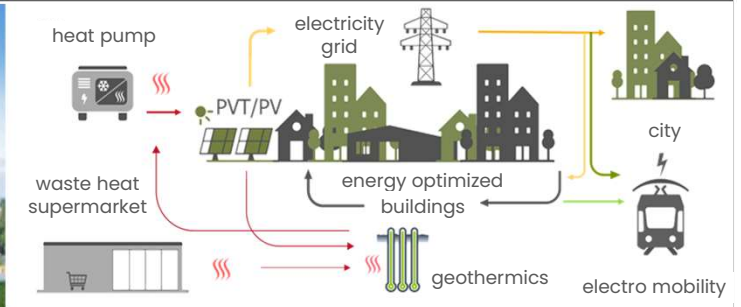


Energy Efficient Construction



The research group Energy Efficient Construction is dedicated to develop methods for reducing the energy consumption of buildings and settlements, right up to zero-energy buildings and energy-positive settlement modules. In addition, innovative thermally activated facade elements are researched and energy-active and flexible building envelope elements for the thermal conditioning of rooms are developed. In this context, the issue of life cycle costs is taken into consideration, too.

SWIVT II

In the SWIVT II project, strategies for linking building concepts in networked operation with operation-optimized, innovative energy technologies are implemented and demonstrated in practice on the basis of the real quarter 'Postsiedlung' in Darmstadt. After successful verification of the SWIVT approach through theoretical and experimental investigations (e.g. prototype constructions and coupled simulations) the project partners aim to validate the effectiveness of the solution approach at system level in all its sub-aspects.

ETA im Bestand

Within the project ETA im Bestand, technical and methodical solutions are developed which enable an increase of energy efficiency in the industrial building sector. A holistic approach is pursued, in which all subsystems of a production system (machines and systems, production environment and technical building equipment) are considered. Based on a typification of existing industrial buildings and the industrial processes that take place in them, specific energy efficiency measures can be derived. One possibility, for example, is the thermal zoning of individual machines or production processes with particularly high requirements on indoor air temperature or quality. For this purpose, modular supply and air-conditioning elements, which are thermally activated by capillary tube mats, are being developed as a structural retrofit solution.

SynErgie

The future electricity system in Germany will be strongly influenced by the energy transition. Due to the increasing share of renewable energies and the associated fluctuations in power generation, solutions must be developed that stabilize the power grid by bringing power consumption in line with power generation. The SynErgie project researches how energy-intensive production processes can be adapted to fluctuating power supply in order to make a contribution to energy transition.

DELTA

In DELTA (Darmstadt Energy Laboratory for Technologies in Application), interacting energy-optimized quarters are researched in practice. The aim is to show that proven technical potentials for increasing energy efficiency and making urban quarters more flexible are also economically feasible and socially acceptable. For this purpose, various methods, such as innovative business models, are tested and optimization potentials with regard to technological and regulatory scope for action are identified. A multi-layered, cross-sectoral approach is being pursued within the project. The aim is to increase the energy efficiency of all sectors and identify potential for shifting electrical loads over time. As a consequence, the urban electricity system is to be optimized and renewable energy sources are to be used optimally. Therefore an intelligent interconnection between individual neighborhood uses and their joining elements is aspired.

