

**The Münster Application  
for the  
European Green Capital Award**



**Content:**

- 1. Local contribution to global climate change .....5**
  - 1.1 Please describe the present situation and the development over the last five to ten years in relation to (max 1000 words): .....5
  - 1.2 Please describe the measures implemented in the last five to ten years in order to reduce greenhouse gas emissions, including resources allocated to implementing the measures (max 1000 words).....7
  - 1.3 Please describe the short and long term objectives for reduction of GhG emissions, including measures adopted, but not yet implemented, and budgets for future measures already adopted (max 1000 words)..... 13
  - 1.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) ..... 17
  
- 2. Local transport..... 19**
  - 2.1 Please describe the present situation and the development over the last five to ten years in relation to (max 1000 words): ..... 19
  - 2.2 Please describe the measures implemented in the last five to ten years aimed at reducing the total transport volume and at changing the modal split in favour of alternatives to car transport (max 1000 words).....22
  - 2.3 Please describe planned short and long term measures for (Max 1000 words): ...27
  - 2.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) .....28
  
- 3. Availability of green areas open to the public .....30**
  - 3.1 Please describe the present situation and the development over the last five to ten years in relation to the percentage of citizens living within 300 m from public green areas and the total of square metres of public green areas (max 1000 words): ....30
  - 3.2 Please describe the measures implemented during the last five to ten years aimed at increasing the size and quality of public green spaces (max 1000 words) .....34
  - 3.3 Please describe planned short and long term measures for the establishment of green areas open to the public (max 1000 words):.....37
  - 3.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) ..... 39
  
- 4. Quality of ambient air .....40**
  - 4.1 Please describe the present situation and development over the last five to ten years in relation to(max 1000 words): ..... 40
  - 4.2 Please describe the measures implemented in the last five to ten years in order to improve air quality, including for example (max 1000 words): .....42
  - 4.3 Please describe planned short and long term measures for improvement of air quality (max 1000 words): .....43
  - 4.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) .....45

<b>5.</b>	<b>Noise pollution</b> .....	<b>46</b>
5.1	Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):.....	46
5.2	Please describe the measures implemented during the last five to ten years in order to reduce noise (max 1000 words): .....	47
5.3	Please describe planned short and long term measures aimed at reducing noise (max 1000 words): .....	48
5.4	Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) .....	49
<b>6.</b>	<b>Waste production and management</b> .....	<b>51</b>
6.1	Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):.....	51
6.2	Please describe the measures implemented the last five to ten years aimed at reducing the amount of waste produced and the amount of waste sent to landfill, especially biodegradable waste, including awareness programmes (max 1000 words) .....	54
6.3	Please describe planned short and long term measures for the reduction of the amount of waste produced and waste send to landfill, especially biodegradable waste. (max 1000 words).....	58
6.4	Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) .....	59
<b>7.</b>	<b>Water consumption</b> .....	<b>60</b>
7.1	Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):.....	60
7.2	Please describe the measures implemented in the last five to ten years to reduce water consumption and water loss in pipelines, including e.g (max 1000 words): .	61
7.3	Please describe planned short and long term measures on reducing water loss (max 1000 words): .....	62
7.4	Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) .....	63
<b>8.</b>	<b>Waste water treatment</b> .....	<b>64</b>
8.1	Please describe the present situation and development over the last five to ten years in relation to proportion of total waste water treated in accordance with the Urban Waste water Directive (max 1000 words).....	64
8.2	Please describe the measures implemented in the last five to ten years to improve waste water treatment (max 1000 words): Text .....	67
8.3	Please describe planned short and long term measures for reduction of water loss (max 1000 words): .....	69
8.4	Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) .....	70

