New award-winning water from air technology

Water from air?

All water on Earth comes from air in a perpetual water circle. Air always contains water and it rains when the saturation limit of water in air is exceeded. In vast regions, however, this does not happen and they are dry, unfertile and unsuitable for life. Nevertheless, there is an unlimited supply of water in the air allover the world; we just need to get it!

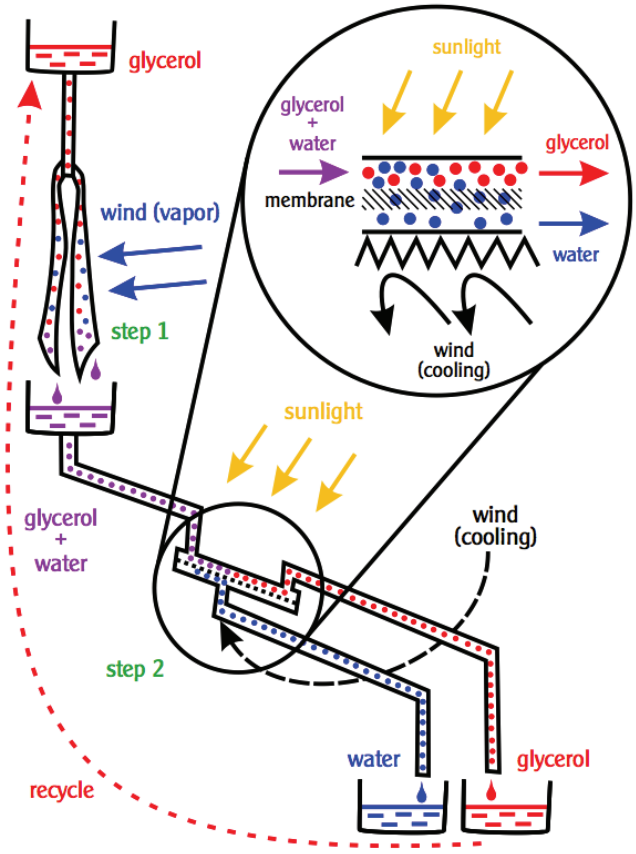
Innovative water-from-air technology provides clean water in two steps

The highly inventive and new process from LAMBDA Instruments, that received the innovation of the year 2012 award in Prague on the 7th December 2012, delivers water of highest purity on most places in the world. It is based on passive absorption of water from air humidity by glycerol and the subsequent water regeneration by solar heat. Air humidity is omnipresent and can become an unlimited source of clean water almost anywhere in the world.

This new technology consists of two steps:

Step 1: Water vapor is transformed into liquid
Water vapor in the air is absorbed by glycerol, which absorbs water with high affinity and thereby transforms water vapor into a liquid (hydrated glycerol). The infrastructure for this step is adaptable to the local conditions using e.g. roofs or walls of houses, clothes lines etc.

Step 2: Water recovery in the extraction module
The water containing (hydrated) glycerol solution enters the multilayer structure of the water-extraction module, which is heated by sun radiation. The water molecules of the heated hydrated glycerol evaporate and the water vapor passes through a semi-permeable membrane. After passing the membrane, the water vapor condenses on a surface that is cooled by the ambient air. This pure water is then collected into a storage vessel.



Recycling of glycerol
The dehydrated glycerol (absorber) is recycled and reused in the water absorption step (step 1). Glycerol, the water absorbing substance is fully nontoxic and is actually edible. Even in case of wrong manipulation or destruction of parts of the structures or modules, there is no danger for the user or the environment.

Due to the high affinity and specificity of the absorber for water (step 1) and due to extraction of water through a semi permeable membrane (step 2), clean drinking water of very high purity is obtained.

The productivity of the system is mainly limited in its second step, by the availability of energy (sun heat) needed for separation of water from the hydrated glycerol solution. Based on theoretical calculations, one square meter of module under direct solar irradiation could produce 15 liters of water per day. Depending on local conditions, about 5 liters of clean water per square meter of module surface can be obtained. The simplest way to increase the water production is the addition of further water-extracting modules. This is more economical than the installation of a mechanically complex sun-following system. **But even 5 liters of clean water produced per day and square meter of module surface correspond to an annual precipitation of 1'825 mm. This represents a water equivalent available only in very rainy places in the world.**

The first step (absorption step) will not be limiting in practice, because it can run 24 hours a day and the air contact surfaces can be made at very low cost.

This new water-from-air technology can supply water regularly every day and generate a constant and reliable source of water for humans, animals and plants. If the necessary attention, support and investments into a broad installation of this new process around the world are made, the impact will be huge for the whole humanity and beneficial for our planet.

For further information and collaboration, please contact Dr. Lehky (info@lambda-instruments.com)

If you would like to offer financial support, please contact the Sanakvo foundation (info@sanakvo.org), a Swiss, non-profit, humanitarian foundation, which supports technology for extraction of clean drinking water from the air for the neediest people in the world. Since 2010 the Sanakvo foundation has chosen to support and implement this innovative technology. Sanakvo has presented the water-from-air technology during the 6th World Water Forum held in March 2012 in Marseille.

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