these countries.

The rapid expansion of the use of renewable energy in Germany is a subject that is being followed with interest, even outside Europe. Experience here shows that the creation of a conducive political and economic framework and the implementation of appropriate promotion measures can speed up the exploitation of renewable energy.

The German and European market acts as the motor for a wind energy industry and provides an indispensable background of experience. The level of growth in this sector within Germany has slowed down, however. Project developers are therefore increasingly turning their attention to off-shore schemes, other parts of Europe, and the Mediterranean states. The markets for technologies based on other renewable energy sources are also experiencing growing interest. While it is true that the potential for hydro-power, wind power, solar power, biomass and geothermal energy in developing and more advanced countries is often considered to be high, obstacles to entry into this field include insufficient knowledge of the framework conditions prevailing in the energy industry in those countries and a lack of transparency with regard to the prior experience and interests of the national actors.

One of the aims of this third, updated and expanded edition of the study – under a new title – is to facilitate entry into the field of renewable energy. It is based on the previous editions from 1999 and 2002, which were published under the title ‘Producing Electricity from Renewable Energy Sources: Energy Sector Framework in 15 [or 12] Countries in Asia, Africa and Latin America’. These studies have been much in demand, not only by suppliers and project developers but also by financing and operating companies involved in renewable energy technologies.

The analyses of the individual countries comprise sections on the respective electricity markets and the actors in those markets, along with information on the energy-policy framework. The policy for promoting electricity generation from renewable energy sources is examined, and the status of the various forms of renewable energy is analysed in detail. The chapters on each country are rounded off by information about rural electrification.

In comparison with the 2002 edition, eleven new countries have been added. The information about a further ten countries has been updated:

New since 2002		Updated	
Albania	Philippines	Brazil	India
Bosnia - Herzegovina	Senegal	Chile	Mexico
Croatia	Sri Lanka	China	Morocco
Georgia	Vietnam	Colombia	South Africa
Jamaica	Yemen	Dominican Republic	Tunisia
Pakistan			

Information about Argentina, Cuba, Jordan, Kazakhstan and Turkey is given in the 2002 edition. Analyses of Egypt, Indonesia and Thailand were conducted in the 1999 edition. These previous editions are available in electronic form free of charge from [www.gtz.de/wind/english/downloads.html](http://www.gtz.de/wind/english/downloads.html).

Our grateful thanks go to a large number of GTZ staff members and other experts for their help with putting this information together.

Eschborn, June 2004

## Legal Information

1. The data used in this study is based on both publicly accessible sources of information (publications, specialist articles, Internet sites, conference papers etc.) and non-public papers (for example internal expert reports from promoting institutions), as well as personal interviews with experts (for example officials at energy ministries in the investigated countries and project staff at promoting institutions). Although all information has been checked as far as possible, errors cannot be ruled out. Neither the GTZ nor the authors can therefore provide any guarantee of the accuracy of the data included in this study; no liability can be accepted for any loss or damage resulting from use of the data included in the study.

2. The sole authorised user of this study for all forms of use is the GTZ. Duplication or reproduction of all or part of the study (including transfer to data storage media) and distribution for non-commercial purposes is permitted, provided the GTZ and the TERNA Wind Energy Programme are named as the source. Other uses, including duplication, reproduction or distribution of all or part of the study for commercial purposes, require the prior written consent of the GTZ.

## The TERNA Wind Energy Programme

Specialised knowledge and experience are needed to determine what wind energy resources a country possesses and to identify suitable locations. Technical and economic analyses of wind power projects are also impossible without hard information about wind conditions. Such analyses, however, form the basis for the financing and ultimately the successful implementation of a wind farm.

The purpose of the TERNA (Technical Expertise for Renewable Energy Application) Wind Energy Programme, implemented by the GTZ on behalf of the Federal German Ministry for Economic Cooperation and Development (BMZ), is to assist partners in developing and more advanced countries in planning and developing wind power projects. Since 1988 the aim within the TERNA framework has been to lay the foundations for sound investment decisions while at the same time enabling partners to plan and develop further wind power projects in the future.

