

2002 Truckee Energy-Smart Home Tour

October 26

**Passive & Active
Solar Systems**

**Geothermal Heat
Pumps**

**Advanced Home
Weatherization**

Clean Air for Truckee

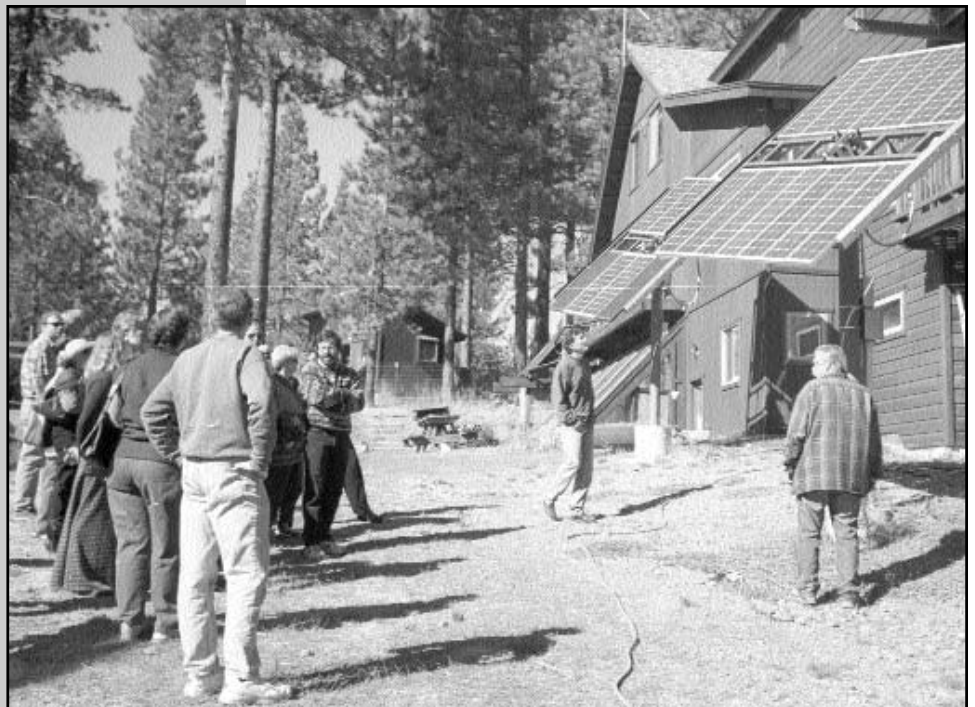
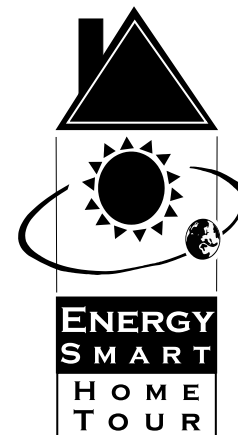


Photo from Truckee Solar Home Tour 2000

Your Guide

- **Schedule of Events** p3
- **Site Descriptions** start p5
- **Resource Directory** p19-20

Keep this guide as a resource throughout the year.



Truckee Ground Source Heat Pump & Advanced Weatherization/House as a System Research

By: Scott Terrell

Truckee Donner PUD teamed up with the Sacramento Municipal Utility District and the California Energy Commission to evaluate the performance of GSHPs and the benefits of advanced weatherization and treating the “house as a system”. The “house as a system” approach involves looking at several different issues in the home and treating them rather than just focusing on one issue like a new heating system or adding insulation. This report includes discussions on both the 1996-98 as well as the 2001-2 research as the earlier research was important in determining the need for the later.

The CEC funded geothermal research that was done in 1996 to 1998 focused on the performance of the geothermal heat pump systems. Two of the significant findings in the study were that the heat pump units varied moderately in their coefficient of performance (COP) from “least” efficient to “most” efficient. More dramatic was the variability in energy usage from site to site. This is very helpful in showing how significant site conditions are to the economic benefit high efficiency heating brings to the building occupant/owner who is responsible for paying the energy bills.

