

# ■ Wettbewerbsbeitrag

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## zu Green Capital City 2012/2013

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## 1. Local Contribution to Climate Change

### 1.1. Present situation and developments over the last five to ten years

#### 1.1.1. Total CO<sub>2</sub> equivalent per capita, including emissions resulting from use of electricity

The City of Nuremberg has put considerable effort into its municipal climate policy, and has experienced some success. The City attaches great importance to energy issues. Increased use of renewable forms of energy and high energy efficiency are two tools to fight climate change. Since 2000 Nuremberg has been a member of the Climate Alliance of European Cities, the largest European city network for climate protection. As a member of the Climate Alliance Nuremberg has committed to reduce greenhouse gas emissions continuously. Since 2009 Nuremberg, has also been a member of the Covenant of Mayors.

The development of CO<sub>2</sub> emissions and other greenhouse gases is linked to final energy consumption. Between 1990 and 1996, Nuremberg's final energy consumption was reduced by 14.2%, but since 1996 it has increased again. Nevertheless, CO<sub>2</sub>-emissions decreased continuously between 1990 and 2004. This is a sign of greater efficiency, both in energy production and consumption. The three most important sources of CO<sub>2</sub> emissions are the use of the final energy carriers electricity, natural gas and fuels for transport. Nuremberg's greenhouse gas emissions have reduced considerably during the last twenty years. Between 1990 and 2004, emissions decreased by 13.4% overall, with CO<sub>2</sub> emissions reduced by 24.3%. The main contributing factors were the decrease in domestic energy consumption, and an overall decrease in electricity consumption. Another reason was the change from fossil fuels, such as heating oil and coal to more environmentally-friendly natural gas.

CO <sub>2</sub> -equivalent emissions	1990	1996	2000	2004
Inhabitants in Nuremberg	493,692	492,864	488,400	495,302
*Absolute CO <sub>2</sub> -equivalent in t CO <sub>2</sub>	5,283,743	4,851,979	4,631,648	4,615,828
*CO <sub>2</sub> equivalent per capita in t CO <sub>2</sub> per capita	10.70	9.84	9.48	9.32
*CO <sub>2</sub> -equivalent per capita in %	100%	92%	89%	87%

\*Including energy consumption and transport, excluding waste water management and disposal

#### 1.1.2. CO<sub>2</sub> per capita resulting from use of natural gas

Use of natural gas	1990	1996	2000	2004
CO <sub>2</sub> -equivalent per capita in t CO <sub>2</sub> per capita	1.35	1.63	1.68	2.31
CO <sub>2</sub> -equivalent per capita in %	100%	121%	124%	171%

Natural gas is an important energy carrier. Final energy consumption of natural gas increased significantly between 1990 and 2004. Natural gas consumption also increased between 2004 and 2006, because the local power plant Nürnberg-Sandreuth was modified to the energy-efficient combined cycle gas & steam technology. Higher electricity production with CO<sub>2</sub> gains for the current decreases the CO<sub>2</sub>-equivalent emissions by 566,204 t CO<sub>2</sub>. But increased use of natural gas in industry and private households also has another advantage: consumption of coal and heating oil has a worse CO<sub>2</sub>-equivalent emission factor than natural gas.

### 1.1.3. CO<sub>2</sub> per capita resulting from transport

Transport	1990	1996	2000	2004
CO <sub>2</sub> -equivalent per capita in t CO <sub>2</sub> per capita	2.19	2.10	2.14	2.06
CO <sub>2</sub> -equivalent per capita in %	100%	96%	98%	94%

Transport is one of the three main sources of CO<sub>2</sub> emissions. Although the City of Nuremberg has a good public transport system, emissions from cars and HGVs are enormous. And traffic is still increasing. The public transport system consists of various means of transport, such as buses, trams, underground and suburban trains. Walking and cycling are also popular in Nuremberg. The public transport system is still improving. New suburban railways to neighbouring cities, such as Ansbach, Erlangen and Neumarkt are under construction. The new underground line U3 from Maxfeld to Gustav-Adolf-Straße is Nuremberg's third underground line. Nuremberg's excellent public transport system means that it is possible to live in the city without using a private car. Without the public transport system, CO<sub>2</sub>-emissions would be substantially higher.

### 1.1.4. Gram of CO<sub>2</sub> per kWh used

Average CO <sub>2</sub> -equivalent emission factor	1990	1996	2000	2004
Grams of CO <sub>2</sub> per kWh used	0.367	0.392	0.347	0.337
Grams of CO <sub>2</sub> per kWh used in %	100%	107%	95%	92%

Between 1990 and 2004, the average CO<sub>2</sub> equivalent in grams of CO<sub>2</sub> per kWh used was reduced by 7.1%. The average CO<sub>2</sub>-equivalent emission factor includes the use of electricity, natural gas, district heating, process heating, heating oil, coal and transport, but not the emissions for waste water management and waste disposal. The increase between 1990 and 1996 is due to the higher national CO<sub>2</sub>-equivalent emission factor for electricity, and the higher local CO<sub>2</sub>-equivalent emission factor for district heating in 1996.

## 1.2. Measures implemented over the past five to ten years

Climate protection is an important task for the future, but Nuremberg's municipal administration has been active in this field since the 1990s. In the last five to ten years, a number of measures have been implemented to reduce CO<sub>2</sub> emissions:

The most important measure relates to power generation: between 2004 and 2006, the power plant in Nürnberg-Sandreuth changed its main energy carrier from coal to more environmentally-friendly natural gas. The energy-efficient combined cycle gas & steam technology supplies Nuremberg with combined-heat-power (CHP) electricity and district heating. The power plant belongs to the local power supplier N-ERGIE Aktiengesellschaft. The City of Nuremberg is one of the partners in this company and can thus influence its activities.

The second significant measure leading to considerable reduction in CO<sub>2</sub> emissions was refurbishment of buildings (insulation and improvements to the efficiency of heating systems). Most buildings in Nuremberg were constructed before 1977. At that time, there were no regulations guaranteeing an energy-efficient building standard. N-ERGIE Aktiengesellschaft has allocated 850,000 Euros p.a. towards building refurbishment as part of the CO<sub>2</sub> reduction programme. Refurbishment of existing buildings and energy-efficient construction of new buildings are two successful measures aiming at further reducing future CO<sub>2</sub> emissions.

Projects in energy efficient landscape-planning have demonstrated that with good planning, energy consumption for buildings can be reduced and valuable areas may be saved for urban development.

The environmentally-friendly implementation of measures in the transport sector remains a challenge for the future. Private transport by car is responsible for most emissions. Between 1990 and 2004, traffic on the inner city circle was reduced by 12%, because more people used public transport. But private transport from the suburbs to the city centre increased by 9%. A new underground line U 3 was constructed between Maxfeld and Gustav-Adolf-Straße, to improve public transport. Cycling was also encouraged by the development of new cycle-paths.

The City of Nuremberg also uses renewable energy sources: hydroelectric power is the most important renewable resource. In 2004, 9,412 MWh of electricity were produced. Photovoltaic and solar-thermal energy are also used. Photovoltaic increased by 656% between 2000 and 2006. Nuremberg boasts the highest amount of energy production per capita from photovoltaics and solarthermal energy of all German cities of over 500,000 inhabitants. In Nuremberg, photovoltaics produced an overall 4,499 kW<sub>peak</sub> 2006, which generated 4,050 MWh of electricity per year. Every year CO<sub>2</sub> emissions of 3,644 t are avoided by photovoltaics. In 2006, solar-thermal devices covered an area of 9,979 m<sup>2</sup> and avoided CO<sub>2</sub> emissions of 1046 t per year.

In 2009, the project association "8KU" (an association of eight municipal companies) was founded, with the aim of extending regenerative electricity generation.

Municipal Energy Management (KEM) checks the energy consumption of all municipal buildings. Between 2005 (160,000 t CO<sub>2</sub>) and 2007 (117,000 t CO<sub>2</sub>), CO<sub>2</sub> emissions were reduced by 27%. The department for public procurement of products and services orders only energy-efficient lamps and refrigerators. Since 2008, green electricity has been procured for all municipal buildings. In the context of the local Agenda 21, the City of Nuremberg established a working group "Energy". Working with citizens and stakeholders, it provides information and facilitates cooperation in the fields of energy-efficiency and renewables.

## 1.3. Short and long term objectives

The City of Nuremberg's policy objectives for climate protection result from the following premises

- national climate protection policies of the Federal Government
- municipal decisions
- membership in the Covenant of Mayors (20% reduction of CO<sub>2</sub> emissions by 2020, via 20% increase of energy efficiency and 20% increase of regenerative energy by the year 2020).

The City of Nuremberg set itself an ambitious goal: a 40% reduction of CO<sub>2</sub> between 1990 and 2020. Increasing energy prices and negative environmental effects require many measures to improve the situation in the future.

### Short term objectives

A plan for energy use in Nuremberg will be drawn up in 2010/2011, outlining a strategy for the future in the fields of both energy production and consumption. Energy efficiency: Information for private households and industry concerning energy-efficient lighting, heating, use of electricity and combined-heat-power (CHP) will reduce final energy consumption and CO<sub>2</sub> emissions.

Building refurbishment: The advisory board of the Nuremberg Building Department will facilitate increased building refurbishment by private owners to an energy efficient standard. An annual event on building refurbishment, the "Altbautage Mittelfranken", demonstrates efficient ways of modernising buildings. This event is especially aimed at private owners.

### Long term objectives Energy efficiency

The extension of district heating seems meaningful, for the co-generation based on natural gas in the power plant Nürnberg-Sandreuth is more environmentally-friendly than other separate ways of producing electricity and heat. CHP and tri-generation are the two measures providing electricity, heat and cooling in an efficient manner, especially for industry, municipal buildings and other larger buildings, such as the trade fair & exhibition centre NürnbergMesse, hospitals and the airport.

Energy efficient refurbishment of commercial, municipal and residential properties is an important measure, because the existing building stock by far exceeds newly-built properties. Building refurbishment The Nuremberg Housing Association (wbg) is actively refurbishing its buildings to energy-efficient standards. Transport Extension of the underground line U 3 to Gebersdorf will improve public transport in the south-west of the city. The installation of new suburban railways to Ansbach, Erlangen and Neumarkt will shift transport from cars to environment-friendly public transport.

The use of gas-dedicated cars by the municipality, and commercial and private owners should be increased.

### Renewables

The use of biomass for heating is an important measure for the future to reduce CO<sub>2</sub> emissions from private households and industry. Co-generation (CHP) based on biomass will also decrease CO<sub>2</sub> emissions. Photovoltaics and solarthermal energy on municipal, commercial and private roofs can increase production of renewable electricity and heat.

### Budgets

The following lists some concrete examples for major investment by the City of Nuremberg or its subsidiaries made in climate protection:

CO <sub>2</sub> reduction programme	850.00 million € p.a.
N-ERGIE (local energy supplier) Pellet Power Station ProjectNuremberg	35.90 million € (investment)
Bio Gas Plant Project (Gollhofen/Ippenheim)	14.5 million €

### wbg Nuremberg GmbH Housing Association

The wbg Nuremberg GmbH is the largest real estate company linked to a municipality in the Nuremberg Metropolitan Region. The portfolio of this subsidiary company of the City of Nuremberg comprises about 18,000 company-owned residential properties let for rent, with an overall net dwelling area of about 1.1 million m<sup>2</sup>, which corresponds to about 10% of all residential properties in Nuremberg. For some years, the wbg Nuremberg GmbH has been one of the leading players in refurbishment of existing properties for energy-saving, and has realised projects such as the first 3-litre-house in Bavaria at Jean-Paul-Platz, and has implemented large-scale refurbishment projects, such as that of the St. Johannis housing estate with about 1,000 residential units. In the past 20 years, the wbg has invested around 230 million € in modernising and refurbishing their existing properties.

Today, about 7,500 of its overall 18,000 residential units have been refurbished for energy-saving. Since 2008, the wbg has held "energy performance certificates" for all its residential buildings. With an average end energy use of about 12.5 litres of heating oil per m<sup>2</sup>/year, the wbg is one of Germany's top "eco-efficient" real estate companies.

For comparison: in 1990 the Federal German average in 1990 was at about 19 litres m<sup>2</sup>/year. The company has the vision of achieving an average end use of 7 litres per m<sup>2</sup>/year by 2015, reducing CO<sub>2</sub> emission by 60%. In addition to many smaller modernisation projects, the following measures have attracted attention well beyond Nuremberg's city boundaries in past years:

#### Investment of WBG

Year	Housing Estate	Measure	Standard	no of residential units	Investment (mio €)
2000-2004	St. Johannis	Modernisation of listed buildings	7 litre	about 1000 units	36.1
2000-2006	Schweinau	Ecol-refurbishment and new construction	5 litre	about 200 units	5.8
2002	Jean-Paul-Platz	EU-Goal-2 Project modernisation	3 litre	6 units	0.5
2004	Ingolstädter Straße	DENA I-Project	4 litre	24 units	1.6
2005	Bernadottestraße 42-48	DENA II-Project low energy house	3 litre	24 units	1.8
2009	Kollwitzstraße 1-17	DENA III-Project EnEV-50 + passive house	3 litre	72 units	6.1
since 1998	Nordostbahnhof	Modernisation / conversion	7 litre	about 900 units	60.0
since 2006	Mögeldorf	Modernisation	7 litre	500 units	about 20-25

#### Photovoltaics

In addition, the wbg has installed photovoltaic systems on many of its roofs. Today, there are 54 systems with an overall collector area of 9,600 m<sup>2</sup>, generating an annual energy input of about 1 million kWh/year, corresponding to the supply to 330 households.

#### District Heating

Switching residential properties to district heating has resulted in a further saving of CO<sub>2</sub> emissions; so far, about 2/3 of the wbg's residential properties are connected to district heating

#### 1.4. Documentation

Nuremberg's contribution to the reduction of CO<sub>2</sub> emissions is documented in the following reports (in German):

- Climate Protection Report 1999: Klimaschutzbericht 1999 Stadt Nürnberg
- Climate Protection Report 2006: Klimaschutzbericht 2006 Stadt Nürnberg
- Climate Protection Schedule 2010/2020: Klimaschutzfahrplan 2010/2020 Stadt Nürnberg
- Nuremberg Sustainability Report (2008): Nürnberg nachhaltig (2008)
- Annual Energy Reports by Municipal Energy Management: Hochbauamt, Kommunales Energiemanagement (KEM): Energiebericht
- Business Report of the local power supplier N-ERGIE Aktiengesellschaft: Geschäftsbericht 2008
- Updated Environmental Statement 2008 - power plant Nürnberg-Sandreuth of local power supplier N-ERGIE Aktiengesellschaft
- Report for the Covenant of Mayors: Energy and Emission Inventory 1990 and 2004
- Statistics of the City of Nuremberg: <http://www.statistik.nuernberg.de/>

## **1.5. Disadvantages resulting from historical and/or geographical factors**

- Urban development was influenced by the city's foundation in the Middle Ages, and industrialisation in the 19th century. During WWII, many buildings in the city centre were destroyed. They were reconstructed after 1945. The fact that many buildings are listed as historical buildings, has repercussions for building refurbishment.
- Nuremberg is the commercial centre of Northern Bavaria and the largest city in the European Metropolitan Region of Nuremberg. This fact determines the amount of traffic from other cities and regions to Nuremberg. The city is an important junction for road, train and air traffic. Nuremberg's position in Central Europe also affects traffic from Eastern Europe, especially from the Czech Republic.
- Nuremberg's climate is moderate. Summers are usually not very hot, but winters can be cold, so that a lot of energy is needed for heating.
- The city area is limited. It is therefore not possible to install renewable energy sources which require a large amount of space. Biogas could only be produced in agricultural areas which are situated in the north of the city (Knoblauchland). There is, however, a conflict with food production. Geographical conditions therefore allow only a limited use of renewables. Hydroelectric power is used in two power plants on the river Pegnitz. There are no plans for further hydroelectric power plants. There are no geothermal power plants, because they would not be efficient in these geographical conditions. The use of wind power is not possible either.

## **2. Local Transport**

### **2.1. Present situation and developments over the past five to ten years**

#### **2.1.1. Length of designated cycle lanes in relation to total number of inhabitants**

The length of the network of designated cycle lanes is about 300 kilometres, for a total number of inhabitants of the City of Nuremberg of approximately 503,000.

#### **2.1.2. Share of population living within 300 metres from a hourly public transport service**

The number of citizens living within a comfortable access radius of the underground system: about 170,000; of the tram system: around 185,000; of the bus service: around 94,000, and of the suburban train service: about 51,000.

