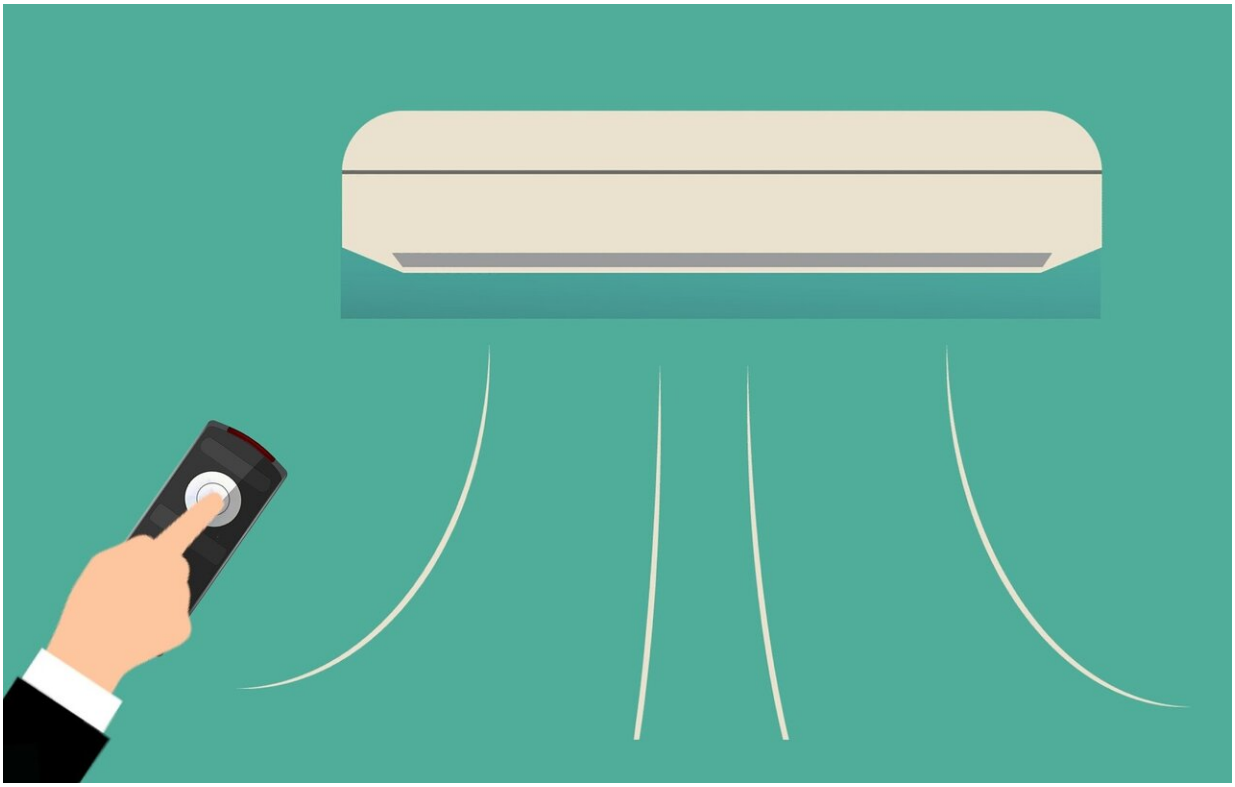
Using geothermal to cool your home

July 16 2019, by David Bradley



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Geothermal energy can be used to sustainably keep a house cool in notoriously hot parts of the world, thanks to the design of a new cooling system by researchers in Italy and Turkey. Writing in the International Journal of Exergy, the team explains how their vapour absorption chiller (VAC) was designed to meet the cooling demands of a 140 square metre, detached family home in Izmir, Turkey.

Hot geothermal fluid from deep beneath the house is transported to the VAC in which water and ammonia are used as an absorbent and a refrigerant, respectively. The system runs at temperatures of 30, 90, and 2 degrees Celsius at the condenser, boiler, and evaporator. The system runs at an equivalent of about 4.5 kilowatts based on cooling load calculations.

Under optimal conditions, the team estimates that costs would be offset by electricity saved running a conventional air-conditioning unit within six and a half years. This takes into account an up-front estimated cost of US$3500. Moreover, the use of sustainable energy to drive the system means a greatly reduced carbon footprint.

It is critical as we face rising global average temperatures and sharply rising local temperatures because of anthropogenic climate change, that we find alternative, sustainable ways to keep people cool in their homes without simply burning more fossil fuels to generate electricity to do so.

More information: Buket Ozcan et al. Thermodynamic analysis and assessment of a geothermal cooling system for a house, *International Journal of Exergy* (2019). DOI: 10.1504/IJEX.2019.100370

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