There are two types of site conditions that affect the cost of heating a building. One is the external site conditions where the building owner has little or no ability to affect. This would include such factors as weather conditions affecting outside air temperature, shading caused by other buildings, trees or other objects, etc. Each site has its own micro-climatic conditions affecting the heating requirements of a building, therefore the cost to heat. The other major site factor is the building itself. Some of the common issues with buildings affecting the cost of heating include: floor, wall and ceiling insulation levels, single vs. double-pane windows, air leakage in the building envelope, distribution system design and distribution system air leakage issues. These are all factors

that the building user and bill payer can improve.

After the 1996-98 CEC funded geothermal heat pump research project it was evident that some sites were not performing very well even though their ground source heat pump units were operating very efficiently. It did not make sense that a home with a super high efficiency heating system had high energy bills. It became evident that we needed to look into making the building and distribution system more energy efficient so that the heat pump could perform as expected and provide low energy bills to the user. The bottom line is it does not make sense to put a high efficiency heating system into a low efficiency building.

After the 1996-98 study, TDPUD did start promoting the “House as a System” approach with all future geothermal heat pump installations. The idea was to first make the building as cost-effectively energy-efficient as possible. This would then bring the sizing of a heating system down. In many cases we were able to reduce the heating tonnage requirement down by about one ton or 12,000 btu’s per hour. This would save about \$4,000 for the cost of a geothermal heat pump installation and also reduce the cost of heating the building each Winter. This could all be done for an average conservation investment of about \$1,500 to \$2,000 per site. The question then became what really are the economics of doing this? This is when SMUD and TDPUD decided to approach CEC staff to do the 2001-02 study.

TDPUD and SMUD received the go ahead to do this study in the Fall of 2001. The sites were set up for monitoring and the “House as a System” work was performed midway through the monitoring. Each of the five Truckee sites had remediation work of between \$2,000 and \$3,000. In some cases the economics of the remediation work was very good and in other cases the economics were marginal. One issue we should note is that all five Truckee sites bordered on extreme



(above) Foam insulation in a crawlspace about to be applied between foundation wall and knee wall

in that some were non-operational prior to the study. The Truckee project manager believes that these were the “worst” under-performing geothermal heat pump sites out of about 50 in Truckee. So not only did the sites require efficiency work, but they required other remediation work to bring them to a standard operational mode. Also, in some cases efficiency work had already been performed on some of these sites reducing the calculated benefit efficiency would have provided these projects had all the efficiency work been performed during remediation and monitoring, not prior to.

(below) Mastic sealing on central air distribution plenum next to GSHP



It may be that these under-performing sites would have shown even better economics if only the basic, most cost-effective remediation work had to be performed on them. If any sites had un-insulated attic spaces they would have shown great improvement. Only one site was practical for adding additional insulation. It was already insulated, but could use a little extra. All sites required reduction in building envelope infiltration. Most sites required a

reduction in central air distribution system or duct leakage. The building and duct infiltration leakage reduction is generally cost-effective. Most sites received a vapor barrier on the dirt crawlspace floor. That is a helpful measure, but is not one of the more cost-effective measures. The economics could have also been improved if the building owners/managers had been able to per-

see Research p17

Welcome!

With Truckee's interest in 'Energy-Smart' homes growing, the call for an event such as this rings louder. Thank you for being curious and for being a part of the 2002 Truckee Energy-Smart Home Tour.

Energy prices are on the rise and there's no better time than the present to seek out the options available for saving your hard-earned dollars. With the extreme environment of this area in mind, this year's tour focuses on energy conservation and the variety of renewable technologies available to us. Many of the solutions to our heating and/or cooling problems can be easily cured by careful planning and often can be alleviated with fairly simple, do-it-yourself-today remedies. You don't need to be a rocket scientist, or energy expert, to identify and eliminate these common problems. Our town is blessed with many people who have the knowledge about efficient and renewable technologies and are willing to share with others - all we need to do is ask.

