

Parametric study and simulation of a novel latent storage heat pump system



Parametric study and simulation of a novel latent storage heat pump system regarding domestic housing within Switzerland

Simulations

To investigate the behavior of the different storages within a domestic heating system, the simulation software Polysun was utilized to compare the performance of multiple variations of sensible and Cowa storages. These results were then used to determine the optimal size for Cowa storages.

Performance

The Cowa systems, when just considering heating demand, showed already an enhanced performance compared to sensible storage tanks.

Overall, the Cowa systems showed similar behaviour for storages 2 to 3 times smaller compared to sensible systems.

Total cost of ownership

Since the Cowa storage provided equal performance at 2 to 3 times lower volumes, therefore the investment costs for the comparative Cowa storage were lower. Additionally, the savings from own consumption (OC) of PV energy was increased, which lead to an overall lower TCO.

Considering the 200l Cowa system and a 600l sensible buffer tank, the Cowa system performed slightly better in regard to OC whilst being less expensive.

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Semester:
FS21