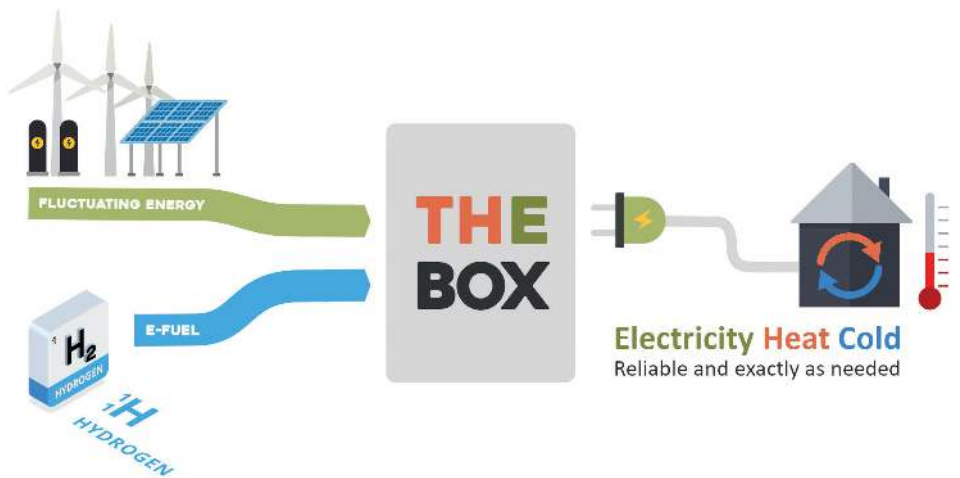




TH-E Box

TH-E Box – Thermal and Electrical Energy Box

TH-E box converts fluctuating energies, such as photovoltaics, into electricity and heat for the building energy supply exactly as required. CO₂-neutral methanol is used as a supplementary energy source, which generates hydrogen for the integrated fuel cell.



TH-E Box consists of an electric heat pump, a CHP unit (preferably a fuel cell), a PV inverter battery system with connected PV system and an external heat buffer storage. Typical TH-E boxes are designed for single- or multi-family homes, but they can also be realised as container variants for entire residential quarters or other larger applications without restriction.

Through the combination of battery storage, heat pump, and CHP unit, any desired ratio of electricity and heat can be generated. This is otherwise not possible with currently available technology. The optimal amount of heat and electricity can always be generated at any time. There is no surplus or lost energy. Even otherwise unusable low-temperature waste heat is collected again via the heat pump.



The system can be operated in both directions to serve the grid (positive/negative load shifting), it has swarm intelligence, and is smart-grid compatible. The system works with model-predictive intelligent control, uses weather forecast models, learns user behaviour, and recalculates the energy demand in the building according to its optimal operating state every 15 minutes.

There are several functional models and a fully working prototype. Industrialization is on-going.



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