

Chapter News

Meet Your Reps

Our local TXSES chapters in Houston, El Paso, San Antonio and Dallas each elects a member to sit on the Board of Directors. In this issue, we would like to introduce you to the representatives from San Antonio and Dallas.



Spearheading one of the most effective and efficient energy programs in the Air Force, Garland Scott brings 25 years of energy management experience and knowledge to the 13 Air Force installations at Randolph Air Force Base, San Antonio. His dedication to the Energy Management Program has been instrumental in Air Education and Training Command's achieving a 22.2 percent reduction over its 1985 baseline. He developed and implemented the Energy Management Incentive Award in which 13 Air Force installations compete for \$100,000 each year for their Energy Awareness and Conservation Programs, which netted Garland the 2001 Federal Energy and Water Management Award for Effective

Program Implementation and Management. He is the facility energy program consultant for five Air Force bases in Texas and eight Air Force bases in other southern and southwest states. Each base is a "small city" with a population between 5,000 and 25,000.

Garland is a registered Professional Engineer in Texas and a Certified Energy Manager. He holds a BS in Engineering from Trinity University in San Antonio. He represents Solar San Antonio on the TXSES Board.



Dick Williams, who represents the North Texas Renewable Energy Group (NTREG), grew up in an oil boomtown so he has first hand knowledge of the effects of the petrochemical industry. Later, he studied Geology, but got bored with school and quit to pursue his main love, which was trucking. Now that the driving is done, his interests have returned to the environment. He hopes to learn enough about alternate energy to be able to make presentations to schools or other organizations, like the boy or girl scouts.

The following companies have chosen to support the Texas Solar Energy Society's educational mission by joining at the business level:
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 Austin Energy, Austin, Leslie Libby leslie.libby@austinenergy.com
 Aztex Alternative Power Solutions, Terrell, Jerry Sutton aztx@swbell.net
 Center for Maximum Potential Building Systems, Austin, Gail Vittori center@cmpbs.org
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 CSG Services, Austin, John Hoffner john.hoffner@csg.com
 Department of Aviation, Baylor University, Waco, Max Schuck
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 Sun Trapper Solar Systems, San Antonio, Michael Fossun suntrap@flash.net
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And special thanks and kudos to the following businesses for joining at the higher levels of support:
Business \$250:
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Meridian Energy Systems
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Business \$500:
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City: _____ State: _____ Zip: _____

Home phone: _____ Work phone: _____

Fax: _____ E-mail address: _____

Other organizations to which you belong (check or write-in all that apply)

ASES TREIA TXSEIA AWEA SEED Sierra Club

How can you help promote clean energy? (check or write-in all that apply)

Attend informal discussions Staff educational booth
 Help w/ solar car races Write articles Make presentations
 Conference volunteer Contact your utility/legislators

Annual Dues

Individual Membership:

\$15 (student or EPSEA member)
 \$25 (minimum regular member)
 \$50 \$100* \$200*
 \$300 Patron*
 *recognized in quarterly newsletter

Business Membership:

\$100 \$250 \$500**
 **includes ad in quarterly newsletter

ASES Membership:

\$55 discounted American Solar Energy Society membership for current TXSES members

School Fund:

\$25 Check here to contribute an additional \$25 to the TXSES school fund.
 This money is dedicated to support renewable energy projects in Texas classrooms.

Total due: \$ _____ Make check payable to: TXSES
 PO Box 1447
 Austin, TX 78767-1447

Texas Solar Energy Society wishes to thank the following members who have supported us with \$100, \$200 and \$300 level memberships:

Randy Combs, Tom Fitzpatrick, Robert Foster, Terese Hershey, Scott Lenharth, Jane Pulaski, Paul Weatherall, Chuck Wright

There are currently over 250,000 solar heated pools in the United States. If a system is installed to reduce or eliminate fuel costs, it can usually pay for itself in 2 to 3 years. If a heater has not yet been purchased then a one-year payback for a solar system is possible (based on the cost of a heater and fuel for one year). The annual cost of operating a pool using a natural gas, oil or electric heater can range from \$750 to \$2000. If a pool is not already heated, a solar system improves the comfort level and almost doubles the swimming season.