#### **2.1.3. Proportion of all journeys under 5 km by private car**

Half of all journeys by private care are under 5 km.

#### **2.1.4. Proportion of public transport classified as low emission**

Various specialist departments are currently analysing the future of electro-mobility or developing strategies in this field. Results remain to be seen.

### **2.2. Measures implemented over the past five to ten years**

Since the early 1970s, the historic city centre has been gradually pedestrianised, in particular in an attempt to address the issue of worsening air quality. Traffic volumes on the other streets grew by only 20-29% of the traffic originally on the then closed roads. Forecasts predicted that the pedestrianisation of Rathausplatz/Theresienstrasse Square (thereby closing a road which carried on average 25,000 cars/16 hours) would result in traffic chaos in surrounding streets. This chaos did not materialise.

After one year, traffic monitoring revealed that overall traffic flow in the historic city was reduced by up to 25%, and the increase in traffic in adjacent streets proved very limited, ranging between 4-19%, well below experts' forecasts. Significant improvements in air quality have been achieved.

The following measures are described in detail in the annotations of the City of Nuremberg's Clean Air Plan (see attachment in Chapter 6 Air Quality) and its update:

1. Topic Environmental Network
  - optimising local public transport (ÖPNV)
  - priority for local public transport over private car transport – adapted traffic signalling, additional bus lanes
  - further extension of designated cycle lanes and of the footpath network
  - establishing "urban railways" for extensive development of local public transport
  - further extension of suburban railway network for commuters travelling into Nuremberg
2. Topic Traffic Guidance o increased car park space management
  - further extension of dynamic traffic and parking guidance systems
  - reduction of goods traffic due to shift of the main customs office and establishing the container railway terminal at Nuremberg State Harbour
  - guidance of HGV traffic o developing strategies for establishing intelligent logistics concepts
  - planning and building measures at special "traffic hot spots"

### **2.3. Long and short term measures**

In order to safeguard sustainable mobility, which is indispensable for guaranteeing a city's basic functions, the City Council adopted a catalogue of traffic political objectives and related measures. The basic aim is to shift as much car travel as possible to the so-called "Umweltverbund" (Environmental Network), comprising travel by local public transport, bicycle and on foot. For this purpose, a variety of traffic planning measures need to be implemented, most of them long-term. Examples of measures required include development of the local public transport network, car park space management, extension of the network of cycle paths, and the traffic guidance system of Messe/Stadion/ARENA, as well as measures implemented in the historic centre of the Old Town. All in all, Nuremberg is well placed, and for some measures, such as traffic guidance systems, the extension of the pedestrian precincts and residents' parking policies, is already in the top tier of major German cities. Against the backdrop of accelerated climate change and stricter legal limits on various emissions in cities, Nuremberg's main objective of shifting as much individual to the Environmental Network has become more topical than ever.

#### **Short to medium term measures for bicycle travel**

More and more Nuremberg citizens use their bicycle for daily travel to work or to school, to go shopping or in their leisure time. Thus the share of cycle traffic as a proportion of overall traffic doubled between 1985 and 2005. For journeys to work and educational institutions, and for shopping, the share increased to 13%, and for leisure travel to 23%. It is known that 29% of all households in Nuremberg do not own a car, which means that the share of bicycle traffic could be increased further. Traffic planning takes this into account by consistently promoting cycle travel as a permanent transport policy. The City of Nuremberg has the objective of achieving a bicycle share of 20% within the city. By purposefully extending the network of cycle paths and footpaths, as well as establishing the corresponding infrastructure, the City intends to promote the use of an intelligent transport mix. Developing the cycle-friendly infrastructure (bike parking facilities, signposting etc.), will make new bicycle links to the surrounding villages and towns increasingly attractive.

A comprehensive cycling campaign ("Nürnberg steigt auf" – Nuremberg gets on its bike) is intended to help achieve the objectives and comprises the following measures: Signposting Strategy Currently, there are about 135 km of signposted main cycle routes within the Nuremberg city area. The signposting strategy adopted by the City Council provides for signposting a further 150 km of cycle routes linking city districts. Cyclists' City Map: In June 2008, the fifth amended edition of the Cyclists' City Map was published. The number of copies printed was increased from 6,000 to 20,000 copies. The new Cyclists' Map is intended to give strong support to the trend towards more and more citizens using their bicycle for everyday journeys. After all, apart from walking, cycling is the mode of transport which is most conducive to protecting the environment and the city. In addition, about half of all car journeys are shorter than 5 kilometres. Bike parking facilities Currently, in the Old Town alone, there are about 1,300 publicly accessible bike parking racks. In early 2008, a bike parking strategy was adopted which provides for around 330 additional roofed bike stands in the Old Town. Bike parking facilities, roofed if possible (Bike&Ride) are provided at all major public transport stops, and will also be provided in further extension plans for the public transport network.

### **Long-Distance Links Between Green Spaces**

Attractive cycle paths and footpaths, linking a whole network of green spaces, lead through the inner city and towards leisure areas in the vicinity of the city. The concept of "übergeordnete Freiraumverbindungen" (long-distance links between green spaces) was adopted in the land utilisation plan and integrated landscape plan for the City of Nuremberg. In 2008, the north-south axis was introduced, further routes are being planned. Extension of cycle path network The budget allocated to measures for extending cycle travel were significantly increased to 4.5 million € in the medium term investment plan for 2009-2014 (compared to 1.09 million Euros for 2003-2006).

### **Public bicycle hire system**

The City of Nuremberg was chosen in a competition for a pilot project "Innovative Public Bicycle Hire Systems – New Mobility in the Cities". The competition was organised by the Federal Ministry of Transport, Building and Urban Affairs. Public bicycle hire systems are intended to promote cycle travel and at the same time attract new public transport users.

PR work In order to promote an intelligent transport mix, the image of cycling has been addressed by numerous activities and projects, such as "Mobile Citizens' Meetings", "City Council Cycling", "Nuremberg – Intelligent Mobility", "One into Three in Bicycle Path Construction", "Bike to Work and "VIPs on Bikes".

### **Medium to long-term public transport measures**

The hierarchy of the various modes of transport (bus, tram, urban railway, underground and suburban railway) will be determined by the public transport development plan with forecasts which run until 2025. The central task of the public transport development plan is to devise a public transport network which will be able to cope with future traffic volumes, and achieve the most favourable modal shift towards public transport, whilst taking into account economic considerations.

In April 2008, engineering consultants were commissioned to produce the public transport development plan. An expert working group has been appointed to help prepare the plan, as well as a project advisory council comprising representatives from the City Council, from advocacy groups and associations and other stakeholders. The public transport development is to be finalised in 2010.

## **2.4. Documentation**

We are currently building up a sustainability monitoring system which will contain documentation on the issues mentioned.

## **3. Green urban areas**

### **3.1. Percentage of green and water areas in relation to the overall area**

- the proportion of area located within the inner city/on city boundaries;
- the distribution across the city;
- size of areas
- fragmentation

The city-owned and city-operated company "Service Öffentlicher Raum" (SÖR = Service Public Domain, roughly equivalent to a Parks Department) looks after the following public park areas within the city boundaries. This should not be confused with general "green areas" which also include further areas in addition to those maintained by SÖR, e.g. graveyards, open-air swimming pools with surrounding grounds, grounds belonging to schools and nursery schools etc (about 150 ha), grounds belonging to other municipal properties, municipal forests, forests owned by the Bavarian State within the city boundaries, all private gardens, as well as roadside vegetation (about 250 ha).

## Public Parks, Playgrounds, Allotments of the overall city area 18,640 ha

1996	2004	2009
417 ha	565 ha	619 ha
2.2%	3.0%	3.3%

Currently the municipal geo data system only permits the display of the position, name and registration number of all public parks etc. A map showing the contours of the parks is appended as a city-wide overview (in two parts) in pdf-format.

### 3.2. Present situation and the development over the past five to ten years

Present situation and the development over the past five to ten years in relation to the percentage of citizens living within 300 m of public green urban areas, the total number of m<sup>2</sup> of green urban areas per capita and public green urban areas per capita.

#### Public Parks

Data technology does not currently allow the calculation of the percentage of citizens living within a certain distance of a public park. However, the distribution of public parks within the city is such that the majority of the population is within 300 metres of a public park. For Nuremberg's 502,828 inhabitants (July 2009), the figures quoted in 3.1. result in an overall green public park area of 12.3 m<sup>2</sup> per inhabitant. If one were to include all green areas maintained by SÖR (see 3.1.: 1,019 ha), this figure would be 20.3 m<sup>2</sup> of green area per inhabitant. All other additional green areas (listed in 3.1.) are not taken into account by SÖR. They would, however, considerably increase the green public area per inhabitant.

#### Trees in Nuremberg

Since 2004, all street trees and tree root zones and their vegetation have been mapped in the new tree land register. It is hoped that gradually, all spatially distributed trees will also be registered. In 2007, 24,193 street trees were listed in the register. In addition, 226 trees were newly planted in 2006. For reasons of traffic safety, 132 trees were felled in 2006 (89 in 2005). Thus with an overall number 24,377 street trees (on 28.02.2007) the number of street trees increased by 94, compared to the previous year (24,283 trees in 2006). In 2005, there was private sponsorship (an "adopt a tree" programme) for 484 trees, as compared to 460 in 2006. This demonstrates the great commitment Nuremberg citizens show for their city trees. In the future, the spectrum of tree species will need to be adapted to urban and climate changes.

### 3.3. Measures implemented over the past five to ten years

#### The Green Campaign:

A comprehensive portfolio of projects within the context of the EU Objective 2 Funding for Nuremberg 2000 – 2006/2009

In 1999, the European Council created the "EU Objective 2 Funding Programme" which benefited the southern districts of Nuremberg, as a designated core programme funding area. 50% of the funding came from the European Regional Development Fund (ERDF), and 20% from public funding programmes of the Free State of Bavaria. Thus, only 30% of the cost had to be born by the City of Nuremberg.

The following objectives were implemented in the course of the campaign "Grün in die Südstadt" (Green for the Southern Districts):

- improved quality of open spaces to encourage public use
- improvement of residential environment
- creating spaces which are more attractive for children and young people
- friendly, pleasant environment for resident enterprises and their employees
- creating a high-quality "green network" consisting of public parks, playgrounds and streets with vegetation.

"Grün in die Südstadt" [Green for the Southern Districts] was initiated as the main outcome of the Conference for the Future I held in 2000, as a co-operative partnership between private and public institutions. As a further result of this conference, committed citizens established the volunteer project group "Grüne Bänder" [Green Ribbons]. This project group, together with representatives from the Town Planning Department, developed a concept for green and free areas for the entire southern part of Nuremberg. This served as the basis for the Town Planning Department and the city-owned and city-operated company SÖR, in co-operation with the project group, to develop an overall plan for improved green and play areas to be

provided in the southern districts, including green axes, which would be eligible for funding by the EU. This was then taken as the basis for the Green Campaign.

The implementation of the Green Campaign for the southern districts has led to 26 projects, establishing or refurbishing public parks and playgrounds, five supplementary road construction projects as well as the re-landscaping of Aufseßplatz. Existing public parks were completely refurbished, and playground facilities were increased. In the process, a new green area was created in Kanzlerstraße. Existing school grounds of the schools VS Herschelplatz, VS Sperberstraße and VS Gabelsberger Straße were re-designed as play grounds, likewise the school grounds of the Sigena-Gymnasium. In Neulichtenhof, a nature playground was established. The Green Campaign thus provided many new playing and leisure possibilities for children and young people in the southern districts – a demand voiced by the public during the first Conference for the Future.

Because Nuremberg's southern districts are densely built up, there were only very few places where green and play areas could be developed. It was therefore only possible to create two new playgrounds. Since 1955, following a City Council decision, all school grounds have to be made available as play areas after school hours. It was, however, only in 1992 that the City started providing the first school grounds with play equipment similar to that in public playgrounds. In the southern districts, four schools were equipped in such a way and made more attractive. 13 public playgrounds were completely refurbished. Play facilities have thus been significantly improved. Some play areas which were deserted in the past, are now used intensively after refurbishment and re-design. When playgrounds are planned, the City of Nuremberg places great emphasis on the involvement of children and young people. In the course of two "user involvements", they are given the opportunity of contributing their individual wishes and ideas. Children and young people can also do practical work as part of the building process. The last Children's Meeting (held every two years parallel to the Citizens' Meeting) expressed its satisfaction with the majority of the projects. The children praised the results and, unlike in earlier meetings of this kind, did not file any demands for the improvement of playgrounds.

The situation for public green areas was similar to that for the playgrounds. Here, too, significant improvements could be achieved by improving the quality of existing areas. Adults were, of course, just as much involved in the planning process, as the children in the design and planning of the playgrounds. Citizens' associations were particularly involved. A citizens' project group "Grüne Bänder" [Green Ribbons] was established, allowing the planners to get direct information about the wishes and needs of the residents.

Now, the implementation is nearly finished, with remarkable results. Complaints concerning insufficient green spaces have decreased significantly. Some streets have also been improved by vegetation, serving as links to and between the green areas. The southern districts are now much more pleasant to live in. In total, the individual measures implemented resulted in an overall construction expenditure of around 7.6 million Euros.

**The following measures were realised:**

1. Refurbishment of Aufseßplatz (Investment 2,627,300 €)
  
2. 14 Green Public Parks with Play Areas Provided (Investment 4,088,200 €)
  - Annapark – public park (85,200 €)
  - Don-Bosco-Heim / sports grounds (136,800 €)
  - Frankenstraße - playground (276,000 €)
  - Hasenbuck – establishing public park with play area provided (495,200 €)
  - Herschelplatz - public park with play area provided (201,900 €)
  - Kanzlerstraße - purchase of grounds and establishing public park (62,300 €/ 153,300 €)
  - Maffeiplatz - public park with play area provided (93,400 €)
  - Nördlicher Melanchthonplatz – with playground (176,500 €)
  - Pferdemarkt - overall construction measure public park (1,196,000 €)
  - Sperberschule - landscaping grounds (200,900 €)
  - Südtiroler Platz (587,700 €)
  - Voltastraße (172,200 €)
  - Pettenkofer- /Kochstraße (190,000 €)
  - Pettenkofer-/Listerstraße / park for ball games (60,800 €)

3. 7 Playgrounds: (Investment 1,057,900 €)
4. 4 School Playgrounds (Investment 711,400 €)
5. 5 Street Conversions (Investment 5,891,200 €)
6. In the context of maintenance work, in the past three years
  - two public parks were completely refurbished (Europaplatz – about 2,000 m<sup>2</sup>; Jenaer Straße – about 6,500 m<sup>2</sup>)
  - parts of the City Park were refurbished, about 5,000 m<sup>2</sup>
7. In the course of the past 5 years, 1,500 trees have been planted along city streets.

### **3.4. Long and short term measures**

- people's quality of life and recreation;
- additional ecosystem services and functions such as, regulating water balance, balancing climate extremes, filtering air pollution, education etc.

With regard to short term measures, the description should include measures adopted, but not yet implemented, and budgets for future measures already adopted.

With regard to long term measures, the description should include planned measures which are yet to be adopted politically.

Since Nuremberg is a densely built-up city and therefore only has very few opportunities for expanding green areas, the emphasis for future development of urban green spaces is mainly on the improvement of existing green areas. Those public green areas which have been secured in the municipal land development plan, but not yet developed, provide some potential for future development of urban green areas. It was most gratifying that the area for playgrounds was expanded by 5% between 2006 and 2008. Additional urban green areas could be generated in the context of the future development of the 47 conversion areas of the German Railway (key project in the Building Department). The land development plan shows six areas for this, subject to planning permission.

### **3.5. Documentation**

Currently, it is not possible (for technical reasons) to provide graphics displaying the green urban areas, distinguishing the green areas in relation to the city (e.g. inside or outside the Middle Ring Road). In 2010, technical improvements are to be made. Once this is achieved, classification and registration of green urban spaces will be implemented. The other data provided will be found retrieved from the existing files.

### **3.6. Disadvantages resulting from historical and/or geographical factors**

The historic Old Town with its narrow, winding alleys and its back yards, although historically extremely valuable, is unsuitable for green spaces. The same applies to the city districts in the north-west and south which were built during industrialisation in the 19th century and are also characterised by narrow streets and densely built-up areas. In these districts, all plots available for urban green areas have already been developed. There is only very limited potential for further development, if any.

## **4. Sustainable Land Use**

### **4.1. Present situation and developments over the past five to ten years**

#### **4.1.1. Percentage of green areas, water areas, residential areas, industrial / economic areas, mixed areas, brownfields**

The following information ("City Areas Classified by Type of Use 2004") was taken from the Statistical Almanac for Nuremberg 2008.

