



Twin houses

Comparing the energy efficiency of residential buildings

*Twin houses at Fraunhofer IBP
Holzkirchen
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In order to study and further develop innovative supply concepts for residential buildings, heating systems (with/without solar thermal or photovoltaic panels), their storage units, ventilation systems and control concepts under realistic conditions prior to practical use, Fraunhofer IBP has twin houses on its field test site.

These are two identical residential buildings with typical single-family house size. The twin houses enable in-situ comparative measurements on different building and supply systems under identical climatic conditions and varying user scenarios. The user influence is simulated. To ensure a realistic test environment, time-controlled heat sources (optionally also humidity and CO₂) replicate the heat input from users including their household appliances. The research objectives include all questions related to energy-efficient construction methods in the residential sector.

The buildings, which were constructed in the early 1980s, have been continuously modernized and meet the current standards governing renovated buildings. Each building component can be adapted to suit the requirements of the research task at hand.

The technical building equipment consists of a heat pump, a gas condensing boiler, radiator & floor heating, domestic hot water, ventilation & cooling systems, and automatic roller blinds. The building also contains extensive measurement and control instruments.



Interior view of a room in the twin houses © Fraunhofer IBP/Paavo Blåfield

Services

(Comparative) evaluation and optimization of

- Energy-efficient supply concepts
- Heating systems, domestic hot water supply
- Intelligent control concepts in the smart grid, demand side management
- Smart home applications
- Model Predictive Control concepts (MPC)
- Storage technologies
- Use of the building's thermal storage mass, Building Component Activation (BCA)
- Demand-controlled ventilation systems
- Radiator & floor heating systems and respective control concepts
- Sun-shading concepts
- Different insulation systems, wall, window & roof superstructures

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We can conduct research on scientific issues related to energy-efficient and comfortable living using a real building and, in addition, perform comparative studies.



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