Solar heating swimming pool This San Antonio Sun Trapper pool system is designed to easily adapt to pool equipment and uses the existing pool pump to circulate the water through the solar collector.

A time clock or temperature sensor will be installed to keep the system working at maximum efficiency and if desired, the warm water from the solar panels can be directed to either the pool or spa, or both at the same time. These collectors are composed of a high-grade anodized aluminum-titanium composite (not a polymer) for longevity and maximum performance. For additional details on specifications see www.suntrapper.com

The Texas Solar Energy Society (TXSES) was founded in 1976 and is a non-profit educational organization formed to increase the awareness of the potential of solar and other renewable energy applications and to promote the wise use of these sustainable and non-polluting resources.

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Visit our web site at:
www.txses.org

More exciting conference news:

Solar 2003 comes to Texas!

The American Solar Energy Society's annual conference in 2003 will be held in Austin, Texas. "America's Secure Energy" will be hosted by the Texas Solar Energy Society, June 23-26, 2003. Along with many national experts in the solar field, the following TXSES members have been hard at work for the past year planning the conference already: Roger Duncan (Conference Chair), John Hoffner, Mac Holder (Passive Conference Chair), Andy Jones, Mark Kapner, Jaya Pichumani, Jane Pulaski, Russel Smith, Gary Vliet and Chuck Wright. Many more volunteers are needed to help organize tours, workshops, social events, educational activities prior to the conference and during the conference itself.

Please contact Kathryn Houser at the TXSES office to volunteer: 512-326-3391 or info@txses.org.

SOLAR REFLECTOR



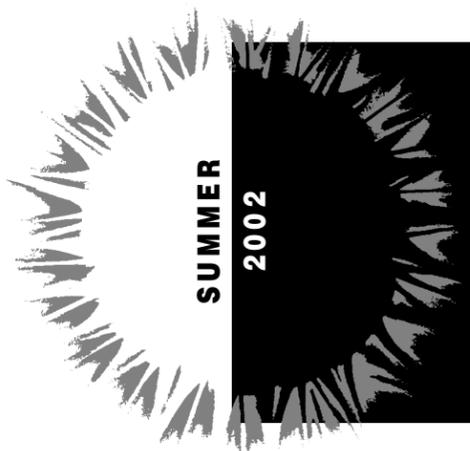
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REFLECTOR

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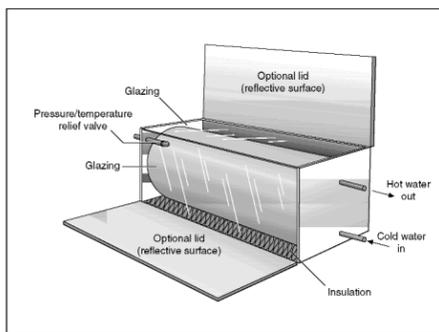
Heating your Water with the Sun

Solar water heaters can be as simple as a garden hose left in the sun or as complex as multiple glass-plated solar collectors filled with propylene glycol. Simple or complex, solar water heaters are an economical option for home and business owners wishing to reduce their water heating costs.

