

projects. High capital costs, licensing and regulation approvals, coupled with long lead times and construction delays, have also deterred public interest [2].

Challenging market conditions have left the nuclear industry struggling to compete. Strict regulations on maintenance, staffing levels, operator training, and plant inspections have become a financial burden for the industry [2].

Stringent licenses and guidelines should be laid to determine the permission to construct nuclear power plant. They are hot targets for militants and terrorist organizations. Security is a major concern here. A little lax in security can prove to be lethal and brutal for humans and even for this planet [3].

To alleviate future disasters, the World Association of Nuclear Operators (WANO) was set up that is geared towards safe and reliable operation of nuclear power plants by conducting independent peer reviews for every new nuclear power plant operating across the world [3]

Thus, humanity needs to try to switch to cheaper, in the future, and environmentally friendly energy, which is provided by renewable energy sources.

Литература

1. Power World Analysis [Электронный ресурс]. - / Режим доступа: <https://www.powerworldanalysis.com/disadvantages-nuclear-energy/> - Дата доступа: 04.03.2018.

2. Department of energy [Электронный ресурс]./ Режим доступа: https://www.energy.gov/ne/articles/advantages-and-challenges-nuclear-energy_- Дата доступа: 10.032020.

3. Английский язык для энергетиков: учеб. Пособие / Е. В. Трухан, О. Н. Кобяк. – Минск. Выш. шк., 2011. – 191 с.

WIND POWER INDUSTRY ВЕТРОЭНЕРГЕТИКА

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The world does not stand still. Progress does not stand still and in most cases negatively affects the environment. Consider such a source of renewable energy as wind power.

At present wind energy is one of the most dynamically developing and forward-oriented types of renewable energy sources and an important area approach to energy efficiency [3].

The usage of wind power dates back to around 200 BC when first windmills were invented in ancient Persia. Later in the 13th century the technology was brought to Europe by the Crusaders. For a long time, windmills, along with watermills, were the only machines used by Man. Therefore, the machines were used in different way: as a flour mill, for processing wood in sawmills, and as a pumping or water lifting station.

The first wind generator for producing electric energy was developed at the end of the 19th century. In Denmark the first wind farm was built in 1890, and by 1908 there were over 72 wind turbines with a capacity of 5-25 kW.

Today the unit rating of a modern wind power generator is about 8 MW. Generators with a capacity of more than 10 MW are being engineered as well.

As at the end of 2018, the total installed wind power capacity, generated worldwide by all kinds of wind electric plants, was 591 GW, 189 GW of which was produced in Europe.

According to the 2018 Global Wind Energy Council (GWEC) statistics, leading countries in the branch are:

With an installed capacity of 221 GW, China is the world leader in the wind power branch, with more than a third of the world's capacity;

The USA is rated second with an installed capacity of 96.4 GW, the main capacity of which is based on land;

Germany has an installed capacity of 59.3 GW. The country has the highest installed wind capacity in Europe;

India has an installed capacity of 35 GW. India has the second largest wind power capacity in the Asian region after China;

Spain has an installed capacity of 23 GW;

The UK has an installed capacity of 20.7 GW. The main share of the UK's capacity is produced by offshore wind electric plants (offshore wind farms). The country owns 6 out of the 10 largest offshore wind energy projects in the world;

France has an installed capacity of 15.3 GW;

Brazil has an installed capacity of 14.5 GW;

Canada has an installed capacity 12.8 GW;

Italy has an installed capacity of 10.1 GW.

The wind power branch is rapidly developing and widely popularized in the world.

Wind farm foundation in the Republic of Belarus is a relatively new approach to energy generation. By now there are more than 90 wind power plants with a total capacity of more than 90 MW in Belarus.

Wind energy meets all the exacting standards to be classified as an environmentally friendly method of energy production. Its main advantages are:

1. It doesn't pollute the environment. While wind power production harmful substances are neither emitted into the atmosphere nor form waste.

2. It needs a renewable, unflagging source of energy, it also saves fuel, expenses on its extraction and transportation.

3. The immediate area can be used for agriculture without any restrictions.

4. It guarantees stable expenses per unit of energy as well as an increase in economic competitiveness as compared to traditional energy sources.

5. It supposes minimal losses on the transmission of energy. A wind power plant can be built both directly at the consumer's and in remote locations, which would require special power connections provided traditional energy sources.

6. Simple maintenance and operation, fast installation, low maintenance and operation costs.

However opponents of wind energy speak about its disadvantages. Compared to the harm caused by traditional energy sources, they are insignificant:

High investment costs as they tend to decrease due to new developments and technologies. Also, the cost of wind energy from is constantly decreasing.

2. The capacity variation over time. The production of electricity depends, unfortunately, on the strength of the wind, which a person can not affect.

3. Noise. The data of noise studies with the latest diagnostic equipment do not confirm the negative impact made by wind turbines. Even at a distance of 30-40 m from the operating plant, the noise reaches only its background noise level, that is, the level of the habitat.

4. Threat to birds. According to the latest research, the probability of collision of wind turbine blades with birds is no greater than in the case of a bird collision with high-voltage lines of traditional energy.

5. The possibility of distortion of the TV signal reception is insignificant [1].

6. Changes in the landscape.

Due to the problems of air pollution by greenhouse gas emissions and the limited availability of fossil fuels, hopes (as one of the most "environmentally friendly" types of renewable energy it can reduce greenhouse gas emissions into the atmosphere up to 330 million tons a year.) are set on wind energy [2].

Литература

1. Ветроэнергетика [Электронный ресурс]. - Режим доступа: <https://www.windpower.by/info/vetroenergetika/> - Дата доступа: 22.03.2021.

2. Ветроэнергетика Беларуси: состояние и перспективы развития [Электронный ресурс] / Режим доступа: https://energobelarus.by/articles/alternativnaya_energetika/vetroenergetika_bielarusi_sostoyanie_i_perspektivy_razvitiya/ - Дата доступа: 22.03.2021.

3. Английский язык для энергетиков: учеб. Пособие / Е. В. Трухан, О. Н. Кобяк. – Минск. Выш. шк., 2011. – 191 с.