



## SAMUI SERVICE SOLAR POWER

The German led engineering company that provides solar energy solutions in South Thailand and ensures reliable follow-up service



### SOLAR WATER HEATER

A Solar water heater (SWH) is composed of a heating unit "collector" and of a storage unit "tank". How does it work:

Imagine a garden hose lying in the sun - the water inside will be heated by sunshine. If you paint it black you will minimize the reflection losses and the water will be hotter. You want to heat the water for a large swimming pool? Just arrange a large array of black painted hoses (see image). In western countries the swimming pool will need hot water during summer in the day time - perfect, your hot water delivery is right in time with the demand and you dont have to store it!



Now you change this hose to a more effective row of glass tubes and cover them with a large glassbox - the water is hotter again because you are reducing the convection losses. Thats understandable?

Now change the glass box for an outer glass tube and you evacuate the air between the outer and the inner glass tubes (like in a thermos jug): Because of the tubes shape you get energy even when the sun shines from left or right and because of the vacuum you will have probably no more energy losses.

If you lean this tubes against a frame you will change the water temperature inside: Because of the larger proportion of hot water than cold water the cold water will flow downwards. This is your collector!

You want to store this hot water and use it later? Connect the upper end of the tubes to a well insulated tank - the water will be hot for several days.

If your tank is higher than the collector you have to limit the water amount by a float valve - like you have in the flush box of your toilet.

This whole system is called a "Thermosyphon" - you can see it in the pic above.

If your tank is lower than the collector you need a closed pressure tank or you must let the hot water flow through the tank in a closed circuit - the so called "heat exchanger" like in a immersion heater.

The less components you have to install the better the system. A good SWH is maintenance free, can last 10-15 years and will pay back your investment after 5-8 years: That's the famous "return of investement" or ROI - don't believe it if somebody promises you a ROI after 1-2 years. Thats "talking for selling".

### But how can we ensure to install the right size of SWH for you?

I give you three examples:



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### **1. You run a hotel/resort and you are concerned about your electricity bill.**

How much water do your guests need daily if every room is occupied?

Guess you have no idea! You just know that it can be a lot! But normally the water is heated by an large, kV heater. If you run your heater with gas you know how much you spent every year. If it is an electrical heater there will probably be no extra meter to measure the power demand. Before you decide to buy a SHW in order to reduce your bill - let both your hot water demand and the electricity to produce it be measured! Then you have to decide if you want hot water at 45°C (enough for a shower) or at 60°C (more expensive). With this informations the size of your SWH system will be determined by a sophisticated german software program that uses weather datas from the NASA to simulate your situation. We don't do:

"You buy a lot - we win a lot".

If you decide to do so you will save a lot of money in the long run!

By the way: Our high skilled german supply engineer will integrate your existing water supply devices in his plannings. Try to find a comparable knowledge somewhere else!

### **2. Your new hotel is under construction.**

We have completed several bigger projects and we can advise you on how much hot water per day you will need and what size of collectors/tanks is suitable for an uninterrupted, secured hot water supply. Depending on your desired hot water temperature we will make several simulations with our software to show you how much you have to invest.

Maybe later you want to built more rooms? No problem, a SWH is easy to be extended - up to your hot water demand!

### **3. You live with your family in a private house.**

You don't like a cold shower at 20°C, you prefer warm water at 35°C? So it seems like there is not a terrible high demand for hot water - you don't have to measure a lot, we don't have to simulate with our software. Just choose the smallest size available but take care that the tank can keep the water hot for several days. Of course we will integrate your electric water heater if you need more hot water during very cloudy weeks.

Because your investment is rather small you will win money in the long term too.

Concerning the climate change due to carbon based energy you can say:

**I am not only part of the problem but I am part of the solution and I save money!**

**But why they are not more SWH in Thailand if the opportunities are so brilliant?**

Good question!

The main reasons may be:

Lack of skilled personal and no political support like in India or China.

In april 2007 I went to Bangkok to a seminar about Solar power - here a table from a speaker of the "International Institut for Energy Conservation of Asia":



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### Cost per sqm of SWH in Thailand is the second highest in the world!

Country	Baht/m2	Typical size	Total (Baht)	Electricity (Baht/unit)
Japan	25,450	2x2 m <sup>2</sup> - 200 l	101,800	7.3
<b>Thailand</b>	<b>25,000</b>	2 m <sup>2</sup> - 160 l	50,000	3
Spain	25,000	2 m <sup>2</sup> - 200 l	50,000	11.5
Italy	17,500	4 m <sup>2</sup> - 200 l	70,000	10
Israel	11,800	2.5 m <sup>2</sup> - 150 l	29,500	4.85
Greece	14,750	2.4 m <sup>2</sup> - 150 l	35,400	3.8
China	7,150	2 m <sup>2</sup> - 180 l	14,300	1.8 - 5

Source: Sun in Action II, ESTIF, and expert interviews

SWH in Thailand is very expensive! Be aware that the thai SWH are mostly imported from China. Why are SWH from Thailand so expensive?

First, there is almost no political support for renewable energies here and there are absolut no informations on TV! Therefor the demand is very low, not like in India or China where SWH is common everywhere to avoid carbon based energy.

Second: It is still a closed market, just a few companies are sharing it.

And why are there almost no SWH on Koh Samui or on the neighbor islands?

Because the thai companies are located in Bangkok or in North-Thailand. Would you buy an aircondition if the next qualified engineer or technician is 1.000 km away?

#### **But how can we do better?**

We have two strong partners with high quality products:

Sunlabob, a german led company in Vientiane, Laos. They are very experienced with all kind of renewable energies. Look at their website!

Solar Solutions, a german led company in Khon Kaen, Thailand. Actually, they are installing many projets in Pattaya for residential and hotel use. They are promoting Photovoltaik in Thailand as well.

Both of these partners have excellent connections to the leading german and chinese manufactures of solar power devices!

#### **We assure a return of investment (ROI) after 5-8 years.**

This means, we are supposed to do a reliable engineering, we must determine the appropriate SWH size for your hot water demand and we have to install it with the least of energy losses!

We are not in Bangkok, we are located on Koh Samui - we are a close located service partner!

#### **We give 5 years of warranty!**



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Here two example sheets for a Return of Investment after 7 years:

- Vacuum tube collector for 5 peoples -
- = investment about 15.000 Bahts
- Private house with 3 peoples, shower time 10 minutes a day

