Scientists discover potential sustainable energy technology for the household refrigerator

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"The evaporating temperature of the refrigeration cycle depends only on the freezer temperature and appropriate reduction of the evaporator area in the fresh food compartment will not decrease the overall efficiency," explained Cao.

"Most families need one or two refrigerators and they are always on 24 hours a day, 365 days a year. That wastes a lot of energy. Even if we can save a little energy, that helps the human race be more energy-efficient," said Cao.

Cao and his team are not the first scientists to attempt to improve the efficiency of household refrigeration. Extensive experiments by many different scientists have looked at various parts of the refrigerator to improve energy consumption, but a definitive solution has not yet been found. In Cao's study, a novel refrigerator with a loop thermosyphon is put forward to decrease the heat transfer between the freezer and ambient air.

"One of the surprises was how much energy we saved. The energy-saving ratio of the improved walls got close to 30 percent—more than we had expected. This technology even works in hot climates like the desert."

Although Cao's study is currently based on theoretical calculation, the results are promising. "It has great potential to be popularized as a sustainable energy technology or applied in the renewable energy field, considering its significant energy-saving effect, simple structure and low cost," said Cao.
