

WIND ENERGY IN BULGARIA



Wind and the energy generated from it have proven to be attractive for several reasons – wind is plentifully available, it is a cheap and virtually inexhaustible source of energy, and does not cause environmental damage or climatic anomalies. Briefly, it possesses properties, which none of the traditional energy sources used for generation of electricity can boast of.

Operational costs for generation of energy, or rather the absence of fuel supply costs does make wind an especially attractive energy source in the eyes of investors.

However, is this technology viable and reasonably usable for production of energy in the actual climatic and market environment of Bulgaria?

Is there enough of wind resource?

Studies carried out in Bulgaria for evaluating the power-production potential of wind energy have demonstrated that the objectively needed preconditions for development of this type of energy do exist.

Before a wind system is installed, one should ensure that sufficient potential for operating this system is in place. The necessary information can be provided by the Institute of Meteorology and Hydrology in the form of a statistical report, or the interested party can make its own measurements at the desired location.

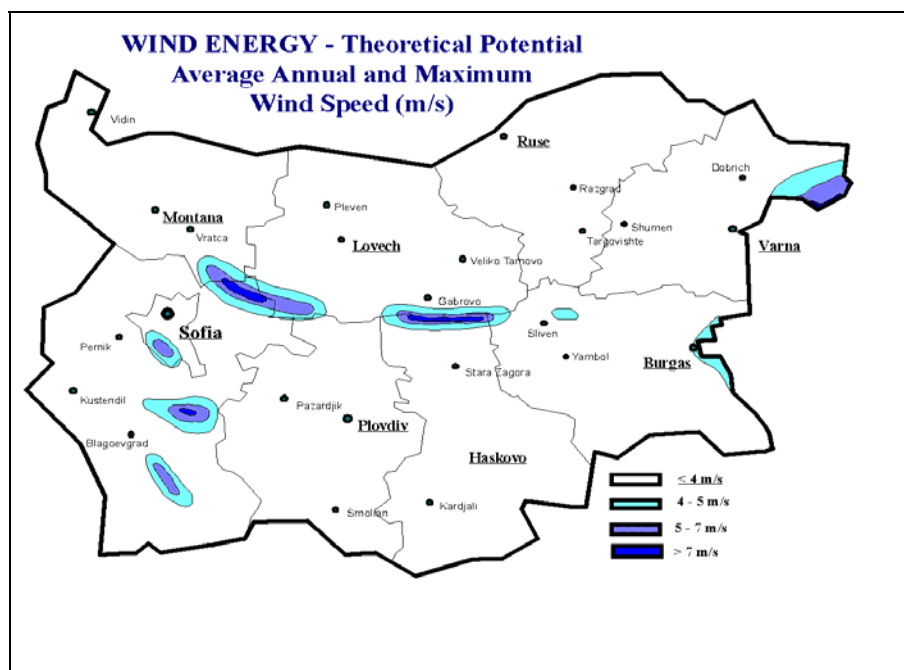
The next section provides an overview of Bulgaria's wind potential.

WIND POTENTIAL IN BULGARIA

Among other countries, Bulgaria also offers potential for construction of wind farms, more specifically along the coastal line and at places with altitude of 1000 meters or more. Future development in suitable mountainous areas or at places with slower wind velocities depends on the implementation of new technical solutions.

Turbine performance depends on wind velocity and turbulence, tower height and air density, therefore it is important to know the specific potential of the Bulgarian region chosen for installing the wind facility, and the conditions under which this potential has been obtained.

There are 119 weather stations in Bulgaria, which register wind velocity and direction. Historical data for more than 30 years is available. The following wind potential map (Fig. 1) has been drawn up on the basis of such data published in 1982:



