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Alternative Types Of Energy Sources And Their Development

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***Abstract* —** *Energy saving (energy saving) - the implementation of measures aimed at the rational use of fuel and energy resources. Energy conservation is an important task for the preservation of natural resources. This article analyzes the dependence of the use of alternative energy sources on energy efficiency.*

Keywords — solar energy, energy sources, energy saving.

Introduction

Today, there are many methods aimed at energy saving. For example, the improvement of industrial installations and heating mains, the introduction of new technologies, the utilization of thermal energy, the use of renewable energy sources, but they require very high costs. Of all the energy consumed in everyday life, a large share - 79% goes to space heating, 15% of the energy is spent on thermal processes (heating water, cooking, etc.), 5% of the energy is consumed by electrical household appliances and 1% of the energy is spent on lighting , radio and television equipment. Experts say that changing our own habits and using modern technology will save up to 40% of electricity.

Nowadays, the topic of energy saving is undoubtedly relevant. Recent events in the world - the instability of energy prices, problems with gas transit to Eastern Europe, the economic crisis, are forcing people to pay more attention to energy conservation issues. Currently, the lion's share of the energy required, for example, for lighting, is "extracted" from non-renewable energy sources (to generate electricity at a thermal power plant, you need to extract fuel, which, as you know, leads to the loss of irreplaceable minerals).

Materials and methods

The problem of saving electrical energy, of course, should be of concern to modern society, not only because such a lifestyle saves the capital of a particular person, but also because it will allow us to more economically spend natural resources and leave our descendants rich reserves of non-renewable energy sources. The problem of energy saving needs to be solved now, since the reserves of energy raw materials are not endless. We need to clearly understand that we will not have a truly economical use of energy resources until every person from a young age understands what caused the need to save, what the savings are made of, and what awaits us if the seemingly inexhaustible energy reserves are exhausted. The relevance of this work includes a number of aspects: 1. Globally - ecological: today it is a well-known and proven fact of the detrimental effect on the planet's environment of the applied traditional energy technologies, which inevitably leads to global catastrophic climate change. Economic: a) the transition to alternative technologies in the energy sector will save fuel resources for processing in the chemical and other industries in order to obtain new materials; b) the unit costs of energy and installed capacity for renewable energy converters are continuously decreasing, and there are already technologies that provide these indicators lower than for traditional power plants. Alternative energy tariffs will be stable, and in the future it will be possible to reduce them. Whereas the cost of fuel energy resources and the energy produced from them (tariff values) are increasing, and this trend can no longer change due to the gradual depletion of fossil fuel resources. Social: due to population growth, it is practically difficult to find areas for the construction of large nuclear power plants, state district power plants, thermal power plants, which, while ensuring the profitability of energy saving, would meet the safety requirements for the surrounding biosphere. In the final document of the international conference on global climate change on the planet in Kyoto (1997), strict restrictions were introduced for states on emissions of carbon dioxide and other pollutants into the Earth's atmosphere. Russia should not exceed the level of emissions in 1990, which means that the construction of new energy facilities is possible only after the implementation of an appropriate compensation program for energy conservation, as well as the use of power plants with renewable energy sources.

4. Political: the country that will be the first to fully develop alternative energy is able to actually dictate the level of world prices for fuel and quotas of payments for greenhouse gas emissions.

The impact of energy conservation on the ecology of the planet.

Over the past century, mankind has burned more fuel than in its entire previous history. Moreover, the bulk of the consumed fossil fuel falls on the second half of the twentieth century, and in the same period of time the planet's noosphere faced another test: the use of nuclear energy technologies. Over the past 25 years, the total energy consumption has increased 5 times.

