

Frequently Asked Questions: About Hybrid Solar Heater which delivers 100% of the home heating needed in cold weather climes for the entire cold weather season in 45 (+/- 15) degree latitude.

Q: Why is your Hybrid Solar Heater (HS 2) better than any on the market today...January, 2004, and is it patented?

A: I put a lot of time, over many years, into researching the background of solar heating, and all of the problems preventing their proliferation. The following paragraphs are answers to F A Q s, which succinctly describe the superiority of my Patented Hybrid Solar Heater (#6,372,978 B1), which promises 100 % of the heat, in 45 degree latitude (plus or minus 15 degrees), anywhere in the world.

Q: Do you have any prior experience in Solar Heating ?

A: About 35 years ago, I built my first working solar heater, approximately 8' x 16' and installed it on the roof of a 4500 sq. ft. factory (which made card-board boxes). At the time, I did not envision nor install a wind turbine. I used a heat-repository sized 6' x 6' x 7' high, composed of 12 " cinder blocks, enclosed by 4 different, pretty exteriors (to hide the pile of blocks), and make it acceptable for locating it in a home basement.

*****: It basically was an air-to-air hot-air system. It delivered a peak temperature of 192 degrees, via a rudimentary air-duct system, on sun-lit periods, to one particular area, where most of the fabricating work was done. The repository temperature peaked at approximately 204 degrees (F).**

Q: Was it successful ?

A: It was NOT. True to form, for all solar heaters constructed, even to this date (except for the HS 2), after three successive non-sun periods, it only delivered air in the 100 degree (F) range. The space attempted to be heated, was 4 times as large as the solar collector could service. Therefore, it was on most of the sunlit day and never had the opportunity to store heat, after the pre start amassing. It itself, was not successful, but it did provide important, hands-on information about **“do’s and “don’ts”, which were important to the design and use of the HS 2. That showed that the Solar Collector must be sized properly, to do the job, you want it to do.**

Q: What did you do to try to salvage the installation ? Did it do anything at all ? Was it cost-effective ?

A: At that time, we opted to by-pass the heat repository, and feed the collector heat directly into the factory. We did learn that the outside temperature was not relevant to the amount and temperature of the heat being generated from the solar collector, into the factory. It mattered little, if the outside temperature, was ..50.. degrees or..10.. degrees.

*****:** The solar heater worked fine, (when the sun was shining), even though the outside temperature reached 10 degrees (F). That's where I found out, that snow on the collector, was not a good thing. Waiting for the snow to melt off, was out of the question. I had to go on the roof and shovel most of it off, and wait for the sun to finish the job. I designed the problem out of the HS 2. It only cut their cold-weather energy costs approximately 26%, and did not appear too attractive (cost-efficient) for the cost.

*****:** I followed up on its usage for the next 8 years, till one of the partners, of a 2-man operation, passed away and the other partner decided to close the business, and sell the building. The building remain closed for approximately 1 1/2 years, and I went on with other things.

*****:** The system never required any repairs, in all that time. But since the original installation cost approximately \$6,000.00, it was not then cost-effective, so I never attempted to pursue it further.

Q: Do you own any other Patents ? Are they technical? Do they work?

A: Yes: I own two others, which are technical patents. Both are in the electronics field, and basically deal with electron tube technology (T.V. Tubes/Radar Tubes,/ Oscilloscope Tubes/Special-Purpose Tubes/etc). One deals with electron gun design, while the other is for a high resolution communication system which combines electron gun technology with fiber-optic signalization, ..(both of which work). I decided to apply for a Patent on this **Hybrid Solar Heater (HS2)**, and was granted Patent **#6,372,978 B1**. Such was granted after 16 months,....with 43 claims.

I also invented the first home video phone, in **1996**. I rec'd a Patent for it, entitled the "**High Resolution Optical Communication System**", Patent **#5,703,636**, in 1997.

******* The fact that a patent is granted, does not mean that the patented device works, because **NO** working model is required(except for a patent claiming perpetual motion)!
BUT, I DID have a working model, which was reported, (with pictures in the foto of my telephone call to an associate), in the New Jersey Herald News, by reporter Richard Calder **Sept 22, 1997!**

******* It is also true that if you conceive something, and you are sure it works,.. protect it.. Patent it.. Further, who would listen to you, if you did not think that the Patent was good enough,.... to spend your own money.... to patent same. However the Patent Office does

NOT prohibit anyone from copying/using/exploiting your patent. They just provide the legal basis, upon which you may stop them..(IF YOU HAVE ENOUGH MONEY)!