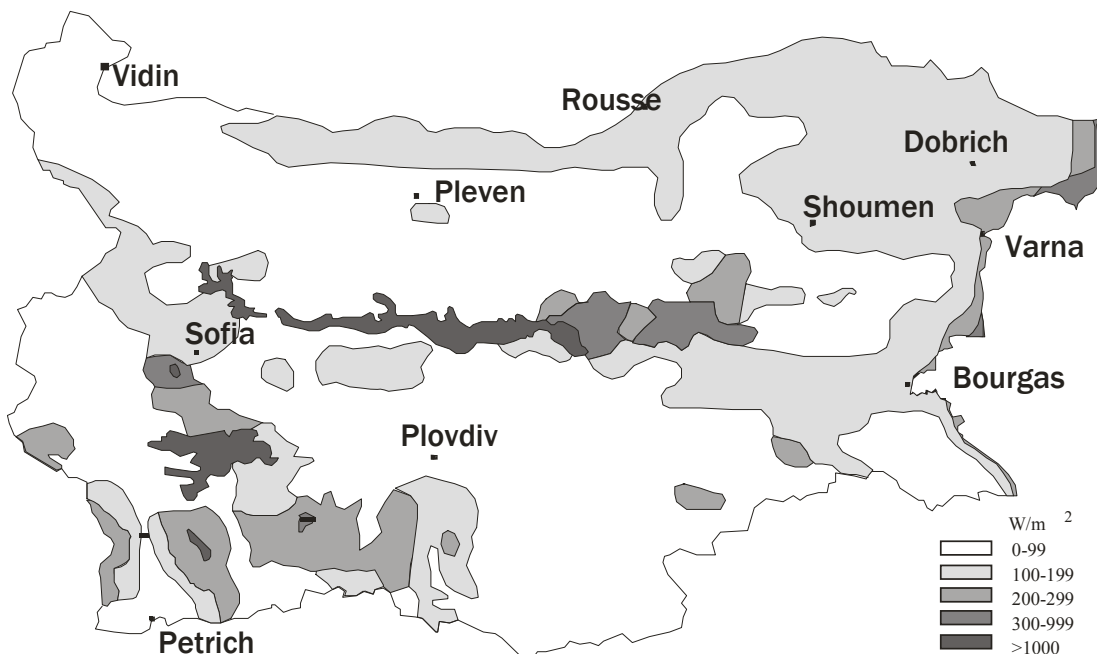
The power potential of wind energy, averaged on annual basis for 10 meters above ground level, can schematically be divided in three regions.

Region One (Zone A) includes the vast flat parts of Bulgaria (Danubian Plain, Thracian Lowlands, Sofia Flat Field, the valleys of Struma and Mesta rivers, and the Fore-Balkan area), where the average multi-annual wind velocity as a rule does not exceed 2 m/sec. Wind speed in these regions is highest in winter (February, March), and lowest in autumn (September, October). 24-hour wind velocity patterns can be clearly identified due to the existence of mountain-valley circulation in the Fore-Balkan.

Region Two (Zone B) covers the parts of Bulgaria situated east from the line Rousse-Veliko Tarnovo-Elhovo, the Danubian riverside as well as the exposed low mountainous parts at approximately 1000 meters above sea level, where average multi-annual wind velocity varies from 2 to 4 m/sec. Annual velocity peaks occur in winter (February, March) and 24-hour peaks occur during daytime. Wind velocity in these places is lowest in the end of summer and the beginning of autumn (August, September). These annual wind velocity patterns are somewhat displaced in Black Sea coast areas: maximums are in February and minimums are June/July. In areas where the mainland indents into the sea (capes), wind velocity exceeds 4 m/sec.

Region Three (Zone C) comprises exposed and forestless mountainous areas of altitude more than 1000 meters. High average wind velocities are typical of this region, significantly exceeding 4 m/sec. Velocity peaks here occur in winter (February), while lowest velocities are in summertime (August). 24-hour patterns with nighttime maximums and daytime minimums are well traceable during transitional seasons.

It should be noted that average wind velocity is not sufficiently representative for evaluating wind as a power source. The parameter used for this purpose is wind power density, as shown on Fig. 2.



Wind power density is proportionate to the third moment of statistical distribution and air density. As air density decreases with altitude, average wind velocity should increase by about 3% per 1000 meters to achieve the same power density.

Average wind power density (W/m^2) in some regions of Bulgaria:

Weather station	Altitude (m)	Height above ground level (m)			
		10	25	50	100
Zone A					
Pleven	163	66	96	124	157
Gabrovo	392	80	117	151	190
Plovdiv	160	107	156	201	255
Petrich	227	60	88	113	143
Sofia	564	182	265	342	432
Zone B					
Novo Selo	45	232	338	436	551
Varna	3	270	393	507	641
Nessebar	29	335	487	628	794
Sozopol	10	384	557	719	909
Sliven	275	498	724	934	1181
Zone C					
Cape Kaliakra	71	1505	2186	2821	3566
Peak Persenk	1750	872	1267	1635	2067
Peak Mourgash	1687	3385	4918	6346	8022
Peak Botev	2376	2631	3823	4934	6236
Peak Moussala	2925	1813	2634	3399	4297

At 50 meters above ground level wind potential is twice stronger compared to the one at 10 meters above ground level.