## **Green areas**

If "green areas" are interpreted as public parks, the Statistical Almanac gives a figure of 3% of the city area. If "green areas" means the total of all open spaces with vegetation, the following figures are relevant:

- leisure areas 4% (including public parks with 3%)
- agricultural areas 22%
- forest areas 16%

It is not possible to put a figure on the extent of grounds surrounding buildings, since these are included, with the buildings constructed on them, as "settlement areas".

## **Water areas**

The water areas in Nuremberg are 2% of the overall city area.

## **Settlement Areas (buildings and surrounding ground): 33%**

The percentage figure for "settlement areas" includes properties are marked for residential building, but not yet built on. At present, no distinction is made between residential, industrial, trade and industry and mixed areas of land use.

## **Brownfield Areas**

The City of Nuremberg's brownfield register lists a total number of 3,200 former and existing industrial sites which may reasonably be expected to have contaminated soil. Insofar, this is a register listing areas suspected to be brownfield areas. There are concrete test results for 915 of these sites. In addition, 38 former dumping sites have been registered and evaluated.

### **4.1.2. Soil sealing (m<sup>2</sup>) per inhabitant**

In 2000, the sealed surface in Nuremberg was 115 m<sup>2</sup> per inhabitant (figure provided by Landesamt für Statistik – Regional Statistical Office).

### **4.1.3. New developments: proportion of on brownfield sites, densification in the inner-city or urban cores, on greenfields**

The land register for building in the Town Planning Department documents building activities in the city. Information registered and evaluated here includes the type of building (house for one or several families), the number of residential units built and the scope of area use.

The land register for building does not provide information on the development of settlements on (former) brownfield areas, neither does it distinguish between building inside the city and outside (building in the open countryside).

### **4.1.4. Population density in built-up areas in inhabitant/hectare**

There is currently no information on population density in existing built-up areas.

### **4.1.5. Population density for new developments in inhabitant/hectare**

At present, there is no information on population density in new developments. Depending on the type of settlement (house for several or one family), the population density may vary greatly. It would also be necessary to distinguish between planned population density (number of planned dwelling units X average size of household) and actual population density.

In Nuremberg, current examples of "land-saving" settlements and building concepts are the use of the former Sebaldus compound (former printers) in the so-called "Sebalder Höfe" (shopping centre) or the settlement "Am Leonhardspark" under construction on the former abattoir area.

## **4.2. Measures implemented over the past five to ten years**

### **4.2.1. Minimising the total area of derelict and contaminated land**

Measures for minimising the total area of derelict and contaminated land:

Since the mid 1980s, about 200 sites with a total area of 4.4 million m<sup>2</sup> have been examined, decontaminated (if necessary), and could then be put to new use. The size of the various sites ranged from several hectares to much smaller building projects.

Measures for minimising derelict sites which were formerly built on:

- monitoring areas in the context of the land register for building
- registering unused derelict sites, as a prerequisite for reactivating these areas
- increasingly taking into account unused derelict sites and other areas with development potential within the city when devising the land development plan and integrated landscape plan
- PR work (e.g. exhibition "How to live? Where to live? Save space, win quality of life" information panels on land saving in Nuremberg)

#### **4.2.2. Increasing or sustaining population density in built-up areas while protecting green areas**

Internal development (i.e. development within the city boundaries) offers the possibility of gaining new residential space within the city, whilst at the same time limiting development in areas outside the city which are not yet built up (urban sprawl). This might be summed up in the slogan: "Development happens inside the city". Activating land potential within the city may mean closing gaps between buildings, increasing population density in existing areas, and putting unused sites or conversion areas to new use (area recycling).

#### **4.2.3. Renovating urban land and renewing urban design**

At all times, Nuremberg has various ongoing urban renewal projects. New projects for city renewal include the northern part of the Old Town, as well as the area in Nuremberg's west. The City of Nuremberg is participating in a project initiated by the Association for National Urban Development "koopstadt". In total, six city districts are being examined in the context of "koopstadt" with comprehensive approaches to urban renewal in mind. New public parks have been established on formerly built-up areas (e.g. Südstadtpark, public park Am Pferdemarkt).

#### **4.2.4. Limiting urban sprawl**

The special purpose association "Gewerbepark Nürnberg-Feucht-Wendelstein" [Industrial Park Nürnberg-Feucht-Wendelstein] is a co-operative project between municipalities on the use of the former Muna area (military conversion area).

There is informal exchange in the context of regular conferences of the city axis (e.g. neighbourhood, planners' and environment conferences).

#### **4.2.5. Integrating current and future changes such as economic growth, demographic or climate change through sustainable land use planning**

Participation in research projects, e.g.

- simulation exercise for trade of contingents for designated areas between municipalities
- model project "Urban Strategies for Mitigation of Climate Change – Municipal Strategies and Potential"

#### **4.3. Long and short term measures in relation sustainable land use**

Measures in relation to sustainable development of settlements include e.g.:

- Conversion of railway areas When former railway land can be put to new use, a significant percentage of Nuremberg's demand for settlement sites can be met using these areas within the city.
- Building area management Long-term task with the short-term objective of preparing an internet presentation of areas for residential building.
- Preparation and continuation of soil protection report

#### **4.4. Documentation**

The land register for building allows numerous important and useful evaluations, but does not permit any statements about development within /outside the city boundaries, or checking the success of the measures for limiting area usage. There have been plans for quite some time to extend the land register for building to include these options.

#### **4.5. Disadvantages resulting from historical and/or geographical factors**

Nuremberg has a comparatively low percentage of urban green spaces and is densely built-up; there was no inheritance of generously proportioned parks from feudal times. In other cities, such parks were the backbone of the city, or open spaces became the crystallization point for public parks (e.g. the Englischer Garten in Munich or the Schlosspark in Karlsruhe).

### **5. Nature and Biodiversity**

#### **5.1. Present situation and developments over the past five to ten years**

##### **Existing Protection Measures:**

- New designations under the Landscape Protection Directive (according to § 26 Federal Nature Conservation Act) of the City of Nuremberg. 19 individual areas were designated as protected areas, a total of 4,422 hectares. This comprises 24% of the total city area (18,637 hectares) and is an increase of 25% compared with the first designation of protected landscapes in 1978.
- New designation of 6 natural monuments (according to § 28 Federal Nature Conservation Act) within the city area. These are outstanding old trees, including an avenue with 113 plane trees which was designated as an ensemble.
- Directive for the protection of trees within Nuremberg city boundaries (Tree Protection Directive) of 1999.
- Protected Forest Directive for parts of the Lorenzer Reichswald [Lawrence Protected Forest] and the southern Reichswald [Protected Forest] of the Rural District Office Nürnberger Land of 2003 and the Protected Forest Directive for parts of the forested area Lorenzer Reichswald [Lawrence Protected Forest] (south-western part) of the Rural District Office Roth of 2005.
- In March 2006, flora and fauna habitats, and in September 2006, a bird protection area were officially registered in the context of the European network "Natura 2000" (§§ 32-38 Federal Nature Conservation Act). These cover a total of 2,565 hectares, 14.5% of the Nuremberg city area (18,637 hectares) and include the compact clearings in the Reichswald, Irrhain, in the Erlenstegen water works, in the zoo with Schmausenbuck, Kornberge near Worzeldorf, Rednitz valley in Nuremberg and Nuremberg Reichswald.
- Since 2008, the biotope mapping for the City of Nuremberg, comprising 784 digitalised biotopes and a total of 2,455 individual areas, has been an important data pool for all environmental purposes. In addition to the 784 biotopes, 345 potential biotopes have been mapped. At the same time, the legally protected biotopes (according to § 30 Federal Nature Conservation Act or Article 13 d Bavarian Nature Conservation Act) were mapped.

#### **5.2. Measures implemented over the past five to ten years**

##### **5.2.1. Management of areas designated for nature protection and biodiversity**

###### **Management plans and measures for protection areas:**

- In 1984, the Bavarian Parliament asked the State Government to draw up a species and biotope protection programme safeguarding increased protection of the fauna and flora, including their habitats. In 1996, in co-operation between the Bavarian State Office for Environmental Protection and Nuremberg City Environmental Department, the species and biotope protection programme for the City of Nuremberg was drawn up, including a comprehensive catalogue of management plans and measures. (ABSP Nürnberg – Bavarian State Government for Landscape Development and Environmental Issues, 1996)
- In 2006 the landscape plan integrated in the City of Nuremberg's land development plan became legally binding.

- The 2008 biotope mapping for the City of Nuremberg (784 digitalised biotopes, a total of 2,455 individual areas) is used as a data basis for all management measures, including notes on management, use and potential damage/threats.
- Five flora/fauna habitat management plans, implementing the European FFH guideline, have been initiated or completed.
- In the context of the funding of farming environmental measures in Bavaria, according to (EU) No 1698/2005, 30 ha of agricultural area and 15 ha of forest within Nuremberg city boundaries were put under nature protection by agreement, and will be managed according to ecological specifications. Many diverse species protection measures have been implemented to promote biodiversity.

**Some examples:**

- Maintenance and development of habitats for the Scarce Copper butterfly in the context of usage and maintenance measures with private ground owners
- Protection Measures for Amphibians (guiding measures, such as mobile protection fences and road tunnels for amphibians)
- Stork project in the Rednitz valley (index species: Common Spadefoot (*Pelobates fuscus*), Banded Dartter (*Etheostoma zonale*), and White Stork (*Ciconia ciconia*)) financed with funds from the municipal compensatory measures. This project included the preparation of a management and development programme for the Green Club-tailed Dragonfly (*Ophiogomphus cecilia*).
- "The Return of the European Tree Frog" The project is aimed at the conservation of biodiversity by settling populations of the European tree frog in selected biotope areas in the City of Nuremberg, in co-operation with Nuremberg Zoo.
- Water management plans have been drawn up for the 23 most important category III bodies of flowing water.
- The 2008 biotope mapping for the City of Nuremberg (784 digitalised biotopes, a total of 2,455 individual areas) is used as a data basis for all management measures. Various species protection measures for the promotion of biodiversity have been implemented in Nuremberg.

**Some examples:**

- Franconian Sand Axis This is the largest Bavarian nature conservation programme, a co-operation between three associations, seven districts and five cities – including the City of Nuremberg. It aims at preserving and promoting sand habitats as irreplaceable elements of the Franconian landscape.
- "Saving *Astragalus arenarius* in Nuremberg" The project is intended to secure a unique population of the vetch species *Astragalus arenarius* in Nuremberg.
- "Lifeline Railway" The project is aimed at conserving and optimising biodiversity and linking biotopes on selected railway property in the Nuremberg city area, in co-operation with Deutsche Bahn.
- Support for particularly endangered species The protection of swifts, bats, peregrine falcons, hornets, beavers and other endangered species is an important contribution to biodiversity and is followed-up in close cooperation with the Zoological Garden Nuremberg.
- Establishing the Airport Eco Account on the Open Spaces of Nuremberg Airport

In the past 5 years, the areas surrounding the runway at Nuremberg Airport have been maintained using scientific plans to maximize biodiversity. These measures are monitored and optimised by expert advisers.

### 5.2.2. Protection of nature in other open spaces

### 5.2.3. Promotion public knowledge and understanding of nature and biodiversity, particularly among young people

#### Approaches and activities in environmental education:

- Nuremberg Landscape Conservation Associations runs co-operative projects with environmental education aspects with nursery schools, schools, companies and citizens. Projects include measures returning bodies of flowing water to a near-natural state.
- International Day of Biodiversity
- Activity of the Department for Environmental Issues for the "Freiwilliges Ökologisches Jahr" (FÖJ = Year of Voluntary Environmental Work), mainly aimed at participants in the FÖJ project.
- "A Sandy Ribbon for People and for Nature" PR publications for this project included a brochure "A Journey of Discovery for Young and Old at Nuremberg's Sandy Ribbon", June 2009.
- Project Stadt/Sand/Fluss [City – Sand – River] This is a continuation of the nationally important nature protection project "Franconian Sand Axis" in the City of Nuremberg. One of the main aims of this project has been the provision of sustainable environmental education activities particularly for children and young people, but also for adults. Excursions, project days and "adopt an area" schemes are intended to further sustainable learning, as is co-operation with the cultural project "Field of Experiences for all Senses". In 2007/2008 and again in 2009/2010, these projects of the Department for Environmental Issues were honoured with the UNESCO Award of "official project for the World Decade of Education for Sustainable Development".
- Information on Nature Protection Area Hainberg
- Stork Project The project aims at sustainable ecological improvement of habitats in the Rednitz valley, with particular focus on the White Stork. A variety of guided walks were offered, surveys were conducted, and information boards were put up.
- Environmental education outside the Department for Environmental Issues Many other organisations offer varied and exemplary activities. These include the nature protection associations, the Natural History Society, the Adult Education Centre (BZ), the Office for Culture and Leisure (KuF), the Educational Institute, the many Agenda groups, and other municipal departments, such as the zoo and SÖR. More detailed information may be obtained from them on request.

### 5.3. Long and short term measures

#### Planned long and short term measures to protect nature:

Many diverse species protection measures are implemented to promote biodiversity. Some examples:

1. The current biotope mapping for the City of Nuremberg, including 784 digitalised biotopes and a total of 2,455 individual areas is an important data pool for all environmental purposes. It has resulted in the following suggestions for protection measures: Landscape Protection Area Dutzendteich Lake including numerous existing landscape elements and natural monuments and other projects.
2. In addition to these suggestions for protection measures resulting from the biotope mapping, the following protection measures are planned:
  - Nature Protection Area Ziegellach
  - Designation of 12 ha of Landscape Protection Area in the rail triangle Langwasser (protection procedure pending).
  - Designation of an oak forest as landscape element in Langwasser
3. "Saving Astragalus arenarius in Nuremberg" The project is intended to secure a unique population of the vetch species *Astragalus arenarius* in Nuremberg. This species is a floral curiosity in Southern Germany and is rare in Nuremberg.

4. "The Return of the European Tree Frog" The project is aimed at the conservation of biodiversity by settling populations of the European tree frog in selected biotope areas in the City of Nuremberg, in cooperation with Nuremberg Zoo.
5. "Many Hands for Nature and Art" This project tries to link nature protection, art and citizens' involvement in the southern districts of Nuremberg. It builds on the "Sandy Ribbon for People and for Nature". Both this and the Nature Experience Path have created an attractive backdrop for environmentally-sensitive nature experiences, sustainable environmental education, and volunteer commitment. A network of companies, schools and active citizens has been established.
6. Focus on Landscape Conservation by the Nuremberg Landscape Conservation Association  
The Nuremberg Landscape Conservation Association was the first association of its kind at city level, and thus became a model for further associations in cities across the entire Federal Republic. Cooperation with the Landscape Conservation Association is always on a voluntary basis. Practical work in the biotope areas is mainly carried out by local farmers. Landscape conservation aims to preserve ecological and landscape variety.

Since 1992, the following measures have been regularly implemented and repeated to maintain and establish near-natural habitats:

- Measures to maintain and develop complex habitats, e.g. in the Nature Protection Area "Sandpits at Föhrenbuck"
- Establishment and maintenance of low nutrient and dry habitats as new, valuable sand habitats in Nuremberg city area.
- Proper maintenance measures to conserve ecologically valuable wet habitats, such as e.g. in the cane brake areas in Erlenstegen, in the floodplains of the Fischbach and the Rednitz, and along the Main Danube Canal.
- Measures returning habitats to a near-natural state and conservation measures in and around bodies of flowing water, such as e.g. Siechgraben, Lachgraben and Brandgraben
- Maintenance measures on the irrigation meadows in Hopfengarten and at Igelsee Lake to conserve an old cultural landscape, the "irrigation meadow".
- Focus on Compensatory Measures by the Nuremberg Landscape Conservation Association
- The Nuremberg Landscape Conservation Association was commissioned by the City of Nuremberg, Nuremberg Airport, the Nuremberg forest enterprise, and the Bavarian Harbours Group to implement regular compensatory measures. These measures supplement the association's conservation measures and serve the purpose of building up a functioning compound system of linked biotopes.
- The following compensatory measures were implemented:
  - Establishment of marsh areas and wet meadows
  - Establishment of meadows with fruit trees
  - Establishment of still bodies of water
  - Returning ditches to a near-natural state
  - Maintenance of nature protection areas
  - Establishing complex biotope sites in the area of the State Forest

7. Eco Account Since 2005, the City of Nuremberg, in the context of the municipal eco account, has made ecological improvements to municipally owned land. This is intended to compensate for the impact of municipal or private building projects. The Landscape Conservation Association is in charge of the planning and implementation of these improvement measures, as well as of the negotiations with tenants. As in landscape conservation, the implementation of the measures is undertaken by local farmers. The measures are a meaningful supplement to the association's landscape conservation measures and thus serve the development of a functioning compound system of linked biotopes.

