Evaluation of modeling and numerical simulation of an Integrated thermal Solar System in several regions in Algeria

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Abstract

In Algeria, the fossil fuel is the primary ful used to generate the energy which is used for electricity, transportation, industry because it has a large oil and natural gaz fields . Seadly, it is not a clean energy and it creates the environment pollution, specially when the international community is conscious of the critical limit of the pollution of fossil fuels. So the evolution of energy situation in the world , forces our goverment to reconsider its priorities to follow the global energy transition, in order to preserve the enviroment. The aim of this work is to analyze the performance of an integrated solar-thermal system at a typical house in five Algerian regions, using a validated model for the evaluation of solar radiation incident on the collector of the photo-solar system, from each region. The results we have obtained show that we can overcome the problem of total dependence on fossil fuels in different Algerian regions, using renewable energy sources (solar energy), especially when Algeria has a large solar field with more than 3500 houres of sunshine. Despite the fact that the first problem with the development and generalization of the use of solar systems in Algeria is the expensive cost of the investment, but our study showed that we can reduce the electricity bill to more than 60% in building in the northern region and almost 100% in the south only by integrating a solar system in the buildings.

Keywords :

Solar radiation, Sunshine duration, thermal solar system performance, curent statut in Algeria, economic study

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