USING SOLAR ENERGY AS A ENERGY SOURCE IN WASTE WATER TREATMENT PLANTS

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EXPERTISE THESIS ABSTRACT

In this study, it is aimed to fulfill the need of information and documents related to the electricity need, which is one of the most largest operational cost item of wastewater treatment plants, by solar energy; to contribute the use of energy resources in an efficient manner; to reduce the pressure of operational costs of wastewater treatment plants on Turkeys' economy and to contribute to the EU harmonization process.

In accordance with this purpose, firstly, current situation of energy end electricity sector in the world and in Turkey were examined, resources that are used for electricity production was presented. All the rapidly developing technology and methods of obtaining electricity from solar energy in the world were evaluated and in the basis of Turkey's solar energy potential, suitability of these technologies to our country have been investigated. The policies of our country in renewable energy sector and the support mechanisms for renewable energy sources in line with these policies were examined and licensed and unlicensed electricity production processes were evaluated.

In order to determine the applicability of all these data demonstrated, Adıyaman Wastewater Treatment Plant (WWTP) has been selected as a pilot plant. Theoretical and real annual average electrical consumption of Adıyaman Wastewater Treatment Plant has been calculated. The amount of annual electricity can be obtained from the solar power plant proposed to be built in Adıyaman Wastewater Treatment Plant was calculated. In order to provide realistic solutions to Adıyaman Municipality about proposed solar power plant in this study, technical and financial proposals were collected from solar power plant installation firms in our country market.

The collected proposals in order to meet the significant part of total electricity requirement of Adıyaman Wastewater Treatment Plant were evaluated in terms of capacity, technology, initial investment cost and operational cost. As a result of the evaluation; average annual electricity production amount, average initial investment cost and average annual operational cost for proposed solar power plant were determined. The average annual gain of proposed solar power plant to Adıyaman Municipality and net gain was disclosed by deducting annual operational cost. Finally with the findings obtained in this study, it was calculated how long it will take to pay off initial investment cost of proposed solar power plant by the gains obtained from it.

It is targeted that this study will be a guidance document to institutions and organizations interested in the topic as it includes capacity and economical knowledge of solar power plant established with modern technology.

Key Words: solar power plant, licensed production, unlicensed production, initial investment cost, operational cost, Adıyaman Wastewater Treatment Plant