During the tour, you will have the opportunity to visit a number of 'energy-smart' homes. These homes demonstrate new ways of creating and storing heat, utilizing efficient and renewable technologies. Many thanks to the following 6 homeowners who have generously offered their homes for public display:

*Neal & Sue Mock
Mike & Becky Kerton
Howard & Jane Wright
Penny & Bob Fink
Jim & Christine Guinn
David Saccullo*

A gracious thank you to the following businesses for opening their

doors as well:

*KidZone
Teen Activities Center*

So many people offered the inspiration in creating this year's Truckee Energy-Smart Home Tour. A special thanks goes to the Town of Truckee, who each year provides us with a bus to ferry around our tour-goers. Likewise, Scott Terrell and the Truckee Donner PUD have been truly invaluable in supporting this project. It is refreshing to know that we live in a community where the city government and local utility district are willing to extend their hand for such a worthwhile endeavor.

Thank you to the vendors and presenters for being dedicated to the cause and giving their time and expertise.

Mary Hetherington & Tony Pastore, thank you for being volunteers and registering our participants at that early hour. Thank you to Mayumi Elegado for the organizational insight and for putting together the program guide. Big thanks to Karin Hedman for bringing together the tasty lunch treat. And last but not least, we'd like to thank New Moon Natural Foods and Soul Sushi & Barbecue for making our farm-fresh, organic lunches possible.

This year's dedicated group of people worked hard to plan this event that is better than we have done in the past. I hope you enjoy this event as much as we enjoyed bringing these people together today to share their knowledge. Next year this event will be hopefully even more expansive and we look forward to your involvement.

*-Rick Solinsky, Tour Organizer
Proceeds from this event go to KidZone*

Tour Schedule

- 8:00 - 8:30 **Registration**
- 8:45 - 9:30 **Mock Home** p5
- 9:45 - 10:30 **Kerton Home** p6
- 11:00 - 11:45 **Wright Home** p7
- 12:00 - 1:30 **Fink Home** p8
& Lunch
- 2:00 - 2:30 **Guinn Home** p13
- 2:45 - 3:30 **Saccullo Home** p14
- 3:45 - 4:30 **Activity Center** p15
& **KidZone** p15



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Mock Home

Project: Photovoltaic Intertie System

Owner: Sue & Neal Mock

Size: 1,280 sq. ft.

Designer: Solar Wind Works & Neal

Date of

Construction: Summer 2002

Builder: Neal & Solar Wind Works



Site Characteristics or focus during construction or remodel: Deck location offers best southern exposure for panels.

Construction Type: Reinforced deck railing to support 20 panels.

Passive Solar System: N/A

Active Solar System: 2, 10-panel strings of BP4160 panels (approx 3 KWatt) powering a Sunny Boy 2500 Watt Grid Intertie Inverter. Panels are mounted to deck on adapted Zomeworks Universal ground mounts.

Main Heating System: N/A

Auxiliary Heating System: N/A

Conservation Features: Home has all Compact Fluorescent light bulbs

Subjective Evaluation/design considerations: Only moving part of system is the wheel in power meter spinning backwards when full sun on panels. Still need to change out electric hot water heater to break even electrically.



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 - Photovoltaic PV Systems & Components
 - PV Modules
 - DC to AC Power Inverters
 - PV Charge Controllers
 - Batteries & Chargers
 - Solar H2O Pumping Systems
 - Balance of System Equipment

Kerton Home

Project: Kerton Residence

Owner: Mike & Becky Kerton

Size: 4,000 sq. ft.

Designer: Mike & Becky Kerton

Date of
Construction: 1984

Builder: Mike & Becky Kerton

Site Characteristics or
focus during construc-
tion or remodel:
Direct Southern Exposure

Construction Type:
Standard 2x6 wood frame,
R-19 fiberglass Batt insula-
tion with 1/2" of
Polystyrene over shear,
under siding

