

# Importance of Solar Business in the European Union and Bulgaria

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## Summary

Solar business is facing major challenges related to the ever-changing regulatory framework, corporate interests and public pressure. Successful adaptation to the high requirements of regulators and competitive alternative energy sources is needed.

The European Union (EU) has constantly underlined its commitment to international cooperation and to fighting the effects of greenhouse gas emissions and the solar business is one of the levers that it uses to implement them.

The formation of the internal market in the energy sector requires the elimination of numerous regulatory and trade barriers; the approximation of tax and pricing policy, norms and standard measures, and environmental and safety rules.

This requires the development and implementation of successful strategies on the part of solar energy producers, traders and consumers.

**Key words:** Solar business, The European Union, Bulgaria, energy.

**JEL classification:** P28, P48, P16, F52

## INTRODUCTION

**S**olar business is of a great importance for the future of the whole energy

sector and its research will allow to discover potential opportunities and possible threats to its development, both in Bulgaria and in other EU member states.

This type of business needs strategic thinking, which allows to outline possible alternatives and long-term development. It is related to making strategic decisions about its goals and strategies. It focuses on reorganizing the business and focuses on creating and implementing effective strategies.

Promoting the solar business and renewable energy sources (RES) is one of the main goals of EU energy policy. The objective is to double the share of renewable energy in total energy consumption and to reach 20% of the total energy consumption in the EU (Directive 2001/77 / EC and Directive 2009/28 / EC). There are various programs, sub-programs and projects for the development of the solar business, supporting and expanding cooperation between the EU and developing countries in the field of RES.

In Bulgaria, the share of RES in total energy consumption in 2009 was 9%, due to the work of the hydropower plants (HPP and PSHPP) in 2012. This share almost reached 13%, and after the boom of photovoltaic power plants in the period 2012 - 2014, this share amounts to 16%. By doing this, our country has almost fulfilled the commitment to reach a certain relative share of RES consumption in total energy consumption by 2020.

Part of the prospects for the solar business in Bulgaria are also tied to the

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reduction of greenhouse gas emissions. Our country ratified the United Nations Framework Convention on Climate Change and the Kyoto Protocol in March 1997 and currently meeting its requirements.

Taking into account the fact that sunshine in our country exceeds the average European indicators for a year, investing in solar photovoltaic parks are a very profitable for the technology sector, but they are still quite expensive. The resource (sunshine) is practically unlimited and completely free. The production market (the purchase of electricity) is still guaranteed not only by the state but also by the European directives. All transmission and distribution companies must prioritize photovoltaic power plants as long as they agree to buy out.

The research hypothesis of the study is that the use of RES, such as the sun, will not only resolve oil and gas supply issues but will also allow the EU to meet its commitment to reduce greenhouse gas emissions. In addition, the solar business will make a huge contribution to the economy, in view of its attractiveness to large investors.

Solar energy becomes the main source of electricity. In many European countries, solar systems are proven effective and are present in almost every home or business.

According to experts, using of sunlight as an energy source will increase drastically in the next years. Other even thinks that the Sun will become a major energy source until 2050. Support for the use of solar energy is also boosted in southern European countries such as Spain, Italy and Greece. The research questions I set up relate to the essence of the solar business and energy. Is it possible to fulfill the three main directions:

- fighting climate change;
- promoting the creation of growth and jobs;
- limiting the EU's external dependence on gas and oil imports.

The research is limited to the territory of Bulgaria and the European Union

### **Renewable energy and solar business in the EU:**

Although energy falls within the scope of EU action, energy policy remains the responsibility of the Member States, in accordance with the principle of subsidiarity. The EU is currently dependent on oil and gas imports. Therefore, it can be noted its constant concern about increasing the use of RES and reducing the greenhouse effect.

The Commission, the Parliament and the Council of Europe emphasize that energy policy must form part of the general objectives of EU economic policy based on market integration and deregulation and that state intervention must be limited to what is necessary to protect the public interest and prosperity, sustainable development, consumer protection and economic and social cohesion. However, beyond these main goals, the energy policy must pursue specific targets that reconcile competitiveness, security of supply and environmental protection.

