



Solar precautions: Do your homework when choosing solar

By **Mark Collins** For the Camera

Posted: 09/22/2009 01:04:22 PM MDT

Thomas David Kehoe's home on 31st Street in Boulder is not a destination on Saturday's Tour of Solar and Green Homes. Maybe it should be.

The tour, sponsored by the Center for ReSource Conservation, kicks off Solar Week in Boulder County. Saturday, people can tour one or more of the 14 homes CRC has on its list, all great examples of how solar power and green building strategies can cut energy costs.

Kehoe's home is not a shining example, however. Instead, it's a solar installation gone wrong, an example of what not to do when installing photovoltaic panels at your home. It's a cautionary tale of old house meets inexperienced contractor.

"I'm one of those annoyingly green Boulder people," said Kehoe, who owns Casa



The solar installation at the home of Thomas David Kehoe was done poorly according to Kehoe. He is showing that the panels are shaded by trees much of the day. (CLIFF GRASSMICK)



Olivier Goedert of Boulder EMF Free, Inc., points to Thomas Kehoe's solar inverter box, which was installed outside near the headboard of Kehoe's bed. (CLIFF GRASSMICK)

Futura Technologies, a company that makes electronic devices that treat speech disorders. "I've done everything I can to make my home energy efficient. My house is as green as a 1961 tract house can be. So putting solar on the roof was part of my goal to reduce my carbon footprint even further."

Kehoe had a 2,000-watt solar photovoltaic system installed on the roof of his house in February 2007. The project misfired in several ways, and Kehoe's home-energy data backs that up.

His system was supposed to generate roughly 3 megawatts of energy per year, a savings of nearly \$350, Kehoe said.

"I got 1,574 kWh the first year and 1,446 kWh the second year, or about \$175 of electricity (half of his system's potential)," he said.

Since its installation, Kehoe has come to understand what went wrong. The following are tips he provided for those considering putting PV solar panels on their home, particularly those who own an older home.

Hire an experienced contractor

Only contractors installing solar on new construction or homes in the midst of remodeling are required by the city of Boulder to have a license to do the work. And even those contractors are not required to pass an exam about solar installation to receive a license.

Make sure your contractor knows what he's doing. The solar panels at Kehoe's home were the first the contractor had installed. That was Kehoe's first mistake.

Check to ensure your home's electrical wiring can handle solar power, and that your house's structure can hold the solar panel's weight and wind-shear potential

Kehoe's invoice for his PV system and installation was \$24,130.15, he said. He received a rebate of \$9,000 from Xcel Energy, and a federal tax rebate of \$2,000. But he incurred two expenses he wasn't expecting.

The electrical wiring in his home, built in 1961, wasn't outfitted for solar. It cost Kehoe \$1,200 to get it solar-ready.

Then his roof couldn't hold the wind-shear potential of the PV solar panels. It cost another \$4,000 to reinforce the roof.

"The wind load is usually greater than the weight, so if this is an issue the contractor can install the panels flush mount to reduce the wind load," Kehoe added.

Put the solar panels in the sun, not in the shade

Sounds obvious. But, Kehoe said, it's not. At least it wasn't to his contractor.

"This isn't as easy as it sounds because the sun moves during the day and during the year," Kehoe said. "A contractor will use an instrument called a solar finder to select the location for the panels."

In addition, if your property has trees that shade your solar panels, trim them before installing the panels. That way you can ensure proper amounts of sunlight will hit the panels where you fasten them.

Consider a safe place for your power inverter

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Kehoe's inverter, the electric device that turns the energy from the PV cells into energy your home's electrical system understands, was installed near his bedroom. The resulting electromagnetic radiation in his bedroom, Kehoe said, was well above a safe limit.

Plan ahead

Solar panels could drop in price in the future. Install your current panels in a way that you could add more in the future, if you desire, said Kehoe, who despite his experience is committed to solar energy.

He is in the process of moving his PV panels to a more efficient place on his roof, and moving his inverter, too. Eventually, he wants to add 10 to 15 more panels and turn his house into a zero-energy home, one that creates as much energy as it consumes.

Contact Mark Collins at 303-473-1369 or BDCTheater@comcast.net.

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[Les_Stroud](#) · 2 days ago +3

Let me see.. Did he get multiple quotes? Check references? Did he go with the cheapest guy he could find? Did he know ahead of time this was the first installation for this company? Did he get a plan from the installation company showing where they were planning on putting the panels? These things should be checked any time you hire anyone to work on your home.

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[GabeMc](#) 54p · 15 hours ago +1

Exactly, once again DC is stating the obvious, to anyone with a brain.

Do your homework when spending \$25,000, wow, what a breakthrough.

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[johnny_sunshine](#) 31p · 2 days ago +2

Well reported and written article, good job Mr Collins and DC.