Passive Solar System:
Attached sun space

Active Solar System:
N/A

Main Heating System:
2 90% + F.A.U. Natural
Gas

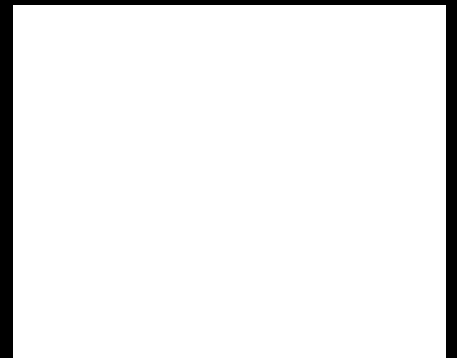
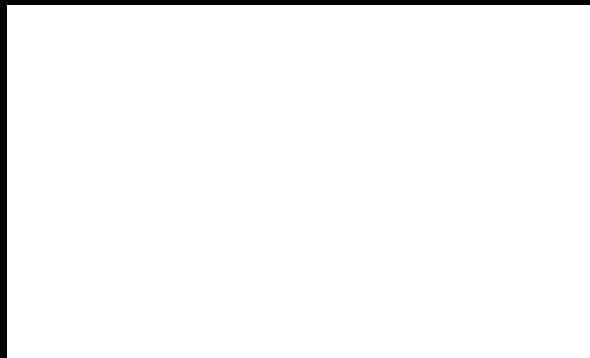
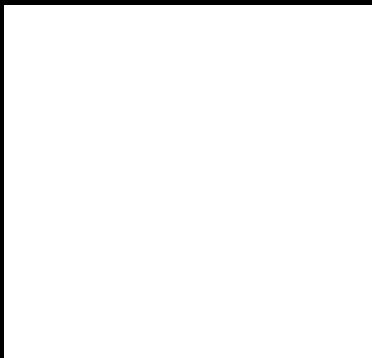
Auxiliary Heating
System:
Wood

Conservation Features:
Ceiling Fans, added insula-
tion, wood heat ducting

Subjective
Evaluation/design
considerations:
N/A

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Wright Home

Project: Wright Residence
Owner: Howard & Jane Wright
Size: 2,050 sq. ft.
Designer:
Date of Construction: approx. 1970
Builder:



Site Characteristics or focus during construction or remodel:

South-facing glass

Construction Type:

Standard 2x4 wood frame

Passive Solar System:

South-facing glass w/ some thermal heat mass and woodstove hearth

Active Solar System:

N/A

Main Heating System:

5 ton Ground Source Heat Pump

Auxiliary Heating System:

Wood Stove

Conservation Features:

In the summer of 2002, the following was performed: 1) Building envelope air leakage reduced from 3,350 to 2,370 cfm
2) Distribution system air leakage reduced from 430 to 315 cfm (29% improvement)
3) Distribution system air flow improved from 905

to 2,150 cfm (27% improvement) which corrected 54% below normal air flow problem.

Subjective Evaluation/design considerations:

There were problems with heating the home due to distribution system air flow problem and leakage in distribution system and building envelope. It is hoped that the corrective work performed in 2002 will result in low heating bills expected with a home heated with a ground source heat pump

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EARTH

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- Tomas Kuhn, 1962

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Fink Home

Project: Fink Residence

Owner: Penny & Bob Fink

Size: approx. 7,000 sq. ft.

Designer: Henrik Bull

Date of Construction: Started 2001

Builder: The Finks & Builder



Hallway

Site characteristics or focus during construction or remodel:

South-facing down-slope lot. Main part of house to be single floor to provide wheelchair accessibility.

Construction Type:

Rammed Earth/Pisé. Pisé is a form of rammed earth where the pressure is applied by shooting the earth-cement mixture from gunnite guns. In this case it is shot from both sides of a wall against a core of solid insulation panels. This is the first house to be built this way. The entire main floor is earth-bermed for insulation. Ceiling will be open beam and rafter – using glulams – and planks. There is no attic. A “green” roof will eventually cover the building. This slopes to ground level at the earth-bermed west end of the building. Wildflowers, and low-growing, shallow-rooted perennial plants, such as thymes, will be planted.

Passive Solar System:

Almost all windows are south-facing – on the main floor, the south facing walls are mostly window. Some sky-lights. Enormous heat-

mass in concrete slab and Pisé walls.

Active Solar System:

A solar water heater will be used to preheat the incoming water to the Takagi instant water heater.

Main Heating System:

Ground-source geothermal, with hydronics in the slab floors.

Auxiliary Heating System:

Two propane-fired fireplaces.

