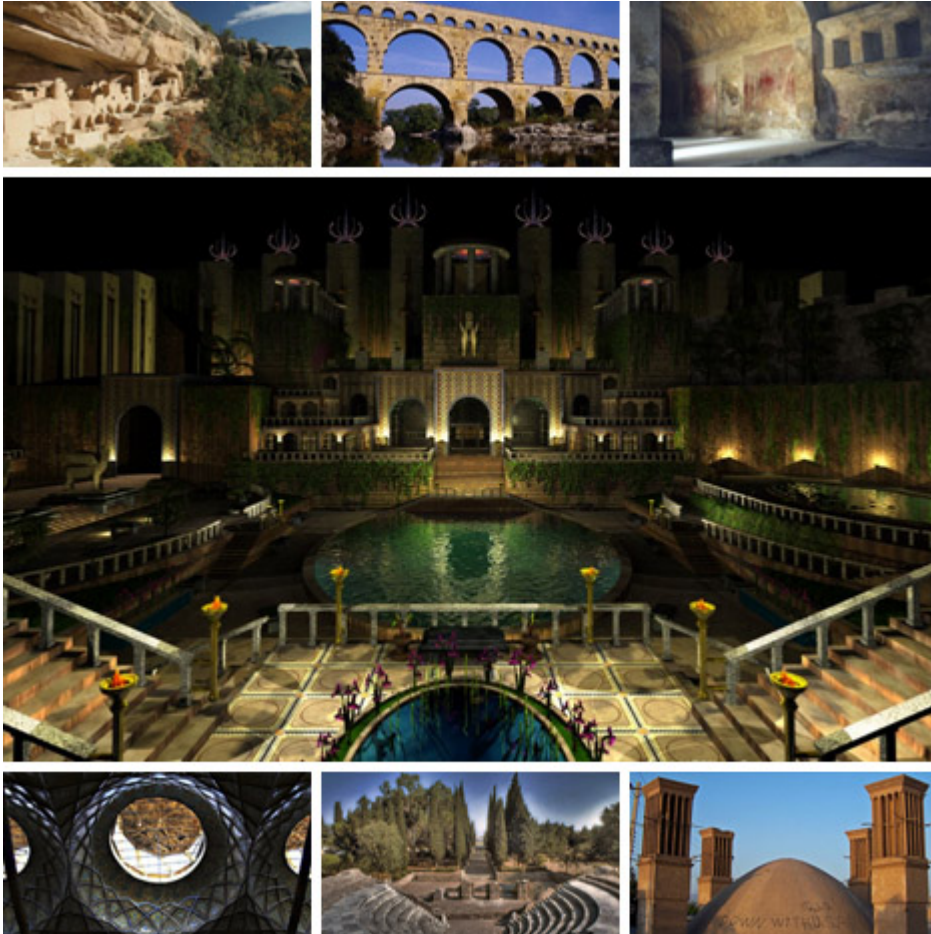


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## 7 Ancient Wonders of Green Design & Technology

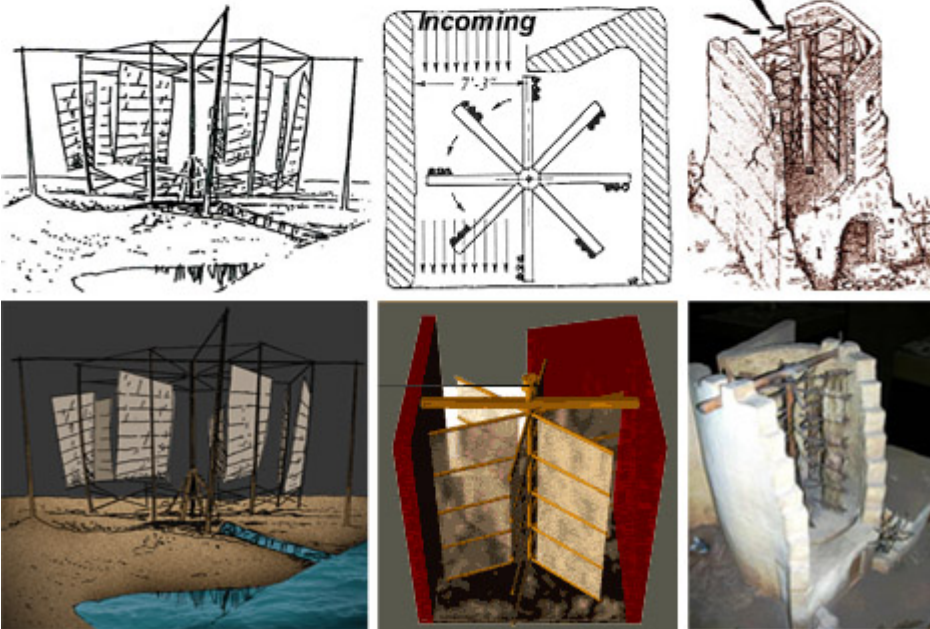
By [Ecoist](#) in [7 Wonders Series](#), [Art & Design](#), [Energy & Fuel](#)



