

# Heat storage



Efficient energy storage facilitates the integration of renewable energy sources into energy systems. Because of temporal variability in the availability of solar and industrial process heat, thermal storage systems are key components for the effective utilisation of this heat in solar thermal power stations, heat recovery processes, solar local heat projects, air-conditioning systems in buildings, and service water systems.

With large seasonal heat storage facilities, around half of the total heat requirements of large building complexes in Germany can be covered by solar energy.

## Research and development requirements

New storage technologies require a comprehensive research and development. The development of new storage materials based on phase-change and sorption materials basically opens up entirely new approaches to heat storage with little loss, higher energy density, and the use of decentralized heat supply systems.

Such new approaches are especially promising in modern buildings with lower energy consumption. Furthermore, new storage materials open up new applications for high-temperature solar thermal stations and improve the use of industrial process heat.

Storage systems for small combined systems (power, heat and cooling) are interesting because electricity generation determines overall output, and the heat generated could be stored for several days.

The installation of heat storage units could increase the capacity utilize a nation of solar thermal stations as well as lower the cost of electricity generation. Considerable research is still required for the development of such storage systems so that the properties of active storage materials can be optimized, new materials found, and costs reduced. In addition, high performance for the entire service life and a minimum service level at a desired temperature need to be improved.

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