

# Solar Cell Powered PJU Light Installation by Utilizing Solar Energy

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## ABSTRACT

Kedungbunder Village is included in the southern part of Blitar. The socio-economic activities of the people in Kedungbunder mostly rely on agriculture. The huge potential is the fertile agricultural land and the availability of potential solar energy around the settlement, allowing solar energy to be utilized as public street lighting. Community service activities through the Community Partnership Program will be carried out in Kedungbunder Village, Sutojayan District, Blitar Regency with an emphasis on community empowerment through the use of solar energy with solar cells for street lighting installations. The result is public awareness related to the benefits of solar energy and the application of solar cell-powered PJU lamp technology as street lighting.

## KEYWORDS

Energy;  
solar;  
sollar cell;  
technology;  
street lighting.



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## 1. Introduction

Kedungbunder Village, Sutojayan Subdistrict, Blitar Regency, East Java Province. Kedungbunder Village has an area of  $\pm 1,671$  Ha. The population is around  $\pm 9,812$  people. [1], [2]. This village has the potential for solar energy that can be utilized for electrical energy sources using solar cells. [3]–[7]. However, until now it has not been able to be utilized as a renewable energy source, including utilizing it for street lighting PJU lights [8]–[11]. The enormous potential of this village and the abundant solar energy around the settlement have not been utilized to the fullest, until now solar energy has only been used to dry agricultural products by residents of Kedungbunder Village, not knowing the process of utilizing solar energy as a renewable energy source hinders the progress of technological tools.[12]–[14]. Whereas solar energy around settlements and agricultural areas can be utilized as a source of electricity generation, using solar cells and can be integrated into PJU lights as street lighting.[15]–[19].

Solar cell is one of the renewable energy sources that can provide great benefits to meet the needs of electrical energy as well as can be used as an energy source in PJU lights.[20]–[23]. The advantage of using solar cells is that it does not incur high costs for designing power transmission systems and maintenance in general [24], [25]. The resulting electrical energy will be used as an energy source for PJU lights as street lighting [26]–[28]. Through the Community Partnership Program, a training program was carried out to install the utilization of solar energy potential in PJU lights with Solar Cell Power Plants. [29], [30]. In addition, this program is expected to help improve the economic quality of the community in Kedungbunder Village.

## 2. Method

The implementation of activities was carried out with a model of installation training and face-to-face socialization with residents of Kedungbunder Village, Sutojayan District, Blitar Regency. The meeting was held using the method of lecture discussion and practice by utilizing the natural potential possessed to be able to process it to be more useful with solar cell-powered PJU lights as street lighting. Socialization and introduction of technology is carried out to provide the latest knowledge about power generation technology with Solar PV. This was done because of the potential for solar energy in the rice fields of Kedungbunder Village, Sutojayan District, Blitar Regency. In addition to explaining about this technology in general, the team also provided an overview of the technology that has been successfully

made by Madiun State Polytechnic. With this activity, it is hoped that villagers will understand and be aware of the new renewable energy around them. After realizing it, the next step is to be able to apply the technology with direction and guidance from Madiun State Polytechnic.

### 3. Results and Discussion

Activities were carried out in stages starting from field surveys, discussions with the management of the Palahasta youth community and the practice of Solar PV technology. Practical activities and introduction to technology were carried out on Wednesday-Thursday-Friday, September 9-11, 2020 at 08.30 - Finish WIB at the Palahasta Youth Community place in Kedungbunder Village, Sutojayan District, Blitar Regency. Participants were villagers, especially members of the Palahasta youth community, village leaders, RT heads and RW heads with a total of 36 people. The stages of socialization activities are as follows:

1. Opening by the Chairman of Palahasta Youth Community,
2. Delivering Village Situation Analysis related to solar energy as renewable energy,
3. Delivering solar cell-powered PJU lights as street lighting, 4,
4. Video playback about solar cells as street lighting followed by the practice of installing PJU lights.
5. Discussion.

After the stages of practice, socialization and introduction of technology, it is continued with mentoring activities with the help of student personnel to continue communicating with partners. This is done to maintain communication and sustainability so that later it can really be applied in Kedungbunder Village, Sutojayan District, Blitar Regency.



Figure 1. Opening and discussion with the Head of Palahasta Youth Community

The community service program has been carried out and is expected to increase knowledge, skills so that it can be used to help the Palahasta youth community.



Figure 2. Material Presentation by Madiun State Polytechnic Team



Figure 3. Practice of installation of PJU lights with solar cells



Figure 4. Group photo after the activity

The activity results of this community service activity broadly include:

1. Achievement of Community Service Stages.
2. Public awareness related to new renewable energy and the application of solar cell-powered PJU lamp technology as street lighting.

This activity is the beginning of energy independence, in Kedungbunder Village, Sutojayan District, Blitar Regency. Of course, in one activity this will not be enough because achieving energy independence needs a long process. The achievement of the Community Service stage is indicated by the implementation of all planned steps and methods of service, from surveys to mentoring. Public awareness of renewable energy from solar cell-powered PJU lamp technology as street lighting is shown by the participants' enthusiasm for the material and practical activities that have been carried out.

#### 4. Conclusion

In general, this activity was carried out well and smoothly. The community service program has run in accordance with the planned stages starting from the survey stage to mentoring. Awareness from the community can be seen from their enthusiasm in participating in activities by the Madiun State Polytechnic team. To achieve energy independence with solar cell-powered PJU lamp technology as street lighting can be directly realized. This activity has at least made the community aware and offered choices about the technology that has been developed by the Madiun State Polytechnic.

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#### Author Contribution

The community service program aims to make the Palahasta Youth Community Group of Kedungbunder Village able to take advantage of its natural potential and be able to process it into more useful PJU lights powered by solar cells as street lighting.

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#### Conflict of Interest

The authors declare no conflict of interest.

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