In these devices, one of the windings has a multiple taps, with which you can change the number of active coils of winding. Thereby you can change the transformation ratio. Changing the transformation ratio leads to a change of load voltage at the same voltage supplied to the transformer.

Electricity is distributed from main substation (MS) in distribution networks of urban, rural, industrial consumers. Main substations usually are constructed in the immediate vicinity or within the separate area of electricity consumption. Distribution of electricity inside the area is firstly produced at the voltage of 6-20 kV. Lines 6-20 to (air and cable), are constructed from the MS to the substations, which feed a group of closely spaced small consumers. Their power is supplied through the network of 220-380V. Transformation of electricity from stage 6-20 kV to stage 220-380 V is carried out by means distribution transformers (DT).

In such networks, due to their mass we provide the most simpler and cheaper control devices: distribution transformers with voltage regulation without power, uncontrolled capacitor banks.

In electrical networks with voltage Un ≥ 110 kV regulation of voltage has its own characteristics. These networks are hard-closed structure. They are equipped supervisory control devices, which let you transmit the information about regime parameters at different points of the network to the control centre.

When we consider networks with Un ≥ 330 kV, we must take into account the loss of active power to the crown in the power lines.

The main objective in the design and reconstruction of EPS is complex solution of ensure the balance reactive power and definition of the conditions of voltage regulation in the networks. Also, developers should ensure manageability EPS voltage and reactive power. By this we mean the possibility of providing allowable voltage at all points in the EPS and In the post-emergency conditions of operation. Control is achieved due to right choice of placement, accurate control ranges of the control system.

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On the Economic Ground for Introducing Bioenergetics

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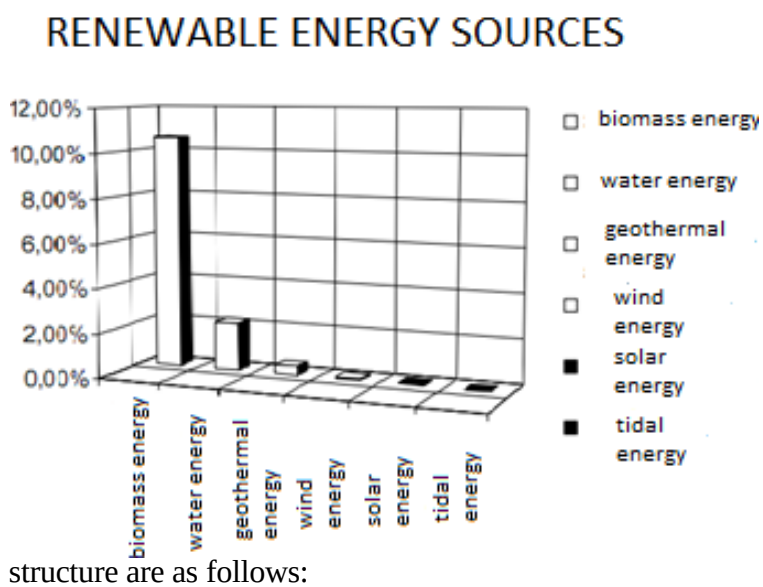
Russia has large reserves of natural resources, giving the possibility to be one of the main exporters of hydrocarbon energy . To reduce the dependence on fossil resources, to strengthen the country's position as an energy power one improves the ecological environment and to conserve resources for the future generations, it is necessary to raise the questions about the possibility of expanding the use of alternative energy sources.



Today the renewable energy in the global energy balance is small – about 11% where most of the energy is biomass (Fig. 1). It is shown in fig 1. (left; Renewables).

This article deals with the renewable energy, the type of such is bioenergy, that makes up 70 % of the total part of renewable sources. One of the most promising subsystems is bioenergy . Biomass energy is based on the use of animal waste . The advantages of this structure are as follows:

- obtaining the energy from waste rapidly renewable raw materials ;
- producing ecologically pure organic fertilizer wild-type ;
- waste managing and environmental improving in the areas of the agricultural production and processing;
- new jobs creation ;
- software installed power the country's agriculture by having a stable centralized power supply.

The main motive for using alternative sources in Russia may be economic incentives, and in their absence – measures direct administration arising from a well-defined position of the state . Under the economic stimulus is meant economic feasibility of bioenergy plants, their payback possible winnings from their use in the form of lower taxes and receive benefits from the state.

Nevertheless, the government's position as to using of renewable energy, including biomass, while is not legally expressed. Benchmark can only be a number of decisions of the Government and the President of the Russian Federation on energy efficiency and resource conservation .According the most experts, the problem of bioenergy development in our country is due to the negative impact of the following factors:

- the lack of the government programs bioenergy and appropriate legislative framework;
- the lack of a coordinating body for bioenergy ;
- the ineffective stimulation participants bioenergy sector ;
- the lack of the financial resources and investment, affordable loans, tax breaks and incentives.

Recently, however, the state began paying an attention to the bioenergy development in the country. Today, with the leading scientific centers of Russia in the field of agricultural mechanization has been established the Center for Bioenergy Development, which is developing the program for the development of bioenergy, the mechanisms of state sub-sector, the creation of the opportunities for joint implementation projects requiring more funds to the Russian and foreign investors.

Currently the field of agricultural mechanization has established drafting the law "On the basis of bioenergy development in the Russian Federation ." The purpose of this Federal Law is a legal framework for implementing the unified state policy in the sphere of agriculture and forestry in the country of production of biomass, biofuels production from it and its

consumption, the development of the country wide using biofuels in various sectors of the economy, especially in agriculture by achieving environmental improvements in the country.

Everything also there is the issue price in the use of biogas plants . This is one of the most significant expansion of the brakes in the implementation of bioenergy . Without the government funding, even in some privileges, Russian enterprises could hardly afford the use of biogas plants to produce their own energy. However, to date the budget allocation subroutine development of alternative energy has already reached 1.5 billion rubles . and continues to grow . The projections for the nearest future, namely 2020, investment volume will have amounted to 19 billion rubles . And electricity production based on renewable raw materials, including agricultural waste, will increase from 2.5% to 4.5%.

Thus, when the possibility of financing the bioenergy introduction at agricultural enterprises and when there are significant advantages of biogas plants is a problem of insufficient activity of Russian enterprises management at the regional level, which are still skeptical and vary the idea of using alternative energy sources. It means a slow growth rate of biogas plants. Additional measures to accelerate the implementation of the growth units may be the following :

- the electricity limitation, replacing it with the consumption in excessing the energy generated through the use of biogas plants ;
- the introduction of social norms to use the electricity for agricultural enterprises ;
- the campaign agricultural producers, summing them to solve the environmental problems to use environmentally friendly sources of energy.

The bioenergy development prospect in Russia is very acute because of the lack of widespread use of energy non-conventional sources . However, due to the distinct advantages of using biomass for energy in the nearest future and this industry is bound to get a wide recognition in our country.

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SCADA system design and security

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Modern electric utilities must meet increasing demand for electrical power generation and distribution while coping with decreasing tolerance for disruptions and outages. One of the most cost-effective solutions for improving reliability, increasing utilization and cutting costs is automating the systems by implementing a supervisory control and data acquisition system (SCADA) [1].

SCADA is typically a PC based software package. The system operates with coded signals over communication channels so as to provide control of remote equipment (using typically one communication channel per remote station). The supervisory system may be combined with a data acquisition system by adding the use of coded signals over communication