The TERNA Wind Energy Programme's partners are institutions in developing and more advanced countries that are interested in commercial exploitation of wind power: these include, for example, ministries or government institutions which have the mandate to develop BOT/BOO projects, state-owned or private energy supply companies (utilities) and private enterprises (independent power producers).

TERNA offers its partners know-how and experience. In order to initiate wind power projects, favourable sites must be identified and their wind energy potential ascertained. To do this, wind measurements are normally taken over a period of at least twelve months and wind reports are drawn up. If promising wind speeds are found, the next step is to conduct project studies investigating the technical design and economic feasibility. TERNA also provides advice to partners on matters of finance, thus closing the gap between potential investors and offers of funding from national and international donors. If required, CDM baseline studies can be prepared and advice can be offered to potential operators on setting up an efficient operator structure. In order to ensure as much transfer of know-how as possible, efforts are made to ensure cooperation between international and local experts, for example when preparing the studies.

In successful cases, TERNA initiates investment-ready wind farm projects by this method. TERNA itself is not involved in financing. In addition to the activities that are tied to specific locations, TERNA advises its partners on how to establish suitable framework conditions for the promotion of renewable energy sources.

The prerequisite for promotion by the TERNA wind energy programme is that project development has a realistic prospect of implementation: if the underlying conditions in the electricity sector are sufficiently favourable, and if the proposed wind farm project has a minimum capacity of roughly 20 MW and is situated in a windy area (expected annual average wind speeds of over 6 m/s at a height of 10 m above ground level). Small individual installations or decentralised wind/diesel systems are not normally eligible for promotion, nor are research projects.

Up until 2004, TERNA has been active in over ten countries around the world. In Colombia the first wind farm started operation at the end of 2003 with the help of the TERNA programme. The municipal utility of Medellín built the 19.5MW Jepirachi wind farm on the Guajira peninsula with a total investment volume of some 27 million euros. The 800,000 tons of carbon dioxide saved by the wind farm by 2012 will be documented and sold to the Prototype Carbon Fund (PCF), which will mean additional revenues of around 3.2 million euros for the investor.

The TERNA projects are not financed from the country quotas which the Federal Germany Government agrees with individual partner countries. From the viewpoint of the partner country, therefore, TERNA offers additional funds for wind energy.

Further information on the GTZ's TERNA Wind Energy Programme, the application procedure etc. is available at [www.gtz.de/wind](http://www.gtz.de/wind) or directly from:

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# Albania

## Electricity Market

### Generating capacities

Electricity supply in Albania is based almost entirely on water power, which accounts for 87% of all installed generating capacity and 95% of all generated power. The total installed power generating capacity amounts to 1,670 MW, including 1,446 MW from hydroelectric power plants and 224 MW from thermal power plants. Three large power plants along the Dini River contribute most of Albania's electricity (80% of the installed hydropower), but there are also numerous small storage power plants and run-of-river power plants. One large oil-fired steam power plant with a rating of 160 MW is still in service, but its outdated technology and a lack of maintenance only allow part-load operation (approx. 60 MW). Most small-scale coal-fired power generating facilities are no longer in operation and probably destined for permanent decommissioning.

### New combined-cycle power plant near Vlore

A new thermal power plant to be located near Vlore, a coastal town in south-western Albania, is intended to expand Albania's power-generating capabilities. An oil-fired combined-cycle power plant with an initial rating of 136 MW (gas turbine with downstream steam process) will be equipped for conversion to natural gas on an availability basis. The plant may eventually be expanded to a total rating of 400 MW.

### Power generation

Figure 7 shows how much Albania's own power production fluctuates as a function of annual precipitation volumes. Intensive rainfall in 1996, for example, produced a peak yield of some 5,500 GWh and even made it possible to export some electricity.