<b>9.</b>	<b>Environmental management of the municipality.....</b>	<b>72</b>
9.1	Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):.....	72
9.2	Please describe the measures implemented in the last five to ten years in relation to (max 1000 words): .....	77
9.3	Please describe planned short and long term measures for improving environmental management of the municipality (max 1000 words): .....	80
9.4	Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words): .....	81
<b>10.</b>	<b>Sustainable land use.....</b>	<b>82</b>
10.1	Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):.....	82
10.2	Please describe the measures implemented in the last five to ten years in relation to (max 1000 words): .....	85
10.3	Please describe planned short and long term measures on sustainable land use (max 1000 words): .....	86
10.4	Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words) .....	87
<b>11.</b>	<b>Other measures .....</b>	<b>88</b>
11.1	Please describe any effective and interesting measures taken to improve the urban environment of your city not covered by the above indicators (max 2000 words):	88
<b>12.</b>	<b>Programme for dissemination of experiences and best practises .....</b>	<b>95</b>
1.	Internet.....	96
2.	Events .....	97
3.	Advertising for the Green Capital .....	99
4.	Media relations.....	99
5.	Trade fairs, conferences .....	100

# 1. Local contribution to global climate change

## 1.1 Please describe the present situation and the development over the last five to ten years in relation to (max 1000 words):



Münster was voted federal capital in climate protection twice: in 1997 and 2006. With this sought-after award, the Deutsche Umwelthilfe honoured the fact that Münster has introduced comprehensive climate protective measures in all relevant communal fields of activity since the early 1990ies.

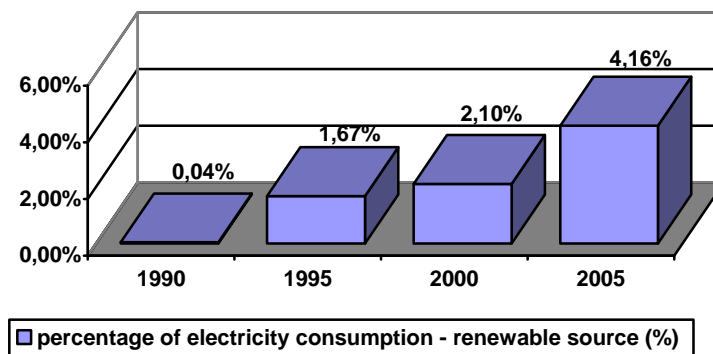
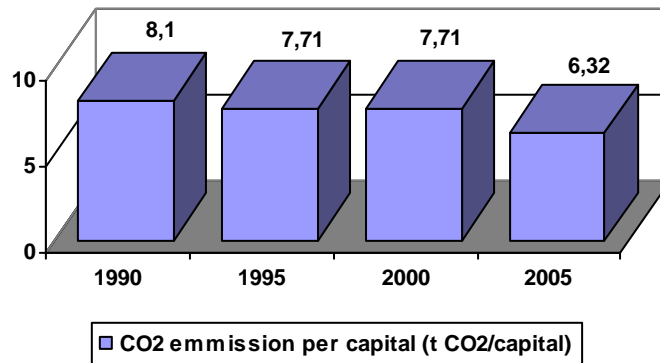
This includes, among others,

- an overall concept for the rehabilitation of old buildings,
- efficient forms of energy production,
- innovative residential area planning,
- a pioneering traffic concept,
- and public relations that keep the population aware of the subject of climate protection with an impressive multitude of activities.

Continuity pays off - for the city, the citizens, the communal economy, and last but not least - the environment.

Münster's record of successes in climate protection is comprehensible based on the indicators listed below.

	1990	1995	2000	2005
CO <sub>2</sub> emission per capital (t CO <sub>2</sub> /capital)	8,10	7,71	7,71	6,32
CO <sub>2</sub> per capital from transport (t CO <sub>2</sub> /capital)	2,15	2,11	2,08	1,99
Carbon intensity of total electricity consumption (kgCO <sub>2</sub> / kWh)				
- German average (used in climate balance of the city of Münster)	0,636	0,636	0,580	0,554
Münster – power plant only electricity	1,804	1,967	1,823	0,482
Münster - power plant (electricity + heat)	0,478	0,378	0,402	0,235
percentage of electricity consumption – renewable source (%)	0,04 %	1,67 %	2,10 %	4,16 %
percentage of citizens connected to district heating (based on heat consumption)	15,1 %	17,1 %	16,6 %	15,5 %
CO <sub>2</sub> emissions per capita - natural gas consumption (to/residents)	1,36	1,44	1,52	1,78
CO <sub>2</sub> emissions g/kWh (energy - excluding traffic)	352	339	325	235



For more than 15 years, the municipality of Münster has been relying on communal climate protection. In 1992, it established an advisory committee for climate and energy. This panel of scientists worked out recommendations for reducing CO<sub>2</sub> emissions by 25 percent until 2005. After the conclusion of these activities, the city installed the coordination site for climate and energy (Klenko) in 1995, which merged the recommendations of the advisory committee into a strategic concept and has been seeing to its consequent implementation ever since. In 1996, the council of the city of Münster passed the package of measures and, in doing so, brought into effect more than 80 measures. Since that time, the entire city has been working on their implementation and further development.