You may see both Patents, (as reported by **Google**), in their entirety, as filed in, and by, the **U.S. Patent Office!**

Last, but NOT least, my pioneering work, in Cathode Ray Tube technology, led to an important foundation for the emergence of the **BLU-RAY DVD** system! See the "**Genesis of Blu-Ray DVD**" in www.cifaldi.org.

Q: Does your background contain any energy-dealing experience?

A: Yes In 1983, as **Chairman of the Passaic County Energy Commission (N.J.)**, I authored a paper, entitled "**NEVER CATCH-UP SYNDROME**". In that paper, I cited, that all material used to fabricate energy-saving devices/equipment were based on a combination of oil prices and the then current labor market. As the price of oil rose, so did the cost of your energy-saving device, because all the parts needed to build same, also rose, due to the rising energy costs (and... labor.. and.. taxes), in their fabrication.

*****: Do NOT forget taxes, as a major player in pricing. For instance: in 1952, a brand new Buick sold for \$5,000.00. A 6% sales tax came to \$300.00. Today, a brand new Buick would cost \$50,000.00. The 6 % sales tax is now \$3,000.00.. more than 50 % of the cost of the 1952 Buick .. (60 % to be exact)..**

*****: Then, factoring in the then current (rising, never lowering) labor costs, always made the new energy saving device(s),(solar heaters /wind-turbines/photovoltaic solar cells/ batteries/etc.), more expensive, albeit with a slight increase of effective cost ratios, due to technological advances,(but never enough to become completely "cost-effective"..... till the HS 2).**

***** And then, some times, when there is no other way, forget cost-effectiveness. Witness such things as solar photo-voltaic power supplies in space (including those in low-orbit circulation of earth). Power supplies, in out of the way facilities, must be supplied regardless of "cost effectiveness", or not.**

Q: You use lead stored in water. Wouldn't crushed stone work ?

A: No: Crushed rock-storage, was investigated in the use of the first solar heater fabrication. Such was not as good a storage BTU medium, as water to start with. Further, using mixed stones, the smaller ones, smaller than the 2" diameter size, tended to ("pack in"), leaving no space or room to freely circulate air around each individual stone, thereby reducing even further the BTU retentiveness of the heat repository, which made it unacceptably large.

Having said that, crushed stone. in layered fashion, added to the water in the Solar Storage Tank.. WOULD.. increase the BTU retentivity of the water in the tank, because the stone, (properly stacked), is denser than water, and displaces less water than its weight, but (red bricks, would be a far better choice).

Q: But isn't a conventional Solar heater simpler than the HS 2 ?

A: I agree that a conventional air heating Solar system is simple, when using only stones as a storage medium (repository), except it can not do an adequate job, as users of said system (including myself) have found out. Further, head-to-head, water enjoys a heat-storage-to-volume ratio of 5 to 1, not even considering problems with bacterial growth, in an air-exposed rock pile. This would make the storage medium (rock "repository") much too large, for any practical purpose.

Q: Doesn't the [HS 2](#) have more parts than a crushed-stone system?

A: Not really! Most important of all, in any comparison....which one does the job? Which one works? Which one is cost-effective. The BTU storage of lead-laden water takes the place of the inadequate crushed stone repository, and the only addition to the solar collector encapsulation, is the serpentine coil of close-looped copper tubing, versus air-to air systems, alongwith 2 strips of electric heating elements, to be fed by the 2 KWH wind turbine.

Q: Well, then why can't you just use water, with nothing in it?

A: BTU storage, in water alone, still could not store sufficient BTUs, to last more than 6 days (+ or -) of contiguous non-sun periods. If a certain volume of water can be made to hold X times the BTU, along with no increase of volume (keeping the heat repository to manageable dimensions), it became possible for the [HS 2](#) to approach to lengthen a period of non-sun days, exceeding more than 10 days.

Q: How was that accomplished ?

A: The [HS 2](#) combines sunlight-supplied BTUs (thermal),with additional wind-supplied BTUs,(via a Wind Turbine), which enables it to increase the non-sun limit reserve, to 13 days, or more. *: It could be longer.. but not less. This is predicated on certain variables, depending on sizing of the unit,(remember the box factory installation), site location and general weather conditions.**

Q: Sounds good, but is that all the Wind Turbine does?

A: No.. it even gets better. This approach presented a bonus, (coupled with back-feeding of heated water from the storage tank), it guarantees that the water lines in the collector, can not freeze, thereby precluding the use of a “drain-down” system or hard-to-work-with, glycol (anti-freeze), kind of toxic, in its own right.

Q: Wouldn't the wind turbine look ugly, on the roof of my house?

