

Summary

How much energy is needed for heating a building? Which heating system for heating and water heating is profitable for building owners? What additional arrangements have positive effects in buildings to the environment? How can renewable energy be utilized through innovative technologies?

In view of the increasing scarcity of energy resources and permanently increasing energy costs as well as the need for decreasing carbon dioxide, these questions become more important. Carbon dioxide emission produced by human beings causes climate change which is irreversible within the constant value of the energy structure. Global efforts for a better climate protection are in progress in industrial nations. An evidence of these efforts among others are the yearly conventions organized by some nations which have the aim to influence the global climate, by decreasing carbon dioxide emissions. Also the Federal Government has committed itself for reaching high levels of energy-saving and therefore, has established ambitious aims by appropriate laws and compulsories through the National Program for Climate Protection.

The focus of this work is based on private households and their achievable possible savings. The aim is to explore possibilities that can contribute to the decrease of carbon dioxide emissions in private household. The energy consumption in buildings amounts 30% of the whole energy consumption in Germany. With 85% the thermal heat and water heating are leading the whole use of energy in buildings through heat energy, water heating, washing, cooking, flushing and so on.

The requirements for the energy demand in buildings as well as the structural and plant-engineering norms become stronger, through the Energy Conservation Regulations. The aim of energy-saving constructions shall be to diminish harmful carbon dioxide emissions. The decrease of energy demand, through energy modernization, in especially huge old buildings is particularly important. But also the energy efficiency and the sustainability within the construction of new buildings play an important role. The rational use of energy through stronger structural heat insulation of the exterior construction and energy-saving building technologies, are adequate solutions which are profitable and technically realizable. Even in heating and ventilation issues there is available innovative technology, which accomplishes enormous saving of energy. Through the use of a block heat station, not only the needed warmth would be satisfied but also the demanded electricity, because of its simultaneous generation of both. With the Renewable Energy Heating Act for promoting renewable energy focuses the use of renewable energy sources that can be used through innovative technology and generates neutral energy. Besides the use of thermal solar panels, photovoltaic systems as well as biomass boiler and heat pumps gain in importance. In addition, governmental programs promote the use of these technologies in the private sector, through investment incentives.