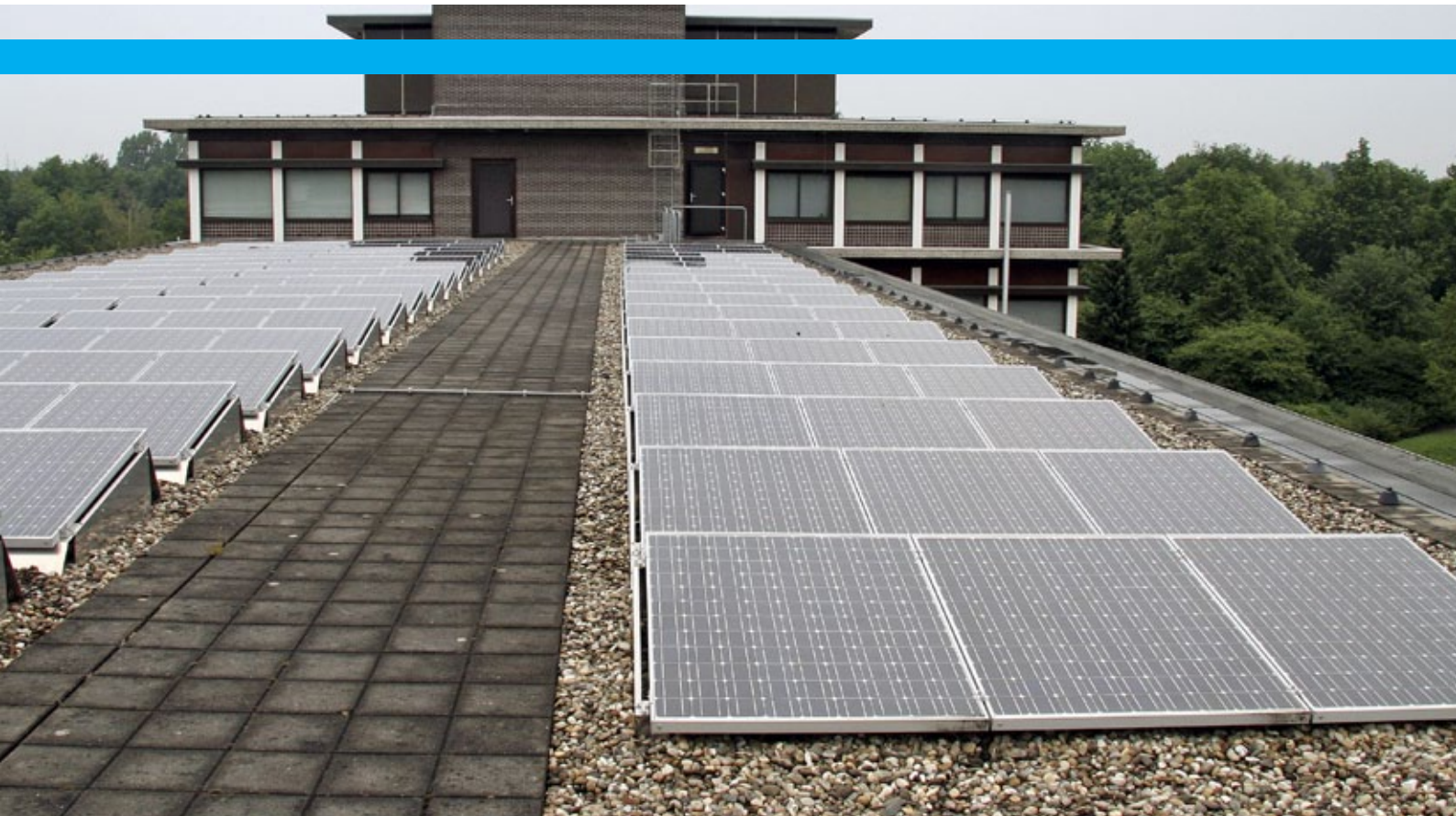
NORTH SEA SUSTAINABLE ENERGY PLANNING

SUSTAINABLE ENERGY SOLUTIONS

PROVINCIEHUIS ASSEN • DRENTHE • THE NETHERLANDS

Contents



Introduction

The Provinciehuis in Assen houses representatives of the regional government of Drenthe and its civil servants. Built at the end of the 1960s, the building had become outdated and no longer suited contemporary needs. Society has changed and with it, the way we work. The work environment needed to be adjusted.