The following improvement measures were implemented:

- Forest conversion measures
- New establishment of sandy low nutrient meadows and marsh areas
- measures returning ditches to a near-natural state
- New planting of hedges and edges of forest areas In future it is planned to coordinate the various activities in management of urban biodiversity through a municipal Agency in cooperation with scientific partners.

#### 5.4. Documentation

Documentation for above projects and plans:

- Nature Protection Directives for Hainberg and Föhrenbuck
- Landscape Protection Directive of the City of Nuremberg
- Natural Monument Directive of the City of Nuremberg
- Tree Protection Directive of the City of Nuremberg
- Directives designating protected landscape elements for the City of Nuremberg
- Directive on Bannwald [protected forests]
- FFH and SPA areas in the City of Nuremberg
- Biotope mapping – new – for the City of Nuremberg
- ABSP [Species and Biotope Protection Programme] for the City of Nuremberg
- Landscape plan for the City of Nuremberg <http://www.landschaftsplan.nuernberg.de>
- Individual agreements in the course of the Programme Nature Protection by Agreements
- Programme for bodies of flowing water
- Information brochure (A Sandy Ribbon for People and for Nature, June 2009, VAG and LPV)
- all brochures, leaflets and project documentation reports for the projects mentioned may be requested from the Untere Naturschutzbehörde [Lower Nature Protection Authority].
- Paper submitted to the Environmental Committee on the ecological improvement of the Rednitz valley (Life Project Optimising Bodies of Flowing Water in Middle Franconia for the Green Club-Tailed Dragonfly) of 10.10.2007
- <http://www.lpv.de>
- Paper submitted to the Environmental Committee "Biodiversity Day" of 22.04.2009, RIS
- Two award certificates for the 2007/2008 and 2009/2010 UNESCO Award "official project for the World Decade of Education for Sustainable Development", presented to the Department for Environmental Issues.
- Nuremberg as Nature Protection Municipality 2007. Thanks to the many and various initiatives of both the municipality and various associations, Nuremberg was the winner for Bavaria in the competition "Federal Nature Protection Capital", with corresponding certificate. <http://www.duh.de/naturschutzkommune.html>

#### 5.5. Disadvantages resulting from historical and/or geographical factors

Unfavourable circumstances: With the beginning of industrialisation in the second half of the 19th century, enormous amounts of land began to be used for industry, trade and housing. Due to continuous structural change and increased demand for residential and industrial land, this trend has continued to the present day. In addition, there are competing demands, in particular from farming and recreation, while space remains scarce.

#### 6. Quality of Local Ambient Air

Air quality is monitored in Nuremberg since the late 1950s. Today six quality monitoring stations are run in the city area – three by the Bavarian State Authority for the Environment, two by the municipal laboratories, and one as a joint station of the two agencies. All these installations are in compliance with European Air Quality Monitoring directives. Additionally the City is running a mobile air quality monitoring unit which has realized over the last four decades comprehensive studies in a grid of 1x1 square kilometer in the complete area of the city according to the First General Administrative Provision for the Federal Immission Protection Act, section on air of 24.07.2002, chapter 4.6.2. Due to longstanding efforts and additional detailed analysis of air quality in the city far more than usual information on temporary and spatial structure of air quality and on its development over the last 40 years exist than legally requested.

## 6.1. Present situation and developments over the past five to ten years

### 6.1.1. Number of days per year on which EC limit values were exceeded for PM<sub>10</sub> (daily mean of 50µg/m<sup>3</sup>)

Year	2004	2005	2006	2007	2008	2009
Days of PM <sub>10</sub> > 50 µg/m <sup>3</sup>	33	33	33	25	18	22

PM<sub>10</sub> is measured in five stations. The data reported are related to the station with the worst air quality situation according to Directive 1999/30/ EC of 22 April 1999.

### 6.1.2. Number of days per year on which EC limit value/long term objective were exceeded for ozone (8h mean of 120µg/m<sup>3</sup>)

Year	2006	2007	2008
Days of O <sub>3</sub> (8h) > 120 µg/m <sup>3</sup>	46	15	12

Ozone is measured in two stations. The data reported are related to the station with the worst air quality situation according to Directive 2002/3/EC of 12 February 2002.

### 6.1.3. Annual mean concentration of NO<sub>2</sub> and PM<sub>10</sub>

Annual mean concentration of NO<sub>2</sub> and PM<sub>10</sub> are measured in 6 respectively 5 fixed stations. Three of them are positioned (according to European Regulation) near to highly frequented main roads in the city, two of the stations are positioned in areas with dense building structures and one station is positioned in the area of the airport.

#### Data for PM<sub>10</sub> (annual mean in µg/m<sup>3</sup>)

Station	2004	2005	2006	2007	2008
Bahnhof	32	30	29	24	23
Ziegelsteinstraße	27	27	27	23	21
Von-der-Tann-Straße	-	-	-	25	27
Muggenhof	27	27	28	23	-
Flughafen	21	22	21	17	16
Jakobsplatz	-	-	22	19	18

## Data for NO<sub>2</sub> (annual mean in µg/m<sup>3</sup>)

Station	2002	2003	2004	2005	2006	2007	2008	2009
Bahnhof	43	43	43	46	47	40	37	38
Ziegelsteinstraße	-	43	36	40	42	35	36	37
Von-der-Tann-Straße	-	-	-	-	-	53	55	53
Muggelnhof	36	40	38	43	37	34	34	30
Flughafen	33	31	28	29	29	22	24	20
Hauptmarkt	33	37	-	37	38	34	35	30

(from 2005 Jakobsmarkt)

## 6.2. Measures implemented over the past five to ten years to improve air quality

### 6.2.1. Existence and implementation status of an air quality management plan

An air quality management plan exists and has partly been implemented and partly is on implementation. The Clean Air Plan has been developed in 2004 and since twice been extended. The present version is in the process of establishing and following implementation. It gives an overview over the development of air pollution in the city and its sources. The Action Program developed for the year 2009/2010 is organised in four main areas with the projects mentioned

I. Environmental Network	II. Traffic Guidance	III. Energy Efficiency and Climate Protection	IV. Automotive Engineering
Further development of public transport <ul style="list-style-type: none"> <li>short-distance traffic development plan</li> <li>rail-bound transport improvement (tram, underground)</li> </ul>	Promotion of traffic flow by adjustment of traffic lights	Projects promoting energy efficiency and climate protection (implementation of the climate protection road map 2010-2020)	Initiatives promoting environmentally friendly retrofit of cars and commercial vehicles
Further development of cycle path system	Intersection-free extension of the Frankenschnellweg	Domestic heating reduction of wood, coal and oil heating and promotion of district heating and gas heating	Low emission standard retrofit for municipal vehicles
Preference given to public transport via adjustment of traffic lights, separate bus lanes	Development of traffic guidance system and parking space guidance system		
Construction of urban railway for regional development of public transport	Parking space management, reserved spaces for residents		

Promotion of metropolitan railway network for commuters	Reduction of heavy traffic in the city centre by removal of custom office and container terminal (to the harbour area)		
Promotion of traffic flow by adjustment of traffic lights	Guidance for heavy goods vehicles		
	Development of strategies for intelligent logistics concepts		
	Special measures for "hot spots"		
	"Environmental zone" (only vehicles meeting certain exhaust gas standards are allowed within the area)		

### 6.2.2. Information to the public

Information on air quality levels is made available to the public, both inhabitants and tourists (e.g. on web pages, information screens) in order to increase public awareness. Other publications: "Daten zur Nürnberger Umwelt" [Nuremberg Environmental Data] published every 3 months and distributed to political parties, NGOs and interested citizens. All reports are also available as downloads through the internet. Air quality data are available as online real-time information under web page <http://umweltdaten.nuernberg.de>.

### 6.3. Long and short term measures for improvement of air quality

#### City of Nuremberg Air Quality Plan - Time for Implementation

Measure	Spatial effect		Time for implementation
	small scale	large scale	
Further development of public transport <ul style="list-style-type: none"> <li>short-distance traffic development plan</li> <li>rail-bound transport improvement <ul style="list-style-type: none"> <li>tram</li> <li>underground</li> </ul> </li> </ul>	medium  medium medium	medium  medium medium	long term (2015)  short term short term
Further development of cycle path system	high	medium	
Preference given to public transport via <ul style="list-style-type: none"> <li>adjustment of traffic lights</li> <li>separate bus lanes</li> </ul>	medium medium	medium medium	medium term medium term
Construction of urban railway for regional development of public transport	medium	high	medium term
Promotion of metropolitan railway network for commuters	medium	high	short term or medium term
Promotion of traffic flow by adjustment of traffic lights	medium	high	short term or medium term

Parking space management, reserved spaces for residents	medium	low	medium term or long term
Development of traffic guidance system and parking space guidance system	medium	low	short term
Reduction of heavy traffic in the city centre by removal of custom office and container terminal to the harbour area	high	middle	short term
Reduction of industrial emissions	medium	low	medium term
Domestic heating <ul style="list-style-type: none"> <li>reduction of wood, coal and oil heating</li> <li>promotion of district heating and gas heating</li> </ul>	medium or high	medium or high	short term or medium term
"Environmental zone" (only vehicles meeting certain exhaust gas standards are allowed within the area)	low	low	short term
Guidance for heavy goods vehicles	high	low	under consideration
Special measures for "hot spots"	not available	not available	planning stage

## 7. Noise Pollution

### 7.1. Present situation and developments over the past five to ten years

In 2006, 23% of the population were exposed to a noise level of  $L_{den}$  above 55 dB(A) and 32% to a noise value of  $L_{night}$  above 45 dB(A). No data are available for earlier years, hence no time series analysis can be calculated.

### 7.2. Measures implemented over the past five to ten years to reduce noise

Strategy for Measures and Activities of 08.03.2006 Noise causes diseases, reduces work performance and well-being, has a negative effect on real estate value, and causes considerable costs. The City of Nuremberg therefore considers the noise problem, especially traffic noise, to be an important issue in the basic services it has to provide for its citizens. Hence the City of Nuremberg's environmental committee, on 08.03.2006, i.e. quite some time before noise mapping according to EU Environmental Noise Directive END, decided to implement noise protection measures.

The following measures are to be continued or implemented in the long or short term:

- a sound proof window programme,
- removal of stretches of cobbled street,
- noise-reducing street surfaces,
- noise protection embankments and walls,
- traffic policy measures, especially promotion of the environmental alliance of public transport, cyclists and pedestrians, and
- PR campaign "Nürnberg - intelligent mobil" [Nuremberg – intelligently mobile]

An attractive programme of subsidies for sound proofing windows (90% subsidy) was created, with funds coming from the current economic stimulus package. Demand has been high, and all funds have been committed until the end of 2010. Strategic Noise Mapping according to EU Environmental Noise Directive has been realized and published in 2009 based on contributions by numerous agencies (e.g. Federal Railway System, Airport, State Agency for the Environment).

### **7.3. Long and short term measures aimed at reducing noise pollution**

The noise protection measures of the activity strategy mentioned under 7.2. will be continued. Noise mapping for Nuremberg (see 7.2.) shows noise levels in various parts of the city. First it highlights those areas where noise can spread unhindered, as is the case in places without buildings. On the other hand, this means that no residents are affected by this noise. The Environment Office then uses the existing data to generate a noise rating map showing those areas where noise pollution is highest for residents. This noise rating map will be available in early 2010. In addition, starting in 2010, information concerning noise mapping and noise reduction action planning will be provided at citizens' meetings held by the City of Nuremberg.

Milestones in Nuremberg's Noise Reduction Action Planning Judging by experiences in other bigger cities, noise reduction action planning will take about three years. The following milestones are envisaged for Nuremberg:

#### **7.3.1. Working groups across municipal departments**

#### **7.3.2. Analysis of the noise and conflict situation**

- noise analysis for streets and roads (excluding motorways), tram rail traffic and above-ground underground stretches, as well as industrial noise from the IPPC enterprises examined
- stakeholder analysis
- conflict analysis
- determining guideline values in order to check whether measures need to be planned, e.g. guideline value of 70 dB(A) (day-evening-night, noise value for complete day) and of 60 dB(A) for night (night noise value)
- determining survey areas for which a catalogue of measures should be planned

Early third quarter 2010 city council decision to determine guideline values

Third quarter 2010: Determine survey areas

#### **7.3.3. Analysis of existing planning and noise protection measures in survey areas**

- Evaluating existing planning, e.g. building planning and planning approval for street construction work with reference to noise protection measures
- taking into account noise protection programmes which have already been implemented
- investigation of synergy effects with air pollution prevention measures

End of first quarter 2011: Finalising analysis of existing planning and noise pollution reduction measures

#### **7.3.4. Planning Measures and Involving the Public**

- strategies and action plans for noise reduction action planning (short, medium and long term)
- drawing up an effect analysis
- drawing up plans for measures
- involving the public
- involving public stakeholders

Third quarter 2011: Draft catalogue of planned measures and presentation to Environmental Committee

Fourth quarter 2011 and first quarter 2012: PR campaign and involvement of public agencies

#### **7.3.5. Drawing up Overall Strategy/Concept**

- Assessment of objections and suggestions for change
- further development of catalogue of planned measures and repeated assessment of effectiveness of measures
- cost benefit analysis, financing

Late second quarter 2012: Presentation of overall concept to Environmental Committee

### 7.3.6. Drawing up Action Plan

Third quarter 2012: City Council decision

It will be necessary to sub-contract parts of the noise reduction action planning. The required finances for 2010 were included in the budget proposal. According to § 47c and § 47d of the Federal Immission Control Act (BImSchG), noise mapping and noise reduction action plans must be checked every 5 years, and revised, if necessary. In addition, the action plan needs to be revised, if there have been any significant developments in the noise situation.

### 7.4. Documentation

Documentation on the issues will be provided in the form of reports, tables and listings, as well as explanatory text.

### 7.5. Disadvantages resulting from historical and/or geographical factors

Over the years, several factors have contributed: to the development of noise pollution in Nuremberg. Nuremberg has been an industrial and trading centre for centuries. This fact and the city's location at the intersection of several major roads and railways have led to an infrastructure focused on production and transportation. Residential areas were built near-by and are very compact. This structure makes it difficult nowadays to avoid noise impact on the inhabitants. During World War II, Nuremberg was heavily destroyed. When it was rebuilt, urban planners gave priority to a layout favouring road traffic. This led to heavy goods vehicles – the chief source of our major noise problems today.

