

THERMAL SOLAR ENERGY

GENÈVE (Switzerland)

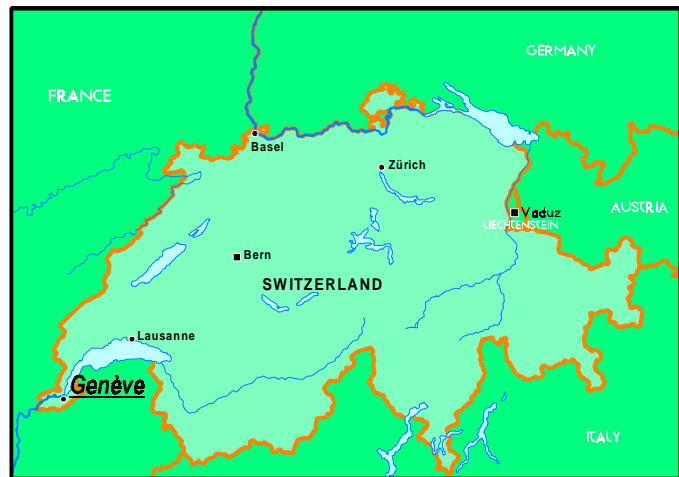
Although the quality of the equipment and the efficiency of thermal solar systems has improved significantly over the last years, this kind of energy production has not achieved yet an important share of the market. Nevertheless, remarkable initiatives could emerge thanks to policies designed and implemented at local level. In Genève, the efforts to keep increasing the use of solar energy for producing hot water have been maintained, despite reduced public grants .

GENERAL ASPECTS

Genève is a city of 170,000 inhabitants located at the South-west end of Lake Genève. The city was built on a hilly land that spreads on both sides of the Rhone. Genève is home to many international organisms, for example the UN and the International Red Cross Organisation. The city is also a major banking centre.

Climatic data:

Hours of sunshine:	2,036 h/a
Solar radiation:	1,260 kWh/m
Annual mean temperature:	9.0 °C



CONTEXT

Solar installations for producing domestic hot water were installed in Genève and throughout Switzerland at the beginning of the 1980s. Since then, the use of thermal solar energy in Genève has never failed. The municipal energy policy is linked with the *Programme d'action Energie 2000* (Energy 2000 Action Programme) of the Swiss Confederation.

The first milestone in this programme was the 1990 referendum. Swiss citizens pronounced themselves in favour of a moratorium with respect to nuclear energy and in favour of the promotion of renewable energy sources. This referendum allowed to reactivate many projects which had been blocked during the 15 years' long "trench warfare" against nuclear energy.

The City of Genève offers favourable conditions for using thermal solar energy. A study on the potential of the Genève canton allowed to identify a surface area of 100,000 m² where solar collectors could be installed. Most of this surface area concerns flat-roof buildings located within the limits of the city of Genève.

EXPERIENCE OF GENÈVE

In 1988, the City Council of Genève decided to raise a loan of 1.26 million Eur to create a fund for the promotion of thermal solar installations. By mid-1999, the fund was almost exhausted. The first installations were erected on public buildings. Since 1994 however, collectors have been installed as a matter of priority on municipal living quarters where they can fully demonstrate their usefulness.

The high number of municipality-owned blocks of flats with flat roofs offer good conditions for using solar energy. As these flat roofs must undergo retrofitting operations every 20 or 25 years, the feasibility of installing solar systems is systematically investigated on these occasions.

Household initiatives are supported by the canton with subsidies up to 30% of total solar project costs. A specific budget is provided every year in support of this type of action. However the subsidy awarded by the State, which amounted to 460 Eur/m² of installed surface area, was stopped at the end of 1996. The Genève canton also supports the erection of thermal solar and photovoltaic installations. From 1990 to 1995, 1.4 million Eur were invested in 1,700 m², including a photovoltaic installation on an industrial building and a "P+D SOLAR FROID" installation at the Genève-Cointrin airport.

Information / Public relations

An employee from the Energy Department proposes training courses for engineers and gives lectures during municipal events, in schools or other vocational training institutions. An energy balance, which encompasses thermal solar energy use, is carried out and published once a year.

Players involved

The initiative to build solar installations comes from a political decision adopted in 1988. The Energy Department has the necessary know-how and is responsible for looking after the programme. A planning office was specifically created within the Energy Department to supervise work progress on solar systems, all of them being installed by local companies.



Difficulties encountered

The main difficulty in Genève lies in the fact that, due to a lack of financial incentives, there is a tendency among owners of rented accommodation to install solar systems themselves. Installation costs cannot therefore be passed on to rents and the 5-10% saving on the gas or fuel bill only benefits the tenants. As a result of this, owners of tenanted properties are not tempted, for economic reasons, to install solar systems even if awarded the grant.

Achievements

Since 1981, the Municipality of Genève has been installing thermal solar systems on public buildings and blocks of flats owned by the Municipality. Since 1980, the surface area covered by solar collectors has kept increasing to reach 1990 m² in 1999. It has been a steady growth. Each installation was subjected to constant monitoring during a one year period and their efficiency was measured.

Vessy stadium

In 1981, the biggest ever built installation was erected at the Vessy stadium with 323 collectors of 1.3 m² each covering a total surface area of 420 m². This project allowed to save 10,500 litres of oil annually.

Block of flats, 8-10 rue de Soubeyran

This 172 m² installation was completed in 1991. With 86 collectors of 2 m² each, it is the third installation in terms of size. Total investment amounted to 130,000 Eur, which means an average cost per square meter of 760 Eur. Cost break-down (including labour costs) is given below:

Solar collectors	67,800
Hydraulic connection and solar accumulator	45,000
Electrical wiring	3,800
Building work	2,300
Wall drilling	1,200
Roof tightness	2,600
Heat metering	2,600
Studies	4,600
Total	129,900



Block of flats, 26 rue de Bâle

Installation was completed in 1992. It is composed of 10 collectors of 1.84 m² each. Investment costs for this 18.4 m² installation amounted to 1,160 Eur/m²

In this example, the average ratio of 0.61 m²/consumer and solar coverage rate of 18 to 25% are similar to the values observed for the previous project.

EVALUATION AND PERSPECTIVES

The 1988 decision to provide financial support to thermal solar energy in Genève, at a time when it was not so common, was the first step in promoting the use of this type of energy production. As far as the Municipality is concerned, considerable efforts were made to install thermal solar systems on tenanted houses owned by the Municipality. The approach consisting in taking advantage of renovation work to install thermal solar systems is particularly interesting. This indeed generally means reduced costs for the thermal solar project. The integration of the canton and municipal policy into the *Energy 2000* action programme encourages a positive exchange of information on possible uses of solar energy between the communes. However, the low prices of conventional energy sources do significantly hinder the erection of new solar systems.



The Municipality is pursuing its effort in favour of renewable energy sources. Thermal solar installations for preheating domestic hot water allow to save around 1% on the overall thermal needs of the city. They also avoid discharging into the atmosphere some 300 tonnes of CO₂, 160 kg of NO_x and 350 kg of SO₂. A publication on these installations and their results is envisaged.

It is however unlikely that thermal solar energy experience a strong growth in a near future if property owners cannot pass installation costs on to the rents.

The Municipality of Genève, which had created as soon as 1998 an “energy” fund provisioned by an increase in some energy prices, has decided to progressively raise it to 0.6 millions Euro by 2003. The fund will be used to subsidise renewable energy installations, CHP units or energy saving actions.

FOR FURTHER INFORMATION

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