We have come a long way since humans first used biomass fuels for their fires over 800,000 years ago. Green design, sustainable innovation, alternative energy – these are all recently-coined buzz-phrases for concepts that in some cases date back tens of thousands of years. The ancient Chinese used concentrated solar power for heat energy and fire, Native Americans used hot springs as renewable geothermal sources for cooking and healing, and some speculate the Egyptians used wind power to help build their pyramids. From Greece and Rome to Persia and North America, here are seven incredibly innovative uses of geothermal, water, wind and solar power from around the ancient world.

### Ancient Wind Power Designs

#### 1) Wind for Power and Water: Ancient Persian Windmills

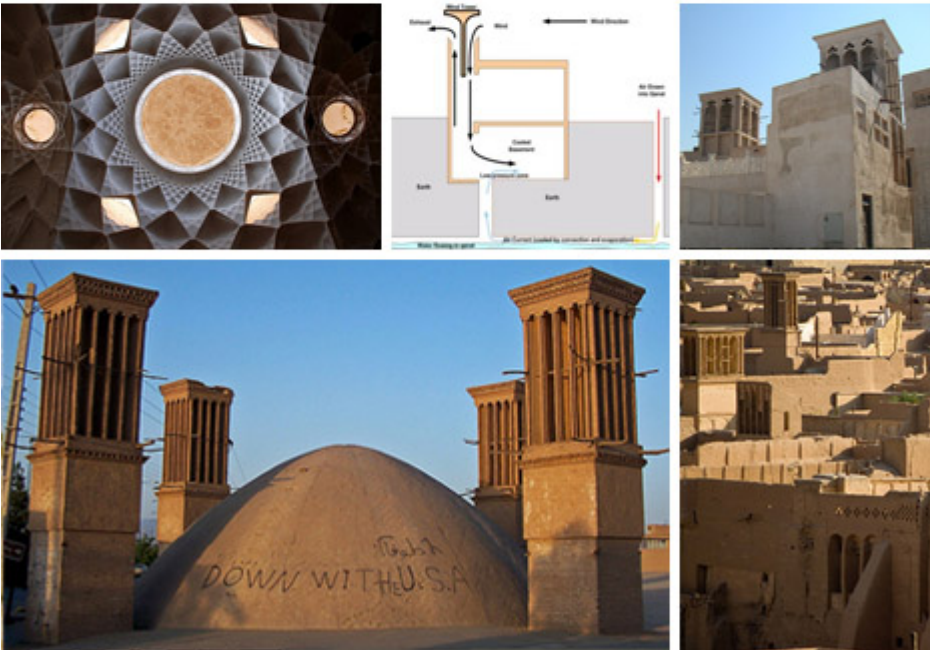


(Images via: [Ullesthorpe](#), [BluePlanet](#), [DeutschesMuseum](#) and [WorldofEnergy](#))

The earliest known windmill design dates back 3000 years to ancient Persia where they were used to grind grain and pump water. Reeds were bundled together to create vertical paddles that spun around a central axis. Carefully placed exterior walls ensured that wind would primarily drive the potentially bidirectional system in the desired direction. Of course, the use of wind power in sailing predates the inventions of windmills but these are the first known use of wind to automate mechanical/manual everyday tasks.

## 2) Wind for Cooling and Heating: Ancient Persian Wind Towers



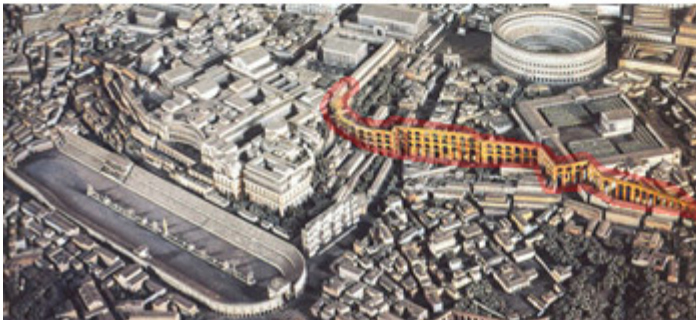


(Images via: [Seier](#), [Pileggi](#) and [FivePrime](#))

Persia is also the original home of one of the most complex passive ventilation and cooling systems that has ever existed – 2,000-year-old engineering that rival modern hi-tech equivalents with the simple and elegant effectiveness of their design. Using a combination of air pressure differentials, structural orientation and running water these windcatcher structures help regulate temperatures in the harshest of desert environments with cool nights and burning hot days.

