INFLOOR HEATING SYSTEMS

March 2015

IN THE LOOP

Chaffee County Home & Garden Show, April 18-19

You can find Infloor Heating Systems at the Chaffee County Home & Garden Show again this year, April 18-19, being held at the County Fair Grounds. We will be teaming up with our friends at the Hi Valley Supply booth, and will be showcasing our radiant heating systems, heat sources, and Wi-Fi thermostats, among others. We are looking forward to returning to this home show and sharing our products and knowledge with the people of Chaffee County. Learn more about the event on their website at: www.chaffeehomeandgarden.com.

Stay In The Loop with Us

There are many ways to stay connected to Infloor Heating Systems, via social media and email. Join the conversation and keep updated on our products, services, design information, projects, sales, tips, and more. "Like" us on Facebook, "Follow" us on Twitter, and/or join our Email List at www.infloor.com/contact-us.

Feel free to contact us with your questions or information requests at info@infloor.com or (800) 608-0562.

Join the conversation

In The Loop is a publication for customers, distributors, contractors, and friends of Infloor Heating Systems; a division of Infloor Sales & Service, Buena Vista, CO. www.infloor.com.

Electricity: The Proof is in the Numbers

An originally designed Infloor Heating System for a Colorado home continues to shine in comfort, performance, low environmental impact, and energy savings. Our customer, Dr. Gregory Kettering, a popular veterinarian, has returned to share his radiant experience and system success, backed up by three years of incredible tracking and charting of his energy use, costs, and production. With his home's total energy use costing him only $800/year, the proof is in the numbers.

In 2012, Dr. Kettering and his wife Dale built a spacious, comfortable, energy-efficient home in picturesque Buena Vista, CO, surrounded by views of 14,000 foot peaks. Their green-home concept was to reduce their footprint as much as possible, use earth-friendly construction materials, and tap into one of our most powerful and abundant natural resources, the sun, as a clean, renewable energy source to heat water and generate electricity for space heating and general house use.

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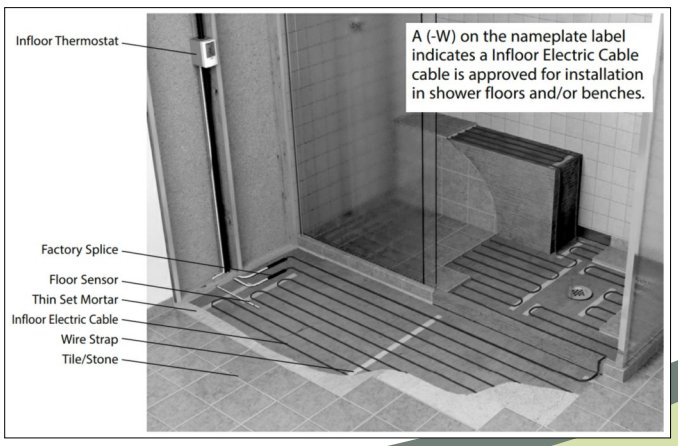
Electric Cable Approved for Shower Use

There's nothing like the comfort of walking barefoot on warm floors. And it doesn't have to end at the shower. Infloor Standard Electric Cable radiant heating is approved for wet locations, including shower floors and benches, taking comfort to another level.

The cables are encased in a thin layer of mortar bed and covered with tile or stone. Set the thermostat for the desired temperature, and never experience the shock of stepping onto a cold shower floor again.

In addition to comfort, there's more to look forward to. Warm floors dry faster and completely, whereby reducing slippery surfaces, and mold and bacteria growth, making it a safer and healthier environment that is easier to keep clean.



Electricity: The Proof is in the Numbers Continued

Apricus evacuated tube collectors on the back of the house turn solar energy into thermal energy to heat domestic and radiant hot water. The southern exposure provides the best results, which is also a chosen design element.

They called Infloor Heating Systems to design a heating system that worked with solar thermal energy for their two-story, 3,795 square foot home, powered solely by electricity. Infloor President Michael Willburn worked directly with the Kettering's to design the system of their dreams. "This was one of our more complicated projects, and also one of our more exciting and meaningful ones," said Michael.

Comfort, energy-savings, and low impact were high priorities for the Kettering's. "We wanted to build an environmentally friendly, energy-efficient house, with added comfort," said Dr. Kettering. "Electricity is the home's only power source, with a vast majority of the energy needs being met by solar thermal energy."

Michael designed the heating system with Infloor hydronic radiant heating throughout the lower level, with nearly 3,000 feet of ½" BPEX tubing, spaced 9" OC, divided into four zones. The smaller sized upstairs is heated by five panel radiators, which are set to the same temperature as the downstairs radiant heating. The hot water for these systems is mostly supplied by a solar thermal system addition.

Four Apricus A-30 evacuated tube collector plates are located on the roof, facing south, generating energy to produce 100% of the home's domestic hot water, with a portion of the excess going to the radiant heating system.

