Technical Potential for Electrical Energy Savings from Residential Solar Domestic Water Heating in BC Hydro's Non-Integrated Areas

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3.4 Thermomax Evacuated Tube

The manufacturers representative of this product has been critical of the Watsun simulations for the evacuated tube system. He claims that the program does not properly represent the evacuated tube technology. The simulations performed for this project would indicate that his apprehension is totally unfounded. The evacuated tube technology is particularly suited for high collector to ambient temperature differential applications and for the collection of energy under partial sunlight conditions. The TMY weather data used by this program is a set of statistically generated sunlight conditions that quite realistically emulates real conditions. A given months data is a combination of bright sunlight days, totally cloudy days and partially cloudy days. Table 3.1 indicates the energy collected per M^2 for both the Thermodynamics and the Thermomax systems used for this study. The third column is a ratio of energy collected by the evacuated tube compared to a flat plate collector. Note that the evacuated tube collector is approximately 1.6 to 4 times more effective than a flat plate collector. The higher efficiency results in the evacuated system having a frontal collector area of only $3m^2$ compared to a flat plate collector area of $5.96m^2$.

Month	Thermomax Evac system (MJ/M^2)	Thermodynamic Flat Plate system(MJ/M^2)	Ratio of Evac to Flat Plat
January	53	13	4.08
February	123	54	2.28
March	223	116	1.92
April	310	180	1.72
May	387	232	1.67
June	393	243	1.62
July	437	267	1.64
August	357	223	1.60
September	240	143	1.68
October	163	84	1.94
November	67	23	2.91
December	47	10	4.70

Table 3.1
Energy collected per m^2 for the Thermodynamics solar boiler and Thermomax evacuated tube systems (based on 18^o and high water loads)