

# Is building with concrete "Green".

Is concrete "green"? This question often arises with buildings associated with sustainable energy. Certainly some other building materials appear to be more green than other, but to back up and look at how the material is acquired from its beginning and the journey it takes to its final resting place could change your mind.

Stick built homes require the cutting of approximately 30 to 50 full grown trees per house. Each tree is has to be cut with gasoline powered saws. Then dragged out of the forest with a large diesel powered machine. Quite often in a detrimental way to the forest and animals. The logs are then loaded on to a truck. IN many cases, the logs will be shipped thousands of miles to an overseas facility where it will be processed in to the dimensional lumber, using more fuel for the mill and its planing operations. Then the lumber is loaded in to a kiln to be dried by millions of BTU's of petrol fired heat. Then the lumber is loaded again with a fork lift back on to an ocean going ship to make it's way to a U.S. where it is unloaded to a large petrol powered tractor trailer. The tractor trailer will then begin its road trip to the retailer. Who once again, unloads it, handles it. The consumer buys the product, it is loaded again on to a large truck and delivered to the local destination. Now the material is unloaded and handled many more times. Many of the boards have to be cut to required dimensions, using electric tools, nail guns with compressors. On and on. How many gallons of petroleum was used from the start to finish, not to mention the noise and vehicle pollution? After the structure is finally completed, there stands a building who's lifespan is only a third of the of a concrete constructed building and will use up to 60% more energy to heat and cool than the concrete counterpart.

Other "green" aspects of using concrete is that the raw ingredient of concrete is limestone. One of the most abundant minerals on earth. Concrete can also be made with fly ash, slag cement and silica fume, all waste byproducts from power plants, steel mills and other manufacturing

facilities. The making of the cement itself, the binding agent, does require large amounts of energy in the form of heat and does account for large amounts of CO<sub>2</sub> gas emissions. The evolution of clean burning facilities, using alternative fuels has come along away, especially the use of clean burning of tires. With this said, if all the buildings that are made in concrete were made from trees, there probably wouldn't be any trees left on the planet, which incidentally absorb CO<sub>2</sub>. Per individual structure, how much energy is used per bag of cement? This would be an interesting figure.

The amount of concrete needed is specific to each project, so there is a minimal of waste, of which what extra concrete there is will be used for fill or other small projects.

In most cases, the concrete is mixed locally using local sand, gravel and aggregates, reducing trucking and supporting the communities business. The money stays in the U.S.

Concrete buildings with the large thermal mass, retain heat or coolness. Slower temperature swings so modest HVAC systems do not work as hard to keep up with changing daily temps.

The concrete building offers unsurpassed protection from hurricanes, tornadoes, fires, earth quakes and other catastrophes

Using concrete for the floors, counter tops and imitation stone allows unlimited imagination to be applied for a very reasonable amount.

Using concrete for the floors with radiant tubing installed when poured, is the most efficient source of heat for a home. It is especially and most importantly, best suited for solar heated water. It is also dust and allergy free.

A concrete home can be completely recycled in later years to be processed in to aggregate for building roads or backfill, but that could be hundreds of years down the road.

Besides building the structure, concrete makes wonderful countertops, tables and stone decor. So, taking a careful look at how "green" products are handled and finally delivered to your home site is an important part of a sustainable building. In my case of the round house, I even used concrete for the entire roof, which was pumped in place in six hours. Cheap enough for a 2080 square foot roof. My house has been extremely warm in the winter and very cool and quiet in the other months. The floors have been extremely durable and with a quick coat of wax, look elegant. Concrete is a great material that can be worked by most individuals.

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