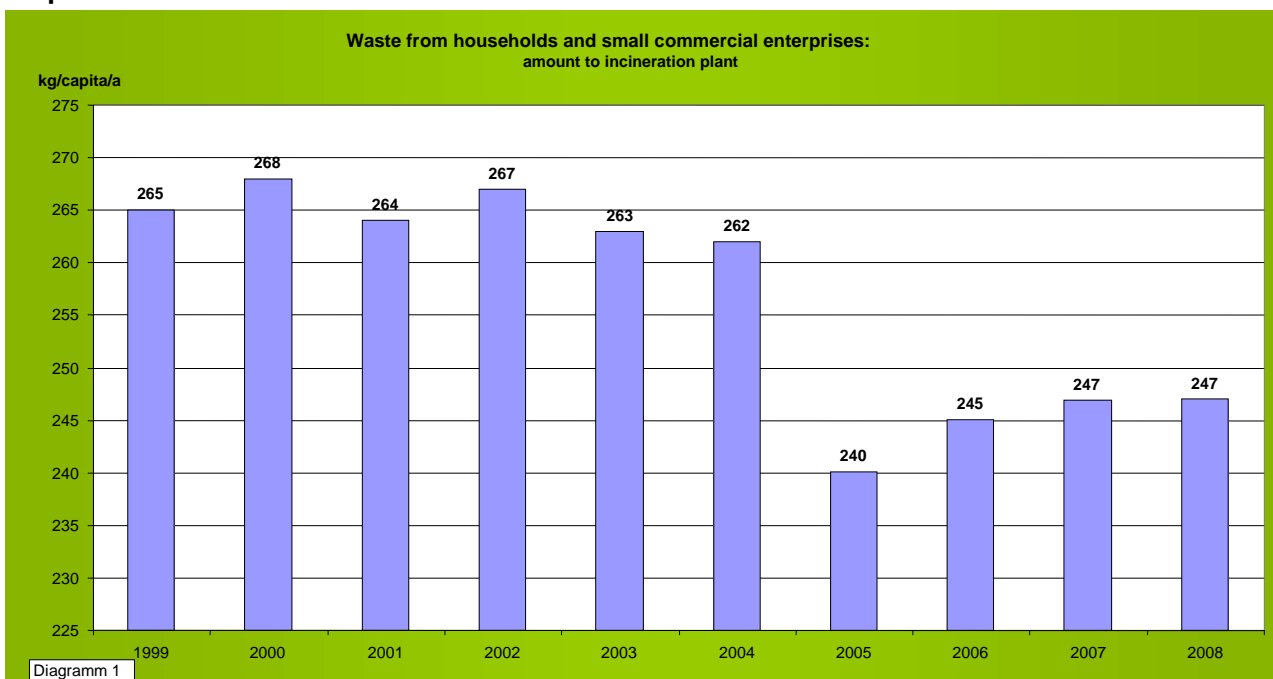
## 8. Waste Production and Management

### 8.1. Present situation and developments over the past five to ten years

#### 8.1.1. Amount of waste per capita

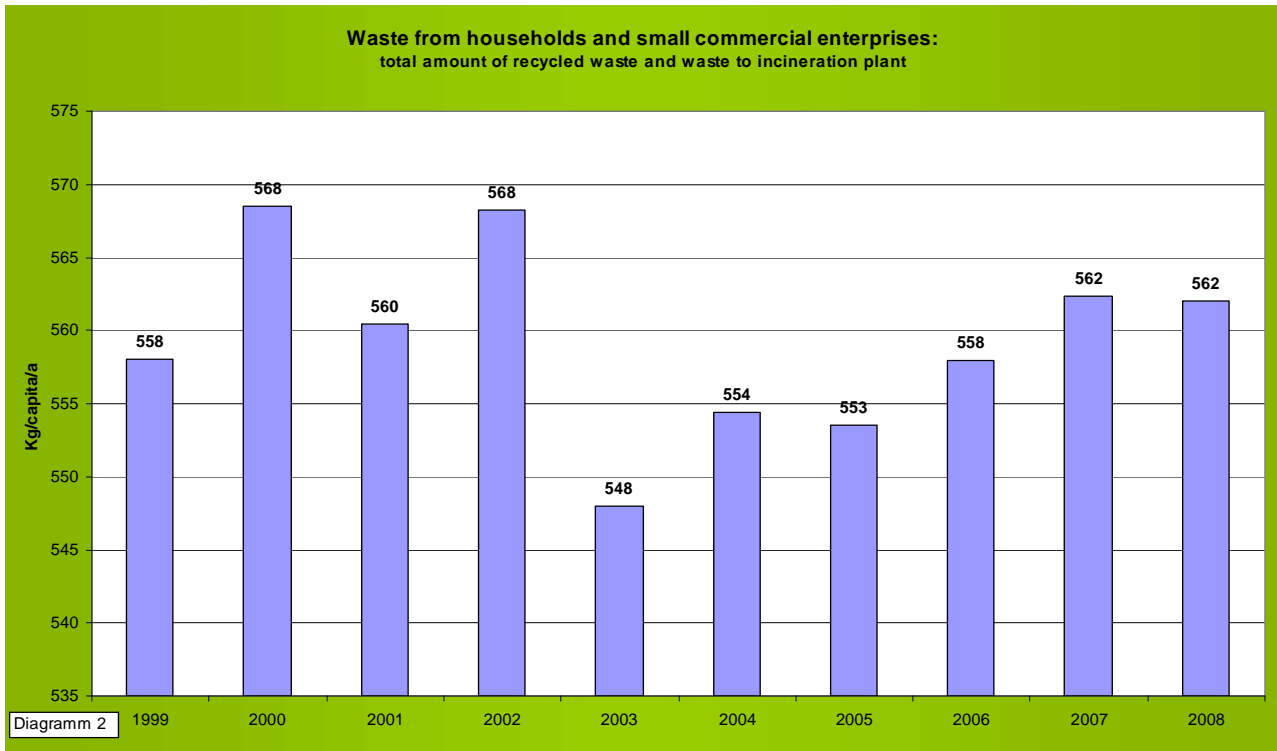
Amount of waste per capita Graph 1 shows the amount of waste collected by the municipality and disposed of by incineration. Waste is classified as follows: - waste from private households - waste from commercial or industrial enterprises which is of similar nature and composition to waste from private households - waste from private or public facilities that is declared to be waste for disposal

Graph 1



Graph 2 shows the overall amount of waste collected in the municipality from the same sources as in graph 1. It includes both incinerated waste (as in graph 1) and recycled waste - which has increased from 293 kg/capita/annum in 1999 to 315 kg/capita/a in 2008.

**Graph 2**

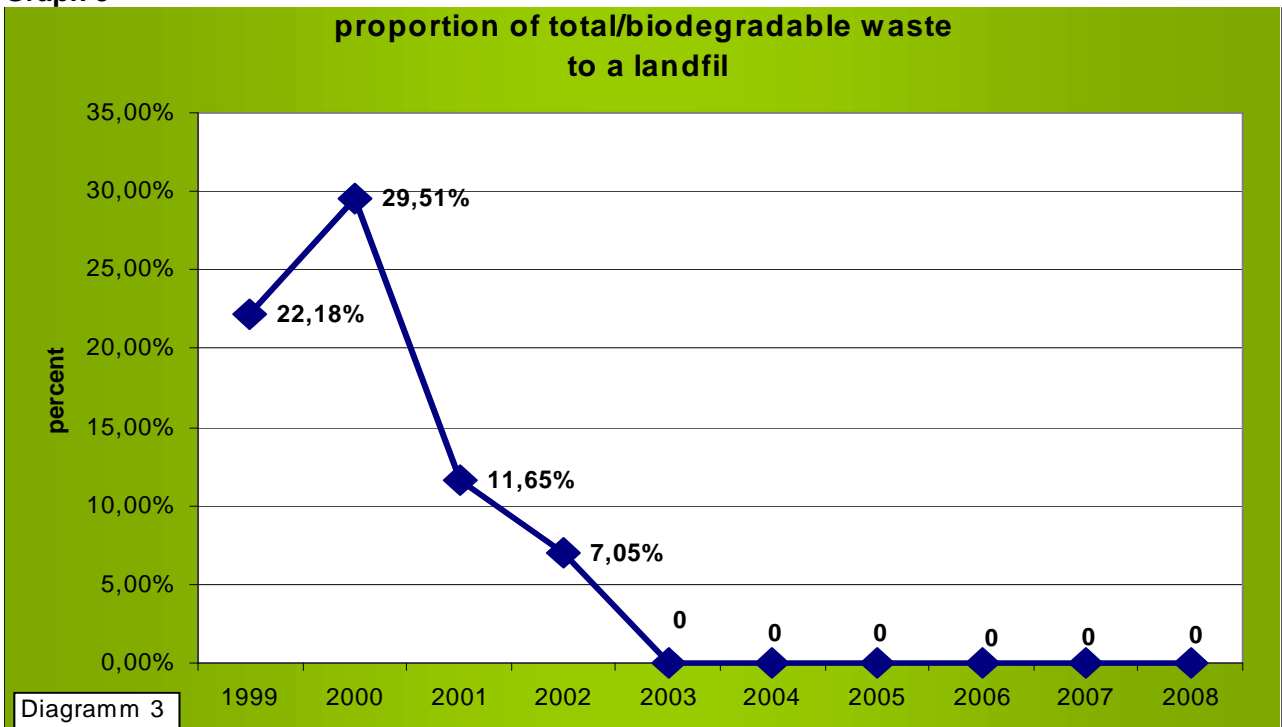


**8.1.2. Proportion of total/biodegradable waste sent to a landfill**

Proportion of total biodegradable waste to landfill

Graph 3 shows that already in 2003 – 3 years before the respective law came into effect – no biodegradable materials were landfilled.

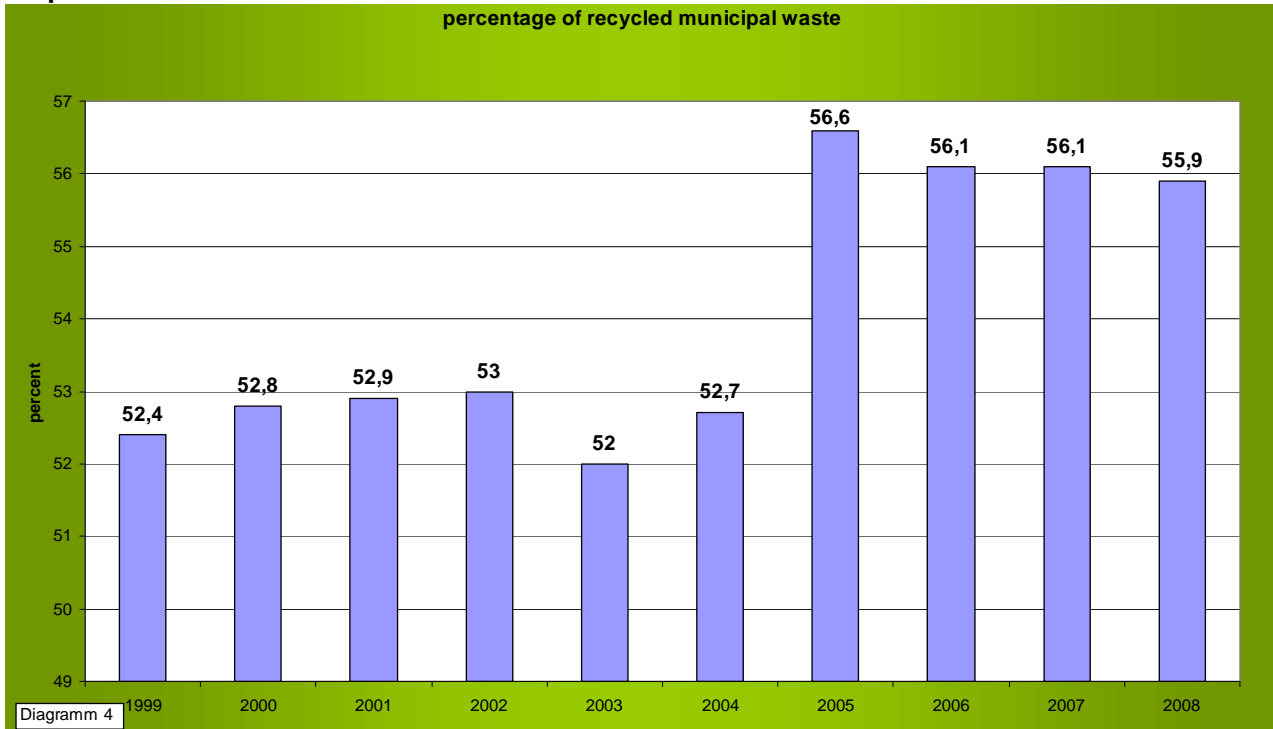
**Graph 3**



### 8.1.3. Percentage of recycled municipal waste

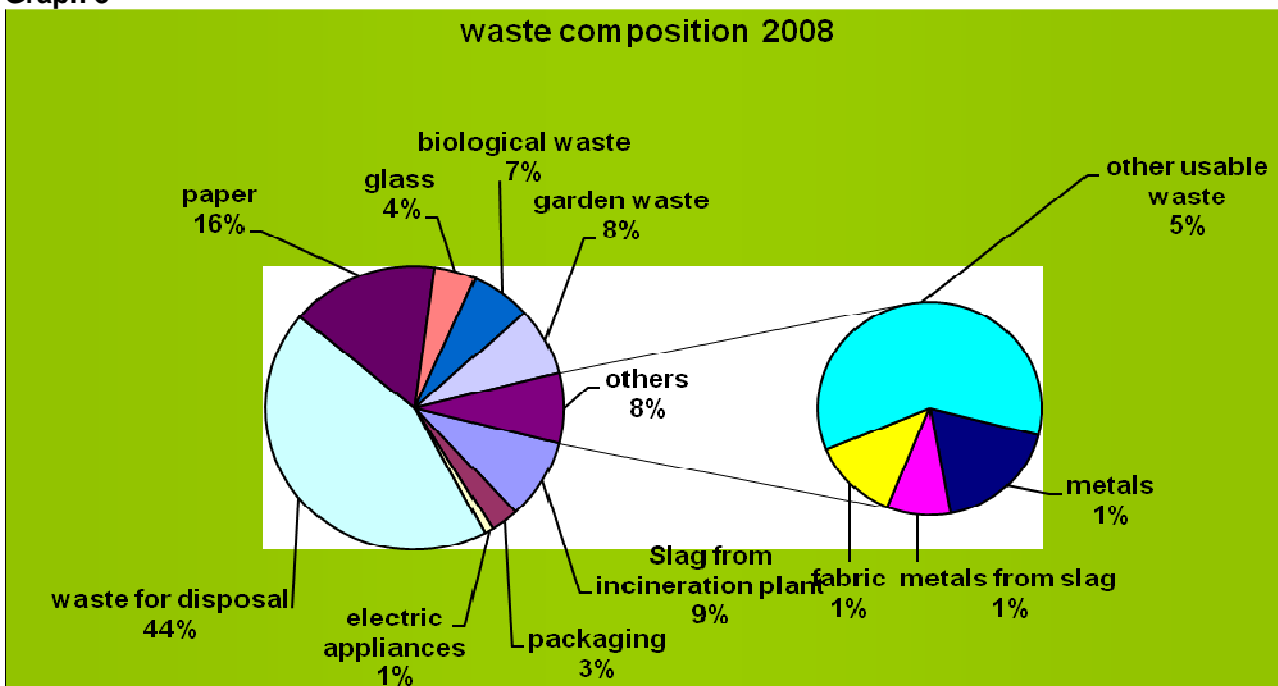
Graph 4 shows the proportion of total municipal waste from households and comparable sources which is recycled. The following types of waste were recycled: paper/cardboard/cartons, waste glass, textiles, scrap wood, recycled materials, sales packing, scrap metal, used slag, organic waste and green waste. An upward trend can be seen particularly for organic and green waste, collected separately, with an increase from 75.6 kg/capita/a in 1999 to 80.2 kg/capita/a in 2008.

Graph 4



Graph 5 shows waste composition for 2008. All waste for disposal is treated in the municipal incineration plant and the heat generated is used for steam production. Via a turbine, this steam generates electricity, and finally, the exhaust steam is fed into the existing district heating network. Furthermore, any residual materials (e.g. slag, metals, fine dust and plaster) are recycled. This series of processes for recycling materials and recovering energy, achieves an effective recycling rate of nearly 100% (thermal recycling).

Graph 5



## **8.2. Measures implemented over the past five to ten years**

In Nuremberg, waste management is based on closely interlinked waste treatment plants, facilities and measures.

### **8.2.1. Plants**

Incineration plant and residue landfill (class II)

### **8.2.2. Facilities**

1. Bring systems
  - 6 recycling centres,
  - 7 garden waste collection centres,
  - problematic waste collection points,
  - Christmas trees collection points,
  - waste glass containers
2. Collection systems
  - weekly waste and biodegradable waste collection,
  - bulky waste collection on demand,
  - containers for recycled paper,
  - “yellow bags” and containers for packing materials,
  - container service

### **8.2.3. Measures**

Waste advisory centres are the interface between the public and the various institutions for waste management. They provide information about services and advice on all matters of waste avoidance, recycling and disposal.

There is a wide and varied spectrum of information services – the advisory centres can be contacted by telephone or in person, and information is provided in brochures and leaflets. About 100 consultations are provided directly to owners, caretakers or tenants of private households or enterprises. Furthermore, special activities can be arranged for schools and kindergartens. A special programme has been established with the Children’s Museum. Children and teenagers are taught about waste avoidance, waste separation and recycling with hands-on exercises.

Since 1991 Nuremberg has had an international team of specially trained voluntary waste advisors. They tour the city districts with our “information bus” and provide advice on all questions regarding waste avoidance and separation. Every year, they have about 70 assignments, with about 3000 counselling interviews.

The questions asked most frequently by the public are answered and published in several brochures, such as e.g. “Ratgeber Abfall” (Waste Guidebook), which provides detailed and clear information. As the first topic in any ecological waste concept is waste avoidance, the brochure starts right at the beginning with tips and tricks regarding waste-reduced shopping, economising on the use of paper or how to throw a party without creating a mountain of waste.

Providing information to foreign citizens is a top priority. The brochure “Gemeinsam gegen Müll” (Joint Action against Waste) gives information in six languages on the topic of waste separation in Nuremberg. The main issues about biodegradable waste are published in a separate leaflet in German, Turkish, English, Serbian/Croatian, Russian and Greek. Furthermore, there are foreign voluntary waste advisors who can provide counselling interviews in their mother tongues.