Types of systems

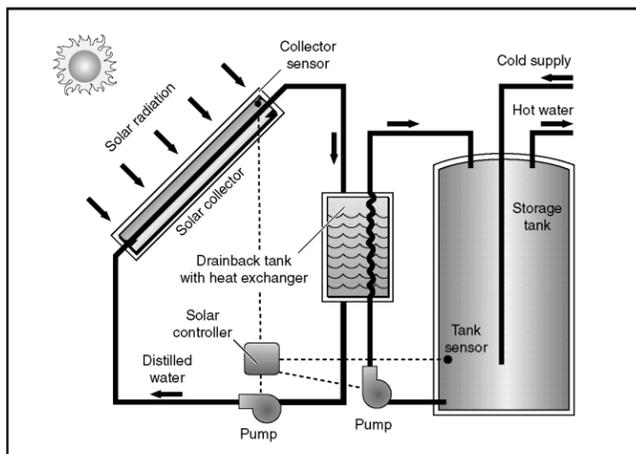
Passive Solar Systems

Generally speaking, a passive solar system requires no moving parts and no external energy source except the sun itself. Passive water heating systems are not much more complex than a regular garden hose that has been left in the sun. The basic passive water heater consists of one or more 40 gallon water tanks that have been painted black and placed in a well insulated box that has glass or plastic on one side to allow the sun's rays to heat the tanks. This Integral Collector Storage (ICS) system, also known as a "bread box" or batch heater, allows cold water to flow in from



Breadbox or batch heater This passive system allows cold water to flow in from the bottom and hot water to flow out of the top.

the bottom and hot water to flow out of the top. The system operates using only the water pressure from the city or



Drain back system The direct systems must be allowed to drain to prevent damage.

where the heat it contains is transferred to the household water.

While direct systems are more efficient than indirect ones, they require more maintenance and are prone to scaling: a build up of mineral deposits that can close smaller pipes. In addition, the direct systems must be allowed to drain to prevent damage from freezing or overheating. This drain down design limits installation options and requires additional components.

your well. Water from the system is then routed to a standard water heater, where your thermostat determines if the water is already hot enough for use or if additional heat is necessary.

Active Solar Systems: Direct and Indirect

Active water heaters are more efficient than their passive brethren, but they also require more equipment in the form of collectors, sensors, circulating pumps and controller mechanisms.

Active systems come in two categories: direct (sometimes known as open loop) and indirect (closed loop). Direct systems heat water in the collectors. Indirect systems do not heat the household water, but instead they employ another fluid such as freon, distilled water or propylene glycol. After the fluid is heated in the collectors, it travels through a heat exchanger,

Collector System Basics

The flat plate solar collector is a very simple machine. An insulated rectangular box, it contains a metal plate (usually copper) that has been painted black, with headers made of 3/4 inch or 1 inch pipe at each end that are connected to small tubes called risers made from 1/4 inch pipe. Supply water flows from the header into the risers where it is heated and then returns to the storage tank. The entire box is covered with tempered glass, which is hail resistant, and then installed at an angle equal to latitude plus 10 degrees.

Simple or complex, solar water heater systems save money

Storage Tanks

Whether the design used is direct or indirect, a large storage tank will be required. The most commonly used size is 80 gallons. Similar in shape to a water heater, solar water storage tanks

continued on pg 3

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Visit our web site for a calendar of events:
www.txses.org

Everyone Wins When You Conserve Water!

There are many simple things you can do at home to reduce water use and therefore your utility bill. This does not mean a sacrifice; it just means minor adjustments to use water more efficiently.

Water Conservation Tips: Outdoors

Sunbathing and watering don't mix. Water lawn and garden during the coolest part of the day. Water in the early morning to reduce water lost to evaporation. Or, try evening watering, but keep in mind that plants and grass are more vulnerable to disease and fungus if watered then.

Put some spring in your step. Step on your grass to see if it needs watering. If it springs back, the lawn is fine. If it does not, water it, but use an empty tuna can or similar container to measure how long it takes your sprinkler to apply one inch of water. Use that time for future watering.

More is not always better. The truth is, watering your lawn too frequently weakens it. Wet grass burns in the hot sun and is vulnerable to disease. Limit lawn watering to once every five days. Water about an inch.



Save a little from a rainy day. Collect rainwater in a barrel and use it to water your garden.

Let your hose spring into action. Use a spring-loaded nozzle shut-off on your hose. Hoses without a shut-off can waste five gallons or more per minute when running.

