

# Evaluate the installation of Solar Photovoltaic Panels on the roofs of UNNC buildings to supplement the university's power supply

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## Abstract

**Solar energy is a renewable energy source. Whether to use solar photovoltaic panels in UNNC is a question to be discussed in this paper. This paper will analyze the feasibility of using solar panels in UNNC from three aspects of cost, environmental impact and safety, and analyze the advantages and potential problems of the above three standards, and finally draw conclusions.**

## Keywords

**Solar energy, Solar Photovoltaic Panels, UNNC buildings, Power supply**

## 1. Introduction

In recent years, in the 21st century, the issue of energy shortage has become a growing problem worldwide. The storage of fossil fuel resources is declining, the global environment is deteriorating, and the development and utilization of new energy sources has become an urgent trend. After research by scientists, wind energy, tidal energy and solar energy are new energy sources worth promoting. Among them, solar energy is the most widely used, the environment is more diverse and the environment is friendly. Solar energy is considered a substitute for traditional energy sources in areas with high GDP in eastern China (Zhang, 2004). This article will explain that the installation efficiency of solar photovoltaic panels on the buildings of the University of Nottingham Ningbo is greater than the disadvantage. This statement will assess costs, environmental impact and safety and make some recommendations. Cost components include installation and ongoing maintenance costs. Secondly, the use of photovoltaic panels to achieve zero environmental pollution and the chemicals involved in the treatment will be discussed. In addition, the safety of using solar energy and old energy sources will be compared. This article will demonstrate that although each standard has positive and negative impacts, the installation will be effective.

## 2. Cost

When considering whether to use solar panels, the first factor to consider is the cost issue. This section will cover the overall cost of design installation and maintenance costs, including solar panels. It explains why using solar panels is superior to using traditional power generation models. Some scientists have suggested that in order to reduce the cost of energy extraction and obtain energy that can be used stably for a long time, many renewable energy sources, including solar energy, are not suitable for widespread promotion and application because of the cost of conversion, this conversion equipment involved. The cost is still higher than the model. It is believed that the cost of solar energy conversion is too high because it is limited by terrain, environment and climate, and economic and biological factors can also affect it. However, if the value of solar energy itself is accepted, then price uncertainty, lower total cost, higher sustainability and a cleaner planet will be the right choice (Fong, 2013).

In addition, solar panels can be designed according to the geographical environment conditions and needs of the roof, different conversion panels are designed. Although the cost will exceed

the expected scale of unified production of solar panels, the future maintenance costs will be reduced to acceptable within the scope (Fishburn,2016). Contrary to previous observations, Irena (2012) argues that even though electricity costs are four to five times more expensive than fossil fuels used in recent years, as technology advances, it will continue to decrease and make installation and assembly easier. Except that, the total cost of capital (CAPEX) is the largest reduction, and the other components are reduced, so the overall price declines. In addition, the price of fossil fuels may rise due to energy shortages. Ball (2017)proposes that China's solar energy companies are relatively mature. From the most basic assembly links to the overall synthesis, some innovative technologies even surpass the mature key technologies that the US has put into use. For example, China has been able to produce beyond the world. High-efficiency solar panels with average values. Moreover, there are a number of large companies in the world that have invested in solar energy use research. It is expected that in a relatively short period of time, solar energy conversion panels with higher conversion efficiency and more suitable for different environmental and geographical conditions can be developed. , thereby reducing the cost of targeted solar panels. In short, the application of solar energy can reduce costs to a certain extent compared with traditional energy sources.