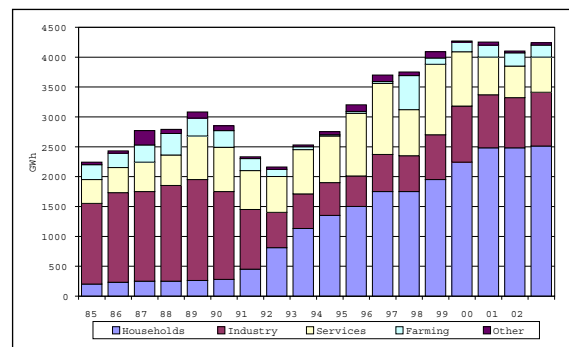


Figure 7: Inputs to electric power grid; Albania; 1985–2002; GWh<sup>208</sup>

### Power supply problems

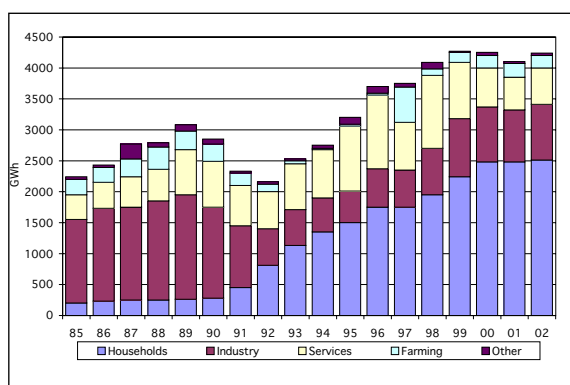
Nearly every day in recent years, particularly during the winter months, there have been hours-long interruptions in the supply of electricity. Several factors have contributed to this development: the power-generating infrastructure is very outdated, relying on plants that were built in the late 1950s or 1970s, with no replacement or expansion of capacity to any appreciable extent since then – among other things because of a lack of spare parts. In addition, the situation further deteriorated in 2001, when a long drought caused the water in the reservoirs to recede to levels not seen in a century. Consequently, nearly one third of Albania's electricity had to be imported that year.

The distribution networks and transformer substations were not designed to cope with today's loads, and due to lack of maintenance, they are also in very poor condition. Hence, there have been substantial transmission losses and intermittent power failures. Moreover, grid loading is rendered even heavier due to poor power factor correction (and, hence, high reactive power levels).

### Changing consumption patterns

In addition to problems with power generation, the past decade has seen a marked change in consumption patterns, and the post-transition years were marred by mismanagement in the energy sector. Albania's infrastructure draws its character from the erstwhile planned economy, which focused on heavy industry and agriculture. Accordingly, major industrial plants enjoyed first priority for the supply of electricity. As long as the country was under communist rule, rural-to-urban migration was forbidden, but after the old government collapsed, a very heavy rural exodus set in between the mountainous regions and the coastal cities.

Large settlements appeared, many of them ‘informal’, with total dependence on electricity for the heating of homes and water. That development produced a tenfold increase in household low-voltage power consumption, from approximately 0.25 TWh in 1990 to 2.5 TWh in 2002. At the same time, industrial demand for electricity, i.e. for medium-voltage and high-voltage power, declined steeply.



**Figure 8: Electricity consumption by sector; Albania; 1985–2002; GWh<sup>209</sup>**

### Technical and non-technical losses

The technical losses attributable to the dilapidated supply system are accompanied by a substantial share of ‘non-technical losses’. Primarily, this refers to the illegal tapping of electricity and to inadequate measuring instruments for registering consumption data. Many electricity meters are completely obsolete, and some of them are hardly functional, if they are still in place at all. Together, all these technical and non-technical losses added up to 56% of all electricity injected into the power grid in 1998. By 2002, however, upgrading of the supply system, coupled with the accelerated installation and better reading of electricity meters, had reduced the overall loss level to 33% (input to network in 2002: 5,650 GWh, technical losses: approx. 1,210 GWh, non-technical losses: approx. 675 GWh).

### Expansion of supply infrastructure

The planned measures will focus on the establishment and expansion of supply infrastructure. Several relevant promotion programmes have been launched with international assistance (World Bank, EBRD). Their main purpose is to improve the supply network infrastructure while reducing losses and improving energy efficiency on the supply side. One important step in that direction

is the (KfW-promoted) construction of a 400kV connecting line with which to synchronise Albania’s power grid with the European UTCE network and reduce transmission-capacity shortages.

