

Title: Home energy storage parameters

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Why is thermal energy storage important?

Thermal energy storage can provide great flexibility, especially for low heating demand dwellings. Low investment cost thermal energy storage is one of the most important factors to improve its uptake. Heat pumps couple best with hot water tanks but have potential with low-cost latent heat storage that melts around 50°C.

What is the thermal equivalent of energy storage for batteries?

The thermal equivalent of energy storage for batteries depends on which heater it is coupled with: if this is coupled with DEH this is near identical to the electrical values shown as DEH efficiency is close to 100 %.

Why is a high temperature a good choice for energy storage?

For DEH although the high temperature allows high energy storage densities, at the higher U values there are more losses and so there is little benefit until around 0.8 W/m² K, below this point the heat can better be retained to more efficiently use off-peak low emissions grid electricity.

What factors affect domestic energy technologies viability?

A key factor to domestic energy technologies viability is the tariff rates, to understand how the increased cost of energy from the energy crisis has altered the position of the heating systems, Fig. 5 uses the same tariff styles but from 2022 for (a) 10th percentile and (b) 25th percentile dwellings again.

What temperature is used for TES storage?

A default temperature of 51 °C is used for the TES storage temperature, but higher temperatures of up to 500 °C are considered in the simulations, and up to 1500 °C in initial material and system comparisons.

Why is high energy storage capacity better than ASHP?

The high energy storage capacity of the high energy densities scenarios with the large 0.5m³ TES coupled with the faster charging DEH, can better take advantage of off-peak electricity rates, and make a larger absolute difference due to the nominally higher OpEx of DEH compared to ASHP.

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