The distribution of maximum wind potential is related with the wind regime at the relevant location. It varies with seasons.

Wind potential breakdown per seasons, in % of average annual value:

	Winter	Spring	Summer	Autumn
Zone A				
Pleven	28	37	17	18
Gabrovo	19	11	21	49
Plovdiv	41	29	15	15
Petrich	29	31	23	17
Sofia	40	29	15	16
Zone B				
Novo Selo	30	33	19	18
Varna	42	23	13	22
Nessebar	48	15	14	23
Sozopol	51	14	9	26
Sliven	42	19	20	19
Zone C				
Cape Kaliakra	41	22	13	24
Peak Persenk	43	28	9	20
Peak Mourgash	43	25	10	22
Peak Botev	43	30	10	17
Peak Moussala	43	26	7	23

It is evident that:

- In Zone A, 60-70% of the wind potential are available in winter/spring, and the remaining 30-40% are available in summer/autumn;
- In Zone B, 60-65% are available in winter/spring, and 35-40% in summer/autumn;
- In the third zone, 65-70% of the potential occurs in spring/winter, and about 30-35% in summer/autumn.

The duration of winds with velocity higher than 2 m/s in winter and spring is:

- Circa 2000 hrs. in Zone A
- Circa 2300-2400 hrs. in Zone B
- Circa 4000 hrs. in Zone C

The above duration times drop by about 200 hours in summer and autumn.

Usable wind potential, expressed as a percentage of the full potential at different wind velocities

Station	Velocity, m/s					
	3,5-40	4,5-40	5,5-40	3,5-7,5	4,5-11,5	5,5-11,5
Zone A						
Pleven	93	87	81	49	56	60
Gabrovo	95	91	86	36	44	51
Plovdiv	95	90	86	43	52	58
Petrich	92	84	76	56	62	63
Sofia	97	92	87	44	55	62
Zone B						
Novo Selo	99	97	96	20	28	36
Varna	98	94	91	38	50	59
Nessebar	98	95	93	32	43	53
Sozopol	98	95	92	34	45	54
Sliven	98	98	97	15	23	31
Zone C						
Kaliakra	99,7	99	98	17	27	38
Persenk	99,4	98	97	21	31	42
Mourgash	99,9	99	99	11	19	29
Botev	99,9	99	99	13	22	32
Moussala	99,8	99	98	15	24	34

Overall, the wind power potential of Bulgaria is not a large one. It is estimated that areas of about 1400 km² can offer average annual wind velocities of more than 6,5 m/s, which is actually the economic viability threshold of wind energy projects. Therefore, the zones most appropriate for development of such projects are limited to certain areas within mountain regions and along the northern part of the Black Sea coast.

The wind potential of Bulgaria has been determined on the basis of measurements made at 10 meters above ground level.

During the recent years, wind power generation facilities worldwide use masts more than 40 meters high, which makes it necessary to evaluate the wind potential at higher aboveground level.

The National Institute of Meteorology and Hydrology under the Bulgarian Academy of Sciences has developed a modelled test for determination of wind velocity at heights of more than 10 meters, using statistical idealization of probable wind speeds.

LEGAL AND REGULATORY BASIS FOR RENEWABLE ENERGY SOURCES DEVELOPMENT

The balanced development of the common energy market will be ensured, and the risks associated with reliability of energy supplies will be reduced to a minimum, meeting at the same time the requirements for reducing adverse environmental and climate change impacts, by using the local potential of Renewable Energy Sources (RES).

Pursuant to the EC Directive of 2001 on the promotion of energy produced from RES, by the year 2010 Member-States are to increase the share of RES energy to 12%.

