

# Integrated Energy and Climate Protection Policy

# Hannover (DE)

## GENERAL ASPECTS

Hannover is the state capital of lower Saxony. The City itself has a population of 520.000 and over 1.1 million people live within its socio-economic catchment area. Hannover's geopolitical situation has altered fundamentally in the light of German unification and the tremendous changes in Eastern Europe; after occupying a marginal position for many years, it now finds itself at the crossroads of a new Europe



## BACKGROUND

For a long time Hannover already had an active local energy saving and climate protection policy. At the beginning of the 1990s the municipality already had developed a close cooperation (it was said that the city energy utility, the Stadtwerke, had a *sonderaufgabe* = special mission). An extensive programme was developed directed towards energy-efficiency on both the supply-side (CHP and district-heating) and the demand-side. In a further development of these activities, a decision was taken in the mid 1990s to develop and implement a climate protection programme.

The World Exhibition 2000 gave a tremendous stimulus to these activities. The suburb of Kronsberg, which formed part of the exhibition, was built as an example of sustainable city planning.

## ACTION UNDERTAKEN

The best intentions are useless unless they're followed up with practical action. Hannover has tackled the global climate problem on its home ground. Local campaigns show measurable results – in the form of thousands of tonnes of CO<sub>2</sub> emissions prevented.



The activities can roughly be summarized as follows:

- Close cooperation between the City and public utilities resulting in the establishment of an Energy Agency (proKlima),
- Improved public transport (new tramlines, new EXPO railway station),
- An extensive insulation programme,
- Local Agenda 21 and the KUKA (Kronsberg Umwelt Kommunikation Agentur). The relevant stakeholders were involved in the development of the Kronsberg district via model public participation arrangements,
- Development of small co-generation plants,

- Development of the NEH house (*Niedrig Energie Haus* = Low Energy House),
- Maintaining their independent small Energy Company: the recent wave of amalgamations in the energy sector has passed by Stadtwerke Hannover.

The following milestones can be identified in the period 1992-2002:

**1992** Responding to the objectives set out at the Rio Earth Summit, Hanover City Council resolved that in 2005 CO<sub>2</sub> emissions will be reduced by 25% compared to 1990.

The Council thereby expanded on its 1986 energy policy resolution, in which it drew lessons from the disaster at Chernobyl nuclear plant by setting new priorities: energy saving as the overriding objective, support for rational use of energy and renewable energy sources, and a gradual reduction of the proportion of electricity from nuclear power.

#### Negawatt, not Megawatt at the Stadtwerke

Under some conditions energy providers benefit long-term from reductions in electricity demand instead of having eventually to build a new power station. Following this idea of 'least cost planning', between 1993 and 1999 the Stadtwerke AG implemented 14 programmes for its customers that attracted admiration across Europe, such as grants towards the purchase of energy-efficient household appliances or analysis of electricity consumption in a household. In total 51,000 private customers alone made use of the programmes.

**1994** To implement the objectives of its energy policy, the City Council established an energy and climate protection section within its environmental protection division. Its brief is to set up climate protection programmes and CO<sub>2</sub> auditing, and initiate, devise and carry out municipal climate protection projects. In the following years the section ran successful projects on energy saving in schools (from 1994), kindergartens (from 1998), and city administration buildings (from 2000). The section supports development plans in which energy efficiency is optimised and the inclusion of appropriate clauses in contracts for the sale of developable land e.g. requiring low energy houses and distributed cogeneration plant.

#### GSE', 'Klik' and 'Tatort Büro'

Heating regulation tailored to demand, switching off lights on leaving a room, brief and thorough airing instead of continual heat loss through a half-open window – possible savings by just being careful with energy are around 15% of total consumption.

Hanover energy and climate protection section therefore supports users of municipal buildings with three projects: 'GSE' (energy saving in schools), 'Klik' (climate protection in kindergartens, and 'Tatort Büro' (energy saving in municipal buildings). This saves both CO<sub>2</sub> emissions and money – over 400,000 Euro a year, from which the institutions receive 30 percent, 40 percent goes on further energy and water saving measures and the remainder to the municipal budget. This concept has been copied across Germany

#### Advice for prospective builders

Back in the early nineties, Stadtwerke Hannover set the ball rolling for energy efficient new construction with its Low Energy House demonstration programme. Since 1999 Hanover City Council has provided an advice service on the Low Energy House standard for property developers on municipally owned land. Investment measures and quality assurance are subsidised by proKlima.

#### The Stadtwerke Hannover's THERMIE project for older buildings

Within the European Union THERMIE project, between 1994 and 1997 Stadtwerke Hannover AG subsidised and supervised thermal insulation measures in 26 multiple-occupancy houses with a total of 300 apartments. The project showed that an average 50% saving on heating energy is possible through economically viable measures.

