

BlueMilk: Preparation of dairy processing for modified energy systems within the energy transition towards renewables. Implementation by energy efficiency measures and use of flexibility of electrical components (FKZ: 281A103616)

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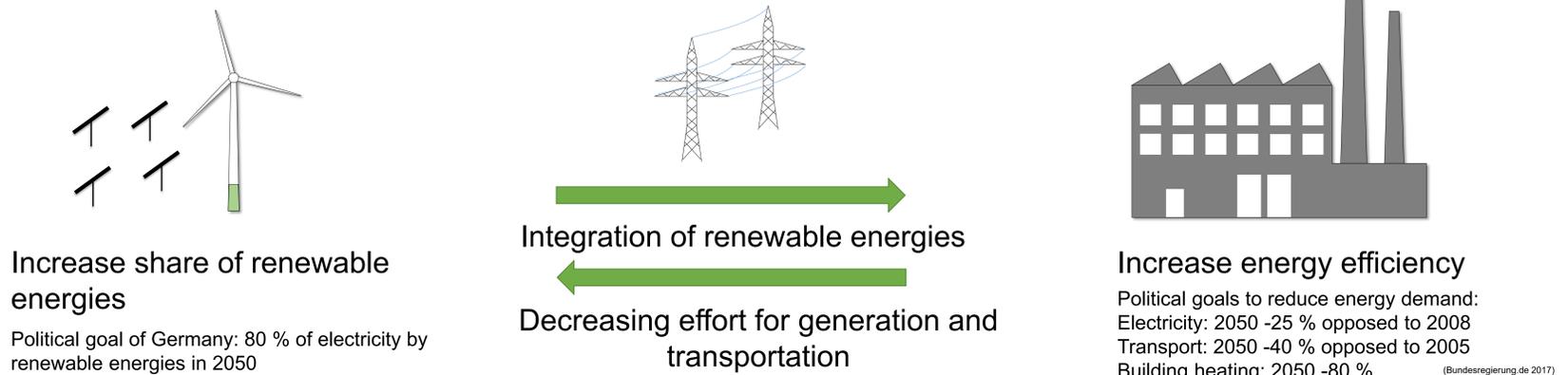


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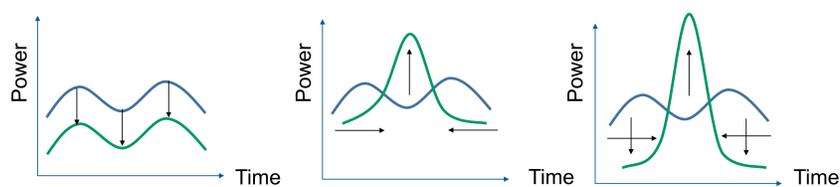
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Motivation – Meeting climate protection and energy policy targets



Research Questions



Increase energy efficiency

- Reduce generation
- Reduce transportation through grids
- Reduce demand for energy storage

Optimize power consumption

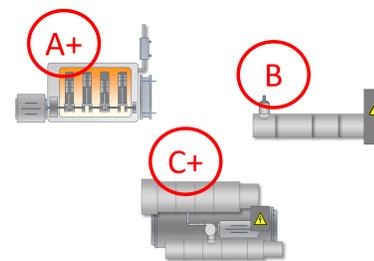
- Using electric power in times of high VRE shares
- Activating existing industrial storage capacities

Consider interdependent effects of efficiency and flexibility

- Flexible usage may increase total consumption, but reduces emissions, if energy is used in times of high VRE shares

Rating of energy conversion units by criteria of system efficiency (Selleneit 2019, Selleneit 2020)

- Ability to provide electricity according to the needs of the public supply
- ... and thus compensate the volatility of renewable energies
- Reduction of CO₂-emissions of the energy supply system
- Cost-efficient integration by considering economic criteria



Rating of energy conversion units by economic criteria (Stöckl 2019)

- How does system efficiency affect energy costs?
- How do charges and taxes of energy costs (electricity and gas) change through the flexible use of energy conversion units?
- Can the company reduce its costs through a sustainable and low-emission supply or must the framework conditions (e.g. subsidies) change?
- How do electricity exchange prices develop due to higher renewable energies in the overall system?
- What effect does the national emissions trading system (from 2021) have on energy costs?