## Ancient Water Power Designs

### 3) Water Power: Ancient Roman Gravity Aqueducts

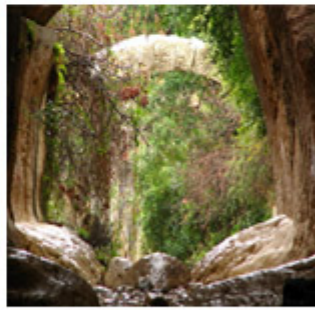
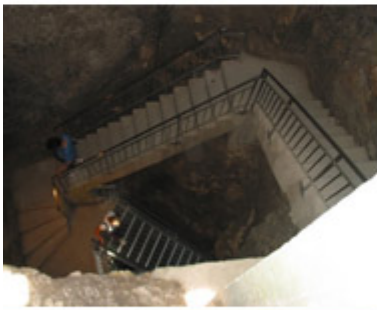
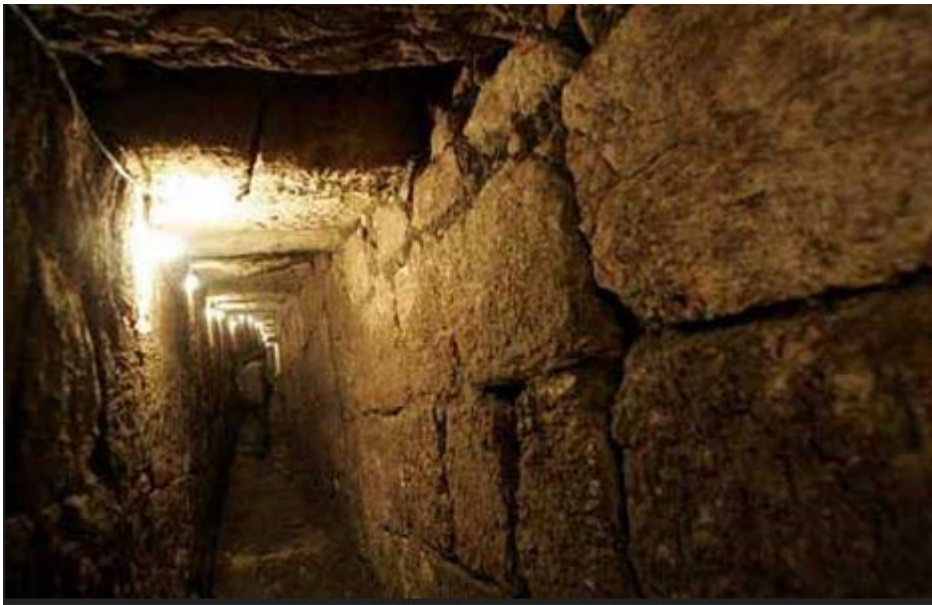


(Images via: [ATPM](#), [KMKZ](#) and [IWAR](#))

The Romans are well known for their many colossal and ingenious works of architecture and engineering but perhaps most of all for their gravity-driven water-distributing and waste-evacuating aqueducts – some of which are still in use today. More than a marvel of ancient plumbing, these aqueducts are also an early example of renewable water power for mines, forges, mills and baths. Water was used in hydraulic mining to prospect for, crush and wash ore and likely to operate hammers to crush ore and water wheels.