### Electricity tariffs

During the planned-economy era, electricity tariffs were extremely low, rarely even sufficing to cover the production costs. This was financed by massive state subsidies. After transition and the introduction of a market economy system, the rates increased only marginally, resulting in major financial constraints for the Albanian electricity supply company KESH. A split-tariffs system was introduced in the autumn of 2001, and the electricity prices have been raised several times since then.

Customer	Electricity price (€/kWh)
High voltage	0.065
Medium voltage	0.072
Low voltage	0.086
Households: consumption < 300 kWh/a	0.029
Households: consumption > 300 kWh/a	0.086

**Table 35: Electricity prices; KESH; 4th quarter 2002; €/kWh**

## Market Actors

### Monopolist KESH

The only actor on the Albanian electricity market to date is the state-owned enterprise KESH (Korporatëa Elektroenergjitike Shqiptare), which is a completely vertically integrated power utility. KESH was transformed into a state-owned joint-stock company in 1995. Originally, three pilot firms were supposed to be spun off from the KESH combine and privatised. However, with the collapse of the financial system in 1997, the privatisation of KESH and those three firms – the local utilities in the Elbasan, Vlore and Shkoder districts – was put aside indefinitely, and the pilot firms were re-integrated into KESH.

### Unbundling of KESH

It is intended that will KESH be unbundled into generating, transmitting and distributing divisions in accordance with EU directives. Restructuring began in 2001 but will initially be restricted to the completion of

internal reform structures designed to improve the financial basis. Completion of the process is planned for 2006.

### **First sale of mini hydropower plants**

The sale of 36 mini-hydropower plants by auction (advertised in February 2003) constituted an initial step toward the privatisation of KESH. Earlier attempts to auction off mini-hydropower plants had to be postponed for lack of potential buyers.

## **Legal Framework**

The institutional framework of the Albanian energy sector was realigned in 1997 in the wake of Albania's crisis of state, and new reform projects were launched.

### **Responsibility for the energy sector**

The Ministry of Industry and Energy (formerly the Ministry for Public Economy and Privatisation) is responsible for the entire energy sector (oil, gas, electricity and renewable energy sources). Its principal task is to push forward the process of reform in the energy sector while opening the energy market for private investors and adapting it to satisfy European directives.

### **National Energy Agency**

The National Energy Agency, NEA, which serves as an advisory institution, has prepared a number of studies and scenarios on the Albanian energy sector. NEA also designed the national energy strategy (approved by the government in July 2003), which forms the basis for new negotiations on the future orientation and structuring of the energy market and provides recommendations for action in the energy sector.

### **Albania-EU Energy Efficiency Centre; Energy Sector Study**

In 1993, in order to contend with technical problems, the Albania-EU Energy Efficiency Centre (CEE) was established within the framework of the European SYNERGY Programme. CEE began work in 1995. The Albanian Energy Sector Study, which analyses the entire Albanian energy market, was completed in the spring of 2003.

### **Energy strategy**

Based on that data, the National Energy Agency (which was founded in 1997) drew up a strategy paper entitled 'Energy Strategy for Albania', in which various scenarios for the future development of the energy sector were investigated. This strategy paper is also intended to serve as a basis for negotiations on further decisions within the energy-policy context.

The core statements and requirements for Albania's future energy policy are:

- improving energy efficiency, primarily by replacing electric home heating systems with systems that use alternative sources of energy, such as oil, gas or solar energy;
- systematically developing the distribution network while reducing technical losses;
- developing alternative sources of energy for electrification in order to reduce the strong dependence on hydrological conditions while adapting the generating capacities to meet increased demand.

### **Basic laws for the energy sector**

The legal foundation for the energy market consists mainly of the laws enacted in 1995: Law 7962 on Energy, Law 7970 on Regulation of Electric Energy Sector, and Law 7973 on Concessions and Participation of Private Sector in Public Service and Infrastructure.