Don't worry if your grass turns brown. Grass naturally becomes dormant during hot, dry spells; so don't worry if it begins to fade. Lawns will revive quickly after a good rainfall, or when the weather becomes cooler.

Give your garden a slow soak. Water shrubs and gardens using a slow trickle around the roots. A slow soaking encourages deep root growth, prevents water loss, and reduces leaf burn and mildew. A watering can also makes a good alternative to the hose.

It's never going to turn green so why bother? Make sure your sprinkler is watering the grass, not the driveway or sidewalk.

Nip the competition in the bud. Reduce weeds in your garden and you'll reduce competition for water.

Feed your garden to prevent thirst. Mulch around flowers, shrubs, vegetables, and trees to reduce evaporation, promote plant growth, and control

weeds. Grass clippings, shredded newspapers, wood chips, pebbles, and hay all make good mulches.

Give the proper sprinkler a whirl. Choose a sprinkler that's right for your lawn. Choose one that waters close to the ground with large drops to prevent evaporation. Make sure it sprays evenly, and ensure that soil and grass absorb the water. No run-off!

Take up roots. Consider planting less grass. Shrubs and ground cover require less maintenance, less water, and provide year-round greenery.

It's all in the training. Certain plants are hardier than others and better able to survive an extended dry period. Train your plants to expect less water this spring. Encourage strong, deep root growth by letting plants dry out. Then water generously with a slow trickle to the roots. Check your local nursery for advice on plants that are the most likely to survive an extended dry period.

It's just as good the second time around. Recycle your wading pool water by using it to water your garden. Your plants and grass won't know the difference.

continued on pg 3

Chairman's Corner

with Jaya Pichumani

Chasing the Summer Blues

I've heard before that there are only two seasons in Texas: hot and HOTTER! With so much sun and heat around us, solar enthusiasts should have lots of ideas for spreading the benefits of solar energy. While complaining about the heat and trying to stay cool, we'll have to remind ourselves that there are ways to make use of all that free energy.



This edition of the *Solar Reflector* focuses on hot summer topics: efficient and environmentally friendly ways to keep cool through the summer; water conservation; and solar water heaters. Although they may seem slightly unrelated, the connection is their importance and relevance that becomes more obvious during the hot summer months.

We'll see many days when it will seem unbelievable that every home and commercial building with hot water needs in Texas is not equipped with solar water heaters. There are many developing countries with climates similar to Texas where every home has a solar water heater. It's not just a choice for the wealthy or those environmentally minded but the most feasible way to get hot water--and in some areas, the only way. Although promoting all forms of solar energy is TXSES's general mission, we'd like to make a special effort to promote solar water heating. It doesn't always make headlines like other solar technologies. Solar water heating can and should have a larger role as one of the many renewable energy options for Texans.

Although it's tempting to take the easy way out by cranking up our air conditioners at home, at work and in our cars (which most of us are guilty of), we'd like to provide some reminders that

there are other ways to be cool by reducing our cooling needs that can ultimately lower our electricity usage as well as our electric bills. Or at least prevent them from skyrocketing. This will help us be less demanding of our resources. No one is advocating being hot and miserable, but it's very easy to push our resources to the extreme while we do have other options.

Summer camps are great opportunities to show kids how solar energy can be part of their lives. From cooking hot dogs in solar cookers to racing solar cars, you can find lots of activities on our web site: www.txses.org. Whatever your summer activities include, stay cool, but also remember to maximize the potential from our sun.

Jaya Pichumani is the Engineering Manager in the Advanced Energy Division of CSG Services.

Summer Savings

Have you noticed that it's warm outside?

Well, let's save for another day the notion that we should put the sun's heat to work for us in Texas. And we'll only mention in passing the fact that warm air and sunlight combined with the byproducts of burning fossil fuels generate ground level ozone that's hard on human health. Aren't there some things we could do this summer that don't involve changing the world? I'm glad you asked.

Blow it off!

