

ARCHITECTURAL SOLUTIONS FOR RESIDENTAL FACILITIES IN USAGE OF SOLAR ENERGY IN TUZLA COUNTY

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ABSTRACT

In this paper, possibilities on usage of solar energy for certain architectural solutions of residential facilities in areas of constantly continental climate are given, as well as suggestion for solar cells.

Keywords: Architectural solutions, software 3D MAX solar energy

1. INTRODUCTION

In this paper, the possibilities for putting up of facilities are given, or in other words architectural solutions for architectural facilities that will use solar energy are presented.

Basic characteristics:

In predetermined location in Tuzla, it is necessary to put up idealistic architectural solution for facility with residential and business profile, which will represent facility in Tuzla county where possibility of usage of solar energy would be one of primary ideas. The number of floors planned in this facility is Ba+Gf+4+loft and Ba+Gf+3+loft.

Business area would cover a part of basement, ground floor and part of first floor, while the rest of the facility would be of residential significance.

Tuzla is a city on southeastern banks of mountain Majeвица and covers middle ground of northeastern part of Bosnia. The city is placed somewhere between 200 and 303 meters above sea level and covers surface of 303 square kilometers. There are 120000 inhabitants in Tuzla and about 500000 inhabitants in Tuzla county. Climate in Tuzla county is constantly continental and mid temperature throughout the year is 10,1°C. Tuzla is one of four major cities in Bosnia and presents significant, agricultural, scientific, cultural and medical center of the state and Tuzla county is one of the most developed areas in Bosnia and Herzegovina.

2. ARCHITECTURAL SOLUTIONS FOR RESIDENTAL FACILITIES IN USAGE OF SOLAR ENERGY

Average temperature throughout the year is 10,1°C. The coldest month is January with average temperature of -0,6°C, while the warmest month is July with average temperature of 19,4°C. There are 91 days in average with frost throughout the year in period from October to April. It is needless to say that Tuzla county is under the certain Sun treatment more than six months in the year.

Residential facilities are ought to be faced towards southern side where major part of building should be built in glass. This part of building should also have a lot of terraces with big glass walls.

Movable glass surfaces are practically closing these terraces from the outside so in summer period these can be opened or closed in winter. These glass surfaces are with isolational character as well as accumulators of solar energy.

Therefore, architectural solutions for this type of facilities are presented in pictures 1,2,3 and 4. These outlooks were made by using 3D Max studio.



Picture 1. Southern fasade outlook



Picture 2. Northern fasade outlook



Picture 3. Flank fasade outlook



Picture 4. Other flank fasade outlook

3. THE ADVANTAGES OF SOLAR ENERGY

Solar energy is ecological and saves energetic resources. It also decreases amount of toxic matters in gases in atmosphere. Instalation of solar system is efficient and simple process of usage of solar energy. Using this system, one can save in first exposal to sun rays. Instalations of solar system increases the value of the house. Modern solar tehnology on the roof of house represents notable sign of enviromental protection.

4. SOLAR SYSTEM AND ITS USAGE

Solar system are sources of heat used for house heating and preparing of watter heating for all the time use which uses sun rays as a primary source of heat, i.e.solar energy. Solar system are mostly used as additional heat resources whily primary ones are tanks heated with electricity, gas or oil. Their usage as primary heat resources for heating systems is rare and limited for areas with sufficient amount of sun heating throughout the year in which climate is also warm and the heating season is short. Therefore, solar system are mostly used for preparation of warm watter for all the time use.

Basic element /part of solar systems are:

- collector
- warm water tank with heat exchanger
- solar cell with water pump and regulator
- instalation with proper solar medium

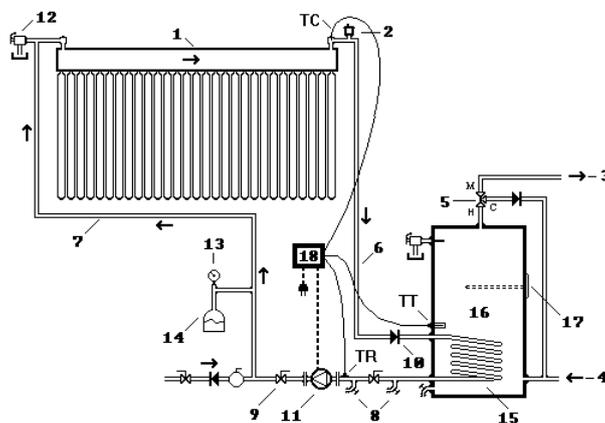


Figure5. Solar system structure

5. CONCLUSION

Concerning the fact that there is possibility of sreation of architectal solution for roof on which solar system would be installed (collector) and underneath it the rest of solar system structure, its construction is shown on picture above.

6. REFERENCES

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