In its own resolution on the EU's share of RES in the EU and proposals for concrete measures, Parliament recognizes the great importance of this type of sources and underlines the importance of setting required targets for 2020, which sends a clear signal to market players and to national regulators policies, pointing out that RES is the future of energy in the EU and part of its environmental and industrial strategy. The Commission sets out measures to increase the use of photovoltaic products and businesses and create market-based incentives and remove barriers to the development of the RES electricity market.

The dependence of some Western countries on energy imports is increasing. Their energy vulnerability is also growing.

Europe is poor on its own energy resources. Production costs for coal mining are on

average 4-5 times higher than world prices. Oil has 2 to 7 times higher production costs than those in the Middle East, for example, with reserves for about 4-5 years. Natural gas accounts for about 2% of the world's reserves, and for limited consumption, it can be extracted for another 20 years. 2% of the world's uranium reserves are in the EU, mostly in France, and the yield may last another 40 years.

There is significant RES potential but it is not enough to meet industrial demand.

The main challenge facing the Community remains the increasing dependence on energy resources. In practice, the EU has limited opportunities to respond to this challenge. The dependence on imported resources will reach 70% in 2020 and dependence on oil - 90%.

The main importer of natural gas remains Russia, importer of oil - the Middle East. In addition to this dependence, which requires flexible geopolitical solutions, the environmental consequences of the use of organic fuels are compounded.

The EU is responsible for creating about 20% of the world's carbon dioxide emissions. Notwithstanding all measures and commitments, CO<sub>2</sub> emissions are 20% above and not 8% below the 1990 level in 2010-2013 as required by the Kyoto Protocol. In addition to limiting greenhouse gas emissions, significant investment resources must also be provided to meet the limitations of other anthropogenic gases. At the same time, the EU has a share of 15% of the energy consumption in the world; the average annual consumption growth is 1-2%.

The growth of energy consumption remains concentrated mainly in the service sector and household sector. Industry in the EU has stabilized its energy consumption thanks to the investments made for modernization. This applies both to old Member States and the new ones.

Transport remains a significant consumer of energy resources, accounting for about

67% of oil consumption. Forecasts for growth in transport resource consumption amounted to about 16% for cars and 90% for aviation for 50% traffic growth.

By 2020 in Bulgaria, the amount of electricity generation from RES should be doubled in order to meet the needs and replace with half of the existing plants that will have to be decommissioned.

The contribution of RES depends on the political will to be supported by the achievement of attractive economic conditions in the production of energy from them. The liberalization of energy markets will certainly improve the efficiency of the system, leading to market price regulation. However, this will stimulate consumers to a higher consumption of resources. Low prices also mean a delay in investment decisions and a maximum delay in the construction of new capacities. On this basis, each European economy chooses a different strategy to meet the energy challenges.

The common European energy policy looks like this: measures to increase energy efficiency, management of the consumption of imported petroleum products, actions to stimulate RES and an open option for the use of nuclear energy. Its success is measured by the specific efforts of the specific countries in the community, with the efforts of the energy industry and consumers.

### **Study methods strategic management of Solar Business in Bulgaria**

The methodology for exploring the strategic management of the Solar Business is based on the use of the intellectual abilities of the professionals to provide useful information under conditions of uncertainty. This refers to the appropriate use of a variety of expert-analytical techniques<sup>1</sup>. Emphasis is placed on the formation of collective agreement in making management decisions

<sup>1</sup> Pavlov, P., Expert-Analytical Methods in Strategic Management, Prizma, S., 1998.

to solve practical problems. This is associated with the competent application of various consensus techniques<sup>2</sup>. The identification of similar groups of subjects is done according to selected compliance and similarity metrics. Various classification methods such as cluster analysis, taxonomic analysis, comparative analysis, discriminative analysis, and other techniques can be successfully applied for this purpose.

The research methodology focuses on the practical use of collective expertise as a reasoned tool for gathering expert information on Solar Business issues in our country.

Collective expertise assists the process of making group decisions. It is used to solve complicated tasks when there is insufficient information about future conditions, trends, processes, phenomena, etc. This is often necessary because of the strategic uncertainty that accompanies the prospective development. It requires careful consideration, proper preparation, proper organization and competent conduct. It is based on the targeted application of special rules and formalized procedures.