We have specially trained advisors for commercial enterprises. They have special knowledge and are able to answer technical questions. They assist companies in developing waste management concepts and disposal documentation.

Outside working hours and at weekends, a call centre with skilled staff provides public information on all questions concerning waste.

Important information regarding waste avoidance, recycling and disposal can also be found on the website of the municipal waste management department Abfallwirtschaftsbetrieb Stadt Nürnberg (ASN).

The Nuremberg Swap and Donate Market is a non-profit online facility by ASN aimed at encouraging waste avoidance. Everyone can get involved here. Free of charge, without time limit and in an uncomplicated way, all sorts of things can be offered on this website, either to be given away for free or to be swapped for something else.

Another highly popular idea was established over 12 years ago – the "market of long faces". Right after Christmas, anyone who has received a present they are less than enthusiastic about may take this item to an auction, and perhaps it will find a happy new owner there.

Any Nuremberg citizen planning a party can hire the municipal "tableware van". Plates, cups, cutlery etc. may be hired, so no disposables need to be bought.

The City of Nuremberg supports the second-hand shops run by the Bavarian Red Cross, by passing on to them reusable and recyclable things and materials collected at the recycling centres.

The City of Nuremberg supports citizens who compost organic waste from their kitchens or gardens by subsidising the purchase of composting equipment.

The City of Nuremberg makes great efforts to minimize the amount of waste left behind after public events. When municipal facilities or premises are used, food and beverages may only be served on reusable tableware and with reusable cutlery, handed out for a deposit, unless this is prohibited for reasons of public safety and public order.

This is also stipulated in the City's ordinances for special use permits, for public parks and for waste management.

By now, the ceramic mugs with an annually changing design and used at the famous Nuremberg Christmas Market have become sought-after collectors' items.

A decisive criterion for judging an event's environmental compatibility is its waste management. Our advisors therefore give assistance to organizers of big events, such as "Rock im Park", in developing and implementing waste management strategies.

In order to reduce the amount of residual waste in biodegradable waste, collection vans have been equipped with an automatic sensor for contraries. These will set off an alarm when an electro-conductive material (metal) part exceeding a certain size is detected in the organic waste container.

The City of Nuremberg does not stipulate a minimum size for waste bins. As collection charges depend on the size of the bin for residual waste, there is a financial incentive to use the additional free-of-charge systems, both bring and collection systems. Further savings may be achieved in sharing a residual waste bin with one or more neighbours.

Back in 1989, Nuremberg started a separate collection for electronic scrap. Again this was long before respective regulations and laws came into force.

In 1997, Nuremberg City Council decided to gradually establish an environmental management concept in every municipal department, with the following objectives: increased environmental protection, reduced costs by saving resources and better organization and involvement of employees. For the implementation and supervision of these waste management concepts, each department may appoint an environmental officer.

Environmental guidelines for the entire municipal administration have made environmental protection a common objective for all city employees. For example, these guidelines specify objectives of environmental protection when tendering or contracting to third parties.

The City of Nuremberg's waste management concept is one module of the environmental management concept. Its components are waste avoidance, environmentally safe disposal of waste and development of exemplary solutions in the field of environmental protection. These guidelines are summarized in the bro-

chure "Abfallwirtschaft in der Stadtverwaltung Nürnberg" (Waste Management in the City Administration of Nuremberg).

### **8.3. Long and short term measures**

Six years ago, the City's top eco-political objective, to cease tipping municipal waste, in particular biodegradable waste, in landfills, was achieved.

This was made possible by the consistent implementation of household waste sorting and separate collection of recyclable / reusable waste, and by building an up-to-date incinerator plant, also incorporating energy recovery.

By incinerating residual waste in our energy-efficient plant and generating electricity and heat for district heating, around 66,500 tons of mineral coal can be substituted every year (energy recycling). At the same time, this avoids around 110,000 tons of harmful CO<sub>2</sub> emissions.

There is, however, an economic problem. So far, the recycling of products has not led to reduced consumption of resources. Some environmentalists even argue that this is an obstacle to mandatory reduction of resource consumption. So far, waste recycling has not reduced the absolute amount of resources consumed. It may be essential to establish product-related environmental compatibility assessments and impact predictions across the entire product life cycle, including the development, production, marketing, use and disposal phases, thus encompassing the total resource consumption. In future, waste management activities will need to take into account waste creation, as well as optimal waste disposal. The eco-political objective of the next few years must be to transform the waste and recycling economy into an economy of material flows and to strengthen recycling of resources.

The City of Nuremberg therefore intends to take part in a relevant research project within the next few years. The objective is to investigate whether it is possible to retrieve valuable metals (e.g. copper) from filter dust.

The total amount of waste for disposal decreased considerably between 2004 and 2005. In this period, the collection of organic waste from households was significantly expanded. Furthermore, from 2004, 10,000 tons of scrap wood from bulky waste collections were recycled separately.

Between 2002 and 2003, the total amount of waste decreased considerably, because recycling by business enterprises became effective through the implementation of the commercial waste ordinance.

At the same time, less organic and green waste had arisen due to weather conditions.

### **8.4. Documentation**

Supporting documents such as licenses, file copies of brochures etc., documentation, test records, statistics, board decisions and waste management ordinance can be provided.

### **8.5. Disadvantages resulting from historical and/or geographical factors**

In the air raids of 1945, the historic city centre and extensive industrial and business areas were reduced to ashes and rubble. In the following decades, and up to the present day, contaminated soil from former industrial plants, deposits of debris from the period of reconstruction and ammunition finds, have all been a major challenge for safe disposal. Special challenges in the implementation of waste management measures arise in the historic city centre with its small shops, many and varied "catering events" and a series of public events throughout the year. Average household size also has repercussions on the amount of waste arising and waste separating behaviour. In Nuremberg, the proportion of single households is above average, at 43.4%. These produce a proportionally larger amount of waste than larger households. Nuremberg is the commercial centre of Northern Bavaria with a central agglomeration of shopping facilities. Because of its central location in the European market and its convenient traffic connections, the city has attracted enterprises from the traffic and logistics sector. The Cargo Centre at Nuremberg Harbour is proof of this development. The city's central location also leads to a certain amount of waste left behind.

## **9. Water Consumption**

### **9.1. Present situation and developments over the last five to ten years**

### 9.1.1. Proportion of urban water supply subject to water metering

The N-ERGIE [water, gas and electricity supply] company measures water volumes at the following places:

- all exits from waterworks;
- all exits into the water supply network;
- all water volumes supplied to customers.

The amount of drinking water supplied can be calculated from these measured data. All unmeasured amounts are summed up as "network losses" (see 3). Water volumes supplied to the fire brigade for fire fighting, to the gardens and parks department for watering (with sponsorship schemes for watering), and to drinking water wells are not measured (i.e. supplied free of charge). Leakages, water left running in winter (protection against frost) or in summer for safety reasons, and water used during building / construction measures in the water network (e.g. flushing pipes beyond the regular scheduled measures) are also not measured.

### 9.1.2. Water consumption per capita

Some explanations for the figures presented:

- Water delivered is the entire volume of water sold in the city area of Nuremberg by the N-ERGIE company. This includes water delivered to business customers (industry, trade etc.) The N-ERGIE company does not supply all Nuremberg inhabitants with water. In the south of the city (the Kornburg and Greuth districts with around 3,500 inhabitants) water supply is via the special purpose association Schwarzachgruppe. Until 2007, some districts in the north of the city were also supplied by the special purpose association Water Supply Knoblauchsland (about 7,600 inhabitants).
- The calculated per capita water consumption is significantly above the average figure for the Federal Republic (supplied by bdew = Federal Association of the Energy and Water Sectors). This is not caused by any particular consumer behaviour of Nuremberg citizens, but by the fact that our data also include water supplied to trade and industry (see above).
- The per capita consumption in the last 10 years shows a significant downward trend.

### 9.1.3. Water loss in pipelines

Network losses Network losses are calculated as the difference between the water volume fed into the network and the water volumes sold, the company's own consumption as well as the water volumes provided free of charge (see 1).

Year	2003	2004	2005	2006	2007	2008
Network losses (%)	10.3	7.3	11.17	7.0	7.0	7.0

### 9.1.4. Compliance with the EU Water Framework Directive

Water Extraction Directive: The N-ERGIE company already meets the objectives of the Water Extraction Directive in many respects.

These include:

- No water extraction for Nuremberg's water supply is above the long term groundwater regeneration rate; none of the water-bearing strata used by us is overused or shows a long-term decrease in groundwater volume. 95% of our water is extracted from the first groundwater storey.
- Our extraction catchment areas are protected by extensive source water protection areas.

- In the water protection areas, the N-ERGIE company is actively fighting to prevent or (if not possible) at least to decrease any impairment in the amount and quality of groundwater. The strategies used have included purchase of land in particularly sensitive areas, in some cases demolition of buildings, conversion of farmed fields to grassland, co-operation with agriculture (cultivation agreements), influencing planning for traffic routes and trade areas to be favourable to water protection.
- The success of these measures is monitored. For the past 15 years, for example, in co-operation with farmers we have worked towards nitrate and pesticide input not increasing, and ideally decreasing. In one water extraction area we have been able to measure a decrease of nitrates in the water.
- In the water extraction areas, the amount and quality of groundwater is intensively monitored.
- Our price structure is a significant incentive for water-saving. The costs in water supply are mainly fixed, volume-independent costs. If this cost structure were to be mirrored in our price structure, the logical result would be a "water flat rate" for our customers. In reality, our prices are almost exclusively volume prices.

## 9.2. Measures implemented over the past five to ten years to reduce water consumption and water loss in pipelines

### 9.2.1. Proactive leakage management

#### Proactive Leakage Management

- Cathodic corrosion protection for all steel pipes
- Systematic water monitoring – regularly scheduled leakage monitoring of all drinking water supply pipes with data loggers, about 400 km/a
- Network inspection, about 400 km/a
- Hydrant inspection, about 2250 pieces/a
- Provision of stand-by for emergencies and of control centre (central fault management) for 24 h/d
- Keeping fault statistics and deriving refurbishment and renewal strategies from these figures
- Systematic evaluation of the age structure and material classes [of the network elements] to derive refurbishment and renewal strategies
- Calibration (matching actual measured and calculated values) of network calculations for checking networks losses

### 9.2.2. Network rehabilitation

Year	Renewed network pipes (km)	Rehabilitation of cement mortar coating (km)	Renewed house connection pipes (no of pieces)
2008	6.5	3.0	600
2007	5.5	10.5	900
2006	5.0	5.5	400
2005	4.5	13	850
2004	5.0	12.5	750

In addition, every year about 430,000 € is invested in replacing sliding valves and hydrants. If water can be blocked off in short pipe lengths, the blocked off stretches contain a relatively low volume of water, and there is less water loss when work has to be carried out on the network.

In addition, about 180,000 € per year is spent on disconnecting or dismantling unused connection pipes to households, to avoid corrosion damage and thus leakage.

### **9.2.3. Non-domestic metering**

The water consumption of all customers is metered, the non-metered amounts supplied are limited to very small volumes (see 9.1.1.).

We do not have any knowledge of whether any industrial plants extract and use groundwater. Information about water use for irrigation in the agricultural area Knoblauchland is also lacking.

### **9.2.4. Byelaw implementation in relation to efficiency in water usage**

We have no knowledge of any bylaw concerning economic water usage. We should point out that the pricing structure for waste water has a damping effect on the amount of drinking water supplied. The charge for waste water is worked out per m<sup>3</sup> of drinking water supplied. This on the one hand promotes water saving in general, but on the other hand has also led to an increasing use of rain water, in particular for watering gardens. So people can decrease both their drinking water charges, and their waste water costs.

### **9.2.5. Awareness raising campaigns**

For many years, the N-ERGIE company has urged its customers to use drinking water carefully. On the one hand this involves information on ways of saving water. On the other hand, we appeal to our customers to take seriously the issue of water protection. We have addressed both aspects in the following media and events:

Website, information brochures, EWAG almanac and N-ERGIE customer magazine [distributed to all households], "Haus im Haus" [House in the House] with demonstration of water-saving fittings, materials for schools and guided tours for school classes.

## **9.3. Long and short term measures to reduce water loss**

### **Short-term measures**

- renewal of network pipes in danger of breaking within the city area, about 6 km, cost 2.7 million €
- cement mortar coating renewal of network pipes within Nuremberg city area, about 5.5 km, cost 1 million €
- renewal of connection pipes to households within Nuremberg city area, about 650 pieces, cost about 2.2 million €
- 430,000 € for replacing sliding valves and hydrants
- 180,000 € for disconnecting or dismantling unused connection pipes to households
- 100,000 € for inspection of network
- 100,000 € for inspection of hydrants
- 40,000 € for leakage testing of network pipes
- 730,000 € for providing on-call service for emergencies

### **Long-term measures**

- Development and purchase of strategic tools, such as asset simulation and optimised planning principles for optimising suitable network planning, network management and network maintenance strategies, as well as deriving the resulting need for finances.
- Drawing up an economic plan for five years, based on the results of asset simulation, the useful life span and fault profile of equipment, legal stipulations, third party measures as well as repair and rehabilitation and provision of on-call service for emergencies
- Planning measures, whilst taking into account optimised planning Principles

## **9.4. Documentation**

### **List of measures planned for network in 2010**

- Medium-term economic plan 2010-2014
- Documentation of results for "Asset Simulation" and "Optimised Planning Principles"
- Data bases with measured values of amounts supplied, amounts discharged, groundwater levels, results of water analysis
- Documentation of water protection areas, comprising sizes, monitoring programme and planned measures
- Information material for the public, website

### **9.5. Disadvantages resulting from historical and/or geographical factors**

One of the disadvantages leading to water leakage in the network is the fact that there is still a high percentage of cast pipes (more prone to breakage) dating back to the years before 1945.

## **10. Waste Water Treatment**

### **10.1. Present situation and developments over the past five to ten years**

Waste water collection for the Nuremberg city area (with 502,815 inhabitants) is mainly achieved with a combined system. The sewage network has a length of 1,415 km. The waste water of 99.9% of all properties is connected to the central sewage treatment plants. The very few properties not connected to the public sewer network are remote individual houses or gardening companies in the outskirts. The waste water from these properties is treated in approved small sewage treatment plants or pit latrines without an outlet. The sludge removed from these plants is monitored by the City Waste Water Treatment Department and is treated in the central sewage treatment plant. Thus all properties are connected to a proper waste water treatment system. This situation was achieved ten years ago. Nuremberg's two waste water treatment plants have been adapted to increasingly strict stipulations according to §7a WHG [Water Management Law] since the mid 1980s. Thus, for over 10 years, they have been up to the current state of technology fulfilling all requirements for further waste water treatment for the elimination of nutrients according to the Urban Waste Water Directive.

### **10.2. Measures implemented over the past five to ten years to improve waste water treatment**

Investment for improvement of waste water treatment plants was finalised 10 years ago. In the recent past, the emphasis has been on the reduction of the amount of waste water including storm water discharged into the water bodies, as well as on the reduction of the volume of surface water carried in rainy weather. By building rain overflow basins and reservoir sewers with an overall reservoir volume of 501,056 cubic metres, 17 rain outlets have been completely closed down or refurbished to comply with existing guidelines. At five pumping plants, the reduction of waste water including storm water was optimised, and a further three rain outlets are currently being redesigned. These measures have contributed to a measurable improvement of the water quality in the rivers Pegnitz and Rednitz. They are classified as "critically polluted" with a marked trend towards "moderately polluted". The City Waste Water Treatment Department aims to avoid any discharge of untreated storm water into the receiving water bodies. As far as the waste water treatment plants are concerned, efforts have been made to optimise processes. By managing the intake volumes, the plant load could be evened out. As a result, parts of the plants which need a lot of resources could be closed down, for example one aeration basin for high load biological treatment in both Waste Water Plant 1 and 2, as well as an aerated grit chamber; while the discharge values for the waste water treatment plants remain safeguarded. Control technology measures resulted in savings in energy (electricity and heating oil) and other resources (methanol as substrate, precipitating and flocculating agents). In addition the use of hazardous materials was reduced, or they were replaced by less hazardous substances.

### **10.3. Documentation**

Since 2003, the City of Nuremberg Waste Water Treatment, and since 2009, the City Water Treatment and Environmental Analysis have been certified according to DIN EN ISO 9001/14001 quality and environment management. For all plants, there are official authorisation and approval documents. These, and the building records document the state of the plants as well as the various construction stages. Since certification in 2003, environmental reports including an environmental balance have been presented annually. These reports list the measures and results. In addition, all plants used for waste water treatment are obliged to monitor themselves and document the results, as well as submit to comprehensible external monitoring by the supervising authorities. All relevant reports are available.