Despite the many successes in communal climate protection, there is nothing that couldn't be improved any further. For this reason, the city of Münster has been participating in the European Energy Award since 2004. This is a formalised certification procedure for introducing a management system in the field of communal climate protection.

Here, the measures are evaluated in six different fields of activities, based on a status quo analysis. Results are compared on a pan-European scale. In the first year of participation, Münster, being the first German major city, was granted the gold award, scoring 80 percent of the maximum points.

In annual re-certification procedures, these successes have been confirmed with currently 83 percent (2007) ever since. Münster will also face up to this competition in the future.

#### Results of the energy and climate balance 2005

In the first two balance periods, up to 1995 and up to 2000, CO<sub>2</sub> emissions were reduced by just 3.2% and 3.3%, respectively. By 2005, a distinct reduction by 20.9% was achieved for the first time. A success all the more impressive, given the fact of emission-increasing trends in the years from 1990 to 2005, such as the definite growth in living spaces (almost 20%) or

the steadily rising power consumption (in excess of 40%). This effect is due to the numerous activities of the city in terms of climate protection.

Emissions due to low-temperature heat generation have been clearly reduced despite the increment in living spaces. Here, crucial factors have been measures such as:

- an almost area-wide low-energy house standard for new buildings since 1997,
- high rates of connections to local heat as well as the construction of numerous new block-unit heating power plants,
- the steady upgrading of the natural gas network as well as the phase-out of night storage heaters,
- the advancement of thermal insulation and energetic rehabilitation of old buildings since 1997,
- the upgrading of renewable energies,
- but first and foremost, the significant reduction of emissions by 190,000 tonnes of CO<sub>2</sub>/a by the construction of the new combined gas and steam plant.

In the traffic sector, public transportation and bicycles are clearly used more often. Combined with the decreasing specific consumption by cars, emissions related to passenger transportation abated, from 1990 to 2005, at a continuous rate by roughly 6.1%.

The balance: Münster's package of measures has led to success in the climate balance, in spite of massive consumption-increasing trends. The city reduced its CO<sub>2</sub> emissions between 1990 and 2005 by 20.9%. The next balance is due in 2010.

## **1.2 Please describe the measures implemented in the last five to ten years in order to reduce greenhouse gas emissions, including resources allocated to implementing the measures (max 1000 words)**

The climate protection package of the municipality of Münster comprises more than 80 measures in the fields of overall climate protection, building and living, power saving, energy supply, and traffic. They have been implemented actively since 1995. The measures listed below have been implemented according to subject areas. Subsequently, a few prominent examples will be explained briefly.

### **A. Energy supply, listing measures related to renewables**

- Development of solar energy since 1995 (5.8 MW photovoltaic and 13,500 m<sup>2</sup> solar heat).
- Photovoltaic solar power plants mounted on municipal buildings (26 plants generating 325 kW in total)
- Photovoltaic solar power plants mounted on many major administrative buildings such as the university of Münster, the regional finance office, regional government, waste management companies and others (550 kW)
- Solar-oriented urban land-use planning since 1997
- Solar campaigns in co-operation with the crafts and the citizens since 2000 (heat energy from the sun, SolarLokal, wood pellet days)
- Supply of green electricity by the public utility company of Münster since 2000
- Solar settlement Twenhövenweg - marketing by the city
- Retrofitting of all residential buildings with solar thermal plants during renovation by the municipal housing association
- Organic waste fermentation plant
- Combined use of landfill and sewage gas in the block heat and power plant (2.3 MW)
- Biogas utilisation in agricultural holdings (1.5 MW)
- Wind energy utilisation (20 MW)
- Hydrodynamic power utilisation (120 kW, low capacity due to lack of gradients in the lowlands)



