

## **GENNARIS AS AN INNOVATION FOR PEOPLE WITH BLINDNESS AND VISUAL IMPAIRMENT**

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Today, technologies are developing so quickly that people do not have time to learn about new products, such as supersonic passenger planes, or flying taxis, and even if people need it, there are already waterproof TVs in the bathroom. The purpose of this article is to describe the GENNARIS system that people really need for a fulfilling life. This device is implanted in the brain in the form of electrodes and allows absolutely blind people to see.

Scientists at Monash University have spent over 10 years developing the first device. The device looks like a small headgear with built-in goggles (Figure 1) and could be a direct competitor to Elon Musk's Neuralink technology.

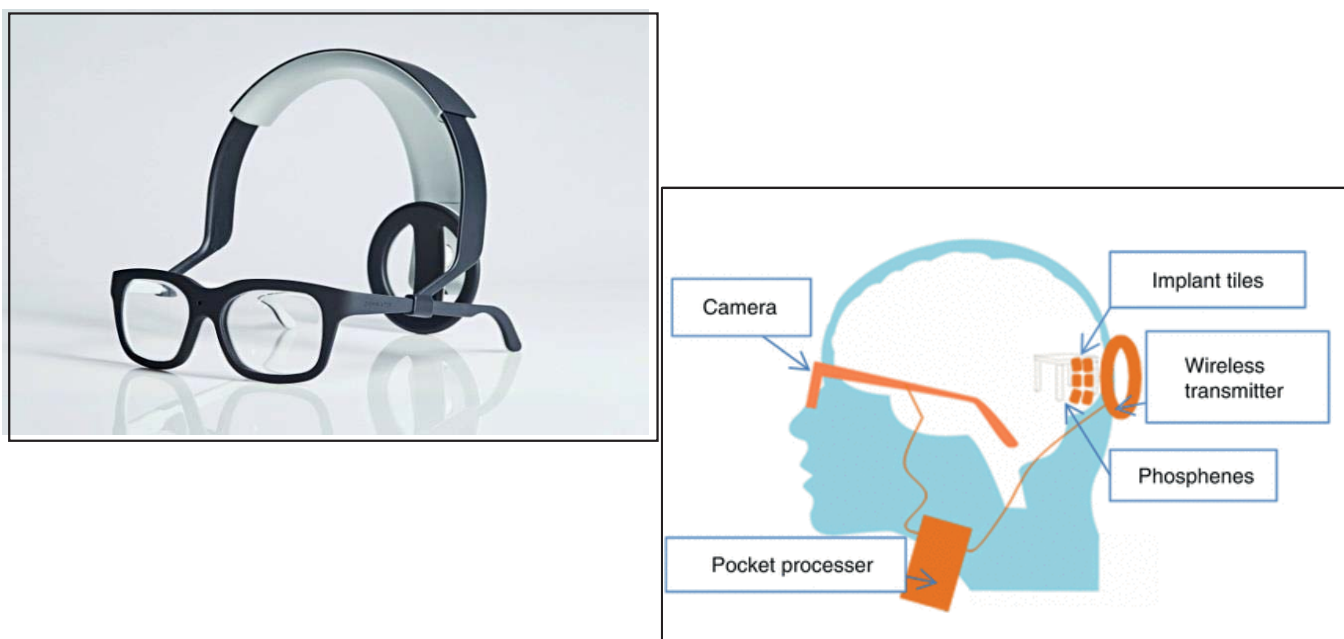


Figure 1 – The Gennaris bionic vision system

According to the creators, Gennaris bypasses the damaged optic nerves and transmits the information collected by the camera and analyzed by the video processor unit through the air into a set of square implants with very thin electrodes that are inserted directly into the brain. Implants (they have a size of  $9 \times 9$  mm) convert images into electrical impulses, which are transmitted to neurons in the brain through thin microelectrodes. As a result, the system should allow people who have lost their sight to "see" the world around them, distinguish objects, bypass obstacles, recognize people, etc. This will be a specific vision, consisting of a maximum of 172 light spots, but experiments on sheep have shown that this is quite enough to effectively interact with the outside world [1].

At the same time, Gennaris can be used not only as a means of fighting blindness, but also for solving more complex problems associated with the brain — scientists promise to use the system in the treatment of paralysis, Parkinson's disease and quadriplegia. For more primitive tasks, Gennaris is already capable of transmitting music directly to the brain, as Musk dreams of in his Neuralink project.

Humanity is not standing still, it is getting better.

## References

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## COMPARATIVE CHARACTERISTICS OF ALTERNATIVE ENERGY SOURCES

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In today's world, with growing rates of consumption and as a consequence - the limited energy resources, the rapid development momentum gaining energy production technologies of alternative and renewable sources. Alternative energy sources are already widely used for solving energy problems, not only commercially, but also in the private sector.

The purpose of work is to consider the popular types of alternative energy sources, and to present the most popular ones in Ukraine. As we have known, 64% of the electricity we need comes from burning fossil fuels such as oil, gas and coal. These resources pollute the environment and are not renewable, so once we have burned them all up, there will be no more. This means that the world must find and use alternative sources of energy. This alternative energy needs to use no fuel and create no waste or pollution [1].

Solar power plants are actively used in more than 80 countries; they convert solar energy into electricity. There are different ways of such conversion and, accordingly, different types of solar power plants [2].

Wind power plants (wind farms) are widely used in the USA, China, India, as well as in some Western European countries (for example, in Denmark, where 25% of all electricity is produced in this way). Wind power is a very promising source of alternative energy; at present, many countries are significantly expanding the use of power plants of this type.

A huge amount of thermal energy is stored in the depths of the Earth. In some parts of the world, high-temperature magma directly reaches the Earth's surface: volcanic areas, hot springs of water or steam. Geothermal sources are used in different ways. Some sources are used for heat supply, others - for generating electricity from thermal energy.

We need to note that Ukraine is rapidly increasing the organization of alternative energy. Over the past years, our country has gradually introduced a system of energy production from renewable sources (RES). It is still at the development stage, but it seems to be a worthy way to maintain the economic situation in Ukraine. This is a necessary step due to the lack of traditional energy resources [3]. For the optimal choice of the type of autonomous source power supply, it is necessary to make a comparative analysis of devices, their technical characteristics and operating conditions. As a rule, the following types are compared with each other alternative energy sources recommended for autonomous power supply: solar power plants with photovoltaic cells and systems that convert solar energy into heat and then into electricity; wind farms with vertical and horizontal axes of rotation; solid fuel power plants and power plants on biogas.