## 11. Environmental Management of the Municipality

### 11.1. Present situation and development over the past five to ten years

#### 11.1.1. Municipal departments with certified environmental management systems (ISO 14001/EMAS)

A number of municipal offices and agencies have been certified according to international Environmental and Quality standards and norms, notably

- ASN, the municipal agency for waste management (first certified according to ISO in 1997).
- the municipal agency for waste water management, which was first certified according to ISO 14000 as well as for ISO 9000 in 2003.

The newly formed agency for waste water management and environmental analysis, named SUN, has been certified for all sectors of work according to ISO 9000, ISO 14000 and (the laboratory unit) ISO 17025.

- the agency for municipal homes for elderly people (NürnbergStift) has implemented a not certified QM-system.
- the recently formed municipal road and public space service (SÖR) was first certified according to ISO in 2009.

Between the years 1998 and 2000, the City of Nuremberg directed and co-ordinated a project implemented by four Bavarian cities "Eco Audit in Municipal Administration" and, in this context implemented EMAS certification in the following institutions:

#### EMAS-certificated institutions

- Nuremberg State Theatre (first entry 18.05.2000)
- Nuremberg Environmental Office (first entry 15.03.2001)
- 2 Elementary Schools Bismarckstraße and Großgründlach (first entry 07.06.2002 and 30.06.2003)
- Vocational School B4 for professions in the retail trade and credit business, wholesale and foreign trade (first entry 01.06.2003)
- Vocational School B14 for office professions (first entry 01.06.2003)
- Company Running Franconian Stadium (first entry 11.01.2006)

#### 11.1.2. Percentage of consumed eco-labelled, organic and energy-efficient products

Purchasing for the municipal administration is organised according to the principle of decentralised administration of resources. All municipal offices, agencies, services or other units have to follow the "Guidelines for Environmentally-Friendly Purchasing", a voluntary municipal environmental compatibility check which has been set in force by the City Council in 1990.

#### Recycled paper:

Since January 2009, only recycled paper is purchased. This includes paper towels and toilet paper.

#### Reduction of costs by Recycled Paper (100% since 2009)

	Recyclingpapier	Frischfaserpapier	Einsparung
Holz (in Kg)	-	67.269,8	<b>67.269,8</b>
Wasser (in l)	460.290,6	1.172.057,0	<b>711.766,4</b>
Gesamtenergieverbrauch (in kWh)	94.186,7	240.767,9	<b>146.581,2</b>
CO <sub>2</sub> -Emission (in kg CO <sub>2</sub> )	19.893,5	23.800,4	<b>3.906,9</b>

### Tissue Towels (100 % Recycled Paper)

2005/2006	20.000.000 Stück
2006/2007	14.000.000 Stück
2007/2008	15.000.000 Stück
2008/2009	17.000.000 Stück

### Toilet Tissue (Recycled Paper)

1-lagiges Krepp	2005/2006	285.000
1-lagiges Krepp	2006/2007	300.000
1-lagiges Krepp	2007/2008	350.000
2-lagiges Tissue RAL ZU 5	2008/2009	Testphase 280.000

### Office furniture:

Office furniture in municipal offices have to be certified according to "Blauer Engel" (Blue Angel) standards.

### Energy saving light bulbs

Since more than 10 years the City of Nuremberg has been changing lighting from conventional bulbs to energy saving light bulbs so that today 100 % energy friendly lighting appliances are used.

Energy saving bulbs Energiesparlampen (Haltbarkeit: 8000-16.000 Stunden)	2005	2006	2007	2008
Energiesparlampe E 14 / 5 Watt	160	15	450	150
Energiesparlampe E 14 / 7 Watt	30	0	0	20
Energiesparlampe E 27 / 5 Watt	0	85	80	50
Energiesparlampe E 27 / 7 Watt	40	20	120	0
Energiesparlampe E 27 / 11 Watt	320	500	180	0
Energiesparlampe E 27 / 11 Watt/827	0	0	100	50
Energiesparlampe E 27 / 15 Watt	140	135	10	80
Energiesparlampe E 27 / 20 Watt	80	0	260	120
<b>Gesamt:</b>	<b>770</b>	<b>755</b>	<b>1200</b>	<b>470</b>

Electric bulbs Glühbirnen (Haltbarkeit: max. 2000 Stunden)	2005	2006	2007	2008
Birnenlampe imatt E14/ 15 Watt	500	600	0	300
Birnenlampe imatt E14/ 25 Watt	300	300	100	300
Glühlampe imatt E27/ 25 Watt	200	200	200	100
Glühlampe imatt E27/ 40 Watt	600	900	300	600
Glühlampe imatt E27/ 60 Watt	1000	1200	1000	500
Glühlampe imatt E27/ 75 Watt	200	0	0	0
Glühlampe imatt E27/ 100 Watt	0	300	100	100
Kerzenlampe imatt E 14, 230 Volt, 25 Watt	200	450	200	0
Kerzenlampe imatt E 14, 230 Volt, 40 Watt	0	0	400	0
Kerzenlampe imatt E 14, 230 Volt, 60 Watt	0	200	0	0
Parabol R 80 imatt Wide 60 Watt E27	550	975	550	400
Tropfenlampen imatt E14, 25 Watt	200	0	200	0
Tropfenlampen imatt E14, 40 Watt	0	100	0	0
<b>Gesamt</b>	<b>3750</b>	<b>5225</b>	<b>3050</b>	<b>2300</b>

Overall Consumption	2005	2006	2007	2008
Energy saving bulbs and electric bulbs Energiesparlampen und Glühbirnen	4.520	5.980	4.250	2.770
Quota of energy saving bulbs in relation to the total quantity of lamps (%) Anteil der Energiesparlampen an der Gesamtzahl der Leuchtmittel in %	17	12,6	28	17

## **Vehicles**

Environmental protection and emissions reduction are priorities when purchasing municipal vehicles. This is monitored by external auditors. The system has been implemented in 1997. Since 2005, all cars purchased have been in exhaust class Euro 5, an exhaust emission standard which comes into force in 2010. Latest acquisitions of trucks for various purposes have been made according to standard Euro 5/EEV which is a standard going beyond Euro 5.

## **Organic Products in Nuremberg Schools, 2009**

On 23.07.2003, Nuremberg City Council unanimously decided to aim at supplying 10 % of all products consumed in school cafeterias and other municipal canteens and service points from organic farms or certified organic processors by 2008. Since October 2008 more ambitious targets of up to 50% of organic food in schools and day care centres are set.

## **Organic Lunch Box Drives 2005-2009**

Since 2005, the "Organic Lunch Box Drive" has been implemented in Nuremberg and other municipalities in the Metropolitan Region. In the first year, about 5,000 boxes were handed out to first-formers free of charge.

On 24 September 2009, the fifth Organic Lunch Box Drive, again all first-formers were handed their new "Organic Lunch Box" with tasty snacks for school breaks. 10,000 "Organic Lunch Boxes" were distributed to 413 classes. After Berlin, Nuremberg was the second city to introduce this Organic Lunch Box Drive.

### **11.1.3. Energy consumption of municipal buildings per m<sup>2</sup>**

The characteristic value for energy used for heating all municipal buildings has continuously decreased in past years. While in 2006 (adjusted to weather conditions) the value was still at around 165 kWh/m<sup>2</sup> per year, in 2008, it was reduced to about 146 kWh/m<sup>2</sup> per year.

A similarly positive trend can be observed for the significant city buildings, such as schools, municipal office buildings, municipal baths, cultural institutions and large child care centres. Thus the average heating energy use characteristic of this group of buildings was a value of about 133 kWh/m<sup>2</sup> per year in 2006, reduced in 2008 to only about 124 kWh/m<sup>2</sup> per year.

The goal is finding the best solution for construction projects fulfilling all functional, need-based, economic and design quality criteria, as well as saving resources and energy and preserving existing buildings.

The City of Nuremberg stipulated stricter "Energetic Standards and Planning Requirements" in order to achieve its high climate protection goals. Thus, all new buildings must be constructed to passive house standard. When existing properties are refurbished, the standard required by the City of Nuremberg is about 20% higher than that stipulated by the current (Federal) Energy Saving Regulation.

The City of Nuremberg owns property comprising about 1.2 million m<sup>2</sup> of heated space, mainly school buildings. Some selected examples for refurbishment of existing properties for energy saving:

- Conversion of a restaurant building to Nursery School – Child Care Centre – Advice Centre, Schlachthof (former abattoir), Philipp-Koerber-Weg 2 (2002-2004): The heating energy needed was reduced by 75% (energy used in 2008: 78 kWh/m<sup>2</sup>), and the primary energy use was reduced by 80%.
- Complete refurbishment of Child Care Centre in Adam-Klein-Straße 37a (2005): The building housing the child care centre was completely refurbished with heat insulation technology. The amount of heating energy used was reduced by about 50% (compared to the value before refurbishment) to 120 kWh/m<sup>2</sup> per year.
- Internal Thermal Insulation Project (since 2001): The Internal Thermal Insulation project, implemented in the buildings of the Bildungszentrum (Adult Education Centre) and in Gemeinschaftshaus Langwasser (Langwasser Community Centre) was successfully completed (between 2000 and 2003). All structural-physical prognoses concerning damage-free processes and energy-saving were confirmed.

### **New (municipal) buildings - Südpunkt (2004 to 2008):**

One of the largest projects of the past years, the new construction of the Südstadtforum Qualifizierung und Kultur – südpunkt (Southern City Forum Qualification and Culture, with about 4,700 m<sup>2</sup> usable floor space), was the first project to take in the requirements for the construction of new buildings to passive house standard. Due to the forum's high PR profile and its wide information network this project had a signal effect for further sustainable development in the city's southern districts. In 2009, the forum's first operative year, the heating energy used for the entire complex was 38 kWh/m<sup>2</sup>. This value is far below the required value of the current Energy Saving Regulation.

## **11.2. Measures implemented over the past five to ten years**

### **11.2.1. Development of an overall policy for environmental management of municipal activities**

Since a couple of years the Department for Environment and Health is working on a sustainability report for the City. The first comprehensive report on sustainable development of the City of Nuremberg has been published in 2009. The City Council decided to follow up this report regularly (i.e. the next full reports will be published in 2011 and 2014). The report is based on indicators characterizing the state of the environment and its development trends, sustainability of the local economy and business, and socio-economic features of civic society. These indicators will serve as orientation marks for future development projects and political decisions in order to analyze their effects on sustainability and adjust – if necessary – development concepts. A Master “Plan Environment and Health” is under progress which will provide an overview on all program, projects and other measures in these sectors and evaluating their impact on sustainability. The sustainability report as well as the Master Plan will be monitored continuously in close cooperation with the municipal institute for statistics and urban studies, in quantitative as well as qualitative terms. It is the vision to provide instruments which will allow all citizens at any time to follow the development and the state of our city's environment, business indicators and social agenda.

### **11.2.2. Increasing the share of the total consumption of eco-labelled, organic and energy-efficient products**

The Department for the Environment has launched an information campaign on new European regulation for public procurement, which permits to apply environmental criteria in the procurement process. The internal municipal regulations are step by step adjusted to the new rules, e.g. by

1. integration of low motor emission standards for vehicles
2. emission-free/-reduced products in the building sector
3. eco-friendly IT-equipment and appliances
4. eco-friendly technical materials used in waste water treatment etc.

### **11.2.3. Increasing the energy efficiency of municipal buildings**

Since 1997, there has been a successful municipal energy management scheme which systematically monitors and reduces heating and electric energy used in municipal buildings. The scheme purposefully influences project development, new construction projects, refurbishment of existing buildings, maintenance and running of buildings, i.e. the entire life cycle of municipal buildings. The City of Nuremberg thus acts as an important model for its citizens in the way that it deals with its own buildings and properties. The appended graphs demonstrate that the amount of electricity used by the entire municipal administration decreased by about 9% between 2002 and 2007. This is a very good result, in spite of increasing IT technology use. Since 2000, heating energy, adjusted to various weather conditions, has also continuously decreased by 13%. Due to a slight increase in 2007, the overall saving of 10% was achieved. This is a very good value, particularly with poor municipal finances in mind.

### **11.3. Long and short term measures to improve municipal environmental management:**

The Sustainability Report gives an overview of trends in the city's social, economic and environmental development in a three-year-period of time (first published in 2009 for the period 2004-2008). This information is used to draw conclusions and to develop action plans. For the sector "Environment and Health" a Master Plan is under preparation. Similar concepts are in progress for Climate Protection (Schedule 2020-2050 including mitigation and adaptation) as well as for public parks and green areas, for playing grounds and sport areas. A major activity is initiated with a recently published Public Transport Plan (covering the years 2010-2020) with the intention to tackle the most urgent transport problems which are caused by the steadily increasing commuter traffic. Special attention is given to the promotion of Cycle Traffic and to the development of long-distance combined cycle-lane and green belts.

### **11.4. Documentation**

If Nuremberg is shortlisted for further participation, the City of Nuremberg will provide the following documents:

- Annual Reports (e.g. on Waste Management, Climate Protection, Water Consumption etc.)
- Decisions of the Municipal Council (all decisions are documented in an electronic version, open to the public.
- Minutes of the Council of the Metropolitan Area of Nuremberg (Europäische Metropolregion Nürnberg) since 2004
- Plans (e.g. land-utilisation plan with integrated landscape plan) and maps esp. in the sector of planning urban green areas
- Results of Traffic census
- Online-analysis data of the quality of ambient air and of river water in print version as well as in electronic version
- Noise register • Action Plans (e.g. on Air quality)
- Public-opinion polls, data analysis and evaluation of the statistics agency Nuremberg
- Internet-presentations of the Department for the Environment and of other Offices with many links to institutions providing interesting data and documents
- Blue pingu (Internet address for organic food markets etc.)
- Integrated multi media document with ppt presentation, animation and video clips
- Films (on the sewage treatment plant or on sustainable mobility)
- Booklets, brochures, flyers and leaflets

### **11.5. Disadvantages resulting from historical and/or geographical factors**

- Nuremberg is situated in an area with particularly low rainfall, and therefore is particularly affected by the repercussions of climate change / increased temperatures.
- Almost the entire inner city of Nuremberg was destroyed by air raids in World War II. The subsoil is therefore characterised by wide areas of deposits of debris.

## **12. Other Measures**

### **12.1. Organic Metropolis Nuremberg**

On 23.07.2003, Nuremberg City Council unanimously decided that "the City of Nuremberg sets itself the goal of increasing the use of both organic products and regional products in the municipal administration to at least 10 per cent each within a period of five years". This decision resulted in the establishment of the project and the working group "Organic Metropolis Nuremberg" in 2004.

Organic Metropolis Nuremberg decided to concentrate and focus on the following topics for the period 2003-2008:

- schools and day care centres, children and young people
- large-scale consumers and catering establishments
- markets, events, Football World Cup 2006
- general consumer information

On 15.10.2008, the City Council's decision was renewed and extended:

Objectives for 2014: 10% agricultural area for organic food, 25% organic products and regional products for all municipal institutions, events, specialist markets, but in particular 50% in schools and day care centres, at receptions and at the City of Nuremberg's farmer's markets.

Nuremberg's children and young people are a particularly important target group.

### **organic lunch box drive**

In recent years, in addition to the "organic lunch box drive" there has been a series of other school events and workshops intended to raise interest in organic food, aimed at teachers, janitors, parents and school students. A total number of about 1,000 participants have attended these events (including e.g. several cooking workshops).

### **Agenda Treff**

In addition, in 2005 and 2006, the "Agenda Treff" [Agenda Meeting Point] of the Environment Education Centre organised a total of 16 events for children and their parents and grandparents. In March 2007, 2 "bio days" were held for school classes whose pupils had won a drawing competition on the topic of the organic lunch box drive. In 2007, the Education Centre offered in-service training for teachers on an organic farm.

### **Schools for the Senses**

Between 26.03. - 26.04.06, the project "Organic Metropolis Nuremberg" and the regional Agenda 21 network organised ten "Schools for the Senses" for children in after-school care from the first to the sixth form in Nuremberg and surroundings. There were displays giving the children an opportunity to try basic tastes, find out about the difference between fresh food and convenience food, explore food by touch, hearing and smell and allocate various fruits and vegetables to their seasons. A total number of 418 children were educated here. 59 carers took part, both teachers and many committed parents, which in addition was a great help in spreading the message.

### **Vocational School 7, Academy for Home Economics**

Students of the Academy for Home Economics at the Vocational School in Division 7 in Nuremberg, in the context of their training run their own school canteen independently. Every day, 60 meals are served to students and teaching staff. Since November 2009, there has been a 100% organic menu twice a week, at no extra charge. This is Germany's first certified organic school canteen, and it has received several awards, including the 2008 Sustainability Award presented by Neumarkter Lammsbräu brewery.

