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Design of a Solar Water Heating System with Thermal Storage for a Three-Bedroom House in Newfoundland

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Abstract : This letter talks about the ready-to-use design of a solar water heating system because, in Canada, the average consumption of hot water per person is approximately 50 to 75 L per day and the average Canadian household uses 225 L. Therefore, this paper will demonstrate the method of designing a solar water heating system with thermal storage. It highlights the renewable hybrid power system, allowing you to obtain a reliable, independent system with the optimization of the ingredient size and at an improved capital cost. The system can provide hot water for a big building. The main power for the system comes from solar panels. Solar Advisory Model (SAM) and HOMER are used. HOMER and SAM are design models that calculate the consumption of hot water and cost for a house. Some results, obtained through simulation, were for monthly energy production, annual energy production, after tax cash flow, the lifetime of the system and monthly energy usage represented by three types of energy. These are system energy, electricity load electricity and net metering credit.

Keywords : water heating, thermal storage, capital cost solar, consumption
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