

# Studying the Opinions of the Population of Tashkent City on the Development of Alternative Energy Sources

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**Abstract:** This article, considering the high global demand for alternative energy sources, presents the analytical results of a social survey conducted among specialists and consumers in Tashkent. The survey focuses on the process of installing and utilizing one of the alternative energy sources, namely solar panels.

**Key points:** urban planning, renewable energy sources, solar panels, multi-apartment buildings, energy sector, specialist, consumer.

## Introduction

Year by year, the use of solar panels to supply electricity to cities is becoming one of the pressing issues in our country. Therefore, special attention is being paid in Uzbekistan to the implementation of energy-saving technologies for utilizing renewable energy sources.

In the Action Strategy for Further Development of the Republic of Uzbekistan for 2017–2021, the following priorities were identified: "...reducing the energy and resource intensity of the economy, widely introducing energy-saving technologies into production, and expanding the use of renewable energy sources..." [1].

One of the most prominent areas of practical use of solar energy worldwide is the utilization of solar panels in urban planning to derive energy from alternative sources. Developed countries, such as the United States, Germany, China, Switzerland, Japan, Canada, and Australia, are placing particular emphasis on scientific research in this field and the creation of highly efficient solar panels. These panels are distinguished by their simplicity and cost-effectiveness compared to non-renewable electricity generation systems.

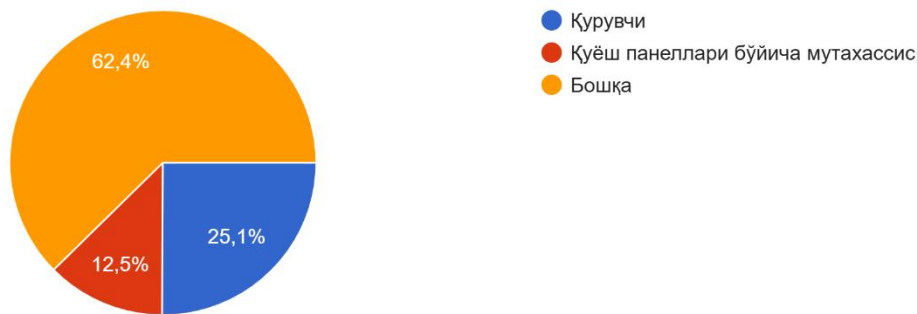
To advance this area in Uzbekistan, several regulatory documents have been issued, including: Presidential Decree No. PF-947 of February 7, 2017, "On the Action Strategy for Further Development of the Republic of Uzbekistan," Cabinet of Ministers Resolution No. PQ-3012 of May 26, 2017, "On Measures for Further Development of Renewable Energy, Improving Energy Efficiency in the Economy and Social Sphere for 2017–2021," Cabinet Resolution No. PQ-57 of February 16, 2023, "On Measures to Accelerate the Introduction of Renewable Energy Sources and Energy-Saving Technologies in 2023," and Cabinet Resolution No. 13 of January 8, 2024, "On Regulating and Developing the Field of Energy Supply Based on Renewable Energy Sources." This article contributes to the implementation of the tasks set out in these regulatory documents to a certain extent.

## Materials and Methods

Although reforms related to solar panels in our country have not been fully implemented, energy consumption in multi-apartment buildings continues to increase significantly. Taking this into account, a "Social Survey on the Use of Solar Panels in Urban Planning" was conducted.

As a result, approximately 350 participants shared their opinions, including builders, solar panel specialists, and representatives of other professions (Figure 1).

335 ОТВЕТОВ

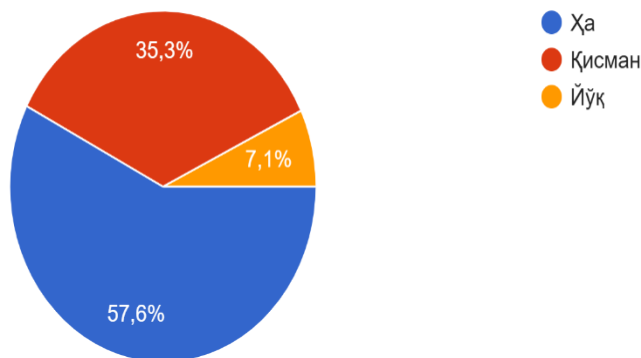


**Figure 1. What is your profession?**

Based on my observations, according to Figure 1, the participants included 42 solar panel specialists (12.5%), 84 builders (25.1%), and the remaining participants were representatives of other professions.

We also specifically discussed the participants' awareness of the types of alternative energy (Figure 2).

337 ОТВЕТОВ

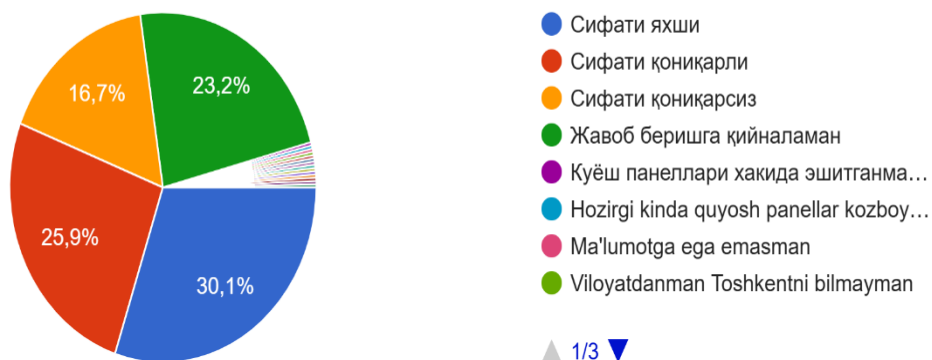


**Figure 2. Are you aware of the types of alternative energy?**

As shown in Figure 2, 57.6% of participants stated that they are informed about types of alternative energy, 35.3% mentioned being partially aware, and 7.1% reported having no information at all.

