Energy Use Recommendation for Hot Water Consumption and How to Improve the Outcome

Solar Thermal Panels for Domestic Hot Water:

Energy Audit Recommendation: This analysis assumes a system size of 50% of the DHW base load for the building (based upon 85 occupants using 30 gallons of hot water per day). This equates to 2,300 square feet of solar thermal array (this is 72 collectors each 4' x 8') and an estimated projected cost of $4,201 per collector with an estimated savings of 6,118 therms of natural gas per year.

Energy Savings	6,118 Therms per year
Cost Savings	$4,160 per year (Cost at $0.68 per Therm)
Estimated Upfront Cost	$302,500

Solar Unlimited NA, Inc. Recommendation using an Ultra Sonic Flow Meter to obtain the correct hot water usage: This analysis assumes a system size of 60% of the DHW base load for the building (based upon 85 occupants using 18 gallons of hot water per day based upon a six day analysis of an Ultra Sonic Flow Meter shown below). This equates to 800 square feet of solar thermal array (this is 20 collectors each 4' x 10') and an estimated projected cost of $6,500 per collector with an estimated savings 7,412 therms of natural gas per year.

Energy Savings	7,413 Therms per year (21% gain over energy audit)
Cost Savings	$5,041 per year (Cost at $0.68 per Therm)
Estimated Upfront Cost	$130,000 (Upfront Cost Savings: $172,500)

Comparison:

- Actual DHW usage is 60% less than Energy Audit projected. See Ultra Sonic Flow Meter Analysis below.
- Energy production is 20% more than Energy Audit using 65% fewer collectors.
- Estimated cost is 57% less than Energy Audit projection.

Conclusion: Using an Ultra Sonic Flow meter is a non-invasive method to get an accurate building DHW use in order to project energy savings.

Example of Ultra Sonic Flow Meter Hot Water Usage

Raw Data		Logged GPD	Adjustment for Nightime Negative Flow			Adjustd GPD	Adjusted Per Person
			Hours	GPM	GPD		
Saturday	12-Nov	684	10	0.5	300	984	13
Sunday	13-Nov	1167	12	0.5	360	1527	20
Monday	14-Nov	1136	8	0.5	240	1376	18
Tuesday	15-Nov	1147	10	0.7	420	1567	21
Wednesday	16-Nov	1256	8	0.5	240	1496	20
Thursday	17-Nov	869	10	0.5	300	1169	16
					Average	**1353**	**18**