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## ON CLEAN ENERGY SOURCES

**Abstract:** This article is about clean energy and green energy. The benefits of clean energy, how it works, its importance in people's lives, and answers to similar questions are highlighted. In addition, the causes, consequences and solutions of clean energy generation are analyzed.

**Key words:** energy, renewable energy, energy shortage, environment, green energy, greenhouse effect, heat balance.

**Language:** English

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### Introduction

Renewable energy uses energy sources that are constantly replenished by solar, wind, water, global warming, and plants. Renewable energy technologies convert these fuels into useful types of energy, not just electricity, but also heat, chemical, or mechanical energy. Renewable energy helps fill the void. Even if we have an unlimited amount of fuel, using renewable energy is better for the environment. Clean energy is energy from renewable sources that do not pollute the atmosphere, as well as energy saved through energy conservation measures, while green energy is energy from natural sources. However, while most green energy sources are renewable, not all renewable energy sources are green. For example, hydropower is a renewable resource, but some argue that it is not green energy because deforestation and industrialization associated with the construction of hydro dams can harm the environment. Green energy

is a pure energy mixture that corresponds to renewable energy like solar energy. An easy way to remember the difference between different types of energy is: clean energy = fresh air; green energy = natural source; renewable energy = renewable source. *How does clean energy work?* Clean energy works by producing energy without emitting greenhouse gases, such as carbon dioxide, without adversely affecting the environment. *Why is this important?* The most important aspect of clean energy is environmental benefits as part of the global energy future. While clean, renewable sources preserve the world's natural resources, they reduce the risk of environmental disasters such as fuel depletion or problems with natural gas leaks. With the diversity of fuels, it is possible to create renewable energy sources for power through different power plants, using different energy sources. *How to use clean energy?* Depending on the energy source, clean energy can be used for a variety

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of other purposes, from generating electricity to heating water and so on. Solar energy can be used to heat and light buildings, generate electricity, heat water directly, and more. However, the same clean energy technology is used to power homes or other buildings. The rapid development of energy poses many challenges, one of which is whether humanity will face an energy "famine". The answer to this question is no, energy shortages do not pose a threat to humanity, because the earth has enough energy resources. Atomic and thermonuclear energy have the potential to provide humanity with energy for tens of thousands of years. The second question is, can we allow more energy to develop? Some experts say no. It is necessary to stop the increase in electricity production, and instead to implement its efficient use and conservation of energy resources, otherwise civilization could collapse [1]. Others argue that the development of energy could pose a potential threat to nature and humanity:

- air pollution;
- heating of water basins and rivers;
- Disruption of the planet's landscape;
- Climate change in some parts of the world;
- global warming;
- melting of ice;
- Rising sea levels, etc.

But all of these can be combated and eliminated [2]. Abandonment of large-scale energy use, advanced industry and agriculture will lead to the death of many people. Non-energy industrial production has a more negative impact on the environment (for example, without fertilizers and irrigation, arable land and pastures are destroyed). Improving soil fertility (fertilizers and irrigation), combating land desertification, water supply (people, land, industry), construction of hydraulic structures, etc. can not be done without the use of energy. Among the negative effects of energy: the first - air pollution (with sulfur oxides - SO<sub>2</sub>, carbon monoxide - CO, nitrogen oxides - NO, and hydrocarbons). The weight of the Earth's atmosphere, which consists mainly of oxygen and nitrogen, is 5 × 10<sup>12</sup> tons. That's about \$ 100 million. tons of other substances do not seem to be able to change its composition. But this is not the case. For example, the possible concentration of sulfur oxide for a human being is 30 parts sulfur oxide to 1,000,000,000 parts air. In cities, sulfur dioxide accounts for 15-20 parts [3]. This can lead to poor

health and gradual death. The problem is exacerbated by the imperfect methods of purifying the air from the toxic gases produced by the combustion of coal and oil products. The second is that the release of hot waste into water bodies raises the ambient temperature, in some cases due to the heating of water bodies and the presence of oxygen in them, creating favorable conditions for the development of microorganisms that emit harmful substances in water bodies. Therefore, the development and implementation of other methods of saving water resources and cooling are also required for cooling power plants. The third is that the average density of artificial energy due to global warming is 0.03 watts per 1 m<sup>2</sup>. But because the sun's rays are 10,000 times more powerful, they could not harm the planet. However, there are countries on earth where the density of artificial energy is high (for example, in Japan, 1m<sup>2</sup> is = 2 watts), which can pose a threat to the environment because it affects the microclimate. An increase in artificial heat by 2-3% of solar energy leads to a disturbance of the earth's heat balance and a sharp change in climate [4]. However, global warming is mainly due to the greenhouse effect. The greenhouse effect is the process of preventing the return of infrared rays into space by the return of carbon dioxide from the atmosphere. Therefore, the concentration of carbon dioxide should not be higher than the specified amount. On the other hand, as a result of the dust cover of the atmosphere, the Earth's temperature drops (according to the findings, the period of freezing on Earth was caused by the fact that the Earth was covered with dense dust clouds from other planets). It is not yet possible to answer the question of how long it will be possible to develop energy. As a result of various human activities, climate change can occur in different parts of the globe (for example, the use of most river water for irrigation, increased evaporation, redistribution of energy balance in the atmosphere, etc.) [5]. People can find solutions to their problems, but they can't do it without energy. Therefore, "clean energy" is needed. What is the future of clean energy? Renewable sources now account for one-third of the world's installed energy. As the world's population continues to grow, the demand for energy is constantly growing, and renewable sources are responding to providing sustainable energy solutions while protecting the planet from climate change.

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