To meet this objective and to implement Directive 2001/77/EC on the promotion of the electricity produced from renewable energy sources, Member-States should establish systems for supporting the production and controlling the discharge of RES energy production obligations, which systems must contain the following mandatory elements as a minimum:

- A clear national target for consumption of electricity from renewable energy sources;
- A system that guarantees the origin of that electricity.

Presently, RES energy production in Bulgaria is supported by means of: implementation of new legislation, special investment schemes, preferential tariffs and systems of marketable green certificates.

The Energy Act (EA), published in State Gazette no. 107 of 09.12.2003, governs the relationships related with the use of renewable energy sources as well as the powers of government bodies in policy making, regulation and control of the energy sector.

The available preferences and the national policies pursued are laid down in Chapter Eleven of the EA:

- **National indicative targets** for promoting the use of electricity produced from renewable energy sources – these are established by the Government on proposal made by the Minister of Energy and Energy Resources, and are expressed as a percentage of the country's gross annual electricity consumption during the next ten years;
- **National indicative production targets** – electricity production is promoted subject to:
 - ◆ taking into account the principles of the energy market;
 - ◆ taking into account the characteristics of the various renewable energy sources and electricity generation technologies;
 - ◆ ensuring that, whenever promotional mechanisms are changed, electricity producers enjoy at least equivalent preferences in terms of their income per unit of electricity

produced.

The Minister of Energy and Energy Resources determines minimum mandatory quotas for production of electricity from renewable power sources to each producer, expressed as a percentage of the gross annual electricity production, for a term of 10 years after the date of introducing the system for issuance of and trading in green certificates.

- **Mandatory purchasing, preferential tariffs**

- The public supplier and/or the public providers that are licensed to provide electricity are under obligation to purchase the full amount of electricity produced by any plant using renewable energy sources, properly registered with a certificate of origin, except the amounts contracted by the producer under Chapter Nine, Section VII and the amounts, with which the producer participates in the balancing market;

- The public supplier and/or the public providers are under obligation to purchase the electricity produced by plants using renewable energy sources, including hydropower plants with rated capacity of 10 MW or less, at preferential prices established pursuant to an ordinance issued for this purpose under EA Art. 36(3);

- **Priority interconnection** – the transmission company as well as all distribution companies are under obligation to connect with priority to their transmission or distribution grids all plants producing electricity from renewable energy sources, including hydropower plants with rated capacity of 10 MW or less.

- **Mechanism for trading in green certificates**

- The mandatory purchasing of electricity at preferential prices will apply until the establishment of a system for issuance of and trading in green certificates.

On the legal premises of EA Art. 161(4), an **Ordinance for issuance of certificates of origin for electricity produced from renewable energy sources or using cogeneration technologies, for issuance of green certificates and trading in such certificates** has been drawn up and approved by the Minister of Energy and Energy Resources.

Said Ordinance lays down the terms and conditions for:

- issuance of certificates of origin for electricity produced from renewable energy sources or using cogeneration technologies;
- issuance of green certificates and trading in such certificates;
- reporting and controlling the discharge of the obligation for production of electricity from RES or using cogeneration technologies.

INTRODUCTION TO THE TECHNOLOGY

Wind technologies use the energy of air movements above ground surface, which occur due to the driving forces caused by sun heat and earth rotation. The air drives the blades of the wind-power mill due to the force, which results from the difference between the pressure exerted on the flat side of the blades and the low pressure on their reverse side. Rotation of the blades directly generates mechanical energy, which can be converted into electricity by means of an electric generator.

In most general terms, a wind turbine is a device that converts wind energy (kinetic energy) into electricity. Oppositely to wind-powered water pumps, which have many blades to ensure higher torque, wind generators have just two or three blades, because the aim here is to

achieve higher rotation speeds (RPM). Besides a horizontal axis, these generators may use a vertical axis.