After the first oil crisis in 1973, most of the developed countries of the world changed their energy strategies, defining the priorities for the development of energy technologies using internal energy sources. However, in the future, fluctuations in the fuel market and a decrease in prices for fuel energy resources had an inhibitory effect on the development of an alternative direction in the energy sector. The Resolution of the Forum on Sustainable Development of the Planet (Rio de Janeiro, 1992), the World Solar

Summit in Harare (Zimbabwe, September 1996) and, especially, the Environmental Forum in Kyoto (1997) significantly influenced strategies energy development in most countries of the world (more than two thousand delegates from 159 countries of the world, including members and heads of governments, took part in the work of the forum in Kyoto). The decisions of the Kyoto conference are binding. Based on the final protocol, the volume of emissions of "greenhouse gases" (carbon, methane, nitrous oxide, hydrogen fluorocarbonate, perfluorocarbonate and sulfur hexachloride) in the period up to 2012 should decrease in general, compared to the 1990 level, by 5.2%. At the same time, each state has its own numerical limits, for which gas emissions should be reduced: the United States - by 7%, the European Union - by 8%, Japan, Canada, Hungary, Poland - by 6%. Three countries are allowed to increase their greenhouse gas emissions: Iceland - by 10%, Australia - by 8%, Norway - by 1%. And Russia, Ukraine and New Zealand must maintain their 1990 levels of gas emissions by 2022. According to forecasts of some US experts, the implementation of the accepted conditions for this country may result in a significant increase in prices for gas, electricity and gasoline and the loss of millions of jobs. Quotas for the emission of "greenhouse gases" practically force the state to engage in energy conservation and the development of alternative energy using non-traditional renewable energy sources. The preservation of mankind on the planet is possible provided that the needs for the resources of the biosphere to meet the benefits of life do not exceed the capabilities of the biosphere, at which its stability is preserved. Today energy is the leading industry in our country. For a period of just over a century, mankind has developed, mastered and continues to intensively use the methods and devices of fuel, hydro and nuclear power, which have become traditional. Energy consumption in the world (as well as in our country) is constantly increasing, and, accordingly, kills the potential of fuel reserves on Earth. This problem is key. It arose as a result of human pressure on the biosphere. At the same time, the growing consumption of energy resources gradually leads to the depletion of non-renewable fuel energy resources, i.e. resources, spending which, a person is no longer able to restore them or expect that they will be restored naturally. These include all types of fossil raw materials and fuels, i.e. everything that has arisen in the process of the formation and development of the Earth over hundreds of millions of years (oil, gas, coal, peat, etc.) Every year the world consumes as much oil as it is formed under natural conditions in 2 million years. According to a number of forecasts, if the current rate of consumption is maintained, all geological reserves of oil and gas may be depleted in the 21st century. The main environmental damage associated with climate change on the Earth is the "greenhouse effect", i.e. warming due to excessive emissions of carbon dioxide, sulfur dioxide, a stream of dust particles and other pollutants into the atmosphere - belongs to the extraction, processing and combustion of fuels, especially coal and oil, the share of anthropogenic environmental damage from which reaches 75%. Over the past 20 years, the number of natural disasters, and primarily hurricane winds and floods (associated with the consequences of global warming), has increased 4 times, the amount of material damage they cause - 8 times, and the losses of insurance companies associated with these disasters have grown 15 times. The flora and fauna on our planet began to develop only after the formation of the ozone layer, which reliably sheltered the Earth from dangerous ultraviolet solar radiation, absorbing 99%. That is why it is so important not to allow changes in this layer, and meanwhile, there are already ozone holes in the world, which have a detrimental effect on residents living in villages, villages, cities located near them. Acid rains also occur from the release of gases into the air. They occur when waste products from the combustion of fossil fuels enter the water cycle in nature. The consequences of such rains are the destruction of forests, damage to buildings and a threat to human health. There is already technology to prevent acid rain these days. These are special filters in power plants and catalytic converters for cleaning harmful emissions into the atmosphere from exhaust and chimneys.

Discussion

Alternative types of energy sources.

