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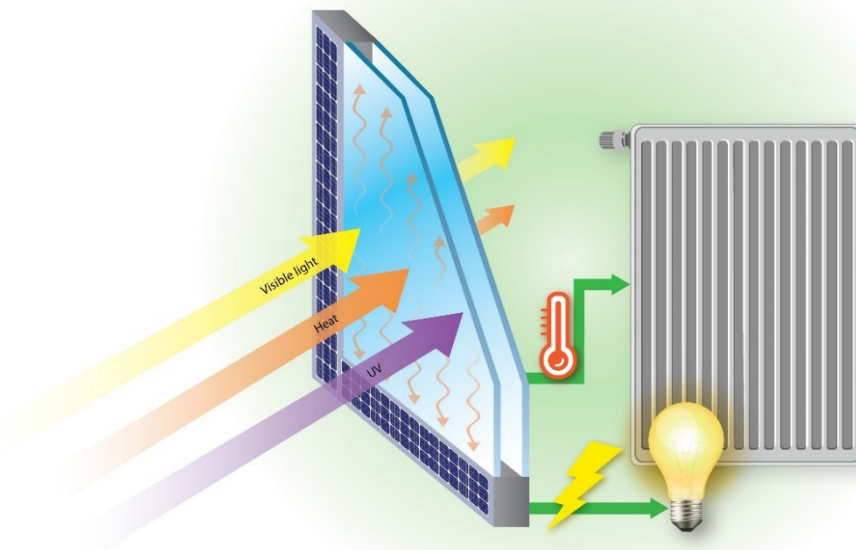
By Sophia Nourozi, Iliia Stavitskii, H.R. Tschudi, Assad Abdulwahab, and Amandeep Virk

A Window that Controls Energy Flow

Seventy-five percent of domestic energy consumption today is used for heating and hot water. With rising energy costs, the utility industries today are taking hundreds and thousands of dollars out of every family's pockets. A start-up project wants to change the utility industry with a simple vision: cut them off.

A team of engineers from a start-up campaign in Vancouver, BC aims to drastically alter the consumption ratio with an economical system that works from both, the delivery and the usage side. The intent is not to infringe user comfort and preferences. The co-inventor, H.R. Tschudi, says that technology today allows them to think in terms of not requiring the user to manage energy at all. While generating plenty, he says, solar energy is not synchronized with usage, which makes it difficult and expensive to harvest and to store. The team has focused on economics and came up with a cost effective, four phase solution that includes harvesting, concentrating, converting, and storing of energy.

In their first phase, they are starting with the weak spot of homes: the windows. The team has developed a system with super-insulating windows that achieves a significant reduction of energy loss and heat gain. In addition, the window can harvest energy from its entire surface area, including the frame. While the frame contributes electricity directly, the spaces between the window panes are filled with a liquid that heats up, contributing to a home's hot water system.



Traditionally, the focus has been on multi-glazing for better insulation and on coatings that alter the energy balance of windows. The window developed by the Vancouver team stands out through its great capability to not only insulate but to also regulate and harvest the energy flow. Due to the window's simplicity, extremely low cost of maintenance is achieved. There are no chemical processes involved that could affect the environment.

The potential for cheap hot water from super-insulated, liquid filled windows and their extended life span has long been recognized. The Vancouver engineers found that a significant effect can be brought forth with the combination of these technologies and with computerized controls. With their approach, the team can regulate precisely how much energy is allowed to flow into a building as well as how much is allowed out. Thus, the inside temperature can be kept constant with a fraction of the previous energy usage and maintenance. The impact is so dramatic that the wide application of these windows alone will scare the utility industry.

The start-up is currently campaigning for funds to produce their full scale prototype on <https://www.indiegogo.com/projects/cut-off-the-utilities/x/8741450>.



Electricity generation: The electricity generated by the solar cells can be integrated with the household electricity system, thus reducing the electricity bills.



Solar collector: The solar energy absorbed by a liquid incorporated between the window glazing will carry thermal energy to dramatically reduce the cooling requirements during a hot summer day and slash heating costs during cold seasons. The hot water can be further used for domestic purposes.



Superb Insulation: The whole system is super-insulated to reduce unwanted heat gain or loss.

Combined, these three factors lead to an unprecedented reduction in energy consumption.

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