Based on this, their opinions on the process of utilizing solar panels in Tashkent were analyzed (Figure 3).

336 ОТВЕТОВ

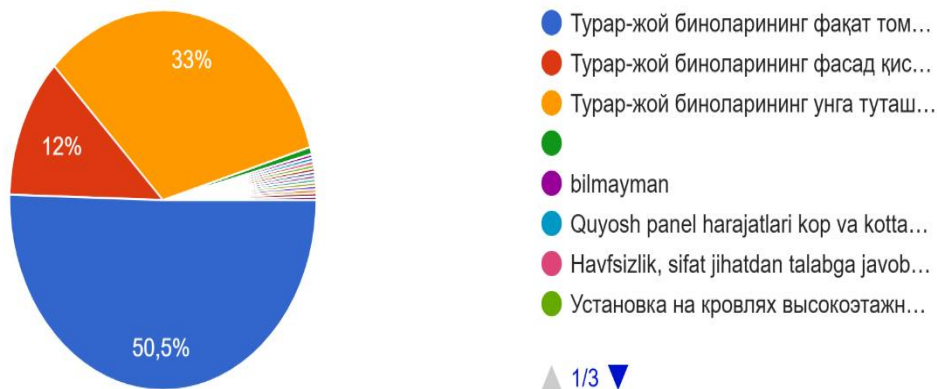


**Figure 3. What is your opinion on the process of using solar panels in Tashkent?**

Based on the participants' opinions on the process of using solar panels in Tashkent, 30.1% rated the quality as good, 25.9% as satisfactory, 16.7% as unsatisfactory, 23.2% chose "I find it difficult to answer," and the remaining percentage provided individual opinions.

Additionally, the survey examined participants' perspectives on equipping residential buildings with solar panels to generate more energy (Figure 4).

333 ответа



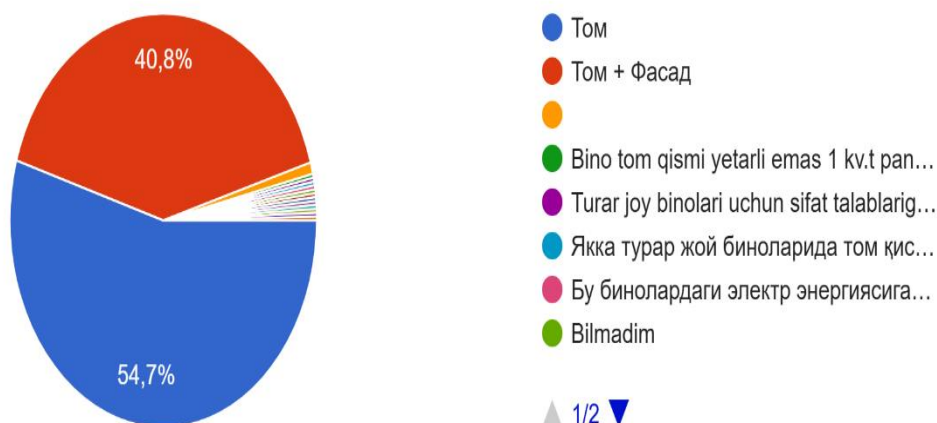
**Figure 4. What is your opinion on increasing energy generation by equipping residential buildings with solar panels in urban planning?**

As a result of this question, participants provided the following opinions:

- Solar panel costs are high, and a large area is required; installation on the roof of a residential building is sufficient only for the lighting system.
- All possibilities need to be tested in practice and popularized as much as possible.
- Solar panels should be installed wherever possible.
- They should be placed on roofs, facades, and adjoining areas, if available.

Considering the presence of experts among the population, their opinions on the question "Which part of buildings is most suitable for solar panel installation?" were deemed important (Figure 5).

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**Figure 5. Which part of buildings is most suitable for solar panel installation?**

In general, 54.7% of participants favored installing solar panels on rooftops, while 40.8% supported the "roof + facade" option. Additionally, specialists provided the following opinions:

- The roof area is insufficient for installing panels, as 1 kW panel requires about 4 square meters of space, necessitating a large area.
- It depends on the electricity demand of the building.
- Suitable areas for panel installation include roofs, parking lots, and other large spaces.

### **Conclusion.**

In addition to the reforms mentioned above regarding solar panels, it is important to note that the efficient use of the territory of multi-apartment residential complexes for energy production can significantly increase the amount of energy generated. To implement this process, it is necessary to carry out installation work on the roofs, external walls, or ground, in harmony with the use of small architectural forms.

### **References**

1. President of the Republic of Uzbekistan. Decree No. PF-4947 dated February 7, 2017, "On the Strategy of Actions for the Further Development of the Republic of Uzbekistan."