But Münster is also treading innovative paths in terms of energy supply. The city-owned Stadtwerke Münster GmbH (public utility company) rely on the co-operation between conventional energy production and renewable energies (wind, solar power, biomass). Either one is exploited with a particularly high energy efficiency. For example, the Stadtwerke inaugurated a new combined gas and steam plant in 2005, with an investment volume of EUR 95 million. It achieves a clearly higher energy output, with an energy conversion efficiency of the plant in excess of 80%, thus reducing municipal CO<sub>2</sub> emissions by 190,000 tonnes.

Moreover, the Stadtwerke offers so-called “ÖkoStrom“ (green electricity) to the citizens. Münster’s green electricity supply was awarded the gold certificate by the Verein Grüner Strom Label e. V. (Association Green Electricity Label, registered society) as early as in the year 2000. This certificate is awarded to electricity suppliers that generate 100% of green electricity through regenerative power plants. Moreover, the surcharge incurred by the green electricity customers is required to be ploughed back in new regenerative generation plants. The city of Münster is supplied with approx. 2 million kWh of green electricity, living up to its model role also in this context.

## **B. Listing measures related to transport**

- Public transport support programme (bus lanes, bus stop upgrading, special arrangements for busses, park+ride, bike+ride etc.)
- Bicycle traffic promotion (development of an area-wide bicycle track network, upgrading of bicycle tracks, closing of network gaps, bicycle track signage, bicycle parking house, bicycle parking facilities etc.)
- Pedestrian traffic promotion (planning principle “city of short distances”)
- Mobility advisory service “mobile” (installation of a mobility central office, ticket service, customer advisory service)
- Internal mobility management (car-sharing)

The traffic sector is another focal point in Münster’s commitment to climate protection. Here, more than 37% of all journeys are travelled by bicycle. This is a unique ratio in Germany. For this reason, Münster is not only the climate capital, but also the national bicycle capital. According to reliable estimates, there are more than 500,000 bicycles used by the 280,000 citizens of Münster, i.e. in terms of figures, there are two bicycles per capita. But what’s more, local public transportation doesn’t miss out either. For example, the connection of the city centre to the outskirts has been optimised by means of the second transit plan from 2005. Far more than 90% of the city region are developed optimally by means of stations that can be reached within a radius of 300 m. Furthermore, the night bus supply has been optimised for the night and the weekend. Over the years, the outlined measures have lead to ecomobility in Münster having increased to 63.6% by now.

## **C. Buildings – listing measures related to district heating, efficiency improvement in new and existing buildings, respectively**

### District heating:

- Local heat priority in three development areas
- New development of the combined heat and power plant in 2005 - gas and steam cogeneration plant
- Consolidation of the existing district heating network
- Support programme district heating provision of the Stadtwerke Münster GmbH (public utility company)
- Thermo concept of the Stadtwerke Münster GmbH - an offer for heating supply, in particular in multiple dwelling units



#### Efficiency improvement in new buildings:

- Specification of low-energy house standards for new buildings since 1997 relating to private residential buildings (5,800 buildings), office buildings, and municipal buildings
- Evaluation of the specification of the low-energy house standard in municipal property purchase agreements in 2002 for optimisation of the procedure
- Quality assurance for new buildings - development of a new offer for builders and municipal assistance since 2004
- Urban land-use planning to take into consideration the following energy-related aspects: South orientation of the buildings, shadow-free installation and compactness of the buildings, optimisation of the energy supply
- Advisory service for low-energy house standard and passive house
- Various passive houses implemented in the city (currently passive house - multiple dwelling unit under implementation by investor)
- Advisory service for efficient heating supply in new buildings
- Field trips for citizens to new buildings (low-energy house standard or passive house)