The district heating network was extended in close cooperation with the Stadtwerke. The section also works at national and international level with municipal climate protection organisations such as the Climate Alliance of European Cities or the International Council of Local Environmental Initiatives (ICLEI).

The City Council negotiated a model concession contract with the Stadtwerke for the Hannover city supply area which commits the Stadtwerke to energy-saving activities.

#### More small scale CHP plant

Small scale combined heat and power stations use their fuel with efficiencies of around 90 percent. Hanover is therefore trying to increase the contribution of such distributed CHP plant via the concession contract between the municipality and the Stadtwerke. The number of such CHP plant has risen to 53.

**1995** A Local Agenda 21 bureau was established within the environmental protection division. Climate protection, an important component of sustainable development, is a central aspect of the Bureau's work.

**1996** A municipal climate protection programme is established as a criterion for action on energy, transport and waste management. The programme recommends effective measures and quantifies their savings potential in terms of climate impact.

**1998** Stadtwerke Hannover AG, the City Council, five municipalities around Hannover and partners from private enterprise and the community set up the proKlima climate protection fund. Financed by the Stadtwerke Hannover AG, its customers and the five municipalities, the fund supports energy-efficient retrofitting of older buildings, innovative designs for new construction, popularisation of CO<sub>2</sub> saving and the use of renewable energy sources. An average of 5M Euro per year is made available for around 1,500 grant applications.

#### The proKlima special district heating expansion programme

Because combined heat and power stations use fuel more efficiently, proKlima subsidises the connection of customers for whom district heating would otherwise not be economically viable from the Stadtwerke's point of view.

*Annual reduction in CO<sub>2</sub> emissions: c16000 tonnes*

#### Setting a good example at Kronsberg

The new suburb of Kronsberg has been taking shape since 1997 as an exhibit for the Hanover World Exhibition. It is a model of town planning, social and ecological practice. A low energy standard was set for housing throughout the entire development. A district heating by-law was imposed requiring compulsory connection and use. In this new residential area the City of Hanover has succeeded in reducing CO<sub>2</sub> emissions by 60% compared to conventional new construction.

District heating comes from two distributed cogeneration plants built for the Kronsberg district. An electricity saving programme was also implemented.

Around 1,350 square metres of solar collectors are used to heat 104 social housing apartments in Solarcity at Kronsberg. These also feed a thermal storage tank, sunk six metres into the ground, with a total volume of 2,750 cubic metres. This means that solar energy can be used from Spring to December, covering around 40% of total heating needs, with the remainder coming from the district heating network.

**1998** Proponents of solar thermal energy and photovoltaic generation join together to found the 'Hannover Region Solar' association.

#### Lummerlund passive house development

The Kronsberg development also features a passive house development of 32 terrace houses. These houses require almost 90% less heating energy than conventional terraced houses, due to 40-cm thick thermal insulation, extremely airtight structures, air extraction plant with heat recovery and isopane triple glazing, while solar panels on the roofs provide hot water almost all year round. The remaining minimal energy needs are compensated for by the owners' shares in a wind turbine generator on Kronsberg Hill, bringing overall CO<sub>2</sub> savings up to 100%. The project was initiated by Stadtwerke Hannover AG and was part of a European demonstration project.

*Annual reduction in CO<sub>2</sub> emissions: c 100 tonnes*

**1999** The 'Energiepass' is created to promote energy efficient modernisation of the building stock.

#### The H)Eissbär Campaign

Begun in 1999 by Hanover City Council, the campaign advises owners of older buildings on renovation measures. Parallel to this, the 'Haus-Partner Hannover' network was set up to build support for the campaign from as many quarters as possible. The aim is to motivate house owners to combine renovation with energy efficient retrofitting and exploit the enormous climate protection potential in the housing stock. An 'Energiepass', specially devised by the City Council, 'proKlima' and Stadtwerke Hannover AG, describes the energy efficiency condition of the residential building and explains viable renovation measures to its owner. Acquisition of this document is the prerequisite for subsidy towards investment measures by proKlima. The

campaign with its polar bear logo is backed up with special services such as energy counselling or discounts on thermographic inspection charges.

The right advice works:

*Annual reduction in CO<sub>2</sub> emissions: 4500 tonnes in 2001.*

#### Herrenhausen hydroelectric plant

As part of the 'City as Garden' EXPO project, Stadtwerke Hannover AG built a hydroelectric plant with a fish bypass in Herrenhausen. This power station is today one of the main suppliers of green electricity to the Hanover Region

*Annual reduction in CO<sub>2</sub> emissions: 4000 tonnes*

**2001**, the city administration offers investors the chance to install and run photovoltaic units on the roofs of municipal buildings.

