

RENEWABLE ENERGY MARKETS: UKRAINIAN PERSPECTIVE

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Energy from renewable energy sources is the most dynamic and one of the most promising sectors of European and global energy, while renewable energy is seen not only as an emergency replacement of fossil organic fuels, especially oil and gas as well as economically and environmentally sound replacement of traditional fossil fuels, where even now there are all conditions for their use.

At present, the majority of the world faces serious threats of global character (effects of environmental pollution and global "warming" climate, limitations of traditional resource base). The development of alternative and renewable sources of energy (NRSE) should be regarded as an important factor in enhancing energy security. In particular, the threat to Ukraine's energy security, energy intensity is due to the economy, low level of use of alternative energy, excessive dependence on external energy sources rapidly exhaustive.

Major global trends in renewable energy are:

1. Accretion of power.
2. Investment build-up.
3. Increase in the number of companies. The number of companies involved in the use of renewable energy continues to increase. Such major corporations as «British Petroleum», «Shell», «Siemens», «Westenhouse" and others have become leaders in the European PV industry, investing millions of dollars in the production of photo module.

Imperfection of interstate institutional structures obviously restricts and constrains economic cooperation. Supranational bodies coordinating the development of fuel and hydropower facilities are primarily engaged in operational control, without affecting the basic issues of development strategy of fuel and energy, optimizing its structures.

In this connection, in January 26, 2009 in Bonn (Germany) International Renewable Energy Agency - IRENA was established; the main purpose of which is to increase the pace of broad and sustainable use of renewable energy worldwide. Besides the IRENA in this industry an international network of independent non-governmental organizations operates working in the field of energy balance - INFORSE, Network of Alternative Energy 21st century, and the European Association for Renewable Energy Eurosolar.

National mechanisms for renewable energy market regulation are often a combination of different types of management that reflect specific national and regional conditions. The first is incentives for investment in renewable energy, combined with subsidies producers of electricity or mechanisms to stimulate

demand, such as job quotas in connection with "green certificates" circulation. These mechanisms are often linked with other policy instruments such as subsidy programs, loans, tax incentives, information campaigns, etc. Incentive tariffs are greatly appreciated by investors and, in particular, by banks, financing projects.

In practice, all the tools to promote renewable energy technologies can be divided into two main groups: quantitative and price group.

The essence of "quantitative" methodology is that the government introduces a system of mandatory quotas, setting the percentage of electricity supplied to the market - traditional and based on renewable energy. In this case, a system of "green certificates" is used as a rule; it enables to take into account the volume of electricity produced by renewable energy. For example, Germany used the following combination of five main policy instruments for the development of renewable energy:

- Direct investment in research and development;
- Direct subsidies;
- Government-funded loans;
- Tax incentives;
- Grants to cover operating expenditures / reduced rates.

The use of price instruments is widespread. The vast majority of the EU members practice feed-in tariffs, which constitute either a fixed rate, independent of prevailing price levels of wholesale market, or premium to the price of wholesale market.

International experience shows that at the early stages of development of promising renewable energy sources (RES) special funds are required as the original focus on the economic efficiency of new installations makes the process of their development difficult. In addition to government support, active participation in projects introducing renewable energy sources is taken by large corporations, regional groupings and international organizations.

Large-scale use of renewable energy potential in Ukraine is not only internal but is also of considerable international importance as a significant factor of resistance to global climate change of the planet, improving the general state of Europe's energy security.

The share of renewable energy in total energy supply of Ukraine is today about 3%, and electric supply - about 6.5%, including large hydropower.

Promising directions of development of renewable energy in Ukraine are: bio-energy, mining and mine methane utilization, use of secondary energy resources (RES), off-balance sheet deposits of hydrocarbons, wind and solar energy, thermal energy of the environment, development of economically viable hydro-potential of small rivers of Ukraine.

The analysis of national renewable energy market shows that:

1. At this stage of development of RES market in Ukraine bio-energy is able to develop the most quickly. In Ukraine today there is no full market of biodiesel

and bio-ethanol. However, Ukraine has already built a dozen of biodiesel refineries with total capacity of more than 250 thousand tons per year, at least that much of ethanol today is ready to be released by enterprises of alcohol industry. According to the results in 2009 there were made more than 6 thousand tons of fuel "BIO-100. All the products were sold on the domestic market.

2. The production of ethanol and its use as a component of the top incense remains a promising building industry in Ukraine; however, it will happen mostly through private investment and construction of new enterprises. As for production of ethanol, besides "KoronAgro", this kind of projects is actively studied in Ukraine as well as by "Techinservice" company. Today, however, for European ethanol producers, including Ukrainian companies, an extremely unfavourable conjuncture has developed. Nevertheless, the resource base for production of ethanol enables the Ukrainians to talk about Ukrainian production as a decent competitor on the European market.