The mathematical and statistical processing of the expert information is carried out with the help of a scientific tool that includes a variety of methods. The use of specific indicators of perspective, relevance, attractiveness, usefulness, effectiveness, etc. is important in assessing future opportunities. Different ratios can be used as indicators such as: the importance factor, the weighting factor, the consensus coefficient, the coordinating factor, the correlation coefficient, the coefficient of association, the coefficient of preference, the coefficient of compactness, the coefficient of correspondence, the coefficient of confidence, the awareness rate, the justification ratio, etc. The precision, accuracy, punctuality and accuracy of collecting and processing expert information

play a significant role in the quality of group ratings.

Cluster analysis serves to classify the objects, processes, phenomena, etc.,<sup>3,4</sup>. His task is to divide the studied multitude into individual subsets based on selected criteria. It focuses on determining the degree of similarity between the surveyed units. Equivalence is determined by association coefficients, distance metrics, compliance metrics, etc. In the classification process, the closest units are sequentially differentiated into homogeneous groups, forming separate clusters. They relate to strategic factors, strategic opportunities, strategic advantages and strategic threats to photovoltaic business.

### **Characteristics of solar business in The European Union and Bulgaria:**

The essence of the solar business and energy produced by RES in the EU countries is expressed in three main directions:

- fighting climate change;
- promoting the creation of growth and jobs;
- limiting the EU's external dependence on gas and oil imports.

At the heart of the new policy is Europe's main energy goal: By 2020, the EU should reduce greenhouse gas emissions in its energy consumption. This goal will allow the EU to measure progress in redirection of the modern energy sector to one that will respond fully to challenges such as sustainability, competitiveness and security of supply. The EU target must be considered, given the need for industrialized countries to take international action on climate change. The aim is to achieve a 30% reduction in emissions by 2030 and 60-80% by 2050. The concerns are not only climate change but also the security of Europe's energy supply and economy and the wealth of its citizens.

<sup>2</sup> Hristov, S., Strategic Management in the Collective Security and Defense System, IM "Holding", S., 2007..

<sup>3</sup> Manov, A., Multidimensional statistical methods with SPSS, IM "Holding", S., 2002.

<sup>4</sup> Duran, B., P. Odell, Clusteron Analysis, Statistics, M., 1977.

In addition to climate change, there are some other reasons for taking the steps proposed by the European Commission. Achieving the goal can limit the growing risk to the EU from greater instability and higher oil and gas prices, contribute to a more competitive EU energy market and promote technology and employment. This is a huge challenge - in the language of energy, achieving the greenhouse gas reduction target means the EU in the next 10 years to reduce the amount of CO<sub>2</sub> in its energy consumption by at least 20% and maybe even more. However, it will help to make Europe, based on a highly efficient low carbon energy economy which is able to confront confidently with future energy challenges.

Strategically this means that the EU will take the lead in the world in preparing a new industrial revolution that will benefit both developed and developing countries, while at the same time accelerating the change to low-growth economic growth and sharply increase the amount of produced and used local energy with low emission levels.

- improving energy efficiency;
- increasing the share of energy from RES;
- new measures to ensure that the benefits of the internal energy market will reach every consumer;
- increasing solidarity between Member States with a longer-term view of developing energy technologies.

This includes a 10-point energy action plan and a timetable for the measures that the EU will implement to achieve the new strategic goal. The first set of specific measures is presented with the action plan. It includes a report on the implementation by the Member States of the internal gas and electricity market policy and also, the results of a study on the state of competition in these two sectors; a plan for the priority connection of the Member States' electricity and gas networks so as to create a genuine European

network; proposals to promote sustainable power generation from fossil fuels; a roadmap and other initiatives to promote the production of energy from RES, especially biofuels for transport; a careful analysis of the situation of nuclear energy in Europe.

The exact definition of "energy of renewable sources" is set out in § 1 (8) of the Renewable Energy Sources Act (RESA) (effective from 03.05.2011):

"Energy of renewable sources" is the energy from renewable non-fossil sources: wind, solar energy, energy stored in the form of heat in the atmospheric air - aerothermal energy, energy stored in the form of heat under the surface of the solid soil - geothermal energy, stored in the form of heat in surface water - hydrothermal energy, ocean energy, hydropower, biomass, renewable energy, landfill gas and waste gas treatment plants leads us."