#### Solar power from the City's roofs

To encourage the use of solar energy, since 2001 Hanover City Council has made the roofs of municipal buildings available to private investors for the installation of photovoltaic cells. One pilot installation is on the Herschel school in Vahrenheide, run by the 'Windwärts Sonne und Wind GmbH & Co Betreiber KG', an investment fund with private shareholders from Hanover; the other has been set up by the 'Ökostadt e.V.' non-profit association on the roof of the Stresemann school.

#### Wind turbines

Two of the latest model wind turbines have been erected on Kronsberg Hill rated at 1.5MW and 1.8 MW. Together with an existing 300-kW turbine, they meet the electricity needs of roughly 3,000 dwellings in the new district.

*Annual reduction in CO<sub>2</sub> emissions: c 9000 tonnes*

**2001** Hanover City Council, the former Greater Hanover local government association (now the Hanover regional authority), Stadtwerke Hannover AG, Üstra public transport utility, five medium-sized enterprises and a specially established association found the Klimaschutz Agentur Region Hannover GmbH to coordinate all climate protection activities throughout the region. It took over the '*Solar energie kommt*' and '*H)Eissbär*' (for energy efficiency in older buildings) campaigns and continues the climate protection promotion weeks. This is the driving force behind innovative projects and activities, and the clearing house for all questions about climate protection issues.

The agency's aim is to build up the role of climate protection as a regional economic factor and thus give a new impetus for long-term employment in the region.

#### Sun power goes public at the 'Solar Weeks'

The 'Solarwochen' is a solar energy information event in the Hanover Region every May. Under the motto, 'Lust auf Solar', the organisers stage exhibitions, workshops, talks and excursions at numerous locations in and around Hanover, climaxing at the solar festival on and around the city's Maschsee lake, with solar art, the German solar-powered boat championships, a solar market with craftspeople, a children's programme and live music. In 2002 the 'Solarfest' was sponsored by the Klimaschutzagentur Region Hannover, proKlima and the Umweltzentrum Hannover.

## LESSONS LEARNED

A key factor in promoting the local Energy- and Climate protection policy of the City of Hanover has been the fact that the City has its own "Stadtwerke"(public utility) in which it has a majority interest of 76%. In the mid 1990s, 12% interests were sold to Preussen Elektra A.G. (now E.on) and Thyga A.G. In spite of natural strains related to conflicting interests between the interests of the local owners and the management of the utility company, this is the essential foundation for the success of the climate protection policy in Hanover. In particular the model of the Climate Protection Fund "proKlima, unique in Germany, would be unthinkable without this foundation.

The Climate Protection Fund in particular with its annual budget of about 5 M euro has gained an enviable reputation in the City, as well as in the region and far outside, for its innovative and high quality approach,. ProKlima has been in the forefront of the implementation of new technology, in particular promoting energy-efficiency in new construction and renovation activities in the regional market (e.g. introducing "Passive haus" standards). In addition quality standards for new building and renovation activity were introduced, as well as the certification of construction firms, architects and engineers. By the continuing the support and

promotion policy of proKlima (2500/3000 proposals to private house owners per year) a substantial contribution is made towards maintaining and creating new jobs ("Passive-haus" designs, solar energy installations etc.).

Due to the financial crises of the municipalities and public finances in general, the financial support of the city of Hanover comes under great pressure. The result is uncertainty regarding how and under what conditions the involvement of the City will continue after the end of the agreed contract period (mid 2006).

In relation to these developments the future involvement of the Stadtwerke Hannover depends on its relative independence continuing. There is a need for the Stadtwerke to continue to positioning itself in the market as a supplier of quality and this characteristic must continue to be appreciated at its proper value by its clients. Political action can deliver a framework which can initiate, but can also hamper, the build up of the necessary public support for this image.

## IMPLICATIONS FOR PUBLIC POLICY MAKERS

The example of Hanover demonstrates that all sorts of interesting initiatives and funding in the field of climate protection and energy-saving can be introduced at local level. However, for this to take place, a certain market-freedom must exist at local level for the players involved, so that they can develop their own strategy.

For national politics this implies the need for the development of a regulatory framework for the liberalisation of the market which does not automatically lead to such a concentration of utility companies so that, at a local level, a rigid situation develops that makes an efficient policy for a climate protection difficult, if not impossible. In many countries the situation has already evolved so much that this could only now be achieved by a active programme of deconcentration or municipalisation. There has been pressure in exactly this direction in certain communities in USA for example with the prime motivation being the protection of the consumer's interest. However one other benefit is the opportunity to implement energy efficiency action at local level, close to the inhabitant so that communication is more efficient.

## FURTHER INFORMATION

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