3. The rapid increase in oil prices and, accordingly, on diesel fuel, as well as moderate growth in prices for raw materials: sunflower and rapeseed oil will allow biodiesel to compete with oil, creating a precedent for active biodiesel plants. Today, in Ukraine, there are about ten biodiesel plants. The largest of them are "Oriana Galev" (Kalusch, Ivano-Frankovsk region, the power of -180 thousand tonnes per year), "Liber" (Kherson, 10 thousand tons), Biopetroleum Company "(Saki, 5 tons)," Styrene "(Gorlovka, Donetsk region, 10 thousand tons) and ATU 10622 (Dnepropetrovsk, 10 tons). Neither one of them is not working at full capacity today. In 2009, several hundred tons of products for own needs (comp-auditing with DT) were produced by Stirol. Other manufacturers released products in quantities to commensurate with the parties necessary for certification.

4. According to the Statistics Committee, Ukraine has more than 7 thousand large and medium enterprises having their own waste; and which can be adjusted to the production of biogas. Some industrial facilities have the opportunity to run simultaneously 10-20 biogas plants (one biogas plant produces in average 2-3 mln. cubic meters of gas per year). One such project was implemented by "Zorg" in 2009. In particular, the biogas plant was run in the Kiev region (B.Kupol) on the territory of the LLC "Ukrainian dairy company".

5. The total capacity of wind power facilities in Ukraine is 85 MW. According to Ukrainian experts resources of wind energy are technically available for development on the continental part of our territory; it is approximately 200 times more than the current amount of generating electric power objects in Ukraine. It is expected to increase the potential of wind energy from 0.018 million tons of fuel in 2005 up to 0.7 million tons of fuel in 2030. The Sivash Lake and the coastal part of the Azov Sea could play a key role in the development of offshore wind energy; hence they supply the Crimea and Donetsk region with energy. European experience convincingly demonstrates the economic and environmental feasibility of offshore wind farms. Today we can name about ten companies that

announced their intention to develop wind energy projects; there are "Nova Echo" and "Concorde Group" among them.

6. The market of small wind energy is mainly represented by foreign manufacturers of wind generators, production of which in the country is represented by more than three dozen companies. However, there are domestic producers of this equipment. Thus, Kharkov CB "Wind World" started production of wind generators with the rated power from 150 W to 2 kW. Top product in the line producer of wind turbines is 08 FLAMINGO AERO.

7. Ukraine has considerable resources in geothermal energy, the total potential of which is estimated up to 4381 kWh per year, equivalent to stocks of fuel in the amount of 50x10⁶ tons of fuel. Nevertheless, the country has no modern operating facilities in this area. One promising area of development of geothermal energy is creation of combined energy-technological nodes to produce electricity, heat and valuable components, which are contained in geothermal fluids.

8. Solar power system in Ukraine is mainly developed through introduction of solar collectors for hot water. Ukraine has tried and tested technology of manufacturing solar modules which transform solar energy into electricity using solar cells based on polycrystalline silicon, and exports them to Europe. Today, the only national producer of polycrystalline silicon solar battery is "Quasar" company. Company "Pillar" and "Prologue-Semikor" produce lead ingots and silicon wafers. Other market participants are engaged in selling, installing, and offer comprehensive services (including delivery and installation) to introduce alternative sources of energy.

In Ukraine there is a sufficient scientific, technological, and industrial base in all the major areas of renewable energy that, while ensuring an appropriate legal framework, is able to create the foundation for a new environmentally friendly energy industry to promote energy independence of the state.

Thus, the goal and fulfillment of the tasks allow us to draw the following conclusions:

1) it is necessary to form the national energy policy with the help of improving the legislative, legal and regulatory framework of the renewable energy development taking into account peculiarities of each type of renewable energy; development of basic economic incentive government policy to conduct of preferential policies for producers and consumers of renewable energy; the use of effective financing mechanisms, and support to the activities of public organizations; adaptation of the provisions of state programs for renewable energy development with the requirements of the EU; distribution of legal rights and responsibilities to all market participants, establishing the necessary reporting systems and mechanisms for appeal, creation of the educational system - as special technical in all the areas of renewable energy, and for the formation of energy-efficient eco-consciousness of the population.

Important tasks are:

- to prepare the forecast of fuel prices basing of the state order for evidence-based level;
- to adopt the package of environmental laws, establishing long-term standards in protecting the environment,
- to improve the organizational structure of state regulation of the electricity market.

2. Taking into consideration the current structure of regulatory power, as well as the experience of foreign countries, we propose the following system of regulation at different administrative levels. Regional energy policy should include a clear delineation of legislative authority and responsibility in the regulation of energy between the regional executive bodies and local authorities. This should be a balance of public authority's interests, utilities and energy consumers, accounting geographic asymmetry in the availability of natural energy resources in the energy mix of different regions of Ukraine.

3. For effective implementation of tasks for the development of renewable energy in Ukraine, first of all, we need a national model of development of renewable energy, as a separate energy industry - creating the legal framework to allow the development of each type of renewable energy sources, definitions of basic economic policy of the state enabling legislation and creation of renewable energy based on the conduct of preferential policies for producers and consumers of renewable energy sources, identification of funding mechanisms.

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