### 3. Environment Impact

In addition to cost, people also need to consider the impact of solar energy on the environment. As Sundaram (2016) mentioned, the use of solar energy is not completely harmless. At this stage, solar panels have a certain lifetime. Usually,solar panels can only be used for about three years, no more than five years, and the replaced solar panels are a very difficult to decompose synthetic materials, if not treated, it is easy to cause great pollution. At the same time, although the total amount of solar radiation to the Earth is large, the density of energy is far less than the energy density it dissipates from the sun, which makes the required solar panels larger. Therefore, when solar energy is used, in order to make the conversion power reach the demand, the area of the solar panel is usually enlarged, and a more complete collection and conversion system is constructed, which increases the area of the solar panel and increases the pollution. However, when Solang(2013) faced the problem of using solar energy in Malaysia, it was proposed that solar energy conversion not only has photoelectric conversion, but also solar thermal conversion.The light-to-heat conversion device technology is more mature than the broadcast TV, and the equipment is durable. The higher the degree, the lower the pollution of the device itself. In addition, as technology advances, solar panel materials are further updated to try to reduce their environmental impact.

On the positive side, solar energy is a clean energy source. The use of solar energy is undoubtedly a more environmentally friendly energy source than the use of fossil fuels to produce carbon dioxide and other toxic gases that cause global warming,pollute the atmosphere and cause harm to the environment. In addition, fossil fuels are non-renewable energy sources. It takes about 300 million years to produce fossil fuels. The fossil fuels stored in the world today are only used for humans for about 200 years. Mining fossil fuels can cause landmines to collapse, threatening the safety of mining workers. Solar energy is a renewable energy source. The energy conversion process is directly converted to heat by the device without affecting the environment or affecting the user. Fishburn (2013) also mentioned that although the total amount of radiation reaching the Earth is 1:20 compared to the energy of the sun's escape, it is still as high as 173,000 TW, which means that the sun's energy per second is equivalent to 500. Ten thousand tons of coal. In summary, it can be seen that the use of solar energy is not only more efficient than the use of fossil fuels, but also more environmentally friendly and safer.

## 4. Safety

In addition to the above two aspects, the use of solar energy needs to consider its safety. In summer, the solar tube inside the solar panel may cause uneven heating of the solar tube due to the large temperature difference between day and night in summer, which eventually leads to rupture, which may cause harm to people. This is the most worrying issue with the safe use of solar panels. (Judy, 2005) Corresponding to summer is the problem of solar tube rupture in winter. Cracking of the solar tube can cause leakage of liquid components within the solar panel and cause certain hazards. However, the above two points can be solved by changing the surface of the solar panel to cover the alloy composition or adding a vacuum tube outside the solar panel. (Boscio, 2016) Traditional solar panels are made of stainless steel. Although the risk of rusting of solar panels is greatly reduced, the ductility of solar panels is also reduced. With the development of technology, the use of crystalline silicon has gradually expanded, and the use of crystalline silicon on solar panels to improve safety has become a way to solve safety problems and is gradually advancing. Since the first solar panels were put into use in 1981, there have been fewer than enough injuries since Sundaram (2016). At the same time, because the solar panels are installed on the top floor, the flow of people is scarce, so it is almost impossible for people to be around when they burst, and the self-damage of the solar panels will not affect the people in the buildings and buildings below. It can be seen that the solar panel has a high safety factor and is safe and reliable in the use of such densely populated places as schools.

## 5. Conclusion

In summary, this paper evaluates various aspects of solar panels at the University of Nottingham Ningbo, China, and proves that despite its flaws, UNNC can still get a greener environment and safer energy use and can save some expenses. First, the increasingly mature solar energy use technology does not impose an excessive burden on costs. In addition, in addition to causing little chemical pollution, the use of solar panels can reduce greenhouse gas emissions, thereby reducing pollution to the atmosphere, reducing the burning of fossil fuels, thereby protecting the environment such as forests. In terms of safety, the device can be operated automatically, reducing the possibility of accidents. Therefore, this paper proposes to install solar photovoltaic panels on the roof of the UNNC. In order to mitigate some of the adverse effects mentioned in this article, it is recommended to use and use a harmless solar cell on a horizontal roof and undergo safety testing. In addition, professional experts should be hired to participate in the project, and the safety level of solar panels should be tested regularly, so that solar panels can better benefit the University of UNNC.

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