#### 4) Water Reuse: Ancient Jerusalem Gray-Water Plumbing



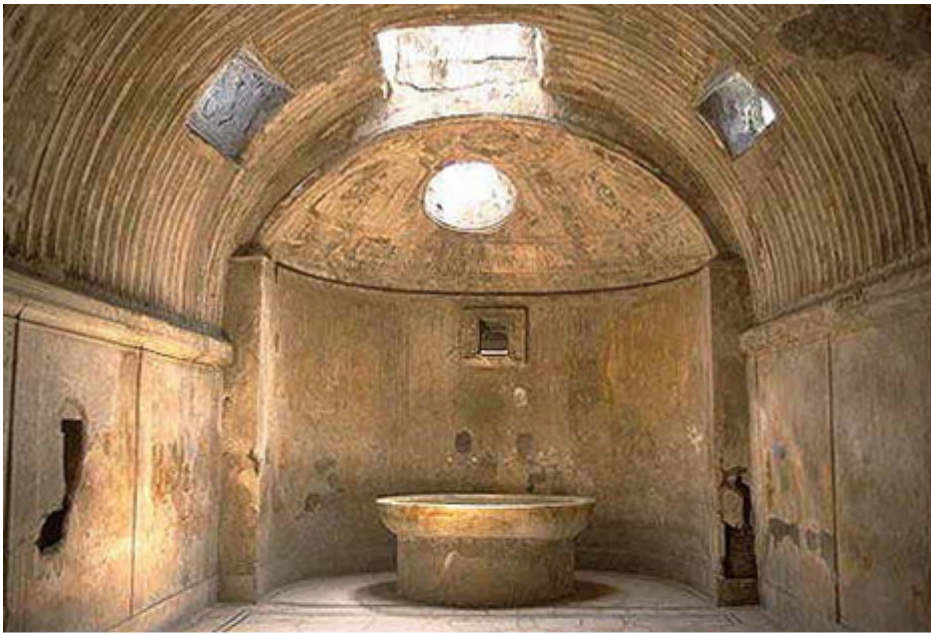


(Images via: [Rhodesium](#), [Samos](#) and [Florilegium](#))

Located at high elevation and away from plentiful sources of surface water, the ancient city of Jerusalem has relied on underground rivers and other difficult-to-access subterranean sources of water for nearly 15,000 years and still has well tunnels that date back to the 12th Century BC. As the city grew and evolved so did its water use and reuse systems. Sink water was conserved in basins and used to flush waste much like modern sewers but also saved to water gardens while particulates were filtered to provide fertilizer for surrounding fields.

## Ancient Geothermal Power Design

### 5) Renewable Geothermal Heat Energy: Ancient Roman Thermal Baths



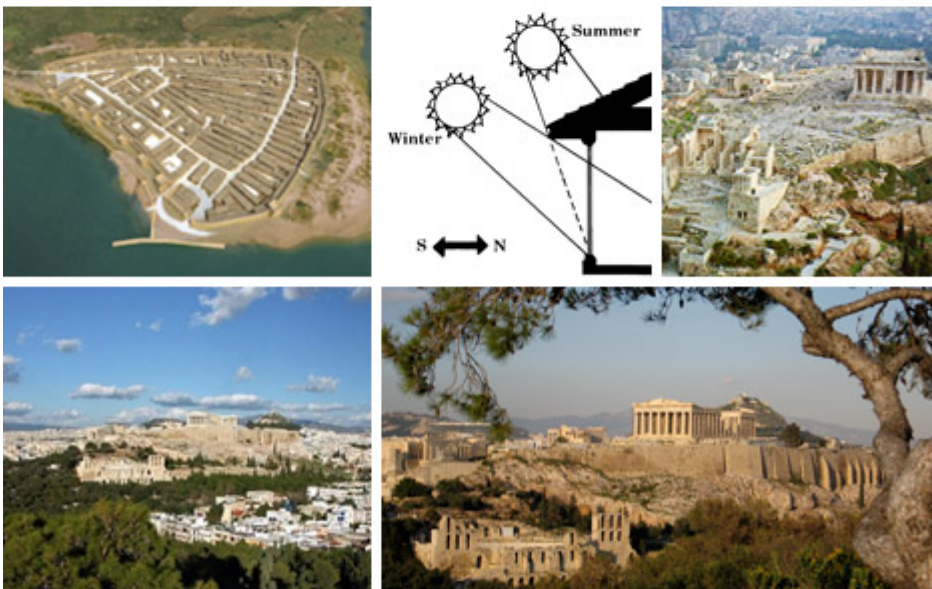
(Images via: [Yasan](#), [ARP](#) and [BBC](#))

Ancient Romans used geothermal energy indirectly through the water it heated, particularly in cities like the infamous volcano-buried Pompeii (shown above) for their baths and to heat homes. These thermal energy projects were invariably limited by location and dependent on proximity to places like the area around Mount Vesuvius where hot magma was closer to the Earth's surface. Romans also created ice using thermal differentials – carving pits, putting in water and covering them during the day so they would freeze at night.