Following the decision-making process, the choice was made to renovate the existing structure. Many aspects were considered with a view to expansion and opportunities regarding energy consumption reduction. It was decided that the exterior of the building would remain intact while the interior would undergo rigorous change. The infrastructure was also drastically in need of renewal.

The province of Drenthe wants to set an example when it comes to climate-friendly and energy conscious behaviour so technical systems must fit in with the ambitions of the council's climate and energy programme. Therefore, a wide range of innovative, technological solutions were investigated and many measures were taken to reduce energy consumption and CO_2 emissions, resulting in an estimated energy saving of 90% and a reduction of CO_2 emissions by 90% (in relation to gas). Since the Province buys 'green' electricity this is not relevant for CO_2.

The renovation took place in phases so that employees suffered the least possible inconvenience. Approximately one third of the staff were relocated to temporary offices in the vicinity and remaining staff had to move office regularly as each section of the building was renovated. Good planning ensured that disruption was kept to a minimum.

The interior transformation was based on the concept of a flexible work style. At the office we all perform various activities; consulting, collaborating, reflecting. So called activity-related workspaces offer a suitable situation, depending on the task. For example, there are basic workstations, concentration areas and communication areas for meetings and discussion. Employees, armed with laptop and mobile phone, are not bound to one place but free to choose the most suitable workspace. After all, the new concept includes working 'digitally' meaning documents and information are always accessible.

The Provinciehuis - a short history

Built 1968 - 1973
Architects: Duintjer, Istha, Kramer & Van Willegen

Building the new Provinciehuis, 1971

In 1954 preparations were already underway for a new Provinciehuis and a number of buildings were purchased in the heart of Assen.
The initial architect, Eschhauzer, unfortunately died before completing his design so Duintjer was requested to create a new plan – this was presented in 1969. Following the tender procedure construction finally began in 1971. The Provinciehuis of that time, located at Assen's central square (Brink) was inadequate. The various departments were scattered over several buildings which was found to be inefficient, and there was a shortage of office space. Parking space was also a problem.

The new Provinciehuis was built in the attractively green area of the Westerbrink. The spot was chosen, not just for its spaciousness but also for its close proximity to the new ring road (which was to be built shortly after). Landscape architect Hollema was responsible for the design of the surroundings while Duintjer's plans included some 2600 m^2 of paving using local stones. The architect strived to 'bridge the gap' between government and the public in this way.

The Provinciehuis is composed of a number of linked pavilions comprising two, three or four levels. The entrance hall is centrally situated and forms the core of the entire building. The state chamber is sunken, inspired by a local legend about the 'Balloërkuilen' where, according to tradition, the first administrative meetings in Drenthe were held.

The three office pavilions have a concrete structure while the state chamber is built of steel. A lot of wood was used in the interior design, and floors were made of composite tiles, with woollen carpet here and there. The facade is mainly glass, consisting of large windows, darkly painted and contrasting with the white painted concrete columns, creating a rhythmic effect.

Some figures

The total site area is 67,200 m^2
The built area is 4,200 m
Gross floor area 12,920 m^3
Gross volume 47,030 m^3
Construction costs in 1973 were 23 million Guilders* (approx. 10 million euro)

*** This entails sections A to D of the building. Sections E and F were built later (1982).**

The need to renovate

Infrastructure
Since construction in the 1970s the technical infrastructure of the Provinciehuis had become outdated and this was one of the reasons drastic renovation was necessary.
Over the years the Province has invested in reducing energy consumption for heating. For example, the central heating boilers have been replaced by HR boilers, another much more efficient VAV (Variable Air Value) Control System has been installed and a building management system has been introduced.

Environmental benefits
The various measures taken to reduce energy consumption in the Provinciehuis in Assen are aimed at reduction of the CO_2 emissions. For every m^3 of natural gas saved the CO_2 emissions decrease by 1.78 kilograms.

Growth and development
The Province of Drenthe is a healthy organization. To offer all employees a good working environment with appropriate conditions expansion was necessary.

Renovation
The choice for renovation was a more durable solution than building new offices. The Province of Drenthe aims to set a good example with regards to sustainability. Main objective of the renovations was to create a Provinciehuis that offers an inspiring, inviting and environment-friendly working situation for the future. The new work environment must also suit the modern, more integrated work-style simultaneously introduced to the provincial staff.

