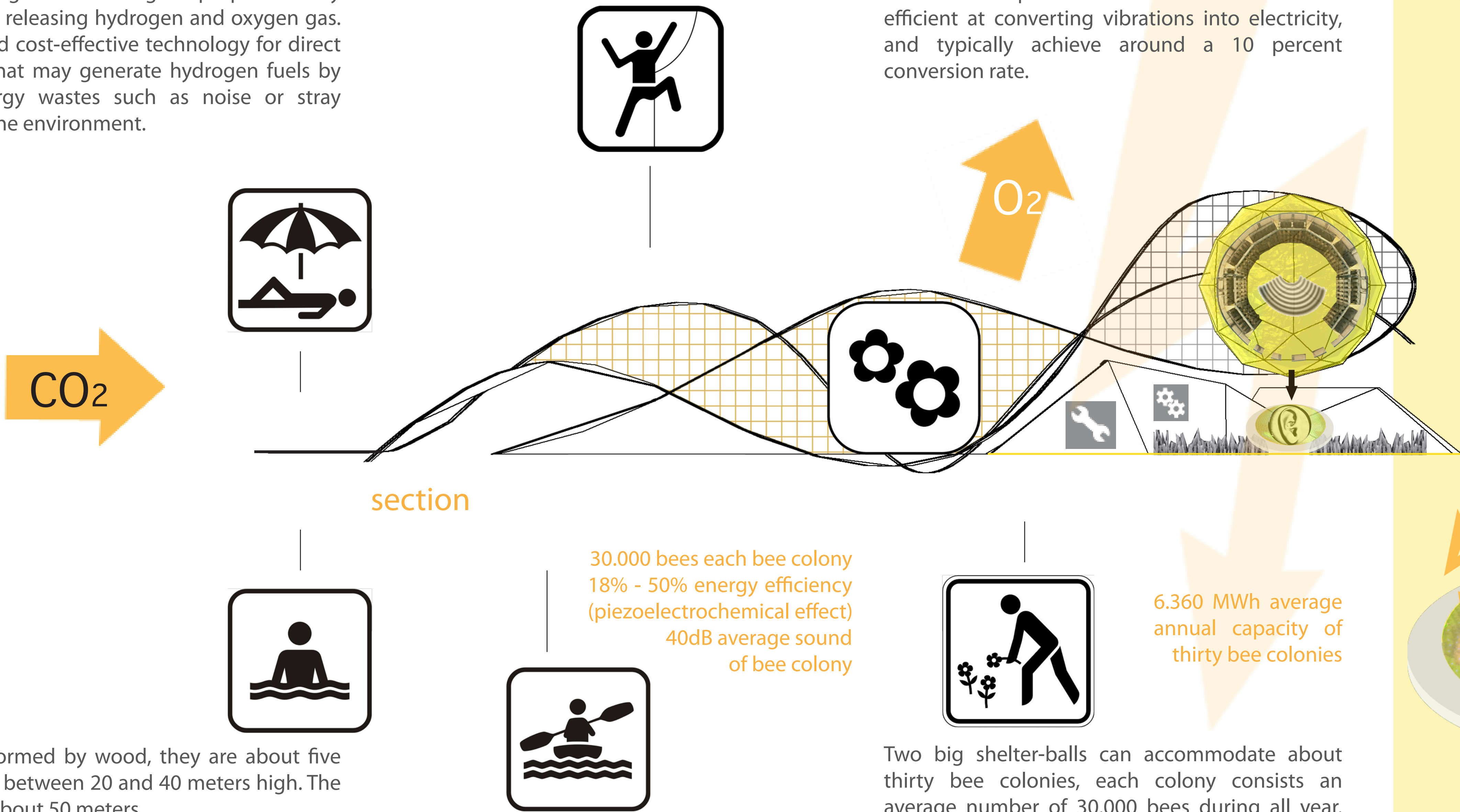


The **piezoelectrochemical (PZEC) effect** is a variation on piezoelectric crystals are designed to be submerged, so the charge they generate instead pulls apart water molecules to release hydrogen and oxygen gas. The chemical energy of hydrogen fuel is more stable than the electric charge. Storage of hydrogen fuel is easy and would not lose potency over time. Crystals of zinc oxide that, when immersed in water, absorb vibrations and develop areas of strong negative and positive charge. These charges rip apart nearby water molecules, releasing hydrogen and oxygen gas. This is simple and cost-effective technology for direct water splitting that may generate hydrogen fuels by scavenging energy wastes such as noise or stray vibrations from the environment.

Thin microfibers of highly flexible zinc oxide crystals need to be grown, that flex when subjected to vibration and creating an electrical field with a high enough voltage to split water and release oxygen and hydrogen. Growing fibers with different dimensions changes the type of vibration they absorb best. For instance, it should be possible to tune them to maximize **energy production from the vibrations caused by any sound**.

The nanocrystals can convert 18 per cent of the energy it absorbs from vibration into energy locked up in hydrogen gas, which can be released by burning. If the electrical potential is kept constant during a tensile extension a piezoelectrochemical current response is found with about 50 per cent mechanical to electrical energy conversion efficiency, enabling energy harvesting. Conventional piezoelectric materials are not as efficient at converting vibrations into electricity, and typically achieve around a 10 per cent conversion rate.



design
The slopes are formed by wood, they are about five meters wide and between 20 and 40 meters high. The highest point is about 50 meters. The secondary construction is also wooden, so plants, bee-friendly and without pesticides, can use it to climb up. The bees will do the pollinating and after a while, grass and climbing plants will overgrow the structure and during the process of photosynthesis existing CO2 emissions get reduced.

The two shelter-balls for bee colonies on the artificial hill, are surrounded by slopes, which form an interesting landscape inside and outside the water for different activities as swimming, walking, climbing, diving, boat trips, etc.

Two big shelter-balls can accommodate about thirty bee colonies, each colony consists an average number of 30.000 bees during all year. Beneath those shelter-balls is an artificial hill, with all the technics and microfibers for the piezoelectrochemical (PZEC) effect. The sound, of approximately 1.000.000 bees in the shelter-balls, moves towards the microfibers, inside the hill and transfers into neutral energy.