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[thecondoguy1](#) 3p · 17 hours ago -1

Give me a break here people, even if this junk performed as promised it would take this bird brain 52 years to break even on this installation, and you and I put 9grand towards it to make that possible.

This trash will blow off his roof a long time before that, and be a maintainance nightmare until it does. People who put this crap on top of their homes are just plain nuts, save your money.....

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[ExBoulderite](#) 55p · 16 hours ago 0

Yeah, why use all that energy from the sun when we can burn coal instead while polluting and poisoning ourselves into chemical comas, good thought.

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[GabeMc](#) 54p · 15 hours ago +1

Or maybe we should heat our homes with fire wood, like the cavemen used to do.

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[rbonilla](#) -54p · 15 hours ago -1

solar still not \$\$ wise....maybe in a few years.....

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It's not about the \$\$, it's about the moral obligation to do your part to end the poisoning of our planet.

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[rbonilla](#) -54p · 15 hours ago -1

that's a bunch of BS.....





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↳  **rbonilla**  -54p · 14 hours ago -1  

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↳  **GabeMc**  · 14 hours ago +2  

Well, what specifically is BS?

Lead is highly toxic and can cause brain damage in developing fetuses.





Mercury is one of the deadliest neurotoxins ever discovered.

Mercury and lead are released into the air we breathe whenever we burn coal.

What's BS about that, I'd like to know.

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


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↳  **rbonilla**  -54p · 3 hours ago +1  

and...please educate us about the mfg of pvc pipe, electrical wire, and solar panels.....it's all about the \$\$.....always has been, always will be....

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 **Lighthousesolar**  · 15 hours ago +2  

Mr. Collins,

Thanks for the article describing precautions prospective consumers should keep in mind when considering adding solar systems to their homes. I applaud your effort to help consumers increase their awareness of potential pitfalls but I would like to respectfully submit that you should carefully check your facts before publishing articles like this one. In this case, I can speak from direct experience since our company installed the system on Mr. Kehoe's home and in fact this was not our first system. The other facts that I would like to correct are:

Mr. Kehoe's electrical service was not up to code. In order to allow interconnection of a solar system we were required to upgrade his service to meet current code. This was clearly articulated and described in the proposal and contract which Mr. Kehoe agreed to and signed.

Mr. Kehoe's 2kW system was projected to produce 2807 kWh/yr – not 3MW. This projected performance was assuming Mr. Kehoe would remove or top a tree in his yard.

The invoice for Mr. Kehoe's solar system including upgrading his electrical service was actually \$11,170.50 after a rebate from Xcel for \$9000. There was an additional invoice of \$3959.65 for engineering and structural reinforcement to his roof for a combined total out of pocket expense of \$15,130.15.

Mr. Kehoe's solar modules were tilted up to maximize the potential production of his system due to the limited roof area.

The location of the modules was determined with Mr. Kehoe on his roof using a Solar Pathfinder. The location of the installation was determined to be the optimal position pending removal or topping of a large cottonwood tree in the South East corner of his back yard which he agreed to take care of.





After the installation was completed, Mr. Kehoe refused to remove or top the tree in question, causing significant shading to his array although the trees' removal was discussed and agreed to during the initial consultation.

The location of Mr. Kehoe's inverter was chosen by him. Any electro magnetic radiation emitted from the inverter should not effect his sleep since the system is off at night.

The last point worth mentioning about this unfortunate project is that Mr. Kehoe failed to pay his bill and still owes \$8500 for the work performed that he contracted. I hope these factual corrections add to your attempt to help educate consumers about solar as well as advise potential contractors about precautions to take when working for Mr. Kehoe.

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



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↳  **GabeMc**  · 14 hours ago +1  

Talk about precautions, maybe DC should talk to both sides before it slams a company on one flakes word.

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 **rbonilla**  -54p · 14 hours ago -1  

It is a fight over toilet paper: the kind that is blanket-fluffy and getting fluffier so fast that manufacturers are running out of synonyms for "soft" (Quilted Northern Ultra Plush is the first big brand to go three-ply and three-adjective).

It's a menace, environmental groups say -- and a dark-comedy example of American excess.

The reason, they say, is that plush U.S. toilet paper is usually made by chopping down and grinding up trees that were decades or even a century old. They want Americans, like Europeans, to wipe with tissue made from recycled paper goods.

It has been slow going. Big toilet-paper makers say that they've taken steps to become more Earth-friendly but that their customers still want the soft stuff, so they're still selling it.

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 **thecondoguy1** 3p · 58 minutes ago

+1  

Junk, boys plain and simple junk, are we morally obligated to load the land fills up with this trash, load the hucksters pockets with cash, load the environment with these eye sores, go ahead suckers, there is plenty of cheap nat gas and that is what I am going to use.

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