



Photovoltaic system on the roof of House 1, one of three four-storey residential buildings that are being constructed during the first construction phase.

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House 2 with a solar thermal energy system and the technical centre during the construction phase.

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House 3 with the PV system on the roof shortly before completion

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Heat supply – solar-active and grid-connected

Since autumn 2016, a new passive house residential neighbourhood has been under construction at the science and technology site Berlin Adlershof. It is connected to the return feed of an existing district heating network and feeds in the solar heat generated inside the district. The project is the subject of extensive research. The aim is to maximise the solar-based coverage of heat and electricity demand. Initial results were presented at this year's Berliner Energietage conference.

The Newton project Berlin Adlershof is dedicated to the monitoring and subsequent operational optimisation of solar-based heat and electricity provision for residential passive houses with district heating network connection on the return side. The first construction phase comprises three four-storey residential buildings with 38 residential units and approx. 3,000 m² of living space, built to passive house standard. The system concept revolves around the highest possible heat demand coverage by solar thermal energy and the highest possible power requirement coverage by photovoltaics. Researchers at the Ostfalia University of Applied Sciences in Wolfenbüttel determined final energy requirements and building loads.

New goal of KfW 40 Plus efficiency standard

As early as the planning phase, they investigated various variants of centralised and decentralised supply for the energy concept of the district. At the time, the goal was still "achieving an energy-plus standard". Following the evaluation of the investigated variants, it became clear: The efficiency standard of KfW Efficiency House 40 Plus is economically viable and realistic in terms of implementation. House 1, for example, was

equipped with roof and façade PV systems, while House 2 was fitted with a solar thermal energy system and the technical centre. A PV system is in operation on the roof of House 3, which has since been occupied. The first consumption measurements have already been carried out in this building and a yield forecast has been prepared for all PV systems.

Renewable district heating with optimised balance

Combined with solar thermal heat provision, the option of grid feed-in and heat purchase represents an interesting solution in terms of energy and economic sensibility. The current focus is therefore the implementation of an energy concept for “balance-optimised district heating”. It mainly comprises the purchase of local and district heating and the infeed of solar thermal heat through the return connection to the existing BTB network, but also the construction of a residential local heating network with bi-directional heat transfer (feed-in and take-off). The operation of an integrated air/water heat pump, building ventilation with heat recovery, photovoltaic systems and battery storage systems is also being investigated. Monitoring of the overall system has begun. The completed measurement results are expected at the end of 2019.

New settlement model

Together with the operator of the district heating network in Adlershof, BTB Blockheizkraftwerks- Träger- und Betreibergesellschaft Berlin, a settlement model was developed which treats the feed-in of solar thermal heat generated in the district in relation to the district heating obtained from the network. Although BTB's network and generation facilities are characterised by very good primary energy factors, this cooperation was a strategic decision for BTB. The motivation: to attract investors as future customers and offering the district heating network as a virtual storage facility.

Further information on the Newton project Berlin Adlershof can be found on the detailed [project business card](#) on the ENERGIEWENDEBAUEN website.

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