

GENERAL APPROACH

HEIDELBERG (Germany)

12 % of the total EU energy consumption shall by 2010 be covered by renewable energy sources. This is the objective that the Community agreed on in its white book on "renewable energies". At the same time, an European-wide action plan has been set up. In order to achieve these goals, local communities do need to actively contribute to this. The city of Heidelberg is in the middle of the implementation phase of its action plan.

GENERAL ASPECTS

Heidelberg has a special reputation as a university town, with a university founded in 1386. The city is considered one of the centres of German Romanticism. With its 135,000 inhabitants, Heidelberg has retained its predominantly university and residential character; only a few industrial companies (mainly of the electrical and cement industries) are located here.

Climatic data:

Degree days (Basis 17 °C): 3,270
Annual mean temperature: 10.7 °C



CONTEXT

Since the early Nineties, the City of Heidelberg has been practising a policy of saving energy, developing renewable sources of energy, and sustainable urban development. In December 1992, the city council adopted a programme of environmental protection and saving energy, and presented it to the citizens. This programme consists mainly of a catalogue of almost a hundred specific measures in various fields. Each of these measures contains a brief description of the action, and names the various players, the potential CO₂ reduction, the priority of the action, and its costs.

The total possible savings amount to 200,000 tons of carbon dioxide annually in private households, business, and industry, and 25,000 tons in transportation. The costs involved are about 870,000 Eur annually in the energy sector alone.

The implementation of these measures is essentially in the hands of the City's Bureau of the Environment, assisted by the municipal utility, Stadtwerke Heidelberg AG, and since May 1997, in the hands of the local energy agency (KLiBA). The implementation of these measures is now being extended to the surrounding communities, as well.

EXPERIENCE OF HEIDELBERG

Of the roughly 100 measures proposed in the climate-protection concept, about 20 concern renewable energy sources, including numerous demonstration projects, but also counselling services and broad-based subsidy programmes. The projects which have already been implemented, some of which are described in more detail below, include:

Passive solar energy

- Optimization of the "Kirchheim – Im Bieth" development plan

Solar heat

- Subsidy programme
- Absorber unit for outdoor swimming pool (1,181 m²)
- 2 collector arrays on sports centres
- Solar array on a multiple dwelling of the municipal housing association

Solar cells

- Full-cost compensation for supply to grid
- Smaller arrays for schools
- Solar filling station for electric-powered vehicles
- Three 20-kW shared units
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Water and wind power and biomass

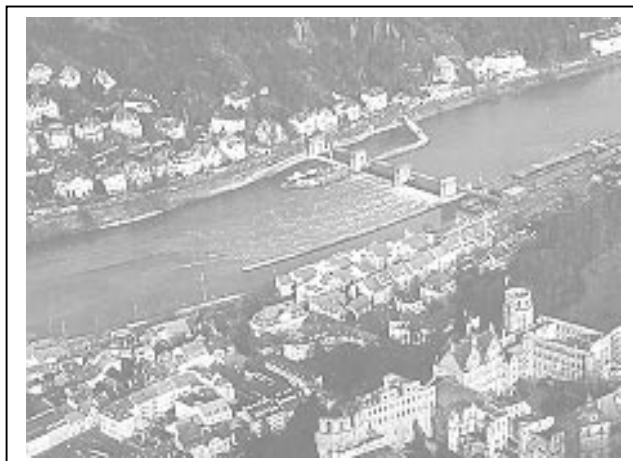
- Hydroelectric plant in the Neckar
- Site study for wind power utilization
- Wood-chip-fired plant with smaller district-heating system (1.1 MW thermal capacity)



Full-cost compensation (Kostendeckende Einspeisevergütung)

By a resolution of the Heidelberg city council of November 1996, the Stadtwerke Heidelberg AG (the municipal power utility) pays full costs for solar power since the beginning of 1997. This full-cost compensation is paid for private units with a capacity up to 5 kW_p (ca. 45 m² area) and shared units up to 25 kW_p. For units up to 5 kW_p, it is 0.69 Eur (as of May 99). By the end of March, 1999, 26 units with a total capacity of 140 kW_p were in operation in Heidelberg, of which 20 supply the electricity not needed by their owners to the city mains.

Hydroelectric plant at the Karlstor



"In effect, this is the Heidelbergers' hydroelectric plant," – in these words, the chairman of Neckar AG (the operator of the hydroelectric plant) praised the very active participation of the City and its inhabitants in the planning and construction phases at its official inauguration in October 1998. Two turbines embedded in the bottom of the river, with diameters of 3.35 m and capacities of 1.6 MW each, generate about 16.8 GWh of electricity annually.

