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# Energy-saving technologies and alternative energy sources

*Abdunabiyeva Noila Yusuffjon*      Researcher, Lawyer on advocacy in law college, Uzbekistan  
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The energy problem is one of the most pressing issues in the world is on the agenda of scientists working in the field of energy. XXI century with the development of science, rising technology creating the opportunity for a person to live normally, providing him with enough energy, food is one of the key issues. Everyone knows digging the energy reserves of its resources are declining. But the need for it increased, and now the world's population has reached seven billion. There are the following types of energy sources that used by humanity: oil, coal, gas, atom, biomass, water, solar, wind, geothermal energy. This energy sources can be divided into two types, respectively. Biomass, water, sun, wind, geothermal energy - renewable; oil, coal, gas, nuclear energy - non-renewable. The energy from these resources is electricity, utilities such as energy consumed for services (heating of buildings, hot water supply) occurs in views.

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## Introduction

In 2008, the world energy consumption was 15 TW (terawatt, 10<sup>12</sup> w), which is not updated every year energy resources are becoming increasingly important. But the next 10-20 years we see that the share of renewable resources is also growing possible. Due to the scarcity of non-renewable resources and their high cost, many countries increase their energy consumption through renewable resources are trying to provide. Hence the development of solar energy remains one of the most pressing issues. Per year to the Earth's atmosphere 120,000 TW (terawatt, 10<sup>12</sup> w) of energy comes from the sun. That's right It is impossible to absorb all the energy, but 0.002% of it is enough to fully cover the world's energy needs. The use of sun energy is beneficial to countries in many ways. Firstly, this type of energy is absolutely free. Second, the energy from the sun is huge both through the construction of power plants and the creation of small farms can be obtained. Third, solar energy is absolutely harmless does not harm the atmosphere and hydrosphere at all. Fourth, the sun energy not only in obtaining electricity, but also in utilities (house heating or hot water supply). That's why many countries use solar energy on a large scale are working. As proof of our opinion, from solar energy we show that the average annual growth in use is 35% possible. But even so, solar energy is fast around the world. The main reason for its unpopularity can be explained by the following:

1. solar energy decreases slightly in the evenings and in the winter months, however it is at these times that there is a great need for energy;
2. from solar energy in use, the states closest to the poles are closest to the equator countries benefit less and solar energy is present due to the fact that it is not fully popular in the days of some other types of energy more expensive.

In recent times it has become more popular and more than 70 another type of energy used in countries is geothermal energy. In 2007, 10 GW of electricity and 270 PJ of thermal energy geothermal energy. This type of energy is a series has advantages: free, can be obtained from any area of land, water and does not pollute the air and this type of energy is a small type of enterprise is obtained by companies.

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## Main part

Energy consumption is distributed differently around the world. It is 6 kW per person in Japan and Germany, 11.4 kW in the USA and 0.7 kW in India. In Bangladesh, the figure is the lowest - 0.2 kW. Advanced countries are the world's main consumers of energy. In particular, the United States consumes 25% of the world's energy. But in the next 10-20 years growth of energy consumption in developing countries we can observe. In China alone, energy consumption averages 5.5% per year is growing.

The importance of coal from non-renewable resources is growing. Because coal reserves are relatively cheap, widespread, ie 909 billion. around a ton and this reserve will be able to meet the demand for coal for another 45 years developing countries are its main consumers. To the energy in them. As the demand for coal increases, so does the demand for coal by an average of 2% per year rising. However, combustion of coal produces gases such as CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub> will be. CO<sub>2</sub> causes global warming, SO<sub>2</sub> gases cause acid rain and NO<sub>2</sub> gases are involved in the degradation of the ozone layer. That is why the use of coal is strongly criticized, and so on great attention is paid to the transition to alternative energy sources or the discovery of new ones. In particular, the EU spent 9% of its energy in 2009 on green energy by 2020, the figure will increase to 20% is projected to rise to 33%. Denmark and Germany have their own large amounts of solar energy despite its inconvenient geographical location investing. In 2009, a total of \$ 140 billion was invested in the green energy sector. The investment is \$ 30 billion more than conventional energy sources means more than \$. More than 30% of them are in Europe and the United Kingdom will come. One of the types of energy that has been considered safe until recently is the atom power plants. According to the International Agency, in early 1982 272 nuclear power plants have been commissioned around the world and they produced only 3 percent of the total electricity.