Conservation Features:

Rammed earth walls, green roof, earth berming, passive solar, high heat-mass, solar water pre-heat, minimal use of wood.

Subjective Evaluation/design considerations:

What were we after? The items on our principle agenda were: As close to zero maintenance as possible – inside and out – including, easy to clean! (We have been slaves to our wood-frame houses.) Fireproof. (The site is in a forest.)

Passive solar, earth-bermed, green-roofed, high heat mass, energy efficient. (Our current Tahoe house is passive solar, and despite it’s leakiness we use much less heat than our neighbors – we have windows open when they are lighting fires! Our Berkeley house also had a passive solar component.)

Solidity. (We love the feel of thick-walled European buildings. Our current wood-frame house shakes in the wind.)

Minimal use of wood. (Both from a conservationist viewpoint, and, again, the European aesthetic.) This includes not using wood windows – we are using fiberglass framed windows.

Access from living area to outdoors and garden. We wanted the house and the outdoors to be one – and on the same level, not raised above on a deck.

Simplicity in design – clean uncluttered lines. We wanted the building to be the statement, not it’s trim.

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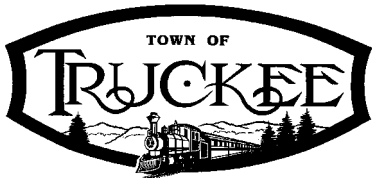
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Compact Fluorescent Light Bulbs Save Dollars and Make Sense

By: Jason Mills

Replacing the standard incandescent light bulbs in your home with highly efficient, compact fluorescent light bulbs (CFLs) is one of the simplest, fastest, and most inexpensive ways to decrease your electric consumption and lower your energy bills.

The incandescent bulbs that are probably lighting your house now have changed very little from the original light bulb that Thomas Edison designed in the late 1800s.

Only 10 percent of the energy used by these bulbs is actually

used to make light; the other 90 percent is wasted in the form of excess heat. There are much more effective ways of heating your house than with light bulbs.

In contrast, compact fluorescent light bulbs produce very little heat, use 75 percent less energy, and can last up to 10 times longer than their incandescent counterparts. Each CFL that is used can save you more than \$25 throughout the course of its lifetime,

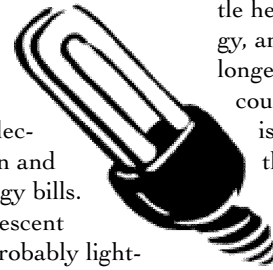
depending on frequency of use and local electricity rates. Also, due to their longevity, one CFL can also keep 13 standard bulbs and packaging from going to the landfill, not to mention the time and hassle of having to replace all of those bulbs in hard to reach places.

If you replace only 25 percent of your lights in high-use areas with fluorescents, you can save about 50 percent of your lighting energy bill. Of course, the more you install, the more you will save.

The compact fluorescents of today, as compared to those of only a few years ago, turn on instantly without flicker and produce a warm, inviting light of whatever spectrum you desire. There are also more versatile sizes available and they can be used just about anywhere, including dimming and outdoor fixtures.

When shopping for CFLs, be sure to bring along fixture dimension information and to read the package carefully before purchasing. If you have any questions, ask a knowledgeable salesperson for help to ensure that you get the right CFL for each application.

For more information on CFLs and other energy efficient products and appliances, contact the U.S. Energy Star Program at 888-STAR-YES or www.energystar.gov.



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California offers \$8 million in rebates

By: Chris Worcester

This is a well-kept secret. It is now more affordable to generate your own electricity using renewable energy. Since December 19 2001, the California Energy Commission has allocated eight million dollars in rebates for renewable energy electric generating systems.

Only 48 reservation requests have been submitted for the eight million dollars (totaling nearly half a million dollars), now available to customers of local publicly owned electric utilities, for small renewable energy systems of 10 kilowatts or less. Customers of the Truckee Donner Public Utility District are now eligible, too.

The California Energy Commission is offering cash rebates on eligible renewable energy electric-generating systems through the Emerging Renewables Buydown Program.

The rebate funds are distributed from the Emerging Renewable Resources Account and offers \$4,500 per kilowatt, or 50 percent off the system purchase price (whichever is less).

