

- Optical measurement systems and digital substations, based on its
- Modern systems of relay protection, emergency and security management;
- Multi-chamber insulator arrester
- Frequency-dependent resistors to limit the high-frequency switching and lightning surges
- Software and information management systems

Intellectual power system with active-adaptive network it is a grid of new generation, based on the principle of multipurpose management of its work and development. The goal of the IPS AAN is the rational using all types of resources (natural, social, industrial, human) for reliable, qualitative and effective electricity supply of consumers.

THE MAIN PROBLEMS OF POWER ENGINEERING AND POSSIBLE SOLUTION

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Nowadays, electricity is playing a huge part in our life. Today, humanity cannot do anything without such an amazing achievement: neither to cook, nor to rest, etc. But it is not so simple with electricity, is not it? Electricity consumption is increasing every day and every hour. Moreover, it follows that energy problems only grow daily.

The first problem that stands out is connected with the exhaustibility of raw materials for electricity generation, and in fact today about 80% of electrical energy is generated from such resources. Also, this problem is complicated by the fact that raw materials for energy are distributed unevenly [1].

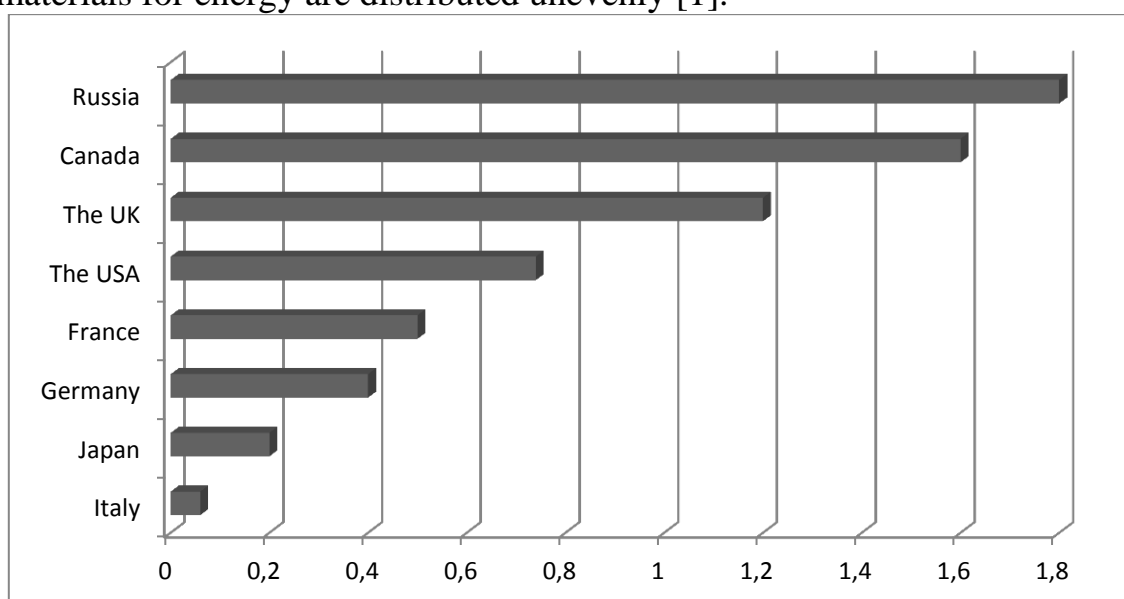


Fig. 1. Energy supply of the countries of the G-7 and Russian Federation (the ratio between the capacity of energy resources to the amount of their consumption)

In many countries there is lack of energy resources, such countries are forced to buy them in "energy-rich" countries, which obviously affects their economy and GDP. Consequently, they are dependent on such countries, as well as on everything that happens in these countries, for example, revolutions, etc.

The second problem is connected with ecology. This problem worries people every year more and more, it grows with the increase in energy consumption. Besides, today there is such a situation that emissions of the energy industry into the atmosphere are about 50%. All energy pollutes and worsens our ecology. And all this has a bad effect on the weather and causes a greenhouse effect[2].

The third problem, one of the most important and dangerous for people, is that energy-deficient countries accuse energy-rich countries of unfair division of energy resources. Some countries have repeatedly tried to divide the energy resources of countries with political, economic and even military methods.

The most effective method of solving these problems will be the replacement of traditional energy sources with non-traditional ones. Unconventional sources are more environmentally friendly and energy-deficient countries can be independent from the seller countries because most of the traditional electricity resources are in the Northern countries. Some countries (Germany, the Netherlands, etc.) have set a goal that they will soon switch to non-traditional electricity[3-4].