### **Law on Energy**

According to the Law on Energy, market actors participating on the Albanian energy market must obtain a licence from the regulatory authority. The law also specifies that the state-owned monopolist KESH is to be restructured and privatised. However, the law does not state how a future energy market should be designed. (Several decisions of central importance are being left to ministerial committees or being made dependent on decisions by the regulatory authority.)

Article 13 of the Law on Energy mentions that local electricity supply companies are obligated to purchase electricity from combined heat and power plants and from renewable energy sources. However, no further details are defined; for example, nothing is said of prices. In this respect, decisions made by the regulatory authority are to be considered binding.

## Law on Regulation of Electric Energy Sector

The Law on Regulation of Electric Energy Sector prescribes the establishment of a regulatory authority for monitoring and regulating the market. This led to the creation of an Electricity Regulatory Authority (ERA), which officially began work in 1999.<sup>210</sup> The ERA functions as an independent authority financed by way of fees levied for power-injection licences (formerly the sole responsibility of KESH). The authority is presently still in the process of becoming established and therefore will not be able to fully exercise its assigned functions until the energy-sector reform process has made more progress or perhaps even been completed. The law on regulation describes in detail matters of membership, financing and responsibilities.

The duties of the regulatory authorities are designed in analogy to those of other European regulatory institutions. The regulatory authority issues licences, specifies electricity tariffs and is intended to serve as mediator in the event of disputes between customers and electricity supply companies.

The law on regulation contains many formulations with contradictory statements regarding jurisdiction between the regulatory authority and the state. Grid access for independent electricity supply companies is allowed in principle, but the details are lacking, and the responsibilities are unclear.

## Law on Concessions and Participation of Private Sector

Finally, the Law on Concessions and Participation of Private Sector in Public Service and Infrastructure is intended to govern the handling of energy-market concessions in general. However, the awarding criteria in connection with the Law on Regulation of Electric Energy Sector are in part contradictory and/or unclear.

## Legal framework being revised

All in all, restructuring of the energy market has not yet been completed, though the aforementioned crises in recent years have produced a shift in policy toward a higher status for the energy supply sector. Substantial changes in the framework conditions can be anticipated for the near future as a result of the national energy strategy, with priority likely to be attached to the develop-

ment and rehabilitation of the distribution network and to the economic consolidation of the utility companies.

## Clean Development Mechanism

Albania signed the Kyoto Protocol as a non-Annex I country, but has not yet ratified it. Within the scope of flexible emission-reduction mechanisms, Albania therefore could be a candidate for Clean Development Mechanism projects.

## Policy for Promoting Electricity Generation from Renewable Energy Sources

### No specific promotion programmes

In principle, the Law on Energy envisages preferential treatment for electricity generated from renewable energy sources. However, as yet there are no specific, appropriate promotion programmes or further-ranging fundamental statutory regulations in place.

The creation of a law on renewable energy sources is being deliberated in connection with the current restructuring and reorganisation of the Albanian energy market, but no actual draft bills have yet been presented.

## Status of Renewable Energy Sources

### Hydropower

Nearly 95% of all electricity generated in Albania is hydroelectricity. The geography and climate in the northern and eastern parts of the country are very conducive to the exploitation of water resources for energy generation. The country's in part very rugged mountains have an average useful gradient, or head, of 600m and receive precipitation at an annual rate of 1,500mm/m<sup>2</sup>.

According to information provided by the National Energy Agency, only 35% of the exploitable water resources have been developed, so the remaining potential is enormous. The hydropower yield can be increased both by developing new sites and by rehabilitating or upgrading the old, mostly outdated plants. Together, the replacement of obsolete plants and the construction

<sup>210</sup> At first, the problem was that a newly established ERE was supposed to regulate a market with a largely undefined structure. Moreover, it was poorly financed and understaffed. Consequently, it never actually began its institutional work. In 1999, the ERE was dissolved and replaced by the 'Electricity Regulatory Authority' (ERA).

of new ones could provide additional installed capacities totalling 3,000 MW, or an annual yield of some 10 TWh.

