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**Renewable Energy Sources**

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Currently in the world there are several large-scale problems. One of them is the depletion of natural resources. There is an increasing demand to use huge amounts of oil and gas. Therefore involuntarily a question arises: how long will fossil fuels last, its use in the same huge volume will go on? According to statistics based on mathematical calculations, the deposits of planet's natural resources will have exhausted by the end of the next century. Thus, future generations will have nothing to use for energy production? No doubt fossil fuels adversely affect the environment around the world. Therefore, mankind is now thinking more about alternative sources of energy to reduce the dependence.

Renewable energy sources (RES) energy constantly exist in natural processes on the planet, as well as energy products, life biocenters plant and animal origin [3].

A special feature of renewable energy is cyclical origin, which allows you to use these resources without time constraints.

Usually, renewable energy sources refer to solar radiation, water flows, wind, biomass, heat of the upper layers of the earth's crust and oceans.

RES can be classified by types of energy [3]:

1. Mechanical energy (wind and water);
2. Thermal and radiant energy (solar radiation and geothermal);
3. Chemical energy (biofuel).

Major opportunities of RES are virtually unlimited because they don't contribute to the depletion of natural resources, land resources but inadequate use of equipment and technology, lack of the necessary structural and other materials makes it extensive to use renewable energy.

Under certain conditions, in low-capacity autonomous power systems, renewable energy can be economically profitable than traditional resources.

**Wind power**

Wind power is one of the fastest growing industry in the world markets. Growth in recent years makes 31% of total RES consumptions [2].

**Hydropower**

Currently, hydropower is more than 60 % of all renewable energy sources and is the most productive one (modern hydroelectric efficiency equals about 85-95 %).

**Solar energy**

The sun is one of the most important sources of renewable energy. Consequently, energy of the star is increasingly being used by humans for producing electricity. Indeed, solar radiation, amounting to the entire surface of the Earth, has tremendous power of  $1.2 \text{ kW} * 10^{14}$ , which in turn raises questions about the global use of this type of resource.

**Biomass Energy**

Biomass includes all substances of organic origin. At the moment, the use of biomass as a source of renewable energy is under development and implementation for mass use.

**Prospects for the development of renewable energy in Russia**

**Wind power.**

In the Russian Empire, there were more than 20,000 windmills with a total capacity of 1 million kW.

Evaluation of the use of wind energy resources shows that for energy use of renewable source is suitable about 8 million  $\text{km}^2$  area where the average wind speed exceeds 5 m/s. If

humanity used only 1% of the area to set up wind turbines, their installed capacity would exceed 300 million kilowatts [2].

### **Hydropower**

Russian hydropower resources are estimated to be 852 billion kW / h per year. This so-called economic potential is suitable for industrial use. Largest hydropower Russia takes 2nd place in the world.

Distribution of hydropower in Russia: European part – 25%, Siberia – 40% and 35% Far East. Hydropower potential in the European part is used almost entirely.

### **Solar power**

Russia has a huge potential of solar energy. Southern Russia, the Far East and Trans-Baikal have a high level of solar radiation, which is comparable with the southern regions of Europe, where solar energy has already gained intensive development.

### **Bioenergy**

One of the most promising renewable energy resources in Russia is biomass. In the meantime, this source is less involved. However, in fact, approximately 10% of the total world consumption makes timber [1].

### **Conclusion**

Reserves of Earth are depleting, the population is increasing every year, but the demand for electricity is growing.

Today humanity is increasingly using renewable energy opportunities, but out dated equipment and technology, lack of necessary structural and other materials do not allow using widely these resources.

### **References:**

1. Biomass as an energy source: Ed. Soufera S., Zaborsky O. Moscow, 1985. 368 p.
2. Gorodov R.V. Alternative and renewable energy sources: Textbook / Gorodov R.V., Gubin V.E., Matveev A.S. 1st ed. Tomsk: Tomsk Polytechnic University, 2009. 294 p.
3. Lukutin B.V., Renewable energy in decentralized power grids / Lukutin B.V., Surzhikova O.A., Shandarova E.B. Moscow.: Energoatomizdat, 2008. 231 p.
4. Ushakov V.G. Renewable energy sources: Textbook / Novocherk, Reg. tehn. Univ. Novocherkassk, 1994. 120 p.

### **Senkiv, K.I.**

#### **The current state of alternative energy in post-Soviet Union countries**

**Alternative energy** – is a set of promising ways of generating, transmitting and consuming energy, which are not as widespread as traditional, but are of interest due to the use of profitability and low risk of environmental at pollution.

#### **Kazakhstan.**

President Nursultan Nazarbayev said that by 2050 at least half of the total energy consumption must account for alternative and renewable resources of energy.

By 2030, the share of electricity generation in coal-fired power plants will amount to 75 per cent. The share of such energy should make about 10 per cent.

By 2015 it is planned to generate by the alternative sources about 1 billion kilowatt hours.

Share of renewable energy in total energy consumption must be 1.5 per cent by 2015, and more than 3% up to 2020 year.