


Passive-House Fire Station - Heidelberg, Germany	
<b>Keywords</b>	Energy Efficiency, Passive-House Standard, Fire Station
<b>Pictures</b>	
<b>Objectives</b>	<p>The new station of the Heidelberg Fire Brigade sets new energy and environmental standards. Commissioned by the City of Heidelberg, the Heidelberg Housing and Real Estate Company (GGH), financed, built and rented out the fire station to the City. The Fire Brigade moved into the building in September 2007</p>
<b>Description</b>	<p>A passive house is insulated so well that it requires less than 15 kilowatt hours of heating energy per m<sup>2</sup> and year, being equivalent to 1.5 litres of heating oil. Passive heat sources are the sun and the waste heat from technical equipment and people. Exhaust air is extracted and delivers most of its heat through a heat exchanger to the incoming fresh air.</p> <p>The upper storeys built to passive-house standards host the control centre, recreation and administration rooms, a cafeteria and a gym. Ground floor and basement are also very energy-efficient; they house the garage for 30 vehicles, exercise rooms and workshops. However, these storeys are not suitable for the passive-house concept because of their specific use by the fire brigade.</p> <p><b>Energy-saving measures</b></p> <ul style="list-style-type: none"> <li>- Consistent thermal insulation of the reinforced concrete structure and large thickness of insulation material (walls: 30cm, roof: 40cm, floor of suspended office area: 28cm)</li> <li>- Triple glazing and insulated window frames in the upper storeys</li> <li>- Air and wind impermeability of the building</li> <li>- Ventilation system with heat recovery</li> <li>- The centrally aspirated fresh external air flows through a geothermal heat exchanger, a concrete tube that is buried at a depth of two metres. Thus the air is warmed up in winter and cooled down in summer.</li> <li>- Additional heat supply by district heat</li> <li>- Ecological roof gardening</li> </ul> <p><b>Heat protection in the summer</b></p> <ul style="list-style-type: none"> <li>- Percentage of windows in the building: 33 percent</li> <li>- Internal sun protection with strongly light-reflecting lamellas</li> <li>- Cooling through window ventilation in cool night and morning hours</li> </ul> <p><b>Use of solar energy</b></p> <ul style="list-style-type: none"> <li>- Photovoltaic facility at the hose tower, performance: 39.3 kilowatt peak (kWp), corresponding to the yearly electricity consumption of eight three-person households.</li> <li>- Photovoltaic facility on the flat roof, performance: 25.9 kilowatt peak (kWp), corresponding to the yearly electricity consumption of six three-person households.</li> </ul> <p><b>Architects:</b> Peter Kulka Architektur Köln GmbH  <b>Owner:</b> GGH, Gesellschaft für Grund- und Hausbesitz Heidelberg</p>
<b>Results / Achievements</b>	<p>Photovoltaic facilities together produce 49,000 kilowatt hours of electricity per year. Heating energy demand was reduced to 15 kWh per m<sup>2</sup> by passiv house technology</p>
<b>Online information</b>	<p><a href="http://www.heidelberg.de/servlet/PB/menu/1154355/index.html">http://www.heidelberg.de/servlet/PB/menu/1154355/index.html</a>, <a href="http://www.ggh-heidelberg.de/content/e7/e2831/index_ger.html">http://www.ggh-heidelberg.de/content/e7/e2831/index_ger.html</a>, <a href="http://www.ggh-heidelberg.de/content/e7/e2831/e2834/GGH_BS_Feuerwache_Druckversion.pdf">http://www.ggh-heidelberg.de/content/e7/e2831/e2834/GGH_BS_Feuerwache_Druckversion.pdf</a></p>
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