What generating systems are eligible?

- * Photovoltaics (PV) - solar cells that convert sunlight directly to electricity.
- * Small Wind Turbines - wind turbines with an output of 10 kilowatts or less.
- * Fuel Cells - devices that use a chemical process to convert renewable fuels into electricity.
- * Solar Thermal Electricity Systems - systems that use solar heat to generate electricity.

What are the system requirements?

- * The system you purchase must be among the four eligible generating types listed above. The system's electricity production should not exceed 200 percent of the

site's historical or current electricity needs.

- * The retailer must provide a minimum five-year warranty.
- * You can have your system installed by a licensed contractor or you may install it yourself. (The difference is that labor cost of the contractor-installed system can be counted towards total eligible system costs while a "do-it-yourselfer" cannot include his or her labor cost as part of total eligible system costs.)
- * Some systems or their components must meet national standards.

Who is eligible to apply?

Every type of utility customer is eligible: residential, commercial, agricultural and industrial.

You can purchase electricity from any electric service provider, but your proposed site must be within the electric utility service area of either Truckee Donner Public Utility District or Pacific Gas and Electric in our immediate vicinity. For a complete list of local publicly-owned electric utilities & other qualifying Utilities in the state, go to the CEC web site: <http://www.energy.ca.gov/renewables/emerging.html>

You must also be and remain connected to the utility grid, in order to qualify for the Buydown Program.

Locally, Solar Wind Works has already helped three Truckee residents step into their share of the eight million dollar rebate. Becoming energy independent is already a reality for many people within the State thanks to the CEC Buydown Program. If you have ever dreamed of slowing down your electric meter or of seeing it spin backwards, now's your chance.

For more info, contact:
California Energy Commission
Emerging Renewables Buydown
Program 1516 9th St. MS-45
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Phone: 1-800-555-7794 (in CA) or
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Guinn Home

Project: Guinn Residence
Owner: Jim & Christine Guinn
Size: 2,800 sq. ft.
Designer:
Date of Construction: 1979
Builder:



Site Characteristics or focus during construction or remodel:

6 acre parcel with excellent solar exposure

Construction Type:

Raised floor. 2x6 frame construction

Passive Solar System:

Passive solar double envelope including attached solar greenhouse

Active Solar System:

N/A

Main Heating System:

Passive solar augmented by 5 ton ground source heat pump system for space heating/cooling and supplemental hot water heating

Auxiliary Heating System:

Pellet stove & generator to be used in case of power outage

Conservation Features:

Home has 6" of foam insulation on outside walls of envelope plus all of outside walls of

home are wrapped with foam insulation under vinyl siding

Subjective Evaluation/design considerations:

The double envelope is an effective design. However it does need the back-up heating system for cloudy days and at night. Cooling is needed on days that are hotter than 80°F. The ground source heat pump is an effective complement to the passive solar heating and also heats and cools a 24'x36' garage & shop area.



Thank you, Soul Sushi & BBQ!

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What's Brewing in Truckee?

Look for an article on the 2002 Energy-Smart Home Tour

We've got news for Truckee.
First issue coming October 30, 2002
Available free in locations all around Truckee

Saccullo Home

Project: Saccullo Home

Owner: David Saccullo

Size: 3,160 sq. ft.

Designer:

Date of
Construction: 1981

Builder:

Site Characteristics or focus during construction or remodel:

Home oriented east-west w/long south-facing exposure

Construction Type:
2x6 wood construction

Passive Solar System:
Passive Solar Design - lots of south-facing windows and thermal mass including trombe wall

Active Solar System:
N/A

Main Heating System:
Passive Solar w/ Propane FAU back-up

Auxiliary Heating System:
Wood Stove

Conservation Features:
Home meets CA Title 24 Building Energy Codes - well insulated, double-paned windows, etc.

Subjective Evaluation/design considerations:

Home gets very warm on a clear day and generally stays warm all night in the winter. Occasionally, the home needs to be ventilated during a warm winter day due to overheating.

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As Seen on
"This Old House"
(HG TV)

Activity Center

Project: Teen Activity Center

Owner: Truckee Parks & Recreation

Size: 2,800 sq. ft.