Turning on a ceiling fan (any fan, really) where you can feel its air movement on your skin makes the room feel 4 to 6 degrees cooler. This allows you to set thermostats up a few degrees and still be comfortable. Each degree set below 78o results in approximately an 8% increase

in your cooling costs! Of course, your skin has to be in the room to feel the benefit. Turn off the fan when you leave.

Keeping air moving freely in your air conditioning system effects how much energy the system uses. That's why it's important to change or clean your filters every month, and keep furniture and storage away from your return air grills. Check your ducts and repair and seal any leaks from breaks, tape failure, disintegration or raccoon relocations.

It's also a good idea to have equipment cleaned and checked each year to make sure that air can freely contact the condenser and evaporator coils.

Note how frequently your unit turns on and off. If it seems quite frequent and runs for less than 10 to 15 minutes each time, then the equipment is probably oversized. Longer, more continuous runs are more efficient and result in much greater humidity control and comfort! Consider replacing oversized equipment with a smaller system with the highest SEER rating you can afford to help pay back the replacement cost much sooner.

If you use window units, don't overwork them. Close off rooms that are not being used.

Put your hat on!

There's a reason we wear hats in Texas and sit under trees when we can. Shade feels good because it protects us from the harshest rays of the sun. Protect your house and pocketbook as well. Shade your windows with permanent overhangs, awnings, shade screens, trees or trellises. Curtains and drapes are less effective than exterior shading but they do help. So use them. And depending on the age or condition of your windows, you may want to add a solar film or consider new low-e, low solar gain replacement windows.

Remember that your roof is absorbing most of the sun's energy without benefit of a tree's breezy structure or purposeful conversion of that energy. It's absorbed and builds up as attic heat. If you can feel heat radiating from your ceiling, consider adding attic insulation (existing may have settled), installing a radiant barrier or adding ridge ventilation.

Shut the door!

Close any obvious openings when your air conditioning system is on or in "automatic." And turn the system off on those rare days that permit you to throw open windows and doors. Make sure the fireplace damper is securely closed. Restore caulk and repair seals and weatherstripping at

windows and doors, cracks and plumbing or electrical penetrations. (Check behind the sinks.) Replace worn refrigerator and freezer door gaskets if you can close the door on a dollar bill and either pull it out easily or it falls by itself. Let frozen food thaw in the refrigerator. (Yes, it takes longer but it reuses the cooling.) Turn off refrigerators and freezers in garages or other unconditioned spaces. Replace refrigerators and freezers older than 10 years old. Choose top and bottom combinations rather than side by side; top-loading freezers instead of upright.

Take the heat off!

Many everyday activities that generate heat just make our air conditioning problem worse. When possible, shift activities to other seasons, outdoor venues, or times of day outside the 2 to 8 o'clock air conditioning peak. Don't use the oven, unless it's a solar oven outside. Use covers when you're cooking to heat things faster and directing more of the heat for cooking and requiring less energy overall.

Set back your hot water heater to 120°. Turn it off when you go on vacation or are gone for more than 3 days. (And don't forget to set your thermostat up a few degrees whenever you will be gone.) Never run hot water continuously while shaving or washing dishes. Set your refrigerator thermostat to 36°-38° and freezer to 0°-5°. It generates tremendous waste heat to remove another couple of degrees from the inside. Use low flow showerheads and take quick showers. Wash and dry only full loads of laundry, using cold water.

If you use a drier (try the sun!), dry loads in quick succession to avoid losing the energy used in heating up the drier initially. Clean the lint filter after each load. Do your ironing all at once in the morning or after 8 in the evening. Run only full loads of dishes; and let dishes air dry. Experiment with detergents to see which eliminate spots or streaks.

Use compact fluorescents for lights left on for most of the evening. Turn off incandescents every time you leave the room. Dust lights and lampshades so you can use fewer lights overall. Dust can reduce effective light by as much as 50 percent, but you still get all the heat! Use timers to turn lights on and off when you're away, instead of leaving lights on continuously. Consider solar security lights outside.

Save your community a bundle!