"By using four evacuated tube collector panels, with a total of 120 tubes, we calculated the majority of Dr. Kettering's domestic hot water would be heated via solar thermal, and it would also make a sizable contribution to his space heating," said Michael. On average year round, the solar thermal water system produces about 164,000 btus per day.

The entire home runs on electricity, which is mostly generated through a separate Photovoltaic (PV) grid-tie energy system, which is a method of converting solar energy into direct current electricity using semi-conducting materials that exhibit the photovoltaic effect.

The Kettering's PV system consists of 33 solar panels, assembled on the ground, generating 50 kilowatt hours a day, covering 80% of the homes total annual power usage. Most of the year it generates more energy than the house is using, which turns the meter backwards, banking the unused energy with the electric company for later use in that year.

Dr. Kettering set out from the beginning to understand the system's value and performance through precise tracking of all their energy production and use. His Excel spreadsheets are a story of his home's energy use and patterns, yielding three years (thus far) of valuable knowledge and numbers showing the system is performing even better than predicted.

"I love numbers and math, and I wanted to get a real look at our energy use and the solar system's performance. I was interested in knowing how much energy we were using, versus how much we were generating through solar power. As those numbers developed, I began to see ways I could further reduce our energy consumption by changing different settings and identifying possible upgrades," said Dr. Kettering. He also tracks how much his energy costs would be without the solar power systems, and how long it will take to recoup his initial investment.

A separate Photovoltaic (PV) solar system turns the sun's energy into direct usable electricity for the home. Most of the year, it turns the meter backwards, for use later in the year.

Electricity: The Proof is in the Numbers Continued

The Kettering's only receive an energy bill three and half months out of the year; Jan, Feb, and March, with a small amount in April. "We don't have energy bills throughout most of the year," he shared. "We just have to pay the taxes and fees, which are around $27 a month."

And every year, the numbers are showing the system continues to perform more efficiently. For example, in 2013 they incurred an annual savings of $1,517.98 in energy costs. In 2014, their total savings was $1,670.21, showing an 11% increase over one calendar year.

The home's total energy use is also declining, year-to-year, as the smart technology features (including tekmar's 402 house control and 552 programmable thermostat) learn the family's behaviors, and Dr. Kettering learns how to manually decrease it through different settings, features, and upgrades.

Two Triangle Tube SmartLine 600 multi-energy tanks are used to store heat produced by both the solar and boiler. Each tank holds 60 gallons of domestic hot water and 100 gallons of space heating water.

Photovoltaic	*-2015 Snapshot-*	*Solar Thermal*
$308.65	***YTD Cost saved***	$493.35
27.04%	***% cost saved***	49.32% (97% lifetime)
1/1/2013	***Start Date***	1/9/2012
2.2033893	***Years Elapsed***	3.183539886
11.94	***Years to payback***	9.05

*These are the totals as of March 15, 2015

Every day that Dr. Kettering adds more figures to his spreadsheets, his overall energy portfolio changes, including the "Years to Payback." The chart above shows an overview of the energy savings and return on their investment as of March 15, 2015. As the entries continue for the year, the savings will increase, and the years to payback will continue to decrease.

Both Dr. Kettering and Infloor call the system a success. "Michael is very knowledgeable about Infloor [radiant heating], particularly with tying a heating system with a solar hot water system," said Dr. Kettering. "Since I was not familiar with the brands of radiant floor heating systems, I had to let Michael choose for me, and I am very satisfied with the Infloor system he chose," he concluded.

So why is the Kettering's fully electric heating and energy system so efficient? "Because it was designed to be," said Michael. Learn all about the components, features, and smart technology incorporated into this awesome system in the full story posted on our website in the Project Showcase section. www.infloor.com/why-infloor/project-showcase

Kettering's 2014 Energy Chart

Month	Previous Year Ttl kWh	Current Year Ttl kWh	Current Heat kWh	Current House kWh	Current solar kWh	Previous Year Solar kWh	Solar meter kWh Adjust	Net Meter kWh Adjust	Previous Year Net mth kWh	Current Year Net mth kWh	Net kWh Carry Forward
											0
January	4492	3913	3374	538	-914	-973	17	1	3519	2999	0
February	3702	3090	2520	446	-1085	-1020	-44	124	2682	2006	0
March	3104	2396	1896	416	-1382	-1232	6	85	1872	1015	0
April	2221	1756	1265	525	-1278	-1436	11	-34	785	478	0
May	1003	1235	467	703	-1336	-1274	-52	64	-271	-101	-101
June	654	725	106	616	-1317	-1338	31	3	-684	-592	-693
July	791	629	94	522	-1161	-1184	-64	12	-393	-532	-1226
August	522	673	132	534	-1065	-719	32	7	-197	-392	-1618
September	645	732	190	538	-1314	-1071	-25	4	-426	-582	-2199
October	1083	645	179	439	-1203	-1404	-31	27	-321	-558	-2757
November	2257	2137	1648	514	-987	-981	40	-24	1276	1150	-1607
December	4301	3053	2435	711	-1056	-609	-46	-92	3692	1997	0
Totals	24775	20985	14306	6502	-14097	-13242	-125	177	11533	6888	