A: Absolutely not. The wind turbine would have a sleek look (technologically called a “shrouded” wind generator). It would tell everyone you are using a renewable energy to do work in your home. Remember years ago..... every home had a TV antenna on its roof? In fact multiple-story dwellings had many antennae sitting on them. Some people even had the antennas go as high as 100 feet. In the 1950's, in another country, people without TV sets, put an antenna on their roof anyhow, (so as to not let their neighbors know), they could not afford a TV set.

*****: Believe me, when everyone (all your neighbors,....at least,) see the wind turbine on your house, they will want one (and have one) put on their house. In fact, they will seek to have even more work done, (than you have), by free renewable energy(ies). The “bigger, better, faster, prettier, more expensive, cheaper”, etc. syndrome.. or.. **“KEEPING UP WITH THE JONES”****

Q: Will the **HS 2 really pay for itself. in energy costs saved?**

A: The economics of my Hybrid Solar Heater (HS 2**), show that with a cost of less than \$ 10,000.00, said unit, if properly installed, would effect energy cost savings, to pay for the unit, in less than 10 years (in the State of N.J.). With a life expectancy of 25 years, with low replacement costs, the **HS 2** would nicely fill that requirement. This of course ignores, saving of fossil fuel, (coal, oil or gas), with all their attendant negative ramifications.**

Q: It seems that the **HS 2 is highly technical, and not simple!**

A: That's not true. The **HS 2, is only slightly more complex. The important thing to remember is that the **HS 2.. WORKS**, all other units **do not**.**

*****: It is more efficient and is the breakthrough, that solar heating technology was searching for, for the last 40 – 50 years. In the final analysis, besides being cost effective, it has completely eliminated problems inherent in all other Solar Heating systems, (including photo-voltaic),..Again, ignoring the fact that some people can not be exposed to hot air blowing in the home.**

Q: Experts say that heating by electricity is not economical and a poor use for electricity. Why are you using electricity?

A: The turbine does not supply electricity per se (in the conventional sense), but it does use the electric derived from blowing wind to make heat, whenever the wind is blowing. Doing so, it provides an ingenious way to prevent freezing of the (non anti-freeze water) lines, during the non-sun hours (especially all nite long),... generally the coldest part of the 24 hours. When not needed to prevent freezing of the water-supply lines, embedded in the Solar Collector, the generated heat supplies additional BTUs for water heating, also.

Q: What happens if there is no wind, in below Zero weather, wouldn't the water freeze then?

A: No.... In that event(s), when no wind-supplied electricity, is available, a back-up sensor system, set at 45 degrees (F),in the Solar (roof-top collector), causes hot water from the lead ingot-laden tank, to backfeed in the collector, till the collector temperature reaches 60 degrees.This should never happen too often, and would be an exception to the rule. But the HS 2 has provided for it, because if it happened once, it would destroy the system .

Q: Isn't it dangerous to mix lead with house-hold water?

A: Yes it would be. That's why the lead ingot-laden storage tank (repository), is fed by a closed loop system, which has nothing to do with household water (except for the initial charging of water, necessary to operate the [HS 2](#)).

*****: Further if you should desire, to have the system provide hot water also, such could be accomplished under these conditions: a smaller, separate, serpentine copper tubing, also in closed-loop condition, never in touch with the lead-laden Storage system, is routed to a separate, smaller, 150 gallon water-storage tank fortified with inert substance(s),(red brick or granite tiles or some other dense inert material, again raising BTU retentiveness of water alone.**

Q: Why do you insist on putting lead or red brick or granite tile in the storage tank?

A: Well, first of all, there are....2....storage tanks. Experience teaches, that water alone, can not store enough BTUs, to continue heating during continuous non-sun periods. Therefore we are looking to beef-up the BTU-carrying capability of this smaller tank.

***** Let's start with the main storage tank containing 1,000 gallons of water (approximately 8,000 pounds)...(8,340 pounds (+ or -), containing 8,000 pounds of lead. Since lead is 10 times as dense as water, it can therefore hold 10 times as many BTU, as water can.**

***** Because of its density, it only displaces about 250 gallons of water. In effect you have a 1000 gallon water tank with 750 gallons of water in it, but with the equivalent BTU holding capability of 9,750 (+ or -), gallons of plain water.**

Q: That sounds like a lot of water. But, how much water, do I really need, to heat my home.

A; The answer to that question always astonishes people. An 1800 sq ft home in N.J., with 3 floors (basement, 1st floor and 2nd floor), was found to contain....nine (9).... gallons of water.

