

When will energy storage become the fourth pillar of the energy system?

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Kurzbeschreibung

The energy transition is still predominantly associated with renewable electricity. When it comes to heat supply, the discussion often gets stuck, although heat is the real "elephant in the room". More than half of the energy consumed in Germany is used for the provision of hot water for heating and of course for process heat. Up to now, up to 85 percent of this demand has been met by burning fossil fuels.

The use of renewable electricity is already cheaper than the use of fossil fuels, as solar electricity has become the cheapest primary energy. However, the rapid cost reduction cannot be harnessed for the heating market: What all integration applications or sector coupling technologies have in common is the fact that their economic viability depends heavily on electricity costs, since the electricity and heat sectors are separated not only physically, but also in regulatory and economic terms. In other words: the economic gap does not arise in the technology costs, but in the regulatory and thus economic incompatibility of the electricity and heat markets. This also leads to incompatibility with the climate goals.

Here, integration technologies such as high-temperature storage can make a decisive and cost-efficient contribution to a CO₂-free heat supply – both for the industry and for utilities. They provide a bridge between the electricity and heating markets by taking advantage of the increasingly higher volatilities in the electricity system, which will intensify with the expansion of renewables. The ultimate aim is to use every kilowatt hour produced most efficiently.

Thermal storage applications thus represent a key technology for security of supply in an increasingly flexible energy system. They make it possible to “upgrade” the use of renewables, which have a production pattern of about 1000 and 1500 hours per year, to 7000-8500 hours to ensure security of supply. For industry, this means cost-optimized utilization of machinery and for utilities of heating grids. For both, industries and utilities, it means a decoupling from temporal fluctuations in electricity prices and from rising CO₂ prices.

In our view, the energy system of the future will orchestrate a variety of integration technologies and mechanisms. To realize this, we call for complementing the three basic pillars of our current energy system - generation, transport and consumption - with a fourth pillar - storage.