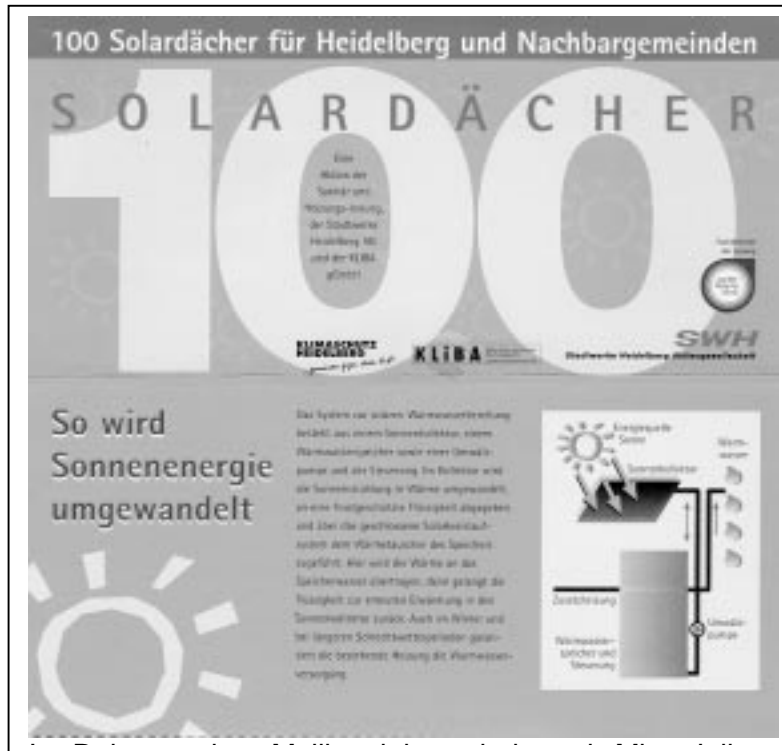
There is a throughput of 160 m³ of water per second, at a height of fall of 2.6 m. About 5,000 households, or the Ziegelhausen district of the city, can cover their electricity needs from this source of energy.

The construction of the first fully submerged, i.e. not visible, run-of-the-river hydroelectric station in Germany began in September 1994. The capital costs amounted to almost 17 million Eur, of which the EU provided 1.53 millions. The generating costs amount to about 0.071 Eur per kWh.

Subsidy programme for thermal solar arrays

The use of solar energy for providing hot water is subsidized by the City of Heidelberg's subsidy programme for efficient energy use with 1,275 Euro for single-family homes, or with 765 Euro per residential unit in multiple dwellings. Despite this relatively high subsidy, only relatively few units were installed by the end of 1997.

Therefore, in May 1998, a concerted campaign, "100 Solar Roofs", was launched by the



plumbing and heating guild and the KLiBA. At the invitation of the guild, the project was presented to interested craftsmen. Participation in the campaign involved a two-day training course, and an undertaking to act as a general contractor for residents. About thirty businesses participated. They offered only certified makes in the context of the campaign.

In mid-July, about 2,500 owners of single-family and two-family houses received an information leaflet (with reply postcard) on solar heating of domestic water in a direct-mailing campaign. This campaign was accompanied by advertisements and

articles in the press. KLiBA received over 300 enquiries (by telephone or reply card). In about 200 cases, advice was provided on site by a craftsman.

About 60 solar thermal arrays were installed during the campaign. In 25 consultations, other measures were advised and performed (overhaul of the heating system, renovation of the controls, lagging of distribution pipes, etc.)

This campaign has shown that there is a large demand among the citizens for information about the potential applications of renewable energy sources, which has not been satisfied by the information provided until now.

The joint appearance of the "authorized" craftsman with the impartial energy consultants from KLiBA was mainly responsible for the success of the campaign. The campaign also helped to improve the level of knowledge among the trades about solar heating of domestic

water. Whether this will contribute to increased use of renewable energy sources in the region, beyond the scope of this campaign, remains to be seen.

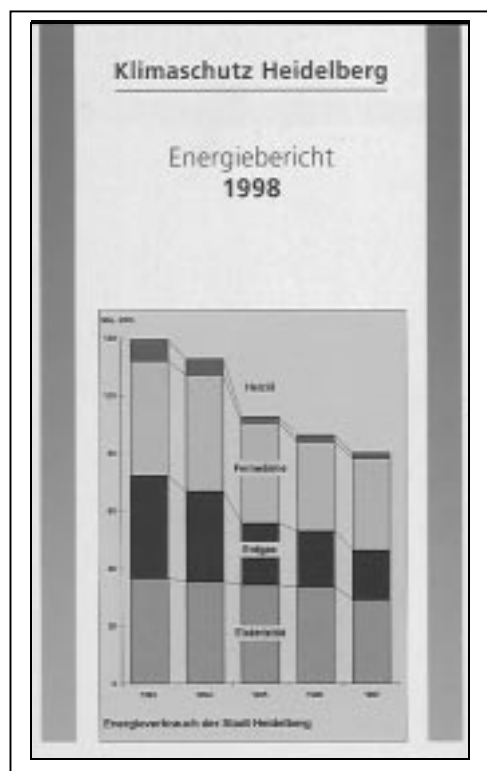
EVALUATION UND PERSPEKTIVEN

Activities in the field of climate protection are published regularly in the *Energie- und CO₂-Umsetzungsberichten* ["Energy and CO₂ Implementation Reports"], which helps to evaluate their success. Over the past eight years, Heidelberg has undertaken numerous measures in the field of climate protection. These were not only in the planning sector, but also quite concrete applications, among which renewable energy sources play a considerable role.

The *Energiebericht 1998* ["1998 Energy Report"] is devoted mainly to municipally-owned buildings. According to the figures published there, the energy consumption of municipal buildings dropped by 33% between 1993 and 1997.

The City of Heidelberg has initiated a remarkable number of measures in its municipal energy and transport policies. After a lengthy and difficult starting phase, these policies have gained a momentum of their own. This is illustrated by the wide support from all political parties, industry, and public services – and not least by the fact that the Stadtwerke Heidelberg has transformed itself from a power utility into an energy services company, which no longer sees its role as simply selling energy.

The City will continue with its climate-protection policy, relying on renewable energy sources as an important pillar in this policy. Some new projects are currently being implemented (such as two biogas plants, a municipal solar-powered district-heating scheme, and a photovoltaic array of 300 kW_p).



FOR FURTHER INFORMATION

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