One of the largest energy users in every community is your water and waste water utility. They require huge amounts of pumping energy to move water through the purification process and through the distribution system. You can help your community reduce its electric generation needs by being more water conscious. See the accompanying article for tips on saving water. Use water thoughtfully--and gratefully.

And don't forget your sunscreen!

I hope you'll find something here to help you save energy this summer. Have plenty of fun in the sun. And don't forget your sunscreen.

Tom Fitzpatrick, a TXSES Board member, is an Energy/Codes Specialist with the Energy Systems Laboratory, Texas Engineering Experiment Station.

IF YOU USE ENERGY YOU SHOULD BE HERE:

The Texas Renewable Energy Roundup, the Southwest's largest sustainability fair in downtown Fredericksburg, Texas.

Speakers, Exhibits, Demonstrations, Food, Workshops, Tours, Kid's Activities, Music

SEPTEMBER 20-22, 2002

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- GREEN & SUSTAINABLE BUILDING
- ENERGY CONSERVATION
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- STRAWBALE CONSTRUCTION

organized by:

Texas Renewable Energy Industries Association and the Texas Solar Energy Society
Contact: Kathryn Houser
Roundup@txses.org
P.O. Box 9507, Austin, TX 78766-9507



IREC's Solar Means Safety Educational Campaign

The Interstate Renewable Energy Council (IREC), in collaboration with the American Solar Energy Society, the Department of Energy, the National Renewable Energy Laboratory, the Solar Electric Power Association, and the Solar Energy Industries Association, has recently launched the **Solar Means Safety** educational campaign, designed to help consumers and businesses use solar energy as a solution to our nation's energy problems. The campaign features a smartly packaged series of six fact sheets describing solar power's versatility and flexibility for a variety of uses:

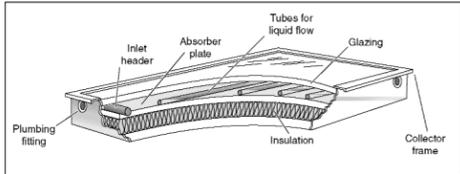
- Solar Means Safety
- Solar for Safer Air and a Cleaner Environment
- Solar For Traffic Safety
- Solar for Safer Public Buildings
- Solar for a Safer Energy Supply
- Solar for Disaster and Preparedness

"The goal of the campaign is to reach out to groups that aren't traditionally part of our solar family-like firefighters and police--and help them realize that solar energy has great applicability to the work they do," said Jane Pulaski, IREC's Program Manager for the campaign. "As we know, solar powered energy provides that clean, reliable power source, while adding huge value to local governments' disaster relief plans. It's up to us to broaden our base of support and help others realize that PV should be a part of a city or county's energy and safety plans before the need arises," she said.

The fact sheets are available in hard copy, though supplies are limited. They're also available in PDF format, and can be found at the web site: www.SolarMeansSafety.irecusa.org.

For more information about the **Solar Means Safety** campaign, or how you can fit it into your organization's energy and safety plans, visit the web site, or email Jane at jane@SolarMeansSafety.irecusa.org

866-SUN FAIR
WWW.RenewableEnergyRoundup.com
photo by Juan Carrasco at Austin Energy



Liquid heating "flat plate" collector

It is a very simple machine.

must be highly insulated to preserve the heat gained by the collectors. From the storage tank, the water is usually routed to a standard water heater.

Tempering or mixing valves are recommended for residential water heating because solar systems typically heat water to 180 degrees, which can be a safety hazard especially with small children. The tempering valve can be set to 120 degrees and allows cold water to mix with the hot water before it reaches the faucet.

Solar water heaters can provide half or more of the hot water needs in the average home.

Getting more from your system

Have you already installed low flow showerheads and aerators on all faucets? This is a cost effective method of not only conserving water but also reducing hot water demand as well.

The time of day when you use water can greatly affect how far you can stretch your solar heated water. For instance after normal morning water usage (when you schedule allows) wait until around noon to do laundry. This allows the solar system to heat up during the morning and to recover again in the afternoon.