Q: You have the equivalent of 9,750 gallons of water, when only 9 gallons does the work. It seem like overkill. Could you explain that, please.

A: Sure. I need a huge reserve to furnish BTUs, through 12 to 15 or more consecutive non-sun periods, because you use 9 gallons of water every minute that the thermostat calls for heat. It may take up to 10 minutes, for the hot water to bring the room, (house), temperature up to the temperature set than the thermostat is calling for.

*****: That means that you have a minimum, of 108 (+/-) heat-producing periods, before you have accessed,.. once,.. all of the water in your Water Storage Reservoir.... Of course, all the heat (BTUs) contained in the circulating water is not used, but figure you use 90 gallons of water every time your system calls for heat. This would be no problem in sun-rich days, but in sunless days, you need all the reserve BTU you can get.**

Q: What is the best material to beef up the BTU retention of plain water and what do you recommend it is?

A: In the 150 gallon tank, some research is needed to pinpoint the INERT material, which would store X times more BTU,(but NOT lead),

in the same volumetric proportions), as taught by the HS2 Patent. For the time being, I would recommend, red building-bricks, with holes in the middle, LAYERED, (so water could circulate freely, around most of the brick).

***** Old timers will remember when the only heat in a 6 room house was in the kitchen. Then a hot water bottle for your feet, in bed, in the dead of winter, was good for an hour. But, a red brick, when heated in the oven of the coal-burning kitchen stove, and wrapped with a thick towel, kept your feet warm for hours...and hours.**

*****: The 150 gallon (inert material fortified) is fed by a separate water line, from the separate serpentine, smaller, copper water-line, also embedded in the external, (roof-mounted) collector which IS fed to the potable water of the home.**

Q: What would happen if the two storage tanks got mixed up?

A: The two tanks are different and are hooked up individually from each other. There is absolutely no chance, under any circumstance, that the two systems would interact/intersect.

*****: Lead-fortified water should never be....and is.... NEVER.. in the design or construction of the HS 2,.....intermingled with the household potable water,..... nor the home hot-water supply of the 150 gallon, potable-water tank.**

***** Note: Lead in gasoline...don't drink it! lead in batteries- leaking batteries present a double problem, acid as well as lead.. ... don't touch or handle, without gloves..! Lead soldiers.. . don't chew them! Lead in storage tanks...Don't mix with potable water supplies!**

Q: Why not, just use anti-freeze, it works in my car?

A: First of all, those systems can not/do not provide adequate cold-weather heating. Anti freeze will provide freeze protection, up to a point. While it solves an immediate problem, it sets you up for ongoing onerous problem, especially in times of needed repairs.

*****: It has proven itself not worthy of use, so it really can't be compared, with any system that works (HS 2).**

Q: What about drain-down systems?

A: In the case of drain-down systems, such needs additional electronic programming, and an additional drain-down storage tank, ...with additional piping and controls, not counting the reliability of the vacuum-breaking valve (the failure of that valve results in destruction of the heat-recovering external water system)..... UNACCEPTABLE RISK!.....It has already happened !

Q: What happen when snow or ice accumulates on the collector?

A: In other solar heating systems, studied (even to date), snow accumulation on the solar collector, either decreases the effective accumulation time, of the collector... or requires someone to go on the roof an clear the snow from it. Freezing combinations of water and snow present vexing problems.

*****: The Hs 2 has eliminated that problem, by a shower-type provision for hot water to automatically clear the snow or ice from the collector.. (part of the Patent).**

Q: What happens when playful people throw stones at the collector?

A: In vandal-plagued area installations, 1/4" sheets of plastic, covering the glass encapsulation of the solar collector, causes minute diminution of BTU-capture and defeats most attempts of vandalism. (part of the Patent).

Q. Isn't the use of soda cans, kinda low tech?

A: Not at all: The low tech appearance of use of the open-ended cans, painted black in all the interior surfaces, acts in high tech fashion.

*****: The use of aluminum soda cans in the solar collector, solved yet another important problem, inherent in all flat plate units. In all those units, some of the sun's energy is lost because of the angle at which the sun's rays hit the collector.**

*****: A certain amount of the rays striking those flat plate collectors, bounce out of the collector and are not able to be used, in the accumulation of sun-ray supplied BTU.**

***** : The HS 2 is based on the premise that we can certainly use, all..... we can get, and then some.**

Q: How does the collector, containing all the soda cans, work better than flat plate collectors?

