

Solarpunk Building Materials

As we've said elsewhere, solarpunk buildings should use materials appropriate to their surroundings. Climate, weather (including rainy seasons, severe heat, long winters, etc), threats to the structure (such as insects and mold), and available materials should all be a factor, as should the needs of the community - perhaps importing an advanced material from further away will allow a structure to last and cause less harm than rebuilding it regularly.

The following is a far-from-exhaustive list of materials and building styles you may want to include depending on your setting:

Salvage

Few solarpunk stories seem to take place in 'clean slate' settings like space colonies (though some great ones absolutely do!), and if anything, a solarpunk society on earth would probably strive to preserve intact habitats and do less greenfield construction than our present day one. So it's likely existing buildings would see a fair bit of upkeep and modification, if only because they already exist and the resources to build them have already been spent.

But there are plenty of circumstances where maintaining a building or bringing it up to modern standards isn't worthwhile, and [deconstruction](#) makes more sense. Deconstructed (and even demolished!) buildings can yield all sorts of useful building materials, depending on the structure's condition at the time, and the care with which it's taken down. Generally this is a less cost-efficient source of materials than extraction from raw sources but part of that is because our current society has had a lot of time to iterate and improve on logging, mining, and other extractive fields - a solarpunk society might get equally good at deconstruction. And there are a few advantages: deconstruction sites/sources of salvaged material are almost guaranteed to be much closer to the places they'll be reused, and these materials are generally retrieved in a much more ready-to-use state. For example, dimensional lumber pulled from a stick-frame house might have some extra nails stuck in it, but it's already cut to size and will be easier to work down than a green tree, which must be cut down, transported, milled to rough dimensions, dried, possibly treated with preservatives, milled to final dimensions, and transported again.

Ideally, a deconstructed structure should provide every building material used in its construction, but realistically there are going to be limitations. Some forms of insulation (like newspaper, sawdust, or asbestos) won't be worth reusing and may even necessitate safe disposal. Horsehair plaster can be extremely fragile and probably wouldn't survive removal, let alone transportation and reuse. Even modern sheetrock will be a pain to salvage. Some wood will be rotten or infested with ants, termites, or other insects. Even brick and concrete can be damaged by the elements.

The easiest materials

Bricks will have to be chipped clean of mortar, and concrete may have to be cut into workable

Geopolymers

If you're looking for a drop-in replacement for CO₂-producing Portland Cement then you probably want Geopolymers.

Geopolymer is almost carbon-neutral, repurposes industrial waste, covers all the uses of concrete, and is much better performing overall. The only reason it hasn't replaced Portland cement already is the broad hegemony of the established industry -which won't matter as industry localizes. Ideally, we want a carbon-negative alternative to allow our built habitat to become a carbon sink, but that's going to take a while. In the meantime, geopolymers are probably the best we can do. So where concrete construction can't be replaced, that seems more likely to become the cement alternative of choice.

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