Low Tech Solarpunk Ideas for a Fantasy Setting

There will be some overlap between this page and others, because a tremendous amount of solarpunk involves reexamining old ways to see if they make sense in a new context, or when combined with another practice, or with modern updates. Because these techniques are old, and the fantasy genre has a rich history of anachronistically mixing historical elements to make a good setting or interesting story, it probably makes as much sense as ever to pluck these ideas from their location and time and mix them together.

Because solarpunk societies fit their climate and region, one of the best ways to find relevant technologies (includeing architecture, city planning) is to read the history of similar regions to what you're writing. (After all, there wasn't generally much choice but to adapt to the climate, weather, and available materials.) But it's also fair to say that some practices which flourished in one place and time could have worked in similar circumstances elsewhere but never did (such as the Chinese wheelbarrow).

Food Preservation

- **Root Cellars**
- **Spring Houses**/**Cold Houses** - Spring Houses are small single room structures built over a spring, to keep the water clean and sometimes to channel some of it into an outflow pipe to provide running water downhill. The chill from the spring could be used to preserve food, so some spring houses were built to keep animals out. A Cold House is a perhaps regional term for a similar small stone building built over a flowing stream instead of a spring, used for food preservation, usually milk. (a couple examples).
- **The Ice Harvest** and **Ice Houses** - Sometimes called the Winter Crop, blocks of ice cut from freshwater lakes and ponds were an important export from cold regions before refrigeration. Ice was cut and stored in Ice Houses (small sometimes-buried structures shaded by trees) where it was covered with sawdust to insulate it into the summer, or sold abroad, transported by wagon, train, and ship.
- For a much older, more permanent and insulated ice house design check out the Yakhchāl from Iran. The design seemes to rely pretty heavily on evaporative cooling and the low humidity of the region and could even produce ice.
- **Fermented foods**
- **Bog Butter** - **and other foods you bury to preserve or prepare them. === Moving and Using Water === * Vâltori - Vâltori are a sort of public outdoor washing machine made from a series of wooden flumes which divert water from mountain streams into wooden tubs with spaces between the slats. The flow of water creates a sort of whirlpool inside the tub, and is used to wash bulky items like blankets. * Levadas - A levada is an irrigation channel or aqueduct often built along or carved into cliffsides to transport water from the Autonomous Region of Madeira southwest of Portugal. *** Carp as Kitchen Scrap Disposal **- This is part of a traditional Japanese practice of running canals through villages for fresh water and feeding food scraps to carp who live in it. *** Qanat **- the ancient qanat system provides water to agricultural and permanent settlements in arid regions of Iran, by tapping alluvial aquifers at the heads of valleys and running the water downhill through underground tunnels, often over many kilometres. This system includes rest areas for workers, water reservoirs and watermills. It can also paired with wind towers on buildings to regulate temperature like a giant swamp cooler, drawing cool air up from inside the tunnels. ***

Waterwheels and mills are already more or less a staple of the genre but definitely fit here. They have been used for pretty much every task humans have that involved a spinning thing, from running machinery, to grinding grain, even lifting water out of a river up into a raised flume. * Canals and waterways as transportation - for most of human history we've used rivers and lakes as a transportation network. Traveling overland features a lot of obstacles, rough ground, forests and other obstructions. Rivers were fairly easy by comparison, especially for bulky or heavy cargoes. Cities frequently used canals, such as Khlongs in Bangkok, for transportation and even floating markets. === Wind === * Windmills - a surprisingly disruptive technology, early windmills upset the entrenched landowners who already owned all the good spots for mills on the rivers and put the capabilities of mills in the hands of regular people. * Vertical Windmills - it appears this design is a little simpler to build, as it uses a straight shaft from the windsails down to grindstone, without the intermediary gears found on horizontal axis windmills. A clever curving wall funnels wind through in one direction so the mill spins - though modern savonious wind turbines use curved blades rather than flat sails to do the same thing and could probably be made in the past. * Windmills aren't just useful for grinding grain, they also played an important role in pumping water for agriculture and harvesting salt! * Sail ships * Land Sailing and Sail Bogies were various land vehicles that used sails as a motive force. There were also variations of the aforementioned Chinese wheelbarrow) which used sails. * === The Sun === Solar panels might be out but there are plenty of other interesting ways to use solar power. Solar Concentrators - There's a ton of different designs (from parabolic mirrors to giant lenses) for use in all kinds of purposes, but the important thing for a fantasy setting is that they're generally pretty simple. Mirrors (which in this case would probably be polished metal because making big sheets of smooth glass is hard), a framework, and mathematical formulas for the overall shape, and you can produce incredible heat – up to 3,500 °C. In real life wood and coal met most of society's heat and metalworking needs, but a society that went all in on solar concentrators could find all kinds of clever configurations, layouts, and scales to use them at. Small, concave, handheld mirrors for starting fires, Scheffler reflectors bouncing light into households, bakeries, or common kitchens to run ovens, parabolic troughs on rooftops heating water in pipes, perhaps cities specifically built where the local rock formations allow for massive solar furnaces or even something like fields of mirrors being manually (or magically) aimed at the right furnace. A mix of some or all of these could give a fantasy region a visually distinctive character. If you want to go a bit later in the timeline, solar concentrators were even used to generate steam which was then used to drive water pumps for agriculture. And to run a basic refrigerator. If you want to get even fancier, Caustic Soda Locomotives and solar steam generators existed contemporaneously and though they never were IRL, they could be combined to set up solar powered steam trains with 1800s technology. === Agriculture === * Biochar is fantastically cool and can be an excellent way to improve soil: * https://medium.com/local-carbon-network/a-perspective-on-terra-preta-and-biochar-765697e27bd5 * https://medium.com/local-carbon-network/biochar-and-the-mechanisms-of-nutrient-retention-and-exchange-in-the-soil-e733dacdc3ea * Many of the techniques in the winter greenhouses section are low tech enough to apply here. Pineapple pits and fruit walls were effective using very simple tech though citrus trenches seem to have been less successful. * If you're interested in farming in wetlands, the Chinampa agricultural system (farming on artificial islands) is very worth reading up on! This is

