


## Low energy standard in the refurbishment of residential buildings - Frankfurt am Main, Germany

<b>Keywords</b>	<b>Energy Efficiency, Low Energy Standard, Building Refurbishment, Different Building Types</b>
<b>Pictures</b>	
<b>Objectives</b>	Setting new standards of low energy houses in social residential buildings
<b>Description</b>	<p>Modernisation of buildings, especially residential buildings, provides for one of the biggest potentials to save energy and reduce CO<sub>2</sub> emissions. But this issue is faced with many problems: investment, shifting costs from the housing company to tenants, finding out the best saving standard to meet all requirements and interests.</p> <p>The following projects are chosen from a broad range of refurbishment actions the City of Frankfurt has been conducting lately:</p> <p>Modernisation of the city district “Karl-Kirchner-Siedlung” (500 dwellings), with a low energy insulation standard and setting up a CHP district heating network. Annual savings of &gt;2000 tonnes CO<sub>2</sub> (-85%) have been reached with lower heating costs.</p> <p>Transformation of a simple residential building (“Teves-Street”) from 1950 into a passive house, thus reducing heat demand by 90% (!) with highest comfort.</p> <p>In the “Windhorst-Street” a former home for nurses of a hospital, a high rise residential building was modernized with good comfort dwellings, low energy insulation, CHP unit and a façade 260m<sup>2</sup> thermal solar collector. CO<sub>2</sub> reduction is of 85% = 1100 tonnes/year.</p> <p>In the “Riederwald-residential district” old houses (1920) are protected as cultural heritage. This caused a heavy conflict between urban planning, heritage office and the housing company. The Energierreferat found the solution to reach the low energy standard, mainly using a new insulation material (“Dämmsation”) which has the same low heat transfer with half of thickness. This project can be replicated in many typical residential houses of this historical period.</p> <p>Modernisation of residential buildings to the energy level of new buildings or even 30% below this standard is supported by loans with low interest rates from the German KfW-subsidy bank.</p>
<b>Results / Achievements</b>	More than 10 projects with a high standard of energy saving by insulation for very different types of residential houses, show, that energy and CO <sub>2</sub> reduction of 50-90% can be reached by combining good insulation standard with CHP and/or solar energy.
<b>Friendly advice for replication</b>	Refurbishment of residential buildings will be a crucial issue not only for energy and climate reasons, but also to keep and protect affordable dwellings for low and medium income people. To maximize energy saving can reduce total costs (rent + energy) to an acceptable level and will be an insurance against higher energy prizes in future.
<b>Online information</b>	<a href="http://www.energiereferat.stadt-frankfurt.de">www.energiereferat.stadt-frankfurt.de</a> (Projektdatenbank, choose Bau + Sanierung)
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