Designer: Ron Gaunt

Date of

Construction: Mid-1900's, Renovated 1998



Site characteristics or focus during construction or remodel:

Utilizing a recycled building, the Parks and Rec Department wanted to provide as much green technology as possible in the construction of the building.

Construction Type:

Raised Floor, 2x6 frame construction

Passive Solar System:

Plenty of south facing glass

Active Solar System:

2kw solar photovoltaic system

Main Heating System:

Geothermal Heat pump

Conservation Features:

Building has incorporated blown-in wet cellulose wall insulation, advanced home weatherization features

Subjective Evaluation/ design considerations:

Conservation features coupled with the geothermal heat pump and active solar system on the roof results in a comfortable, highly energy-efficient structure, which has low energy bills.

KidZone Center

Project: KidZone Center

Size: 3,600 sq. ft.



Passive Solar System:

Good Sunny Location

Features:

The KidZone building is a state-of-the-art "tension structure," a series of trusses interlocked with a weather-tight Teflon coated vinyl fabric. The design is cost effective and fun, featuring a skylight and cathedral-style windows that will look out

to Donner Peak. Engineered to stand up against the worst Truckee winter, the building sits on a concrete slab that will be warmed with a hydronic system that heats the floor itself to make it even more comfortable for our budding crawlers. KidZone will be a warm, well-lit space where infants, toddlers, and children can escape the winter snows for a great day of fun and stimulating play.

On the web

www.ases.org

The American Solar Energy Society (ASES) is a national organization dedicated to advancing the use of solar energy for the benefit of U.S. citizens and the global environment. Their annual National Tour of Solar Buildings is the inspiration for Truckee's Energy-Smart Home Tour.

www.norcal solar.org

NCSEA is the northern California chapter of the American Solar Energy Society (ASES). They are part of a worldwide network raising awareness about solar energy.

www.buildinggreen.com

Publishers of environmental building News; authoritative information on environmentally responsible building design & construction

www.realgoods.com

Real Goods strive to find and deliver appropriate technologies to its customers.

www.solarliving.org

The Solar Living Institute is dedicated to the belief that education will help bring about the changes in consciousness and behavior necessary to create an environmentally sustainable future. The Institute is headquartered at the



Solar Living Center in Hopland, California, just 95 miles north of the San Francisco Bay.

www.abundantearth.com

Abundant Earth offers a wide variety of environmentally sensitive products and services for people who want to make a difference in the world.

www.energy.ca.gov

This is the home of the California Energy Commission which is the state's primary energy planning and policy agency.

www.energystar.gov

ENERGY STAR offers businesses and consumers energy efficient solutions -- helping to save money while protecting the environment for future generations.

TDPUD pays you to save energy

Now, it's easier than ever to save energy and lower your energy bills.

Just sign up for one of TDPUD's Energy Conservation Cash Rebate Programs by calling a TDPUD customer services representative at 587-3896.

Either way you will receive a program package including information on qualifying measures and an application.

Cash rebate measures include qualifying efficient refrigerators, clothes washers, electric water heaters

and ground source heat pumps. Or you can have an energy efficiency evaluation performed on your home by a qualified contractor.

Call the Conservation Office for more information at 582-3931.

Sustainable Building email newsletter

Check out GreenClips, a summary of news on sustainable building design and related government and business issues published every two weeks by email.

Architectural researcher and environmental consultant Chris Hammer of Sustainable Design Resources publishes GreenClips in San Francisco.

Ms. Hammer helps planners, developers, building owners, designers, builders, and facility managers practice sustainable planning, development, building design, construction, and operation.

To contact webmaster:
GreenClips@greendesign.net

Is that a Fact?

FACT:

There are 1,000 power plants in California putting out 53 MW (megawatts) on average for a total combine output of 53,204 MW. With 24 hours in a day, the average California power plant can put out 1.3 GWh (gigawatt hours or 1300 MWh) per day.

FACT:

There are 34 million people in California and approximately 15 million households.