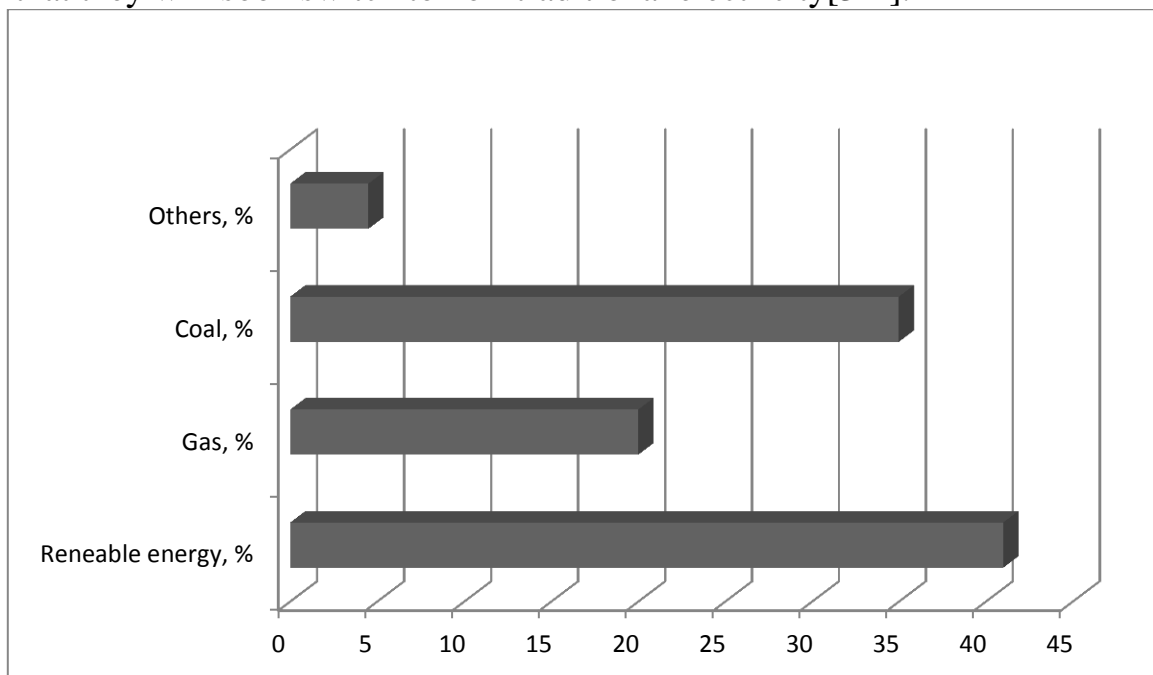


Fig. 2. Sources of electricity in Germany

Nevertheless, this option is not suitable for countries where there are unfavorable climate conditions for non-traditional energy sources, for example, Russia. About a fifth of our country is in the harsh conditions of permafrost, where it is simply impossible to switch to this kind of energy and there people will still have to use coal, gas and other sources of electric power for a very long time.

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SOLAR BATTERY: ADVANTAGES AND DISADVANTAGES

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To date, the issue of solar energy is discussed by many scientists. It is mainly the pros and cons, advantages and disadvantages, paying much attention to the environmental friendliness of this equipment, etc. Yet, there are both good and bad sides, and all this must be carefully weighed and pondered over to make the decision of exploitation of solar power plants.

Let's consider this topical issue in more detail. The main resource of the solar battery is sunlight, which leads to a number of advantages, such as: renewability, unlike fossil fuels - coal, oil, gas, which are not restored. According to NASA data, for about 6.5 billion years, the inhabitants of the Earth have nothing to worry about - as much as the Sun will warm our planet with its rays until it explodes.

Abundant, since the potential of solar energy is enormous - the surface of the Earth is irradiated with 120 thousand terawatts of sunlight, which is 20 thousand times higher than the world's need for it. In addition to other advantages of solar energy, it is available in every point of the world - not only in the equatorial zone, but also in the northern latitudes. Due to the fact that in systems on the solar resource there are no moving nodes, as, for example, in generators, the generation of electricity is noiseless.

Moving to solar panels as an autonomous energy source, the owners of frequent houses receive tangible savings. It is also important that the maintenance of solar energy systems is characterized by low costs - it is only necessary to clean the solar cells several times a year, and the manufacturer's warranty on them is usually 20-25 years. Such energy has a wide range of applications - it also produces electricity in regions where there is no connection to a centralized power supply system, and desal-