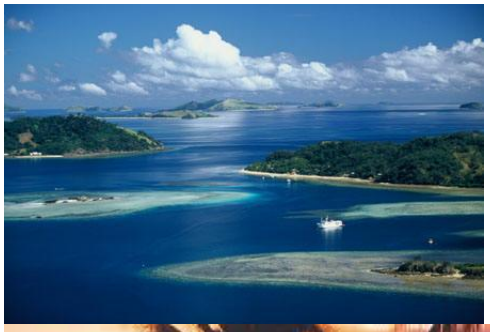
THERMOSYPHON HOT WATER SYSTEM IN THE FIJI ISLANDS

BY PHILIP LEE

Greetings from the Beautiful Tropical Island of Fiji.

We are located about 3000KM South west of Australia and in the middle of the Pacific ocean!



We have a population of about 800,000. Our economy is based on Tourism and sugar exports. I live in the most developed part in the eastern division of the island. The city I live in is call SUVA. I live approximately 10KM from downtown Suva at a new sub division called Panaromic Road development. I live up on a hill so I get plenty of trade winds and beautiful sunshine daily.

A recent price increase by the local electricity supplier (Fiji Electricity Authority) only one provider on the island forced me to start investigating alternative energy for heating water.

I stumbled onto the **Build It Solar** website and started learning about constructing my own Solar Hot Water System.

Many weeks later and a thousand questions to Gary I finally finished the system. I now enjoy daily hot baths compliments of the sun.

All of the details for building Thermosyphon Hot Water System are provided below.

Since Fiji gets blisteringly hot days I made my collector slightly smaller. 1.5M x 1.5M area.

The Collector (the heating unit for the water)

Material list

3 length copper pipes, 1 length 5.8 Metres.

1 sheet of corrugated roofing iron 5 feet by 4feet as the backing for the cooper pipes.

18 T copper joints

2 sheet of perspec Fibre glass transparent roofing.

4x2 and 4x 1 for the framing

1 litre matte black paint.

I find that the corrugated roof sheet gets plenty hot to reflect the heat on to the pipes.

I did not use fins in my collector. The average daily temperature in the tropics is 30 deg Celsius.

Water Cylinder

2 x 100Litre PVC tanks bought from the local manufacturer. I used seconds because they were half the price of the normal retail price.

4 x ½ inch male connectors

4 x 1/3 inch female connectors

2 for the inlet and 2 for the outlet

One inlet for the cold

One outlet for the cold

One inlet for the Hot water returning from the collector

One outlet for the hot water to the shower

2 x 2 metre heat resident hose

One for the cold water inlet to the collector

One for the outlet from the collector

Foam packing for tank insulation.

Basically I encased one tank over another for insulation. I then sealed all the gaps with roofing tape.

Results

My Collector can heat water to 110F with only 5 hours of sunlight. I need to relocate the collector to get about 10 hours of sunshine. Now the sun hits the collector round about mid day. Personally the current water temperature is sufficient for all our household needs.
I have enclosed a few pictures of my set up.
Here is the collector

Note the 4 x2 sticking out because I need to secure this directly onto the roof for Cyclone protection.

I left a few bricks on the collector to hold down the fibre glass roofing before i screwed them in permanently.

The water tank has a capacity of 100 Litres. I constructed a basic metal stand to have it on the roof.

The red hose is the hot water return from the collector. The copper pipe next to it goes to the shower downstairs.

The system was built for less than $500 FJD or $250 US dollars.

The design is similar to most Thermosyphon systems.

It does not require a pump to pump the water up.

Accessories

The stand made from 1 inch tubing. I Got my metal from a scrap yard. Got a welder friend to weld it, then I painted it and bolted it to the purlins of the roof with Cyclone bolts.

The system can be assembled in a few hours, what took time was making the collector frame, the painting and bolting onto the roof.

The tank will take some time too. I think it's a matter of taking the time to get it right and get things done properly.

If anyone has any questions please email me on: Phillee777 AT aim DOT com (change AT to @ and DOT to a period).

A picture of me and my wife - Mili.

Sincerely

Philip Lee
Fiji Islands