#### Efficiency improvement in existing buildings:

- Support programme old-building renovation since 1997 with EUR 5.3 million of subsidies in total and an investment volume of EUR 45.5 million
- Energy performance certificate for old buildings since 1996
- Annual award of the best energy performance certificates in six age of structure classes
- Demonstration projects old-building renovation
- Evaluation of the support programme old-building renovation of the city of Münster
- Network of craftsmen for energetic renovation (AltbauPartner Handwerk (old building partner crafts))
- Training initiative for craftsmen within the framework of AltbauPartner Handwerk
- Information gateway „AltbauNeu – Münster“ (old building new)
- Intensive advisory service for citizens regarding old-building renovation
- Annual thermographic activities since 2003
- Regional cooperation with the surrounding districts “Better living in the Münsterland”
- Expert opinion on the old-building renovation of a tenement block in the social hot spot (renovation hold-up)
- Expert opinion “Old-building renovation of heritage-protected buildings in Münster - possibilities and opportunities”



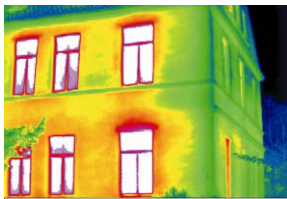
The city of Münster has been running a state-of-the-art combined heat and power plant (gas and steam turbine cogeneration plant) since 2006, replacing the previous coal-fired power plant. Energy production in the gas and steam turbine cogeneration plant works based on the resource-friendly principle of combined heat and power generation. In conventional condensation power stations, heat accrues as a “waste product” and is not exploited. Quite different as far as the cogeneration plant in Münster is concerned. Here, power is produced by means of two gas turbines, one steam turbine, and the associated generators.

The heat accruing from the cooling circuit and the flue gas is not just released to the environment as a “waste product”, but is used as a valuable form of energy. By combining power generation and heat recovery, an unrivalled efficiency factor of 88% is achieved, with the dust emissions being reduced by almost 90 percent by the conversion of the fuel from coal to gas.

In 1997, the **low-energy house standard** (NEH) was introduced for all municipal building sites. Since then, the NEH has been implemented in some 5,600 residential and 85 non-

residential units. The corresponding requirements are approx. 30 % below the legally binding requirements. Furthermore, residential area planning has been aligned with energetic criteria, such as freedom of obscuration, compactness, and south facing of the buildings for improved solar energy exploitation. Successes can be perceived in many building areas where, for instance, a local heat supply with cogeneration has been implemented, or the number of solar energy and solar thermal installations is on the steady rise. In this manner, Münster remains continuous winner in the “Solarlandesliga Nordrhein-Westfalen” since 2005.

The “**Overall concept for the rehabilitation of old buildings**“ includes three essential elements: support programme, energy performance certificate for buildings, and demonstration projects allowing for an illustrative consultation. The communal support programme is backing up the thermal insulation rehabilitation of private buildings, the introduction of the energy performance certificate documenting the energetic status of the respective building, and demonstrative rehabilitations of city-owned buildings with more than EUR 5 million.



It is accompanied by a high-publicity mix of events. In order to implement the concept, the coordination site for climate and energy (Klenko) has collaborated with numerous local protagonists, including, in particular, architects, energy consultants, handicraft businesses, and housing societies. Not only have they contributed to the concept, but procured resources and took over commissions as well.

#### **D. Industry – listing measures related to efficiency improvement, low carbon electricity and fuels**

- ECO PROFIT with more than 60 companies
- Several major industrial plants in Münster with extensive energy saving measures like the use of block heat and power plants, energetic optimisation of the production processes, innovative products for the thermal insulation of buildings, etc.
- Public utility company Münster: gas and steam cogeneration plant
- Use of geothermal energy in office buildings such as the new building of the LVW insurance company (550 kW)
- Block heat and power plant use for insurance companies such as Provinzial
- Support programme of the Stadtwerke Münster GmbH "Natural gas as a fuel" for citizens, service providers, and vehicle fleets since 2003
- Stadtwerke Münster GmbH operates more than 50 natural gas vehicles; all new acquisitions are natural gas-powered; the city of Münster maintains a total of 21 natural gas and 4 electric vehicles.

ECOPROFIT supports enterprises in reducing operational costs by environmental protection measures. Up to the present, 62 companies have been participating in five projects within the scope of the ECOPROFIT programme. In the process, they have scored the following annual results:

- cost reduction by 1.6 million EUR/a
- saved 1,200 tonnes of CO<sub>2</sub> for climate protection
- almost 11 million kWh of energy saved



A few enterprises have used the ECOPROFIT project to build up or support an environmental management system (e.g. as per DIN 14001 standard). **In 2008**, Münster will launch the 6th ECOPROFIT project.