Nowadays there is an accelerated depletion of natural resources as well as an increase in the level of toxic pollution. The constantly rising prices of electricity, oil, gas, oil cause a corresponding response. Consumers reduce fuel use and scientists are looking at ways to develop alternative energy sources, new and effective ways to meet energy needs. In the new energy sector, the massive use of solar energy practically does not have geographical and climatic restrictions and is very suitable for use in our country due to the large number of hours of solar energy per year. Thanks to this, photovoltaic systems have a very high degree of technology and have a very long economic life - up to 30 years.

Solar energy is becoming a major source of electricity. Modern, sophisticated technologies use sunlight everywhere - from illuminating premises in buildings to powering vehicles. In many European countries, solar systems are proven to be effective and are present in almost every home or business as heat and power systems. The consumption of solar energy systems will increase especially in Japan and



Germany. High efficiency in reducing energy costs can justify the initial investment as well as fully satisfy the need for energy. An important aspect of solar systems is their ecology.

According to experts, the use of sunlight as an energy source will increase drastically in the next years. Support for the use of solar energy as a source of electricity is also boosted in southern European countries such as Spain, Italy and Greece. In these countries, governments are increasingly aware that the sun's energy can be used to protect the environment and energy dependence from other countries.

The modern photovoltaic systems enable efficient solar power generation. The low temperature coefficient contributes to high productivity in hot weather, and good efficiency helps to improve performance in bad weather. With new technologies, solar panels are now becoming less polluting and have an optimal self-cleaning system. Researchers have also developed an option for recycling modular elements, which is another asset for environmental protection.

Within the environmental protection requirements, the extended warranty on production material and workmanship guarantees 90% of the plant's nominal power for 10 years and 80% for 25 years and is linked to the return and recycling program that provides a gratuitous removal after termination of exploitation.

According to some experts, even before 2050, the Sun must be the main energy source in Europe. The horrific oil prices, which reached \$147 a barrel in the summer of 2008, and the speculation that the \$ 200 limit would soon be transferred, made many believe that conventional energy is coming to an end. For others, it was a motive to redouble their efforts to find alternatives.

One of the best-developed and proven potential and future alternatives is the production of photovoltaic electricity. Already in March 2007, The European Council has set

the goal of increasing electricity from RES. In the past years, the key question has gradually changed from "What can RES contribute to European energy?" on "How can growth of RES production be realized?" (Tonchev, G.,2008)

And the answer comes from an important sector of the industry - by improving photovoltaic production. Fortunately, solar resources in Europe are plentiful and cannot be monopolized, so efforts must be directed in this direction.

Growth is already a fact - after 2009 photovoltaic business grew by more than 70% and reached a global volume of 4 GWp and the sector was over 16 billion. Average annual growth over the past 5 years is about 50%. Experts predict that after 2015 the market share will be about 90 billion euros despite the crisis and slightly shrunk investment in the sector.

Thanks to such strategies and strategic prospects, photovoltaic business helps to avoid CO<sub>2</sub> emissions. The advantages of photovoltaic power generation are obvious. That is why the EU and the Member States are keen to increase significantly the share of cogeneration in the production of electricity and heat in the next years.

Compared to other non-energy business, the return on photovoltaic power plants is longer and therefore the profits are lower. At the expense of the lower profit in the production of ecological electricity, the market risk for the realization of the production is 0, because the latest amendments to the Energy Act and the special law for stimulating the use of RES guarantee 100% electricity buy-out preferential price. But even without preferences, the energy business to produce green energy is less at risk than most other types of businesses due to the high universality of the commodity - electricity and liberalization of the market.

In a liberalized market, each manufacturer can determine who to sell the electricity. Undoubtedly, investments in photovoltaic

parks and systems, as well as in solar parks, are the new winning wave for legally guaranteed capital investments in Bulgaria, as has already happened with hydropower plants and currently with wind power plants. However, as the purchase price of the HPP electricity is considerably lagging behind the preferences for wind and solar power plants, the development of wind and photovoltaic parks will take place at a very fast pace. The EU has launched a program that foresees a sharp increase in the share of alternative and RES in meeting the energy and fuel needs of the European countries. In line with the existing and new policy - even stricter measures for limiting fossil non-ecological sources of energy, is the Bulgarian internal economic policy, which stimulates the development of the natural RES sector.