### **BioFach and Marketing for Organic Metropolis Nuremberg**

Because of the outstanding economic importance of the organic food sector, the Department for Environmental Issues has forged a "strategic partnership" with NürnbergMesse [Nuremberg trade fair and exhibitions organisers] in order to increase the importance of "organic" as a location factor for Nuremberg and the region, in the context of the trade fair "BioFach", the world's most important fair for organic products. Nuremberg has major potential to become one of the top players in the field of "Organic Markets", both in Germany and throughout Europe. Against this background, the City and NürnbergMesse have been significantly involved with an initiative proposed by the Nuremberg Chamber of Trade and Commerce – named "Bio-Markt Metropolregion" [Organic Market Metropolitan Region N] - as well as in the registered association "Bio-Innung" [Organic Chamber]. The objective of this involvement is increasing networking in the organic product sector.

On the occasion of the BioFach 2010 trade fair, a joint marketing campaign will be organised in order to give increased publicity to the economic importance of the organic product sector in the city and in the region. The campaign title will be "Nürnberg: Where organic people meet"

### **Events and Markets in the Public Realm**

An expert report prepared by the City's Legal Department has advised that the City does not have power to demand the use of organic products at events run by non-municipal organisers. However, for municipal events, the concrete organiser can make legal stipulations and/or make sure that organic food products are served.

Municipal events organisers include:

- Market Department (markets, special markets, Christmas Market)
- Culture Department (Blue Night, Bardentreffen Singer-Songwriter Festival, Classic Open Air),
- Sports Service (cycle races)
- Department for Environmental Issues

The Market Department has included "organic stipulations" in its tendering documentation and, independent of this, has organised new "organic offers" for various events. For example, following an initiative by the Market Department, the number of organic options offered at the Nuremberg Christmas Market has been increased. In addition to organic mulled wine and organic spicy gingerbread, in 2004, for the first time organic roast sausages were on offer.

In 2009, there was the first completely organic stall at the Christmas Market. For several years, the Market Department has also supported organic producers and traders at Nuremberg's farmers' markets, some of them which are characterised by a very high percentage of organic products. During the 2008 Asparagus Days there was 100% organic wine, and a very high percentage of organic food ingredients served. In the meantime, the organic share at farmers' markets is between 20 and 65 per cent.

Since 2006, the tendering documentation for the Bardentreffen (Singer Songwriter Festival) and Klassik Open Air have stipulated that organic foods should be taken into account. The Culture Department leaves the implementation of this stipulation to the respective general caterers. .

Last year, for the event "Stadt(ver)führungen" [Conducted (seductive) tours], there was a co-operation with the "Summer Kiosk – Market for Eco Design" in Rosenaupark (Eco = differentiated overall consideration of the entire lifespan of any particular product). In addition, under the programme heading "Gelüste und Geschmäcker" [Appetites and Tastes] guided tours and encounters were organised in shops particularly active in the organic sector (such as e.g. Organic Food Store Lotus).

In December 2009, a further market under the heading "Winter Kiosk – Market for Sustainable Presents" was organised, with catering exclusively with organic products.

### **Highlight: "Bio Experience" on the Main Market Square**

Nuremberg is the location of the BioFach, the world's most important trade fair for organic food products. Since the BioFach is deliberately organised as a specialist's fair, consumers cannot attend this event. Nuremberg, as bio metropolitan city, therefore organised a major consumer event "Bio Experience Nuremberg", giving a wider public the opportunity to find out about certified organic food stuffs and obtain information on organic food. In addition, this independent event organised by the City publicly and emphatically underlines Nuremberg's intention to promote organic food. Annually, around 25,000 visitors enjoy the many and varied organic products on offer. About 80 exhibitors from the organic sector, catering stands, an extensive cultural programme, as well as a special programme for children and young people, have ensured that the event has been extremely popular.

### **City of Nuremberg Open Day**

Traditionally, the City of Nuremberg has organised an Open Day every two years, in order to give citizens and insight into its offices and working areas. In 2009, the closing event was organised on Nuremberg Main Market Square, by the Department for Environmental Issues. The city authorities were proud because for the first time, all food and drink served was 100% organically grown.

### **Large-Scale Consumers**

Nuremberg kitchens catering for large numbers of people are a further very important target group for the objectives mentioned above, because great amounts of food ingredients are prepared here. They include e.g. the Municipal Clinics. Here, catering already includes 30% regional produce, but for cost reasons, so far only about 2% organic produce. In order to increase this share, further networking with regional organic farmers is planned.

At this point, it must be pointed out that the focus is not only on the use of organic produce, but also on the increased promotion of regional produce, as well as on products from fair trade. In May 2009, a working group of the local Agenda 21 was established with a view of positioning Nuremberg as a "Fair Trade City".

## 12.2. Energy Region Nuremberg

With 500 companies and over 60,000 employees working in this sector, as well as a turnover of more than 10 billion Euros, the energy sector plays a major role in the Nuremberg Metropolitan Region.

Nuremberg Metropolitan Region boasts a unique concentration of competence in the energy sector, with the combination of energy technology / automation / power electronics and energy and buildings, and with numerous companies, universities, colleges and research institutes.

This initiative is supported by strong pillars: science, industry, politics/administration, chambers of commerce and associations in today's Nuremberg Metropolitan Region.

Nuremberg Metropolitan Region is characterised by a healthy mix of globally active companies and successful medium sized companies which offer components, products and services from the entire value creation chain of energy supply, transport and efficient energy use.

The research environment in Nuremberg Metropolitan Region contributes greatly to the performance of the local energy industry. The universities of Erlangen-Nürnberg, Bayreuth, Würzburg, as well as the universities of applied sciences in Nuremberg, Ansbach and Weihenstephan-Triesdorf offer a wide spectrum of courses relevant to the energy industry and energy technology.

### Competence Initiative ENERGIEregion

As a regional player for Middle Franconia – but increasingly also beyond this region – the competence initiative ENERGIEregion has the task of creating a network linking companies, research institutions, universities, technology institutions, and politicians, of generating projects on energy technology, organising events on key topics, and co-operating with other networks, such as the Bavarian cluster for energy technology.

The objective of the competence initiative ENERGIEregion is sustainable promotion of the competitiveness of the companies in the energy sector, initiating and implementing co-operation between companies, setting up and maintaining the region as an internationally renowned location for energy technology and the energy industry, securing and extending jobs and supporting and advising research and development projects.

### Energy Campus Nuremberg – ECN

There are plans for a joint research institution for future energy technology. The ECN will bring together the university of Erlangen-Nürnberg, the University of Applied Sciences Nürnberg, and the regional Fraunhofer Institutes, IIS and IISB, located in Nuremberg to do leading research on energy efficiency and climate protection. In winter 2009, the Free State of Bavaria announced initial funding of 50 million Euros for this project.

### The competence initiative ENERGIEregion also comprises the additional institutions and activities

Institution	Activity
Energie-Technologische Zentren (etz) [Energy Technology Centres]	Funding body of the Energy Technology Company Founders' and Service Centre in the southern districts of Nuremberg. Founder of etz [Energy Technology Centre] for Western Middle Franconia in Treuchtlingen
Solarinitiative Nürnberg [Nuremberg Solar Initiative]	Support for Nuremberg Exchange for Solar Energy Roofing and other municipal solar energy activities.
Energieberaternetz Mittelfranken [Network Energy Advisers Middle Franconia]	Network activities for energy consulting in Middle Franconia
Stiftung Stadtökologie [Foundation Urban Ecology]	Projects and citizens' advice
Netzwerk BAU und ENERGIE [Network Building and Energy]	Network activities to extend the refurbishment of residential property for energy-saving.

## Selected Projects and Events of Nuremberg Metropolitan Region

2nd German-Chinese Energy Forum, Nuremberg on 30.10.2008 – 06.11.2008	Co-operative forum on the occasion of a delegation travelling to China (Changping, Beijing)
12th International Passive House Conference, Nuremberg	International Conference with exhibition on 11./12.04.2008 with over 1,000 participating experts <a href="http://www.passivhaustagung.de">www.passivhaustagung.de</a>
Days of Historic/Old Buildings for Middle Franconia, Nuremberg	Information event for property owners 09./10.02.2008 with over 5,000 visitors and over 100 exhibitors 28.02./01.03.2009 with about 6,200 visitors and over 100 exhibitors <a href="http://www.altbautage-hwk.de">www.altbautage-hwk.de</a>
Green Building – A Global Topic Arrives in Nuremberg Metropolitan Region, Nuremberg	Expert forum with exhibition on 25.05.2009 with about 100 participants
Long Night of Science, Nuremberg	The Nuremberg centre for energy technology took part in the "Long Night of Science" with a programme of events, on 24.10.2009. <a href="http://www.nacht-der-wissenschaften.de">www.nacht-der-wissenschaften.de</a>

### Project "Comprehensive Energy Balance for Nuremberg Metropolitan Region"

Until 2010, the project will collect, aggregate and process basic energy data, in order to calculate a final/end energy balance for the entire Nuremberg Metropolitan Region and to initiate implementation of measures for increased climate protection in the region,

### Project "Establishing Regional Energy Technology Centres in Nuremberg Metropolitan Region"

This project is to set up a network of independent energy agencies in several area municipalities, based on the model of the Nuremberg Centre for Energy Technology [etz] The project's initiators expect major synergy effects with etz's existing know-how and the network effect.

The Nuremberg Centre for Energy Technology has existed since 2001, as a successful centre for start-ups and services.

### Project "Sector Energy Analysis for the City of Nuremberg"

This project examined existing sector energy analyses in order to find out whether they are applicable to various trades practised in the City of Nuremberg, and selected the vehicle repair and catering sectors. A special training programme is planned to train

Project "NETZQ – Decentralised Monitoring and Improvement of Grid Quality Using Power Electronics and New ICT Technology"

Due to increasingly unsteady, decentralised power input (photovoltaics, wind power, block-type thermal power station etc) power grids are increasingly pushed towards the limit of their capacity, particularly as far as maximum permissible voltage is concerned. Increasing interference from power electronic systems (harmonics) is an additional problem incurred. The project NETZQ is intended to develop relevant device technology. It will be tested across parts of two grids, urban and rural.

## 13. Programme for Dissemination of Experience and Best Practice

Please describe the programme of events and activities that your city will commit to should you win the European Green Capital Award. For example:

Co-operation and partnership among authorities, citizens, business communities, and other stakeholders aimed at sharing experience and best practice.

### 13.1. Programme Goals

Nuremberg is a German city with a rich historical heritage (Free City of the Empire in the 15th century, Nazi Party Rallies, war damage in the Old Town, Nuremberg Trials) presently undergoing strong economic structural change, but also a city sending out signals for the future concerning the environment, a solidarity-based society and economy. In addition, there are lively networking links and co-operation arrangements between Nuremberg – the central city of the European Metropolitan Region Nuremberg – and the surrounding 33 North Bavarian towns, cities and regions.

Should Nuremberg win the Award, the City intends to centre its PR activities on the idea of developing a "green" city fit for the future, building on present economic and cultural structures and linking up with the urban and rural surroundings. The City of Nuremberg thus intends to show concrete examples which are practical and can be implemented, using campaigns, events and a comprehensive information and motivation strategy which might be transferrable and useable in many other medium-sized European cities. By disseminating successful and affordable best practice examples, Nuremberg would like to inspire and encourage other cities to become "green cities" too.

### **13.2. Programme Strategy**

Nuremberg's PR activities will focus on the following topics:

- publicity for and promotion of the topic "Organic Metropolis Nuremberg" – promotion of organic foods on a wide level (in schools, works canteens, at events and in retail)
- Nuremberg City of Bio Diversity – maintaining and expanding bio diversity and green areas within the city
- Nuremberg Energy Metropolitan Region – examples of better energy- efficiency in cities (refurbishing existing housing stock) and rural areas (renewable energy / bio mass)
- From sustainability towards a Masterplan for the Environment – monitoring and transparency for all interested parties/stakeholders

In particular, Nuremberg intends to:

- involve as many citizens, networking partners and players in industry, politics, science and administration as possible;
- make visible those co-operations between city and rural surroundings which seem to be easily transferable to other locations;
- use international contacts (EUROCITIES, Covenant, partner cities) to promote the dissemination of the Green Capital City concept on a wider platform;
- continue supporting and promoting citizens' involvement and commitment; and
- target particularly young people (general-education in schools, vocational schools, colleges and universities) when addressing the topic of a "city fit for the future".

### **13.3. Programme of Events**

The City of Nuremberg will organise a year-long programme of activities with various events briefly described below:

1. Opening Conference in the context of the world's largest trade fare for organic products, "BIOFACH" in the Nuremberg Trade Fair and Conference Centre in January 2014. The agenda will be content-oriented, supplemented by a creative cultural event (band, cabaret). The conference, focusing on the topic of "organic products", will aim at national and international experts and opinion leaders from politics, industry and science. There will be close co-operation with the towns, cities and regions of the Metropolitan Region Nuremberg.
2. Conferences / Workshops
  - Nürnberg aims to organise a series of international conferences in co-operation with EUROCITIES und Covenant of Mayors, as well as a "Conference on Sustainability".
  - Nuremberg will host an expert event "Greener Metropolitan Region" in co-operation with towns, cities and regions of the Metropolitan Region Nuremberg.
  - There are plans for scientific conferences, in co-operation with the universities of the Metropolitan Region Nuremberg, on various topics including electro-mobility and energy-efficient buildings.
  - Nuremberg will present its activities in the context of European events, such as e.g. the OPEN DAYS.
  - Nuremberg will present its best-practice examples in the context of existing national co-operation projects, such as e.g. koopstadt 2020
  - There will be dissemination within existing bodies promoting co- operation at expert and political level (environmental conference of the city axis Nürnberg-Erlangen-Fürth-Schwabach-Ansbach).
3. Visitor Programme
  - "Green Weekend in Nuremberg" for tourists -Initiatives in co- operation with the Hotel and Catering Association and Nuremberg Tourism Centre (eco-friendly travel, guided tours, nutrition, ecological adventures in Nuremberg, experience vs consumption etc.)

- "Mobile Citizens' Meetings" – politicians and citizens cycle to ecologically interesting destinations, such as e.g. tour of passive heating houses in Nuremberg (plus other tours on linked topics)
- "Green City" as the main topic of the "Science Night"
- Tours on ecological topics for delegations of international experts from politics and industry, in Nuremberg and surroundings

#### 4. Films

Agenda 21 Cinema – film series on environmental topics, already tried and tested with success Films on sustainable mobility

#### 5. Proactive "Greening up" – "Nature in the City" Day, involving all organizations

#### 6. City Cycles – councillors and partners to cycle as many kilometres as possible within 3-4 week period

### 13.4. Educational Work

The City of Nuremberg in particular wants to co-operate with schools and universities, in order to interest and motivate young people on environmental and sustainability topics, such as e.g.:

- co-operation with universities (films, project models, short cartoons) and specialist colleges (Triesdorf)
- co-operation with schools, vocational schools and the media, e.g. school students producing critical short films on the environment, or "green projects" for school grounds
- competitions with awards, e.g. specially endowed Nuremberg Sustainability Award 2013
- co-operation with "Grünclusiv" (Nuremberg association of landscape planners and landscaping companies)

### 13.5. Competitions

Presentation of the Nuremberg Environmental and Sustainability Award

### 13.6. Closing Ceremony

- With eco fireworks over Nuremberg Castle
- With internationally renowned experts and motivators, such as Prof. Töpfer
- With cultural highlights
- With Nuremberg's commitment to consistent future activities as Green Capital City

### 13.7. Website and Internet

Nuremberg will establish a website on the topic "Green Capital City" with links to various topics and organisations, the Metropolitan Region etc, providing information on topics, events, co-operation possibilities, opportunities for getting actively involved, best practices for download in German and English. The internet will be the City of Nuremberg's main communication medium.

Envisaged use of new forms of communication, such as flash mobs or twitter

### 13.8. Publications

- publications on the topics bio diversity and model bio city
- papers in international specialist magazines, such as e.g. on the concept of Nuremberg Zoo (integration of local plant and animal species) or on the topic "Environment and Human Rights"
- dissemination of guidelines. e.g. those worked out by Nuremberg's Municipal Energy Management and BUG

### 13.9. Branding

- Decorating exterior of public transport vehicles with designs by school children on the topic of Nuremberg Green City
- Rental bicycles
- City Light campaign (Blue Night Nürnberg)
- Info screens in underground stations
- Cinema spots (short) in all European languages