## E. Agriculture, forestry and land-use change

- Utilisation of biogas in block heat and power plants by five agricultural holdings (1.5 MW)
- Wind energy plants in agricultural expanses
- Euregio project for the energetic utilisation of small dimension wood in the Münsterland bioenergy region
- Municipal wood chip facility in the cemetery Lauheide
- Management of the municipal woods completely according to the FSC (Forest Stewardship council) certification programme
- New development of approx. 100 hectares of forest (since 1998)
- Reforestation programme after the hurricane Kyrill
- Readjustment of the municipal forests in nature-oriented assets in accordance with the locations
- Reactivation of conversion areas (former military sites) since the mid-1990s within the framework of the settlement development
- Drafting of urban climate analyses
- Landscape plans and green structures policies to secure free spaces



Münster's spatial urban development planning orients itself by the overall concept of sustainable settlement development. Good prerequisites for this are provided by the city's structure with the compact city centre and the independent quarters with functional local centres. The centre-oriented city of short distances is the guiding principle here. The "inner development before outer development" principle is attached high significance in this context. Consequently, Münster has reactivated virtually 150 hectares of conversion area (former military sites) within the scope of settlement development since the mid-1990s.

## F. Waste management

- Biowaste fermentation plant with block heat and power plant
- Combined use of landfill and sewage gas in the block heat and power plant (2.3 MW)
- Sorting of residual waste, composting of organic waste, etc. => innovative waste management concept doing without waste combustion
- Renovation of the main sewage treatment plant including energetic optimisation of the digestion towers and control technology



Münster prioritises ecologically reasonable recycling measures in waste treatment. However, the concept of the mechano-biological waste treatment plant also includes energetic utilisation. Approx. 30% of the potential recyclables sorted out (fraction high in heating value) is recycled energetically. In part, the synthetics fraction (approx. 10%) is also recycled energetically. 2,388,000 m<sup>3</sup> / a of biogas are produced in the biological stage of the plant, a portion of which being utilised in the plant itself, replacing primary gas. The remainder is converted into electricity in the block heat and power plant with a power output of approx. 1,750,000 kWh / a. Consequently, the energetic potential is utilised to the greatest possible extent.

Organic household waste in Münster is utilised in an organic waste fermentation plant. The throughput rate is roughly 18,000 t / a. In 2003, 2,650,000 m<sup>3</sup> of biogas were produced from 18,000 t of organic waste and directed to the block heat and power plant. The biodegradable waste of the city of Münster is completely composted.

The landfill gas is energetically utilised in Münster as well. Vertical gas wells have been installed for collection. All of the gas is directed to the block heat and power plant via a system of collector and transport lines. In 2002, 4,350,000 m<sup>3</sup> of gas were produced in this manner.

## G. Education, information

The **environmental advisory service** of the city of Münster comprises about 15,000 annual consultations of the citizens on the last years' average. About one-third of the consultations are directly related to climate protection, e.g. for renovation measures for old buildings or tips on power saving. Furthermore, within the scope of public relations, a host of projects, events, and consultations has been implemented regarding the following subjects:



- Saving energy and waste at schools and daycare facilities for children (since 1998), currently including 20,000 children at 100 facilities
- "The climate seeks protection in Münster...and also with you" - a climate protection campaign everybody can participate in
- Lectures on all subjects related to saving energy and protecting the climate
- Stop the power devourers - power saving campaign for the services sector
- Saving energy in low-income households - information and counselling projects on saving electric and heating energy
- Energy saving campaign of the university of Münster
- Cool-Region - an EU project on cooling efficiency in office buildings
- Energy neighbourhoods - an EU project dealing with saving energy in the household
- Energy and environmental advisory service
- Energy advisory service of the Verbraucherzentrale (consumer advice centre) NRW since 1997
- Federal capital in climate protection in 1997 and 2006
- Did you know already? - a power saving campaign 2000
- Energy for the people - series of events for the citizens
- Offensive for the restoration of old buildings since
- Old buildings demonstration projects
- Old buildings partners handicraft
- Green street number - awarding the best old building retrofittings since 1997
- Thermographics campaigns
- Subsidies advisory service on any subjects related to climate protection for households and the economy
- AltbauNeu – Old buildings renewed Münster
- Solar energy campaign "Heat from the sun"
- Solar electricity campaign "SolarLokal"
- Efficient heating systems for households - district heating, wood pellets, heat pump, condensing boiler technology
- Better living in the Münsterland
- Heat from the sun
- Wood pellet days
- Solar local
- Energy efficient construction - low-energy house standard
- Energy efficient construction in the services sector
- Energy and environment market
- Intercultural weeks 2008 - peace and climate