Techniques

Many measures were taken to contribute to CO_2 reduction, sustainability and energy efficiency. The newly renovated Provinciehuis is not just a pleasant place to work, it is also an energy efficient building using a range of different techniques.

Sensor technology

- Lighting circuit with motion sensors;
- Solar tubes with glass-fibre technique for lighting the front courtyard area;
- CO_2 sensors for fresh air supply system in meeting rooms;
- Sensors for flushing the toilets;
- Sensors for cold water taps;
- Indoor climate control system;
- Various temperature and humidity meters to ensure correct functioning of indoor climate installations.

Optimal insulation

Insulation is an important aspect when renovating an old building and this has also been greatly improved in the Provinciehuis. The challenge is to keep the heat inside in the winter and the heat out in summer. When aiming for energy reduction the first step should always be to look for the opportunities, and where possible improve the insulating shell of a building. Then the interior installations can be fitted.

Dual system for water

The use of a dual water system is relatively new. Water is precious – the filtering of sewage water and the purification of drinking water has become increasingly expensive so the opportunity to introduce an alternative technological system was taken. To get the most out of this technology the Province started up a project together with Water Board Hunze en Aa's. The current sewer system in the area is not suitable for this technique so the renovation committee chose for 'self collection'. Sanitary water is collected from the specially designed toilets and stored in separation tanks. The great advantage to this system is that the water filtering results of the drinking water authorities are greatly improved. Additionally, hormone disrupting agents, medicinal residues and other conventional pollutants are no longer dispensed into the existing water system. The Water Board Hunze en Aa's empties the sanitary water tanks every two months and re-uses this water effectively. Innovative possibilities, such as 'energy harvesting' from this water, are also being investigated.

Rain water

To further increase water conservation rainwater is collected and used to flush the toilets and to supply the existing decorative water elements and garden sculptures. The results in terms of saving drinking water are quite significant.

Electricity

Electricity for the Provinciehuis is delivered through various channels. The largest source is through the main network (about 75%). Solar panels deliver approximately 3% of the total electricity requirements. There are currently 350 m^2 of solar panels in place. By opting for a heat pump installation with a combined heat power (CHP) system natural energy sources are optimized, thus resulting in minimal use of fossil fuels and a significant reduction in terms of CO_2 emissions.

Energy consumption and CO_2 reduction

High frequency TL light fittings emit a lot of light while using less energy. By optimizing the use of natural daylight and optical sensors for infrequently used spaces energy use is minimized.

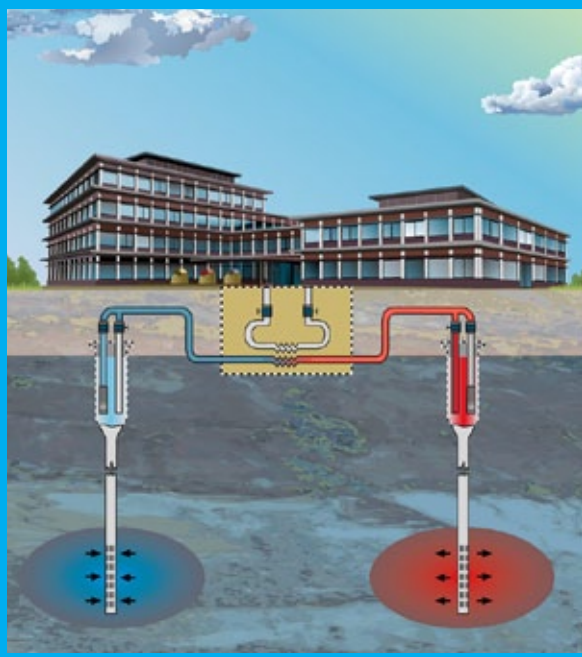
Energy label

Following the renovation of the Provinciehuis and the implementation of all energy-reducing measures, the building's Energy Label has to be redefined. Needless to say it is expected that scores will now be more favourable.

Thermal storage

The Provinciehuis now has an open thermal storage system. The use of this system is an important renewable energy technique which will lead to a substantial reduction of greenhouse gas emissions, both in the near future and in the long term.

Construction works at the Provinciehuis - the thermal storage system.