a pretty ancient farming practice from Mexico and Central America, which is still in use in some areas. It's also important to note that despite a lot of claims by Europeans over the years, Chinampas didn't float. For that you may want to check out the floating islands of the Uros on Lake Titicaca. === Working with Trees === * Pollarding and Coppicing** are a useful way to harvest wood from living trees, and even to shape the wood a bit (the long, straight branches produced were useful for fences, tool handles, firewood etc). * Hedgerows and living fences - Hedgerows are a traditional practice of shaping suitable trees into living fences which provide valuable habitats and last generations. (A version tailored to North American plants)** * Living bridges** - This is a type of tree shaping mostly found in India and Indonesia, using the aerial roots of trees to bridge rivers and canyons. As long as the tree from which it is formed remains healthy, the roots in the bridge can naturally grow thick and strengthen. These carefully shaped bridges are an excellent fit for wet climates - they survive long rainy seasons, earthquakes and floods, grow stronger over time, and can be made with time, effort, and an understanding of native plants.

Architecture

Solarpunk structures will generally be designed to fit local conditions and use local materials - especially in a lower tech setting where there's less choice to do otherwise. (Although a setting where an overuse of magic serves as a stand-in for oil and allows for lazy one-size-fits-all design at an environmental cost could be cool). Architectural designs and urban planning from basically all of human history prior to the last few hundred years probably qualifies as long as the climate and available materials are similar to your setting. This section will call out a few interesting examples but there's simply so much out there it won't be comprehensive.

- Consider whether to make access to sunlight a foundation of your urban planning or whether people would want to minimize it to stay cool.
    - I've seen some claims that the villages the Puebloan peoples built in cliff alcoves on the sides of mesas were intended to benefit from winter sunlight while sheltering from summer sunlight, but since most of those articles didn't get the name of the people right, I'm now doubtful that that fits. It could just be the alcoves were more sheltered than living up on the mesa tops where they farmed. (I'll update once I've done some more reading)
- In addition, consider passive systems like Awnings and sash windows which were common before air conditioning.
- From what I've read, cave cities were mostly designed around defense, but the stable underground temperature also provided protection from cold winters and extremely hot summers. Below ground, the ambient temperature is constant and moderate. As a bonus, it is easier to store and keep harvest yields away from moisture and thieves.
- This post on How to build a heat-resilient city has a bunch of low-tech solutions to hot climates/seasons.

Transit

The first Fixed Route Public Transport network was a series of horse drawn carriages traversing carefully selected routes on a frequent schedule in Paris (ferries operated in a similar way earlier but this was the first planned system I could find that deliberately set out to operate this way). It started up surprisingly late in human history in 1662 but the prerequisite technologies were horse-drawn carriages and the idea itself, so it's not unrealistic to move the timeline up if your setting needs it.

In a way, the idea of the structured system of independent drivers operating on planned routes is itself a technology which can fit any vehicle such as water taxis, or Chinese wheelbarrows.

Societal Systems

There's a ton of alternative ways to organize and run a society, many of which have been done at some place and time, sometimes successfully for hundreds of years. Capitalism doesn't like acknowledge that other systems can work and our current society has done a fair job of burying some of this history. This is one area where I hope we can expand this article in the future, though I'll acknowledge that I'm not terribly qualified to gather and write up these snippets of other cultures.