How do wind turbines work? - The "heart" of a wind turbine is its rotor. The rotor propels a generator, which in turn produces electricity:

Main components: (see Diagram 1)

Turbine component	Function
Gondola	Houses the most important elements of the wind turbine – gearbox (transmission), brakes, electric generator, rotor cooling system, hydraulic system, cooling system.
Rotor (wind wheel)	Captures the wind in its blades and relays the mechanical energy to the rotor hub.
Hub	Connects the rotor to the wind turbine by means of a low-speed shaft
Low-speed shaft	Connects the rotor to the gearbox
Gearbox/ transmission	Connects to the low-speed shaft, transmits the torque to the high-speed shaft
High-speed shaft with mechanical brakes	Propels the electric generator at about 1500 RPM. Mechanical brakes are used to prevent aerodynamic breakthroughs at high wind speeds or wind turbine failures.
Electric generator	Normally this is an induction or asynchronous generator with maximum electric capacity ranging from 500 to 1500kW.
Yaw drive	Keeps the gondola and the rotor in upwind direction using electric or other type of actuator.
Electronic controller	Monitors the turbine condition – the yaw drive and the pitching system. In case of malfunction, automatically disconnects the turbine. Can be designed such as to send electronic signals to the turbine operator.
Hydraulic system	Ensures the safety of the wind turbine.
Cooling system	Cools the electric generator by means of an air or water cooling system. The cooling system may also house the gearbox oil cooling system.
Tower	Supports the gondola and the rotor.
Anemometer and wind vane	Measures wind speed and direction, and connects/disconnects the turbine by sending electronic signals to the turbine controller.
Energy storing system	This is not a mandatory component, but it is desirable to include energy storage devices.