## Ancient Solar Power Designs

### 6) Passive Solar Orientation for Heating: Ancient Greek Cities

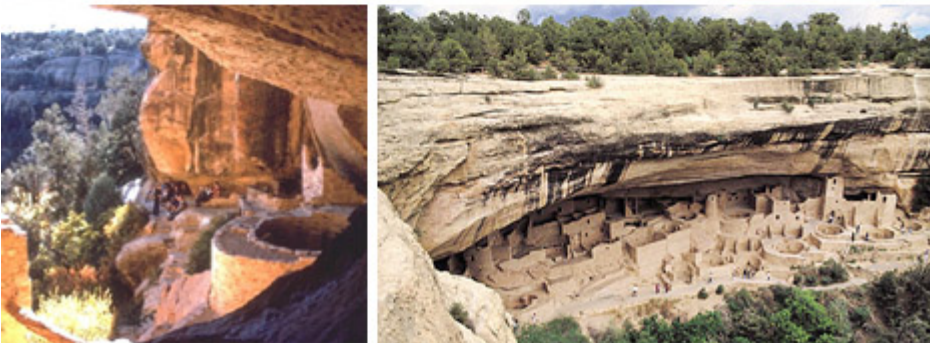
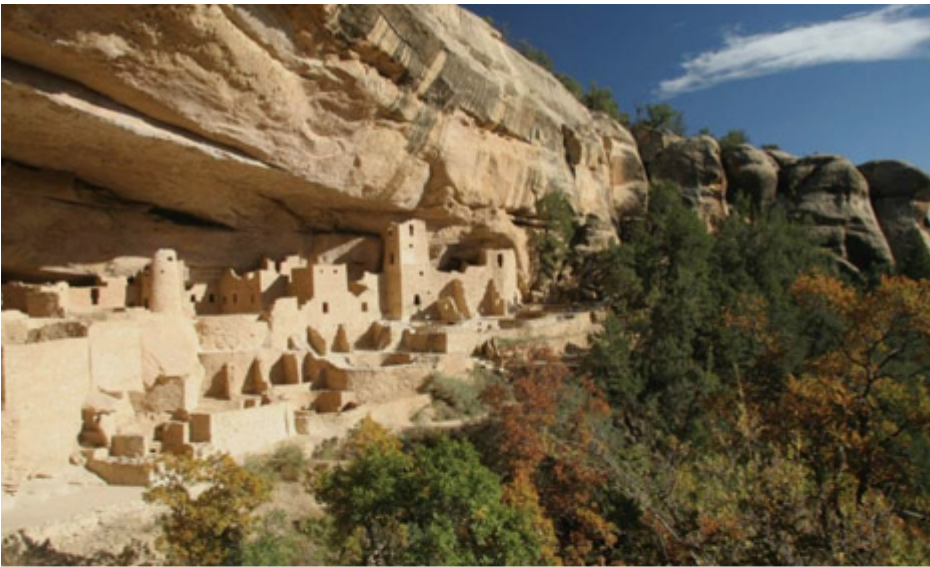




(Images via: [ESNAthens](#) and [HotelGuide](#))

As the ancient Greeks ran into fuel shortages, much like the contemporary western world, they started to think more about how to design buildings to maximize heat gain and retention during winter months. They began orienting buildings and entire city grids such that houses had extra southern exposure to capture the sun's rays from low in the sky in the coldest parts of the year. Romans eventually took things a step further by adding glass to their windows in order to retain more of the heat gathered from sunlight.

## 7) Passive Solar Shade for Cooling: Native American Cliff Dwellings



(Images via: [About](#) and [Britannica](#))

The so-called Cliff Palace in Mesa Verde National Park, Colorado is the largest cliff dwelling of its kind in North America. The people who once lived there had lives that revolved around the sun in more ways than one. The passive solar (and other weather) protection provided by the monstrous overhanging cliff above the settlement is just one example. They also build structures in key positions to be solar indicators at particular times of the year, including solstices, for pragmatic and religious purposes.

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- tom  
February 6th, 2009 at 6:53 am

your an idiot! A programmable simple AI Gore droid. Everything was green in the stone age, that's all they had.

- [SolReka :: solar cookers | alternative energy](#)  
February 15th, 2009 at 12:18 pm

@Tom

Totally right what you said. AI Gore the whore preaching his marketing pitch that most refer to as 'global warming'.

I wonder when we will have a green tax / carbon tax imposed on us. It should be industry leaders who makes the changes to combat so called global warming, and not the little people – the end user.

Finally, the Cliff Palace in Mesa Verde looks like an awesome place to have lived.

Regards  
Sol

- [Erica](#)  
March 31st, 2009 at 12:11 pm

Thanks for the great article!

Well, technically not all ancient technologies were sustainable – some of these examples are still in use, but many more have become ruin after a short period of use.

The thing we have now, that they didn't use on the same scale, is fossil fuels and plastics. We've used these to create some amazing technologies – but will we be able to keep them after we use up our legacy fuels?

We may have reached a magical threshold where our technology can run on little enough energy that we can preserve it this time. Or we may be heading into yet another "dark ages," when things fall apart.

I prefer to remember traditional tricks of the trades, just in case we need them again.

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