Thermal Storage System

Results

During a meeting of the Provincial Council on 22nd April 2009, the council members committed to the allocation of funding for renovation. These funds were already reserved in 2008 for measures to be taken under the Provincial Climate and Energy Programme. The following amendment was introduced and accepted: 'For measures under the Climate and Energy Programme, there is a maximum payback period of thirty years'.

Besides the payback period there are three arguments to justify the investments:

- The Province as role model;
- Protection of the environment;
- Total Cost of Ownership.

Expectations based on preliminary calculations (with regards to gas) indicate that the total reduction of CO_2 emissions will be 430 tons per year.
In comparison to the emissions of the time (500 tons) this is a saving of 86%.

The Province as role model
By implementing the energy and climate measures during the revitalization of the Provinciehuis, the Province of Drenthe shows that investment in sustainability is important. They are practising what they preach.

If local businesses are stimulated to do likewise then they can see that much is to be gained from such investments. Setting a good example can encourage many followers.

Protection of the environment
An energy monitor, featuring a measuring and recording system for energy and water consumption, has been installed at the Provinciehuis. Based on the information from this monitoring system more insight can be gained into the environmental effects of the works undertaken at the Provinciehuis.

Total Cost of Ownership
Part of the investments made available for the climate and energy measures during the renovation can be marked as general repair or replacement costs for existing installations. With regards to the insulation of the entire building, this can even be seen as overdue maintenance. From this perspective it is more realistic to look to the Total Cost of Ownership than the payback time on investments. Based on current information the Total Cost of Ownership is not expected to be higher than it is at present.

Benefits for the Province, benefits for the environment

Monitoring

Which information is kept where?

Since 1990 several initiatives have been undertaken to integrate the internal environmental management system with business operations. In 2008 a policy statement was signed by members of the Executive Board, thereby underlining the importance of sustainability in business operations. In the Annual Report on Environment and Energy 2008 a description is given of the energy consumption in the Provinciehuis and the environmental effects. In this report a goal was set to become a forerunner in terms of renwable energy solutions, meaning that the Province of Drenthe has held to its legal obligations and is actively involved regarding environmental management.

As a result of the building's revitalization and the outplacement of employees, there was a temporary decrease in the amount of staff working in the Provinciehuis. Additionally, several changes were made in a number of systems. During this period no energy or environment related information was centrally collected and reported.

One of the registration systems for energy and water consumption is the Energy Monitor. Based on the information from this monitor the environmental effects related to works done at the Provinciehuis are visualized. The building's energy consumption can be read on the monitor screen that is situated at the main entrance.

The Energy Monitor can be seen on a flat screen by the building's main entrance.

The Energy Monitor shows the following information:

- A total view of all the facilities in the Provinciehuis;
- An energy label; electricity and gas consumption (daily, monthly and yearly figures);
- Electricity generation kWh: solar panels (CO_2 reduction per kilo, (daily, monthly and yearly figures);
- Renewable energy use with heat cold storage;
- Water consumption (use of tap water and rainwater in m^3 (daily, monthly and yearly figures).

Environmental Barometer

The Environmental Barometer is an instrument, a benchmarking tool, whereby government organizations can compare their environmental performance. At the end of 2007 and the beginning 2008 the Province of Drenthe participated in this 'environmental survey'. A cautious comparison with other government buildings showed that the offices at the Provinciehuis prior to renovation had a number of notable issues requiring improvement.

- Decrease energy consumption;
- Decrease water consumption;
- Decrease the total amount of paper purchased and used.

Now that all staff has been relocated to the Provinciehuis registration and monitoring of energy consumption and other environmental aspects can recommence. It is important that registering all this data becomes part of various work processes. In the provincial Integral Health and Environment Programme it is stated that a reassessment will take place in 2012 with regards to continued monitoring, and that a Work and Environment Management System will be introduced.

Conclusion

In terms of initiating a credible and succesful energy policy, the Province of Drenthe believes in setting a good example. The necessary renovation offered an opportunity within the organization to show how energy and environment goals can be accomplished - both efficiently and economically. By making this visible to all who enter the Provinciehuis, visitors are stimulated to undertake similar steps in their own organizations. In this way the underlying goal is also achieved - a good example is worth following!

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BC11110807

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Investing in the future by working together for a sustainable and competitive region