INCREASING THE EFFICIENCY OF USING SOLAR PANELS

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Every year the world needs more and more electrical energy for its existence. In order to provide yourself with everything you need, it is necessary to use large power plants capable of producing the required amount of energy. Unfortunately, most of them cause a great damage to our nature, which is connected with global warming. The solution to this problem is the use of non-traditional and renewable energy sources, which allows you to meet the growing needs for electricity, replacing old coal-fired power plants.

In my opinion, the best examples of non-traditional and alternative sources of energy are solar power plants. Years of use show very successful results, but one of the serious problems of their use is that they require significant areas to be installed. Fortunately, new technologies do not stand still and several ideas have already been invented to solve this problem.

The first idea is using floating solar farms, which can produce large amounts of power without requiring vast areas for installation, and offering as much as 10%

higher efficiency thanks to the cooling effect of water. In addition, it costs less to install floating solar panels rather than land-based ones.

The first commercial 175 kWh floating panel system was put into operation in the USA in 2008 (Solar Reviews, 2022). Along with generating clean solar power, and actually minimizing energy waste, these systems can improve water management since they restrict circulation of air and prevent sunlight from falling down on the surface of water, thus making less water losses during evaporation.

The second solution is building-integrated photovoltaics (BIPVs), which can be defined as an advanced version of rooftop-mounted solar panels whereas photovoltaic properties are found in the building materials themselves. In other words, all the roof tiles, window glass, and facades of the house will be able to generate electric current and feed power to meet the energy needs of that building. Interestingly, BIPVs can become a nice part of the architecture, being incorporated into the house design and allowing us to do without installing separate solar panels.

Out of all the different types of BIPVs, solar glass is especially useful in the countries with typically hot weather because it can decrease the amount of heat penetrating through the windows, which will also help avoid wasting energy required for turning on an air conditioning system. In fact, demand for more BIPVs seems to be growing as urban population around the globe is increasing and the daytime temperatures are getting higher because of climate change (Rodrguez, 2021).

The third technology is solar fabric, which is a new way of harnessing the sun's energy. This material can be bent, or attached to any surface, if necessary, and it is ten times lighter than ordinary PV panels. What is more, it does not contain any toxic materials, and the service life is longer, reaching up to 20 years. In all respects, this is an attractive alternative to traditional silicon-based solar panels. As we know, the big selling point for traditional cells and panels is the high-efficiency rate, which may go as high as 20 per cent if some modern technologies are employed. For example, one of the recent developments of the University of Queensland is a flexible solar skin that demonstrates the efficiency rate of 16.6 per cent, breaking the earlier made record of 13.4 per cent. It can be used for multiple objects, such as umbrellas

and awnings at local businesses, restaurants, ice-cream parlours, and cafes, which could actually produce electricity. The range of applications gets even more extensive if we use this technology for marine and agricultural purposes as well as in schools, hospitals, stadiums, and other buildings where large, heavy solar panel systems cannot be installed (Energy Matters, 2021).

Over the years residential and business zones have complained about traffic noise near heavily travelled main roads. Local communities can tackle this problem in most advantageous manner by constructing photovoltaic noise barriers (PVNB). In fact, these barriers use not only acoustic dampeners, which reduce noise, but also the acoustic foam, which serves as an insulator and allows harnessing solar energy most efficiently. In particular, PVNB are meant to be physical obstructions with PV panels designed to generate renewable energy and also to minimize noise levels within the areas between noise sources and sensitive receptors. For instance, this would be a good practice inside hospitals, schools as well as densely populated residential districts. What is more, some PVNB models, such as the ones designed by “Solar Innova”, are equipped with semitransparent PV panels, aimed at lowering the visual impact caused by other types of conventional barriers. In short, the greatest advantages of PVNB comprise such properties as noise reduction, effective light transmission, high resistance to weathering, recyclability and, of course, ability to supply renewable power (Roper Roofing & Solar, 2021).

In conclusion, I believe that these ideas can help us develop solar energy and completely get rid of the negative impact of coal-fired power plants. The implementation of these technologies will solve the most significant problem, which is the lack of large areas required for any construction and installation purposes. By solving this problem, we will be one step closer to overcoming global warming.

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