Changes in the regulatory framework on green energy purchases and depending on the price of electricity for household consumers will soon bring Bulgaria to the much desired network parity i.e. the price of electricity generated by solar power plants is equal to the price at which it is purchased by the electricity distribution companies. In some southern European countries and the southern states of the United States, this has already been achieved and should also be done in Bulgaria. This will pull the business out of the influence of the political factor, considering that the price of electricity produced will be marketable. A distribution fee will not be needed as the generation will be on the consumption side. No high-voltage distribution lines and other expensive equipment will be needed.

The strategic direction for the solar business is the creation and purchase of technology. Sooner or later Europe will introduce preferences for European equipment. In Germany, subsidies for small plants are larger if the details are produced in the EU. Chinese manufacturers use cheap electricity, cheap credits and almost free land for factories. They also produce large volumes

of production, allowing them to buy materials at very low prices, investing in vertically integrated production - producing silicon and all the details and finally producing the panel. However, they are increasingly thinking of exporting their production to Europe - either the final assembly of the panels or the production of cells.

The Chinese solar equipment manufacturers will remain a factor that the industry will take into account, even if there are already such practices - there are Chinese joint ventures in Poland, a Polish company assembles Chinese panels. In Hungary too. The Chinese are not only interested in producing panels and shipping them here. They want to cooperate with high-tech European companies. The latter understand that if they close their entire production in Europe they can not succeed either. Leading Chinese companies are also addicted to competition and they have already taken steps in this direction, there is a process of consolidation of hundreds of companies that produce solar. This is not only in the solar business, but in all industries. Priority is given to those who invest in innovation, work efficiently and have low production costs. Panel prices began to fall seriously, due to improved production organization, reduced material prices and increased efficiency.

In the beginning of 2015, in order to balance the national grid, each producer from a given upward power had to provide hourly schedules for electricity generation. This has been a complex task for solar power plants and what scares investors right now is the security of the Bulgarian lev. It is more correct if the purchase price of the energy is fixed in euro, because the credits that are received are in euro or its lev equivalence. These two obstacles - the lack of fixed price and the currency risk - must be removed in order to develop more quickly the electricity market produced by photovoltaic parks and Bulgaria to start fulfilling its commitments under the EU accession treaty.

In Bulgaria, the installed photovoltaic power plants, as already mentioned, are still small, and by 2020, 16% of the country's electricity production is expected to come from renewable energy sources - from power generated mainly by wind and solar-driven sources. If this is not the case, we are expecting solid fines from the EC. Given that barely unobtrusive 3 megawatts of photovoltaic power in are now produced in Bulgaria, the comparison with Germany is unthinkable. For 2009 alone, the solar systems installed there are 2 gigabytes (2000 megawatts). This benefits not only the environment but also the economy as a whole, because new jobs are created in high-tech production. Bulgaria has not yet developed a strategy for the development of solar energy nor for RES as a whole.

The solar business has distinct advantages, the use of solar radiation as an inexhaustible source of energy is a key advantage. It is associated with the use of RES and the taking of natural solutions that are in the interest of human society. Nor should the economic advantages: cheap exploitation, acceptable returns, insured sales, etc. be overlooked. All of this definitely helps to accelerate the development of energy. This demonstrates the relatively high consistency of strategic management views.

Very attractive to potential investors are state preferences and profits, which are a kind of anti-crisis measure in the global economy and have a positive impact on the solar business.

## CONCLUSION

The solar business is the future of energy policy in Europe. The use of RES, such as the sun, will not only solve oil and gas supply issues but will also allow the EU to meet its commitment to reducing greenhouse gas emissions.

In addition, the solar business will make a huge contribution to the economy, in view of its attractiveness to large investors.

It will provide the necessary environmental sustainability of the EU by ensuring a stable energy future with low carbon growth, provided

by policies covering not only the energy sector, but also by maintaining complex systems such as "smart" cities and transport systems, "green" buildings and etc.

The right decisions in the solar business sector can also lead to new dividends for Bulgaria related to our neighbouring countries that will already be on our way to the European community and will still meet the requirements that we currently have for a percentage of energy from RES in their gross domestic consumption. Then the solar industry in Bulgaria would be very well positioned to export goods, know-how and services and will begin to add a positive balance to the foreign trade balance of the country.

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