WORLD ENERGY RESOURCES

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Energy resources are material objects in which energy suitable for practical use is concentrated. They are divided into primary and secondary.

Primary energy sources are natural resources that have not been processed or transformed: crude oil, natural gas, coal, oil shale, sun, water of seas and rivers, geysers, wind. In turn, they are divided into renewable and non-renewable.

Renewable sources are those whose restoration is constantly carried out in nature, and which exist on the basis of constant or periodically occurring energy flows in nature.

Non-renewable sources are naturally formed and accumulated reserves of substances in the bowels of the planet. These are fossil organic and nuclear fuels.

In addition to natural renewable sources, today anthropogenic ones, which include thermal, organic and other wastes of human activity, are gaining more and more importance (Renewable and non-renewable energy sources, 2022).

Different types of resources have different quality, for fuel it is characterized by calorific value, that is, how much energy (heat) can be released by this source.

The world's energy resources are huge: potential geological reserves of all types of mineral fuels on Earth are estimated at 25 trillion tons. A large part (80%) of organic fuels is coal. In addition to mineral fuel resources, there are also so-called renewable and unconventional resources, the use of which is gradually increasing. Significant prospects are also associated with the use of reserves of uranium and thorium, which can provide thermal energy hundreds of times more than all known reserves of fuel minerals.

According to the classification of the International Energy Agency, renewable

sources include: solid biomass and animal products; biogas obtained in the process of fermentation of biomass and solid waste; industrial and municipal waste; hydropower, potential or kinetic, converted to electricity using hydroelectric power stations; geothermal, heat energy that comes from deep within the earth, usually in the form of hot water or steam; solar, wind and energy of tides, sea waves and ocean.

RES occupy the second place in the structure of the world production of electrical energy. They provided 19% of the world's electricity production, after coal, ahead of nuclear energy, natural gas and oil (Energy resources, 2022). The main amount of electricity produced by RES is obtained from biomass.

Coal. More than 3,600 coal deposits are known on Earth, which occupy 15% of its territory. Most of resources are located in Asia, North America and Europe. Australia is considered the largest exporter of coal today, which supplies almost a third of the world market. Worldwide, coal-fired power plants generate 30% of electricity.

Oil. More than 600 oil and gas bearing basins have been explored on the globe, 450 of them are being developed. The total number of oil fields reaches 35,000. The main reserves are located in the Northern Hemisphere. The International Energy Agency estimates global geological reserves of oil at 200 billion tons. The world's oil-bearing areas amount to 32 million km^2. Transport remains the main consumer of oil products today.

Natural gas. The world's explored reserves of natural gas are estimated at 100 trillion cubic meters. The use of natural gas is constantly increasing due to the fact that its impact on the environment is less harmful than the use of other types of fuel. However, it should be noted that the main component of natural gas is methane, which increases the greenhouse effect 20 times more than carbon dioxide.

Uranium raw materials. Uranium is the main energy carrier for nuclear power plants. There are approximately 450 nuclear reactors worldwide, producing 16% of all electricity. Dozens of nuclear reactors are put into operation every year. Nuclear energy still remains promising despite the fact that accidents happen at nuclear power plants (Boychenko, Yakovleva, Vovk, Leyda, & Shamansky, 2021, p.30).

Total energy consumption is as follows: oil products ~33%, natural gas ~24%, coal ~28%, hydroelectric power stations ~7%, nuclear fuel ~5%, and other renewable energy resources ~3%. Therefore, more than 90% of all consumed power is produced from non-renewable hydrocarbon raw materials.

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