By the 1990s, the number of nuclear power plants (NPPs) had reached 423. 2000- nuclear power plants (NPPs) are the total electricity produced in the world estimated to produce a quarter of the energy. The use of nuclear power plants (NPPs) in the world is 400 per year million tons of oil. This is every year in Saudi Arabia about 2 times the amount of oil extracted. At one time, the absolute safety of nuclear energy was a myth. The Chernobyl accident put an end to this myth. Now it's his turn the opposite is true, the nuclear power plant is labeled a "hell horror." This is it also far from the truth, but the danger is not great. Chernobyl Nuclear Power Plant (NPP) The accident was caused by a gross error of its staff. But the crash of a nuclear power plant in Fukushima, Japan, is a whole to limit the practical use of this type of energy by world scientists proved to be necessary.

There is a saying among our people that cheap soup does not taste good, "cheap" energy gives us can be very expensive. Another problem is the storage of radioactive waste. Nuclear power plant in the territory of nuclear power plants (NPPs) there are special places for waste storage "graves". But there are objections to saying they are completely safe.

Experts say the most promising energy sources are hydrogen energy added that its reserves on our planet are practically unlimited. Extensive use of hydrogen as a source of energy for environmental cleanliness only distilled water is formed during its combustion process will be Several methods of obtaining hydrogen on an industrial scale from ordinary water already searched. Nuclear power plants for the production of hydrogen in industry, It is proposed to use the rising energy of the sun and sea.

From a fundamentally new energy source now called heat pumps is being used. Heat pumps use heat from freon gas to collect heat for practical use. The energy collected from the environment is used to run heat pumps several times more energy. Thus, the conservation of energy due to the condensation of heat from the environment without violating the law "permanent engine" -like devices have been developed. This appliance can operate until the ambient temperature is high enough. Of energy another new type is fusion energy. Thermonuclear energy is hydrogen for

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human needs from the energy released when converted to helium based on use. Thermal power plants are nuclear power plants will be much “cleaner” and “safer” than the stations. But such electricity will require very complex and expensive equipment to build power plants, because the fusion reactions are only in plasma (aggregate state of matter 4) goes However, the energy of the future belongs to these power plants is assumed to be.

According to IRENA's annual Renewable Capacity Statistics 2019, global renewable generation capacity reached 2,351 GW. The three alternative energy sources with highest percentage are:

1. Hydropower accounts for 1,172 GW, which is about half of the total amount.
2. Onshore and offshore wind energy come second with 564 GW.
3. The capacity of solar power is slightly less — 480 GW, divided between solar photovoltaic and solar thermal power.

Alternative energy sources are forecast to expand in every sector by 2023. The electricity sector has the biggest share of 30%, and on the path of decarbonisation, electrification will become the main energy carrier, the bulk of it being generated by renewable energy.

Heating is second with 12% and the transport sector comes last with only 3.8% of alternative energy sources with room for improvement. In the infographic below, GreenMatch highlights the current and future scope of alternative energy sources, and gives an overview of investments and future projections on our path to a sustainable future.

In the future, creating a supply and storage infrastructure will enable a more efficient use of hydrogen. Future plans for hydrogen include building an underground storage system where surplus wind energy, for instance, can be transformed into hydrogen through electrolysis.

## Alternative Energy and Infrastructure

### Subcategories

Alternative energy - Energy sources considered to be alternatives to fossil fuel sources

Electric variables control - Topics pertaining to control involving electric variables including current and gain control

Electrochemical devices & processes - Devices and processes which produce electricity from chemical reactions such as batteries, fuel cells and supercapacitors

Energy facilities design, construction and operation - Various topics related to all aspects of energy facilities

Engines - Machines which transform energy into physical motion

Fuels - Topics related to materials used as energy sources

Power electronics - The use of electronics for conversion of electric power

Power engineering - Engineering for power distribution and electrification

Power systems - Various kinds of power systems such as hybrid power systems, industrial power systems and transformers

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Production and well operations - General topics related to well operations

Renewable energy - Energy sources considered to be replenishable

Reservoirs - Naturally occurring and artificial stores of fluid energy

Smart grid - Modernized electrical grids which attempts to automate efficiency controls for electrical power distribution

Solar energy - Energy derived from the sun

Well completion - The process of preparing wells so they are ready for production

## Conclusion

In conclusion, it can be said that it is of great importance now non-renewable resources then lose their value. The main thing The reason is their limited time due to the reduction in quantity .The service is more expensive and more environmentally hazardous does. Getting energy from renewable resources is gaining popularity year after year, and that's it which in turn ensures that their prices fall. We have practical proof of this we can also see in the energy trends of recent years. Over the next 30-40 years, the share of alternative energy sources in energy will increase.

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