The problem of accelerating and large-scale use of alternative fuels is especially urgent for Russia, and first of all for large megalopolises and cities. At present, there are all prerequisites for solving this problem: political, environmental and economic. The main political component is the decision-making at the July 2006 G8 summit in St. Petersburg, chaired by Vladimir Putin, when discussing a key issue related to global energy security. Thus, in the section on improving the investment climate in the energy sector, special attention is paid to “promoting the wider use of renewable and alternative energy sources” and “introducing more environmentally friendly and efficient technologies and methods”. When discussing the section on improving energy efficiency and saving energy, it was stated the need to apply tax incentives to promote the introduction of energy efficient technologies, as well as “encourage the diversification of energy sources for vehicles based on new technologies, including the introduction on a large scale of various types of biofuels for vehicles, as well as increased use of compressed and liquefied natural gas, liquefied petroleum gas and various synthetic fuels. The environmental prerequisite is mainly associated with catastrophic air pollution due to the rapid growth of the vehicle fleet. As of the beginning of 2006, the total car park in Russia amounted to more than 35 million units, which emit about 15 million tons of harmful substances into the atmosphere. All this negatively affects the health of citizens, especially the health of children and youth. The growing interest in alternative fuels for cars and trucks is driven by three significant considerations: alternative fuels tend to produce fewer emissions that contribute to smog, air pollution and global warming; most alternative fuels are produced from inexhaustible supplies; the use of alternative fuels allows any state to increase energy independence and security. The US Energy Policy Act of 1992 defines eight alternative fuels. Some of them are already widely used, others are not yet widely available or are in an experimental stage. But all have the potential to provide full or partial replacement for gasoline and diesel.

Renewable energy sources.

Energy production has a large impact on the environment and therefore we must use energy sources very carefully. The future environmental conditions on Earth largely depend on which energy sources we choose. Relatively safe and cheap forms of energy are increasingly being used in many countries. They are commonly referred to as "renewable" because they are these are resources that are renewed as a result of natural processes occurring in nature, or can be restored by humans at a certain cost. They can recover, but the rate at which they are consumed is much faster than the rate of renewal. They have a huge energy potential, and at the same time they do not threaten the environment at all. Clean energy sources include rivers, wind, sun and others. And clean industries are characterized by the absence of a negative impact on natural systems, for this they must use clean energy sources and have closed production cycles.

1. HELIOENERGY. The sun is the source of all other types of energy on the planet. It sends a huge amount of kilocalories to Earth. Since there is no absolutely clean atmosphere, half of the solar energy is dissipated, and only 50% reaches the Earth's surface. And even this amount is enormous. SOLAR COLLECTORS are devices for preparing hot water used both for domestic purposes and for heating, as well as for heating water in the pool. Powered by solar energy (even in cloudy weather). SOLAR PANELS - photovoltaic panels that convert sunlight into electricity. Advantages: - SES do not pollute the atmosphere; - solar kilowatts are free.

2. WIND POWER ENGINEERING. Attempts to use the power of the wind have their roots in ancient times. Wind power can really be considered the basis for the development of future energy. WINDMILLS (WINDSCREWS) are devices that convert wind energy into electrical ones. Advantages: - free energy is used; - environmentally friendly, do not affect the thermal balance of the Earth's atmosphere.

3. HYDROPOWER ENGINEERING (HPP). HYDRO TURBINE PLANTS - devices, the power of rivers (water) to generate electricity. The energy of the tides is enormous. However, practical use is difficult, so the seas and oceans can meet only 1% of the world's energy demand. HEAT HYDRODYNAMIC PUMPS - an innovative energy-saving technology. The installation of such equipment solves the issue of heating by converting the energy of water circulating in a closed system. Advantages: - the atmosphere is not polluted; - new reservoirs are created; - the atmosphere is humidified, the microclimate changes; - water resources do not need to be extracted or somehow processed.

4. HEAT POWER ENGINEERING (TPP). More than 80% of all electricity in our country is generated at thermal power plants, using all types of fuel (natural). BOILERS - devices for internal heating and hot water supply systems, operate on the basis of the combustion energy of various types of fuel. GAS BOILERS - using boilers. Installations for heating and hot water supply for buildings where it is not possible to allocate a large area for the construction of a boiler house Advantages: - small areas are used for the station; - high specific heat of combustion (coal, oil, natural gas); - easy storage of coal, suitability for direct the use of coal, oil and gas.

5. GEOTHERMAL ENERGY. This is the heat that is generated inside the Earth into sources of enormous power (internal energy of the Earth). Advantages: - Practical inexhaustibility and complete independence from environmental conditions, time of year, day.

CONCLUSION.

Now humanity is faced with a choice: either "cooperate" with nature, taking into account the natural cycles. Or - to harm. The future of humanity on our planet, like the planet itself, depends on what we choose today.

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