Chemical sites as energy hubs in the context of the energy transition
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Abstract

Chemical sites are characterized by a high specific electricity and heat demand. Security of supply and energy efficiency are key drivers and lead to a complex network of assets for electricity, heat and utility supply.

The continuous development of local energy systems and energy markets favor the demand side integration approach and bring new considerations to greater flexibility of processes and interconnected systems in the foreground. These include, for example, the use of novel technologies, increasing the flexibility of existing assets and the combination of those. Newly identified degrees of freedom, resulting from digitalization, sector coupling etc., offer chances throughout the supply chain to exploit opportunities in the energy markets.

The energetic crossnetwork use of all assets at chemical sites enables the representation of an virtual power plant at the site level. This allows a communicative coupling of locally distributed systems to find potentials for flexibility, which can be brought together under optimized energy and material aspects. The entire site is thus conceived as an energy hub in order to achieve efficient energy use for all consumers, while maintaining high availability and product quality. In parallel the chemical site is supporting the sector coupling between the hub and the public domain by energy exchange.