- Weekly tips on climate protection in the press since 2007
- Information campaign “Blankets instead of radiant heaters”
- Energy performance certificate since 1996

Also from 1997, the subject of “**Saving energy and refuse in schools and daycare facilities for children**” has been tackled - with sustainable success. While there were 15 facilities initially partaking in this programme, 101 schools and daycare facilities are participating by now, with more than 25,000 children. For instance, in the period between 2003 and 2007, they have, altogether:

- reduced the quantity of residual waste by more than seven million litres,
- saved more than 3.5 million kWh of heat energy,
- avoided almost EUR 604,000 of energy and waste disposal costs.

The success of the project, however, can be seen not only in the relief of the communal budget, but especially in the relief of the environment. During these five years, CO<sub>2</sub> emissions amounting to 1,000 tonnes were saved, and it was great fun for the children as well.

Taken together, the city of Münster has spent budget funds amounting to approx. EUR 2.5 million since 1995 for concepts, expert opinions, public relations, projects, energy consulting, etc. Personnel costs are not accounted for here. Within the framework of the “rehabilitation of old buildings” support programme, more than EUR 5.3 million of subsidies were distributed in Münster between 1997 and 2007.

### **1.3 Please describe the short and long term objectives for reduction of GhG emissions, including measures adopted, but not yet implemented, and budgets for future measures already adopted (max 1000 words)**

Originally, the city of Münster aimed at cutting down on one quarter of the CO<sub>2</sub> emissions from 1990 to 2005 - a very ambitious target. The communal climate protection balance for the year 2005 showed a factual saving of 21 percent. This is a giant success. Yet the city is not resting on its laurels, but will continue to consequently pursue communal climate protection. For this reason, more than 90 experts have formulated ideas and suggestions for the new climate protection target 2020 during the climate change conference for Münster in August 2007.



The council of the city of Münster took up these suggestions in March 2008 and decided to cut CO<sub>2</sub> emissions by the year 2020, relating to the reference year 1990, by at least 40 percent. Furthermore, the renewable energies are supposed to obtain a 20% share in communal energy supply. By mid-2009, the municipality will provide a novel/revised climate protection concept with tangible measures. Based on this, the new climate protection target for Münster is to be achieved by the year 2020.

As a supplementary measure, the city is planning the development of a city-wide "network for climate protection in Münster". All active climate protectors throughout the city will be members of this network, such as service providers (insurance providers, banks, etc.), handicraftsmen, the chamber of commerce and industry, the university, the public utility company, associations, building societies, public transportation services, and citizens. Building up this network presents a major challenge in terms of both personnel and funding, but it will play an important role for the future climate protection in Münster. The experiences

gained from the climate change conference 2007 show many protagonists in Münster to be greatly interested in an intensive collaboration. This ambitious objective will be achieved only, according to consensus, if municipality, citizens, and the above-mentioned institutions work together. Intensive support and coordination of tasks is clearly desired on the part of the municipality.

In terms of decentralised responsibilities, it is imperative to identify further protagonists in various consumption sectors who would initiate and coordinate climate protection measures in their respective fields. The municipal coordination site (Klenko) is supposed to adopt - beside the overall municipal coordination - a consulting and accompanying function. By way of this participative concept, climate protection in Münster will be lifted to a whole new level.