Do it yourself?

Passive hot water systems, which range in price from \$800 to \$1,500, are among the easiest ways to incorporate solar design into the home. Because of their simplicity, many homeowners design, build and install passive hot water systems themselves for under \$400. If a homeowner does not want to embark on a project without help, there are a myriad of instructional videos, blueprints and other material available to the home handyman.

Of course, a competent contractor can reduce the hassle factor. If you decide to use a contractor, ask friends for recommendations and be sure to ask potential contractors about their experience with the type of system you want installed. Whether you build it yourself or purchase a passive system,

all permits should be purchased and local plumbing codes followed. The installation of an active solar system, which can cost \$2,000 to \$3,500, is best left to a professional. The best equipment may not operate correctly or may even be ruined by a bad installation. For a database of solar thermal professionals, see www.txses.org at "Product and Service Providers."

This article was excerpted from the Infinite Power of Texas fact sheet #10, written by TXSES members and funded by the State Energy Conservation Office. To read the complete set of fact sheets, go to www.InfinitePower.org

conserve water con't.

Let it grow... Let it grow... Let it grow. Short grass belongs on the golf course. Let your grass grow longer than usual (about 3 inches) to provide shade for roots. Taller grass absorbs water better and looks richer. Set mower wheels to the highest cut.



Use a little elbow grease. Clean your sidewalks and driveways with a broom, and get some exercise at the same time.

Wash your car or truck less often. When you do clean your vehicle, try using a bucket. Wet the vehicle and then turn the water off while you wash. Rinse it on the lawn.

Water Conservation Tips: Indoors

Don't flush it down the drain. Consider the cumulative effect of each 5-gallon flush. Toilets account for about 40 per cent of total household water use. Combine that with showers and baths and you'll see why 75 per cent of all indoor water use occurs in the bathroom. New toilets use only 1.6 gallons per flush.

Add color to your day. Check for a leaky toilet by putting a bit of food coloring in your toilet tank and waiting about 10 minutes to see if the color appears in the bowl. It's not uncommon to lose up to 115 gallons a day from one of these otherwise invisible toilet leaks.

Treat your toilet with respect. Put trash in its rightful place—the garbage can.

Control the flow. Replace your showerhead and toilet with low-flow models, and install aerators on your faucets. An aerator is a simple device that mixes air with water from your faucet to reduce the flow. It cuts down on splashing, too.

Don't let your water run away from you. Don't let your faucet run continuously when brushing your teeth or shaving. Turn the water off while you brush or shave.

Shower the water-wise way. Take shorter showers whenever possible, and turn the water off while soaping up. Five minutes is enough for most people. If you prefer a bath, try not to overfill the tub.

Be a leak seeker. A little leak can lose a lot of water. A dripping faucet can waste as much as 70 gallons of water each day. Check every faucet in your home for potential leaks.

Do you know how to shut off your water? Do you know how to turn off the water in an emergency? Locate the master shut off valve, and you will be able to deal with leaks more quickly.

It's the real diet drink. Keep a jug of ice-cold water in the refrigerator instead of running the faucet for cold water. It saves water and makes for a great thirst quencher.

Give your dishes a dip. Don't leave the faucet running as you wash dishes; fill the sink with water for rinsing instead.

Give vegetables a bath instead of a shower. Wash vegetables and fruit with a vegetable brush and a basin of water rather than under a running tap.

Fill'er up. Make good use of your dishwasher and washing machines by using them only when you have a full load.

Share your ideas with your children and friends.

Don't keep your water conservation tips a secret. Tell your friends and neighbors, and ask your kids to help out. Set a good example and see how many ways you can think of to cut water use in your home and garden.

These ideas for conserving water were provided by the City of Austin Water Conservation. For more information, see www.cityofaustin.org/watercon

Renewable Chatter

with The Solar Guy

Dear S.G.

