Integrated Solar Panels with Steve Hern from CertainTeed

In these grey November days it is hard to imagine that solar power can do much to take the chill out of our New England homes. But Steve Hern from CertainTeed joined us on Nov. 15 to tell us about innovations in solar roof panels. First a quick lesson on how solar power works. Solar power is the process of converting solar radiation into direct current electricity (DC). The more surface you have grabbing that sunlight, the more electricity. The panels are connected and daisy chained together and work in sequence collecting power. Our homes use alternating current (AC) so how does this work? There is a piece of equipment before the panel called an inverter that converts the DC to AC.

Solar power augments our eclectic service in our homes, it does not replace it. The panels can only generate power while it is sunny and power storage is expensive. So you aren't making your own power and storing it for when you need it. It is a very literal process; even the shade of a tree or chimney can affect the power generated. And in terms of location, one doesn't need a compass in the city to know where south is, look at the solar panels on houses, or the satellite dishes! In addition to a south facing roof, slope matters as does any possible obstruction. Vents, chimneys and nearby trees may create too much shade. The goal is as much continuous sunshine as possible. Because of this, the extent one can augment their electricity purchase will vary with the sunshine, at its maximum in the summer months and decreasing in the winter months.

As we all know, the building industry is an innovative business. The days of window ropes and chimneys (when you don't have a fireplace!) are gone. Throw a concern for and respect of the environment into the mix, and there are amazing innovations happening all the time. The Apollo system from CertainTeed is a solar panel that "is" the roof covering. Unlike the traditional (!) solar panel that sits on top of the roof shingles, the Apollo panels <u>are</u> the roof cover. Here's how they are installed: The old roof material is removed and the sheathing is clear of matter, and likely renailed to ensure the sheathing is secure. A layer of ice and water shield is laid down over the entire roof. Of course ideally the attic is vented. The panels snap together and are connected electrically like a snake. Any damage or obstruction (shade) and the system reroutes around the weak link. The panels are covered in tempered glass. The panels come in 4' lengths and cannot be cut, so the roof is covered in increments of 4s. The balance is covered with shingles or flashing depending on location and the amount to be covered. The panels themselves warm up in the sunshine and snow will slide off. Because of this, snow guards are often installed just below the panels. The life expectancy of the ice and water shield is 50 years while the panel life expectancy is 25 years. The inverter is in the basement near the meter and panel. Any wiring related to the solar panels (in DC current) inside the house must be in metal conduit and labeled as power generating conduit.

This exciting innovation may not be for everyone, do the math. Folks that don't use a lot of power may not reap any financial benefit for years to come, if at all. But for many the benefit of solar power is not economic but environmental. We will likely see more solar panel installations with time and with that will come innovative materials. Stay tuned!

Nov. 2012