### Wind Energy

With the exception of a few small historical wind mills used for grinding grain and driving water pumps, the country has no means of exploiting wind energy, at least not in the form of modern wind turbines for generating electricity.

The lack of measured data makes it difficult to assess the wind energy potential, but good wind conditions may be presumed for the Adriatic coast, and also for parts of the interior.

Likewise, the lack of measured data for siting purposes, and, even more so, the low prices paid for electricity are impeding the further exploitation of wind energy in Albania.

### Biomass

Biomass in the form of wood is, by tradition, the principal source of energy, particularly in the mountainous regions. There are no significant projects under way that deal with the exploitation of biomass for energy recovery on a sizeable scale or in any connection other than the burning of wood for heat.

#### Assessing the biomass potential

It is difficult to assess the given potentials for harnessing the energy content of biomass. While Albania is still characterised by industrial agriculture as a result of the erstwhile planned economy, that sector underwent partial collapse following the political transition. (Albania has since become dependent on food imports.) The absence of data recording means that no reliable figures are available on biomass resources.

In terms of standing forest (36% of the land area), the energy-generating potential of wood could be estimated at approximately 12.8 GWh, and that of rural livestock production, i.e. of biogas, at roughly 3.5 GWh<sup>211</sup> (both figures based on 1995 inventories).

### Solar Energy

Albania has a Mediterranean climate with solar irradiation levels between 3.2 kWh/m<sup>2</sup>d in the northern parts of the country and 6 kWh/m<sup>2</sup>d in the southern regions, averaging out to 4 kWh/m<sup>2</sup>d. for the country as a whole. The mean number of hours of sunshine ranges from 2,000 to 2,800 per year.

It follows that Albania is basically very well suited for exploiting solar energy. Until now, though, only a small number of thermal systems have been put to use, and there is accordingly little technical know-how available in connection with solar energy; what is more, no regional insolation data has been collected.

#### GEF pilot project for PV-based drinking water supply

The National Energy Agency, however, is interested in expanding the use of solar energy. In cooperation with UNDP and GEF it has initiated a relevant pilot project devoted to establishing and expanding rural drinking water supply systems employing solar power installations. Following an initial feasibility study in 2002, a number of sites were to be selected in 2003 for the installation of solar-assisted water pumps. No final documentation of the project is yet available. The project work also includes the surveying of local solar irradiation data in certain parts of the country. Again, no results have yet become available.

### Geothermal Energy

Albania has a few geothermal springs, but most of them have water temperatures that reach only about 35°C. In one stretch of land extending from the Kruje region on the Adriatic Coast north-west of Tirana all the way down to Greece, there are springs with higher temperatures (>65°C at a depth of 3,000 m). The highest temperatures of all (106°C) are found in the Peshkopi area near the Macedonian border.

Until now, virtually the only use to which geothermal springs have been put is to feed thermal baths. There are no local or district heating networks or electricity generating installations in operation.

Considering the moderate temperatures of the spring waters, the use of geothermal energy in the future can be expected to remain restricted to direct thermal applica-

tions, i.e. for heating buildings or for agricultural uses (greenhouses). There are no specific promotion programmes for the development of geothermal energy.

## Rural Electrification

Projects such as the one promoting the use of solar pumps for the supply of drinking water in rural regions indicate that there is certainly potential for stand-alone installations based on renewable energy sources in certain areas.

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The potential of renewable sources of energy in developing and emerging countries is often considered high. Obstacles to their exploitation and foreign investors' engagement often include a lack of knowledge of framework conditions in the energy industry and insufficient transparency with regard to the prior experience and interests of the national actors. These are barriers which this third, updated and expanded new edition intends to overcome.

The **electricity markets** and their respective **actors** are investigated for **21 countries** in various regions: **Latin America – Caribbean, Africa, Europe – Caucasus** and **Asia – Pacific**. The country reports analyse the **energy-policy framework conditions** and closely examine the **status** of and **promotion policy** for electricity generation on the basis of **hydropower, wind power, solar power, biomass** and **geothermal energy**. The chapters on each country are rounded off by information about **rural electrification**.



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