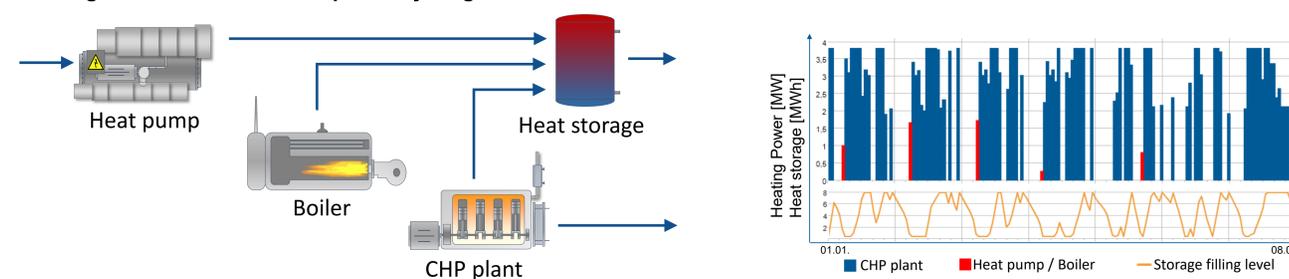


Joint approach to research

- Where in the company can a sectoral coupling of electricity and heat be achieved in order to increase the use of renewable electricity?
- Where is there potential for increasing energy efficiency in the company's production?
- How can the purchase and/or supply of energy be designed flexibly?
- Where is the optimum of efficiency and flexibility with regard to emissions (increase in sustainability) and energy costs (increase in operating profit)?

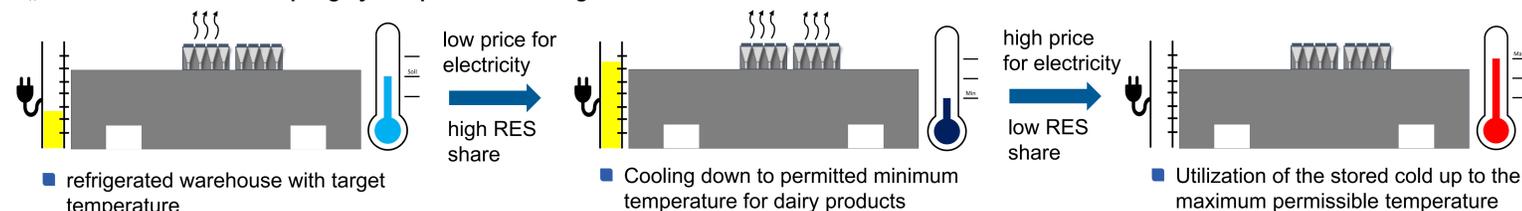
Sector coupling approaches and flexibility options for dairies

Intelligent combined heat and power by co-generation units



- Efficient usage and generation with intelligent feed into the public supply system with low RES share or intelligent purchase from the public supply system with high RES share, in each case taking into account the process heat demand

„Power2Cool“- sector coupling by compression cooling machines



- Production of cold with a high share of renewables in the public supply system and utilization of the storage capacities of cold stores and warehouses
- Optimization of system efficiency under consideration of building losses and utility efficiency

„Power2Heat“- sector coupling by heat pumps in cleaning systems



- One feasible idea for implementation of a heat pump: Use waste heat of residues (1) to reheat detergents with a heat pump (2, blue) with high temperature loss during cleaning (2, red) before they are returned to the tank

Project structure and project partners

Dairies Plant designers and builders Media partners



Gefördert durch:



aufgrund eines Beschlusses des Deutschen Bundestages



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