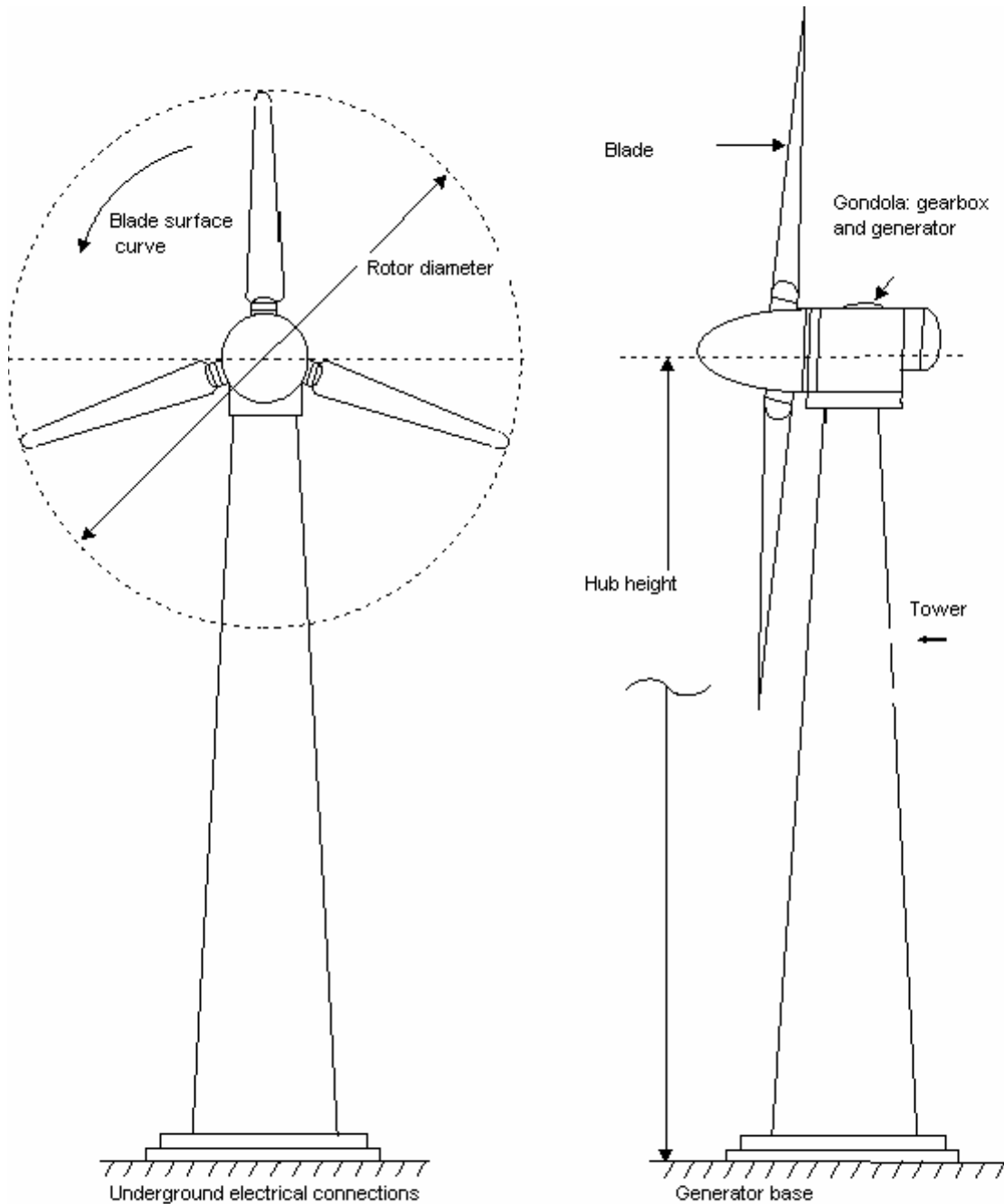


Diagramme 1.

DOES IT MAKE SENSE TO INVEST IN WIND TURBINES?

↪ In order to take a correct decision, the first and paramount factor to be considered is the availability of sufficient power potential having all parameters needed for implementation of a viable and financially sound project.

When analyzing wind power as a potential source for production of electricity, one has to bear in mind that areas of commercial-scale importance are those, where wind velocity exceeds 6 m/s, withal these are less than 3.3% of national territory and are mainly concentrated around Cape Emine, Cape Kaliakra and the ridge of Stara Planina (Balkan Mountain).

- ↪ Availability of sufficient technical area for construction of the facility and its operational infrastructure. Previous analyses have demonstrated that the area needed for installation of wind turbines varies from 6 to 33ha/MWe depending on their capacity.
- ↪ Financial and economic viability – the parameters needed for a preliminary economic appraisal are explained in the following paragraphs.

Economic and technical characteristics of wind power conversion systems

Wind energy generation plants

- ✓ *Application: production of electricity or mechanical force;*
- ✓ *Capacity range: 1 – 500kWe for utility systems and 1-25kW for distribution systems.*
- ✓ *Fuel: wind power*
- ✓ *Efficiency: 700-850kWh/m²/y (at average annual wind velocity 5.8m/s)
1070kWh/m²/y (at average annual wind velocity 7.2m/s)*
- ✓ *Service life of the facility: 20 - 30 years.*
- ✓ *Application: connected to the power distribution grid or self-standing*
- ✓ *Cost: 1100-2400USD/kWe*
- ✓ *Operational and maintenance costs: 0.01-0.025USD/kWe*
- ✓ *Area occupied: 6-33ha/MWe*
- ✓ *Impacts: noise, injury of flying birds, visual contamination.*

HOW TO PURCHASE

Several parameters need to be considered when selecting a turbine.

In addition to the above-mentioned technical and economic features, other factors to be taken into account in selecting a turbine include:

- **Longevity** – service life of the facility and warranty terms vs. the prices offered by different producers.

The workload of a wind power generation unit is comparable to the workload of a motor vehicle doing 150,000 kilometers per year.

- **Ability to generate power from weak winds.**

Practically, a wind turbine performs well at wind velocities from 5 to 9m/s (20-35km/h). Within this range, the expected performance is from 60 to 90% of the turbine's rated capacity. The turbine capacity shown on its technical specifications is always related to a specific wind velocity. However, the performance of a turbine depends on wind velocity and turbulence, tower height, air density and other factors. Producers provide charts displaying the impact of these variables on turbine performance. Economic estimates are also available from producers.

APPLICATION AREAS

Possible application areas of generators rated 1KW – 5 KW

Power supply of sites not connected to power distribution grids. The wind generator is an autonomous one and its output can be used to:

- Charge rechargeable batteries;
- Provide light to buildings, parking lots and gardens/parks;
- Heat up water in boilers;
- Supply power to office equipment;
- Supply power to air conditioning equipment;
- Drive centrifugal water pumps;

- Ignite the oil burners of heating boilers.

Possible application areas of generators rated 5-50 KW

- Sites running in maintenance-free autonomous mode for continuous periods of time;
- Alpine transmitters and relay stations;
- Weather stations;
- Alpine huts and hotels;
- Residential and commercial sites not connected to electrical lines;
- Sale of excess power to the National Electric Company (NEC).