FACT:

If every household in California replaced four (average 100 watt) incandescent light bulbs with four (equivalent 27 watt) compact fluorescent light bulbs, burning on average five hours per day, we would save 22 GWh per day - or enough energy saved to shut down 17 average California-sized power plants.

FACT:

If every household in California replaced one average-flow shower-head with an energy-saving shower-head, we would save 1.3 KWh per day per household or 19.2 GWh per day (due to the extra water not needing to be heated) - or enough energy saved to shut down another 15 average-sized California power plants.

FACT:

If every household in California installed a solar hot water heater that saves 5.8 KWh/day, we would cumulatively save 87 GWh/day - or enough energy saved to shut down another 67 average-sized California power plants.

Source: John Schaeffer
Real Goods Catalog, Spring 2001
p 2-3

form some of the work with their own maintenance staff or themselves. With some measures this can be done while others require contractor equipment and expertise. Overall, the project was successful. All five sites are operating efficiently and the users are very appreciative. TDPUD staff has documented the remediation work with photos, also available on disc.

Since the last research was done from 1996-98 Truckee Donner Public Utility District put together a cash incentive to encourage homeowners and businesses to perform "House as a System" measures. TDPUD provides a \$100 rebate for just having one's home or business checked for insulation levels and tested for building and/or duct air leakage. Since the results of this current 2001-2002 research study, TDPUD staff is even more convinced of the value of applying conservation first.

TDPUD plans on putting greater emphasis to building users on the need to make their buildings as economically efficient as possible, then pay for and install the more expensive higher efficiency heating systems like geothermal heat pumps. It is worthwhile because of the savings on the capital cost of buying the system is reduced by about \$4,000 and the future reduction in the building's operational energy costs.

Heating contractors have a lot to gain from approaching their building heating jobs from the "House as a System" approach. When heating contractors are sizing the heating equipment for a building they need to determine the buildings hourly heat loss using information about the efficiency of the building envelope at some specified design temperature. They typically bring together good data about r-values on the building materials, but do not have an accurate way to determine the heat loss caused by a leaky building envelope and/or central air distribution system. The "House as a System" analysis can



(above) Sealing ducts at air distribution registers with mastic.

provide those numbers and show where important efficiency improvements can be made in a building. Heating contractors who improperly size heating systems for a building will run into problems heating the building and have several return trips before they solve the problem. They may solve the problem by putting in a larger heating system at their expense whereas they could have solved the problem by reducing the building's heating requirement through the "House as a System" approach. Efficiency reduces equipment capital cost requirements, reduces the energy costs associated with heating the building and may save a contractor considerable time, money and problems.

TDPUD will continue to encourage "House as a System" measures to our utility customers. TDPUD will expand their education and marketing emphasis of the value of this work. TDPUD appreciates the funding for the project by the CEC and would like to help the CEC promote this work statewide as can be done practically.

If anyone has any questions regarding this research or TDPUD energy programs please contact Scott Terrell, TDPUD Conservation Specialist, at (530) 582-3931.

Truckee Home Building Show

MEMORIAL DAY WEEKEND
Saturday and Sunday,
May 24 – 25, 2003
10 am – 5 pm
Truckee High School
Truckee • California

Are Rising Energy Costs a Concern?

See the latest technology in energy efficient alternatives. Learn about solar, wind, hydro and geothermal systems. Bring your plans. Meet with building professionals and suppliers. Great ideas for the home ... all under one roof!

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TRUCKEE HOME & BUILDING SHOW
P.O. Box 10952, Truckee, CA 96162

■ Architects

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BBS and its associates provide a wide range of services to support the use of S.I.P.'s (Structural Insulated Panels) including planning, architectural design, engineering, fabrication, construction, etc. for super energy efficient homes and commercial buildings.

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Please see our ad on page 17.

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consultation, thermal conductivity tests, design, installation, maintenance training, and service of GeoExchange space conditioning systems. Federal, State, Institutional, Commercial, Residential installations. Recently completed projects include Truckee Middle School ground loop.

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Sierra Insulation Co has been serving the Truckee Tahoe area since 1980. We install insulation in new homes, commercial buildings, and existing homes. We offer a wide variety of different types of applications.

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