A: It doesn't matter from which direction the sun's rays strike the can, (North..South..East..or..West,) they are bounced into the interior of the can, not back into space. Even when the sun is directly overhead, the sun's rays will still not bounce out, because the bottom of the coda cans are convex, thereby directing those rays to the sides of the containers. There is very little scattering of sun rays (outside of the cans). The ray-gathering efficiency of the soda cans is about 99.9%.

Q: Can other types of cans be used, made of different metals?

A: All types of metal cans, may also be used. Aluminum soda cans are being manufactured by the billions. Naturally, some of these cans, for one reason or another, are rejected because they can not be used to hold liquid. But, they are perfect for use in the [HS 2](#) Solar Collector, altho flat-bottomed cans will be less efficient.

***** This guarantees an inexpensive purchase price....plenty of supply,...and saves the can manufacturer, energy costs, labor costs, for re-formation of new cans, from the rejected ones, (A win/win situation—saving energy to using the cans to create energy).**

***** Worth repeating: Using cans, (painted black), left shiny on the outside, traps nearly **ALL** of the suns rays impinging on the unit, with efficiency(ies) close to 100 %, and is thereby superior to any other design/way, than any flat plate collector now being used today, (in the world).**

Q: Can't anyone get a Patent for anything they want and cheaply too?

A: Almost. But believe me, you have to go through extremely knowledgeable “examiners**”. They research all Patents actually granted in your field, and are experts, in their own right. They are allowed a wide discretion of not allowing claims you are making. **Note:** Did you remember that Einstein worked in the Patent Office?**

*****: This patent was not lightly sought, and hours/months/years were spent, evaluating competing technologies, eliminating weak points of current technology, thereby revising my System.**

***** Finally, over a period of 12 to 24 months (average time from start to finish), \$7,500.00 of mine was spent finalizing the Patent application. In view of the potential value of the **HS 2**, you could say that the cost of Patenting.... was indeed cheap.**

Q: How does your **HS 2 compare with other Solar Heating systems in the world today?**

A: There is no other system in the world today that could even be able to compare with the **HS 2. As an expert in Solar Heating technology, I can honestly say, I have the only Solar Heating System, in the world today, that **WORKS**. Further, the system **IS** actually cost-effective, despite the “never catch up syndrome”, the “exception to the rule”. Consider the cost for an **HS 2**, below \$10,000.00, which saves energy-costs (\$ \$ \$) every year, which uses naturally-occurring, renewable energy,**

.....versus.....

installing an in-ground pool in Florida costing \$30,000.00, plus has to be artificially heated. Even in Florida, (in an effort to provide a longer swimming season, it is even more important in the 45 degree latitudes), such pool-water is usually heated (by propane/ electricity, or even a supplemental solar heating system.

That little Solar pool water-heater still costs about \$3,800.00. Even then, maintenance costs are far greater in the just-described pool installations. The point here, is that the \$10,000.00 price tag for the **HS 2, continues to save you money over the years while the pool heater continues to cost money over the years. The **HS 2** is certainly a far better buy, than an in-ground pool.**

Q: I truly would like to have one, but I really can't afford it.

A: That is generally the first impression. But I say that you can't afford to...not... buy one. If you are already in your home, such is then called a retro-fit, installation. Consider this: people are spending \$12,000.00(for a new Hyundai) up to\$60,000.00 (for a new Cadillac)....and up.

*****: A lending institution would be more than happy to advance the money (as they do for new car purchases), because a \$10,000.00 payment plan.. .. over X amount of months,.. .. could be presented as showing (truthfully), that the energy savings, are paying for the unit.**

***** As an added bonus, depending on where you live, Governmental (State and/or Federal and/or (local) monetary assistance or tax credits, may even cut your initial cost.**

*****: Some local energy suppliers, (Gas & Electric) may also help you to pay for the unit/ installation.**

Q: I am thinking of purchasing a new home shortly, can the HS 2 be installed at the same time, and could I afford it?

A: Absolutely.. In the case(s) of new home building, the HS 2 would be cheaper to install (as well as planned placement of the water storage tank). Further, this applies also to new home builders as well, especially new home builders designated as "Energy Star" certified builders.

*****: There would be little difference in monthly payments, with a 20 or 30 year mortgage if you could afford the purchase of a home priced at any of the following examples:**

**\$150,000.00 instead of \$140,000.00
or \$370,000.00 instead of \$350,000.00
or \$725,000.00 instead of \$700,000.00.**

***** No Question: *** The dream situation promised, many times, of many things, in the past, (unit pays for itself)....is now here.. in the.. [HS 2](#) The energy savings will actually pay for the unit, in the first 10 or 12 years of your mortgage. Energy savings thereafter are in your pocket for the following 15 or 20 years or.. ? longer ? *******