

DOMESTIC SOLAR WATER HEATER FINANCIAL ANALYSIS

***RETROFIT EXTERNAL HEAT EXCHANGER VERSUS
ELECTRICAL GEYSER COMPARISON***

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Comparison between Electric Geyser and Solar Geyser with Electrical Backup

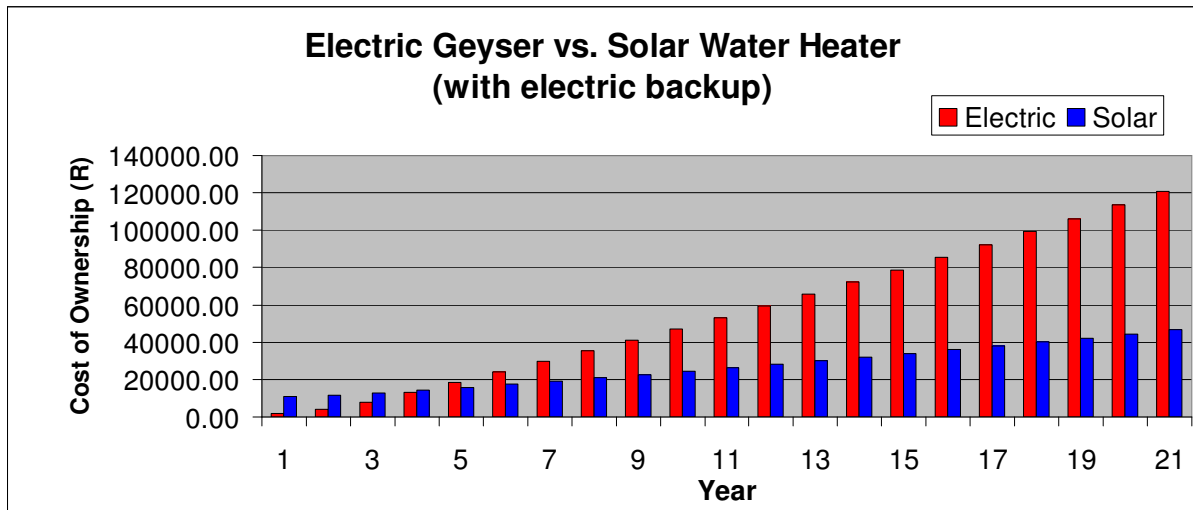
Electric Geyser Energy Use and Cost Calculations

	Operating Temperatures		
	60 degrees	70 degrees	
Geyser size	150 Ltr	150 Ltr	
Average hot water consumption/houshold/day	150 Ltr	150 Ltr	
Average daily losses	0.01533	0.01533	kWh/l/day
Specific heat of water	0.00116	0.00116	kWh/l/degree C
Average Inlet Water Temp	18.00	18.00	
Thermostat setting	60.00	70.00	
Energy required/day	9.61	11.35	kWh/day
Energy required/month	292.24	345.17	kWh/month
Electricity Cost - Current	0.51	0.51	R/kWh
Ave monthly water heating cost	R 149.04	R 176.04	/month

Note: 95% efficiency of element assumed

CORE ASSUMPTIONS

Elec geyser cost	R 0.00
Elec geyser cost/month – Current (60 degrees)	R149.04
SWH cost (incl install+ Eskom incentive)	R 10,376.20
SWH elec cost/month (30%) – Worst Case	R44.71
Finance rate	15.0%
Financed over (years)	3
Discount rate	15%
Electricity Increase Rate (1 st 3 yrs)	45%
Electricity Increase Rate (4 th yr onwards)	2%



Total Cost of Ownership over twenty year period per system:

Electric geyser (already installed)	= R 120,909
<u>Solar geyser with electric backup</u>	<u>= R 46,673</u>
Difference	R 74,232

Seven (7) Year Projection of Monthly Costs – Worst Case Scenario

Assuming an interest rate of 15% on a principal loan amount of R 10,376.20 per system for a term of 36 months (three years), and that the solar water heater uses 30% of the power required by an electric geyser (a most unlikely event).

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Cost of Operating Electric Geyser	2510	3640	5279	5384	5492	5601	5714
Cost of Operating and Repaying SWH	5073	5412	5903	1615	1647	1680	1714
Annual Savings	(2563)	(1772)	(624)	3769	3845	3921	4000
Net Savings	(2563)	(4335)	(4959)	(1190)	2655	6576	10,576

It can be seen from the data above that the systems will be paid for in three years, and that the payback period will be four and a half (4.5) years.

Seven (7) Year Projection of Monthly Costs – Best Case Scenario

Assuming an interest rate of 15% on a principal loan amount of R 10,376.20 per system for a term of 36 months (three years), and that the solar water heater uses no electricity.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Cost of Operating Electric Geyser	2510	3640	5279	5384	5492	5601	5714
Cost of Operating and Repaying SWH	4320	4320	4320	0	0	0	0
Annual Savings	(1810)	(680)	959	5384	5492	5601	5714
Net Savings	(1810)	(2490)	(1531)	3853	9345	14,946	20,660

It can be seen from the data above that the systems will be paid for in three years, and that the payback period will be three and a half (3.5) years.

CONCLUSION

Assuming the financed model, the real savings will be positioned in between these two projections – a four year payback period for the systems, leaving 6 years before the warranty expires, with an additional 10+ years expected lifespan thereafter, in which the owners are benefiting significantly.

Cost benefit for the owners will be (conservatively) over R 24,000,000 in the next twenty (20) years.