I'm considering a solar water heater. Are they a good investment in Texas? How do they compare with electric, propane or gas water heating in terms of payback?

A long time TXSES member
Coldwater, TX

Dear LTTM,

Solar hot water (SHW) or solar water heating is one of the very best of the solar energy options, particularly compared to electric water heating. Then the payback is in the range of 5 to 10 years, depending on the particular system and the local cost of electricity. Against natural gas or propane the payback is somewhat longer—possibly 10 to 15 years. There are two other attractive features of SHW: for electric utilities they are peak shaving and they provide "distributed generation" (DG in today's parlance). That is, on those days and periods of the day that electric utilities in Texas experience their peak demand (between about 4 and 8 pm on the hottest and sunniest days of the year) solar water storage tanks are fully charged and demand little or no electricity. Each residential SHW system provides about a 0.4 kW reduction in demand compared to electric water heating. And since they are located at the point of demand, they represent a means for a "distributed reduction in the need for electrical power." In many urban areas electrical distribution lines are at capacity, so production or reduction at the point of demand is of great interest. Really, every municipality and electric utility in the south should encourage and provide incentives for this technology. The cost of a typical SHW system is between \$2000 and \$3500 installed, depending on the type of system.

So yes, solar water heating is good for you, good for the utility and good for the environment. So GO SWH!

The Solar Guy

Dear S.G.

I would like to use solar power to pump water between a 30-gallon pond and an inground cistern about 3 feet deep. I am going to use the setup as a watering and bathing trough for my

dog in the summer. She's a water-loving lab. I figure that if I can drain the water into the cistern through some small PVC pipes and pump it back into the pond, it will cool it and keep it moving in the hot summer months. Any advice you can give me would be appreciated.



Regards, David J. Granniss, DBU

Dear David:

Sounds like a "cool" idea, at least for Bowser! Hope you have alternate plans for yourself to escape the summer heat.

PVC is good for piping but not very good for the heat exchange surfaces in the cistern, so you will need to provide extra area there to do the job. You don't say how fast you want to circulate the water, but I'll assume the 30 or so gallons a few times each hour. Since the head (3 feet) is very small this should be relatively easy.

Since solar (PV) panels are DC, you will need a DC circulation pump. Suggested sources are West Marine or Academy that have 12-volt DC pumps for aerating fish tanks. They have at least two, one being 500 gph that draws 2.5 (therefore about 30 Watts). This may be more flow than you need. In any case, this matches well with a typical PV panel. You could just hook a PV panel (30 Watt, 12 volt) up to the pump directly, and this would do the job when the sun is shining. The pump will be about \$20-30, and the panel will be about \$150-200. Since your concern is to keep the water cooler while the sun is shining, you should be able to use the power directly and not worry about storage in batteries for cloudy days.

Happy wading, The Solar Guy

2002 National Solar Conference in Reno "Sunrise on the Reliable Energy Economy"

The American Solar Energy Society's annual conference will be held June 17-19, 2002, in Reno, Nevada. Multiple speaker tracks of peer-reviewed papers will be presented throughout the three-day conference. In addition, the following notable speakers will address the full conference: David Garman, Assistant Secretary for Energy Efficiency and Renewable Energy, US Department of Energy; Larry Kazmerski, Director of the National Center for Photovoltaics at the National Renewable Energy Laboratory; Amory Lovins, CEO, Rocky Mountain Institute; Paul MacCready, *Time Magazine's* "Engineer of the Century"; and William McDonough, American Institute of Architect's Committee on the Environment. The Sunrise Sustainable Resources Group, the Nevada ASES chapter, is hosting the conference and will also produce the Sunrise Sustainability Expo the weekend preceding. With exciting speakers, over 200 technical presentations, dozens of tours and workshops, and social events with renewable energy advocates, practitioners and friends, Solar 2002 is an event you don't want to miss. For more details, see www.ases.org/conference or call the ASES offices in Boulder at 303-443-3130.

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