FUNDING SCHEMES

Preparation and implementation of Energy Efficiency (EE) and RES utilization projects include the following four steps:

1. Step 1 – Project identification, including technical and economic feasibility studies;
2. Step 2 – Project funding;
3. Step 3 – Project implementation: design, construction/installation and commissioning of the site;
4. Step 4 – Operation and maintenance of the new technology and/or equipment.

Once the technical and economic aspects of the project are known, the financial resources needed for its implementation must be secured. The objective is to study the available financial options and to select the most appropriate one. The options are:

1. Own resources;
2. External funding:
 - Credits from commercial banks;
 - Loans from international banking institutions (the European Bank for Reconstruction and Development, the European Investment Bank, the World Bank); normally in these cases minimum loan amounts exceed by far the requirements of an energy efficiency project, therefore additional financial facilities should be available (e.g. credit lines);
 - Donations, grants and preferential loans from specialized government funds or from programmes of the European Commission. Usually, this type of funding is more limited and difficult to obtain;
 - Equipment suppliers may provide leasing arrangements, in particular where the supplier delivers the project on turnkey basis. A supplier may also agree to extend a loan to the project;
 - Third-party financing: Energy Service Companies (ESCO) undertake Guaranteed Energy Savings Agreements (GESAs). Energy Service Companies provide project identification, funding, construction and operation services. This option is a proven financial tool for implementation of EE projects in developed European countries.

The above-noted funding options may well be used in combinations.

- **Implementation of projects through Guaranteed Energy Savings Agreements or on the basis of third-party financing** – this type of contracting does not require financial inputs from building or property owners, investors are rewarded for their investments in RES installations on the basis of the effects, benefits and saving achieved and agreed in the relevant contractual documents;
- **Joint Implementation (JI) of projects for reduction of harmful emissions under the Kyoto Protocol** – applications for such projects or packages of similar projects are submitted to the Joint Implementation Unit under the Ministry of Environment and Waters (JI-Unit Bulgaria);

- **Nordic Funds**

Within the UN Development Programme (UNDP), the Governments of Denmark, Norway and Sweden have established funds for supporting advisory services and activities in various countries. These activities should be aligned with UNDP's sustainable development framework and donor policy. Bulgaria can receive funds from the Danish and Swedish funds. Eligible candidates for using these funds include institutions, non-government organisations, individuals, private sector entities or the UNDP. Applications are submitted to the UNDP office in the relevant country, and the projects as such are administrated by the UN Office of Project Services (UNOPS) in Copenhagen.

The funds may be used for advisory services. Eligible activities include: pre-studies, project design, monitoring missions, evaluation, full or partial projects.

The priority areas are: freshwater and sewerage services, renewable energy sources, industrial, private-sector, environment and education initiatives, etc.

- **COMMERCIAL FUNDING (bank credits)**

Credit opportunities available from local banks

The efficiency of Bulgaria's financial system is still low (although the system as such is stable), in other words, for the time being the financial system does efficiently perform its main role as an intermediary between savings and investments in the real economy.

Local banks still adhere to cautious credit policies.

Due to the intensive dynamics of the banking system development process, it is yet not possible to identify local banks that are narrowly specialized in investment banking for the energy sector. Loan seekers should examine and evaluate the terms offered by almost all players in the banking sector.

Inasmuch as EE and RES projects require relatively low levels of capital investments, local banks will afford loans to these more easily compared to large-scale energy projects. A key factor for successful negotiation of such credits is the presentation of a convincing financial proposal to the prospective lenders.

On the other hand, EE and RES projects have certain specificities and would usually require the bank to possess specific expertise for their evaluation and for designing the pattern and terms of the loan.

Presently, it is hard to identify even one local commercial bank with traditions in the funding of energy projects. Bankers are tuned favourably and do not immediately exclude this sphere of lending opportunities.

Currently, in order to apply for funding from local commercial banks, the owner of an energy project must meet the general eligibility criteria applicable to all funding areas.

The main features of bank credits are:

- lack of interest in investment loans;
- short credit periods (mostly up to 2 years, the maximum credit period can be 5 years) at interest rates 10-12 percentage points above the basic interest rate (i.e. the interests charged on these loans are 13-16% per annum);
- borrowers are required to provide credit guarantee (security) of at least 100% (and sometimes even higher), which is an extremely burdensome requirement for Bulgarian companies and organisations;
- extremely cautious lending, banks usually provide loans to regular customers, whom they know well, including their sales and financial performance figures.

Each project is appraised on case-by-case basis by the bank's experts, and lending terms may vary significantly depending this appraisal.

To illustrate the foregoing conclusions, the next comparative table summarizes the lending terms of three local banks, which provide credits to small and medium enterprises.

Bank	Maximum credit amount	Security	Grace period	Credit period	Disbursement time	Interest rates charged
Unionbank	BGN 250,000 (for investments)	All securities allowed by law	12 months	For investment projects – 2 to 60 months	5 to 20 days depending on the credit	Depending on the credit amount, period and security.
Eurobank	Express Eurocredit – 15,000 USD or €	Real property, goods, machines, equipment	Negotiable	Max. 2 years	5 working days	13% per annum
	Eurocredit – 100,000 USD or €	Real property, goods, machines, equipment	Negotiable	Max. 2 years	10 working days	14% per annum
ProCredit Bank	ProCredit Dynamo - BGN 100-20,000 or equivalent in foreign currency	Real property; vehicle; commercial or production equipment; goods; guarantee by a legal or natural person; other security at discretion of the credit officer	Negotiable	Max. 24 months	48 hours	1,65% per month
	ProCredit Business – credit amount negotiable	Same	Negotiable	Max. 3 years	1 week	Negotiable
	ProCredit Business – credit amount negotiable	Same	Negotiable	Max. 5 years	1 week	Negotiable

- **The United Bulgarian Bank (UBB)** provides investment loans to small and medium enterprises for energy efficiency and environment protection projects; this is within an agreement with the US International Development Agency (USAID), which secures, on behalf of the borrower and in favour of UBB, 50% of the eventual net principal loss. Interest rates for these loans are in the range of 14-16% per annum.
- **European Bank for Reconstruction and Development (EBRD)**
The EBRD provides assistance to transition countries in Central and Eastern Europe. The Bank has a special unit for identification and development of energy efficiency projects. In principle, the EBRD and other international banks fund only large-scale projects (e.g., the Bank's participation is limited to 35% of the long-term capital of the project, but such participation can not be less than EUR 5 million). Most EE and RES projects are way below under this threshold. The problem with small projects is solved by a lending mechanism for multiple projects (known as Multiproject Facility) – this is a credit line for a string of EE and RES projects.
Apart from the EBRD, these projects can be funded by other banks having representative offices in Bulgaria, such as the World Bank, the European Investment Bank and so forth.
- **The new credit line of the EBRD, which manages the Kozloduy International Decommissioning Fund (KIDF), supports small projects** in the area of energy efficiency and renewable power sources; the cost of each such project may be from EUR 20,000 to EUR 1.5 million, eligible borrowers are private companies, and no

state/municipal support is required. The credits are disbursed by three Bulgarian banks: the Bulgarian Post Bank, UBB and Unionbank.

- **Global Environment Fund (GEF)**

To be eligible for GEF funding, EE and renewable energy projects must have a clearly defined environmental effect.

The key requirements to be met in preparing these projects are:

- Projects must be related to national priorities and programmes, i.e. they must be ones of "national significance";
- Projects must fall in one or more GEF priority areas;
- Projects must meet GEF's operational strategy, which is focused on performance-oriented programmes and promptly demonstrable effects from the measures, i.e. fast benefits at low costs;
- GEF funding is limited to the approved estimate of Global Environmental Value. This requirement seeks to help recipient countries change their current or planned activities to ensure they are beneficial to, or prevent the pollution of, the global environment;
- Small and medium projects should secure co-financing from other sources (such as provision of land, equipment, etc.);
- The public at large must be involved in the preparation and implementation of the project;
- The project must originate from or be supported by the government(s) of the country (countries) concerned.

The concept of Global Environmental Value is crucial to GEF funding arrangements, the GEF will cover only and solely this value. In other words, this is the difference between the costs of a project designed to achieve a positive environmental effect globally and a country's alternative project targeted at the achievement of national objectives (the concept of additional, gainful costs).

The written approval and endorsement of the Bulgarian Government must be obtained as part of preparing a GEF project. In Bulgaria, this coordination is entrusted to the Ministry of Environment and Waters, which is the operational and political contact point for GEF projects.

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