In parallel, the municipality continues to work on the ongoing climate protection projects in various sectors (building and living, power saving, traffic, etc.), of course. Moreover, it has initiated a broad climate protection campaign: "The climate is seeking protection in Münster...and also with you!" The intention is to anchor the global subject of climate protection on location even more intensely. For this, the municipality relies on the support of the citizens. These are supposed to contribute as individuals to climate protection in word and vision, in order to make climate protection an "everyday fact". For this purpose, various roadshows, field trips, and further interesting activities will be implemented.

The total budget for each categorie can only be exemplified. There are many different departments and institutions in Münster contributing money and manpower. A lot of them do not belong to the City of Münster, so we do not know exact figures.

**Budget:**

Annual product costs only of the Office of Green Space and Environmental Protection in the climate protection sector:

approx. 0.4 Mio €

(The budget of all the other offices ist not included.)

Annual investment costs for energetic retrofitting measures

approx. 6.0 Mio €

(The budget of all the other offices ist not included.)

In addition, funds are raised from the federal state of North Rhine-Westphalia.

The following compilation shows an overview of the measures planned in the short and long terms for climate protection in Münster:

<b>Measure</b>	<b>Status of plan</b>	<b>Target</b>	<b>Included in plan</b>	<b>Budget</b>
CO <sub>2</sub> reduction until 2020	decided	40% until 2020	yes	not specified yet, will be substantiated in climate protection concept
utilisation of renewable energies	decided	20% of energy consumption until 2020	yes	not specified yet, will be substantiated in climate protection concept
climate protection concept 2020 for Münster	decided	action plan for accomplishing the climate protection targets 2020	yes	EUR 90,000
networks for climate protection recruiting all the city's protagonists (industry, services, crafts, citizenry, university, etc.)	on the drawing board	every participant takes over a percentage for CO <sub>2</sub> reduction in the city	yes	not known yet (estimated approx. EUR 300,000 to 400,000)
support programme old-building renovation until 2010	decided	renovation measures for old buildings	yes	EUR 100,000/year
expansion of the old-building renovation offensive Münster	on the drawing board	augmented renovation activities	yes	from the existing budget
improvement of the standard for new buildings up to passive houses	on the drawing board	improved residential buildings in Münster	no	external costs
development of renewable energies in Münster	on the drawing board	increased renewable energies in Münster	no	not known yet
three solar settlements in Münster	under implementation/ on the drawing board	improved presentation of solar construction	yes	external costs of private investors
climate protection campaign - climate package Münster - 10,000 citizens for climate protection	on the drawing board	raising civil awareness	yes	from the existing budget
transport development plan	planning decided upon	future-oriented transport systems, e.g. affecting modal split	yes	EUR 100,000 (1 <sup>st</sup> phase)
clean air plan	planning legally required	action plan for improved air quality	yes	external costs
waste - waste management companies Münster expert opinions on the climate protecting effects of measures	on the drawing board	targeted action planning	yes	EUR 50,000

## Activities aiming to address impacts of climate change

In Münster, the consequences of climate change will become manifest, according to today's predictions, first and foremost in the form of increased precipitation in the winter half year, beside a general temperature increase. Furthermore, extreme summer aridity, events of heavy rain, and the formation of tornados are to be reckoned with. Water supply issues are not to be expected, though, for the water recovery plants are protected against both harmful high water and long-lasting summer aridity based on water enrichment facilities. In fact, high water protection is becoming the focal point of interest. The local government of Münster has established high water action plans for the Ems and Werse rivers under the participation of the districts, towns, and communes. The main objectives are:

- Improvement of high water information
- Raising high water awareness
- Decreasing the risk of damage
- Decreasing the high water levels

For improved high water prevention and protection against the effects of heavy rain events, the city of Münster has established a department-spanning working group commissioned to coordinate the various concerns such as emergency management with the municipal fire brigade or area precaution with the town planning office. Within the scope of the settlement expansion, spacer areas of 30-50 m along the waters have been designated among others, alongside with the floodplains that are legally specified already (at the Werse, Angel, Münstersche Aa, Kinderbach, Emmerbach rivers) in order to ensure these spaces to stay clear, thus effectively contributing to preventive high water protection.

The principal target is the consolidation of numerous information sources as well as a comprehensive description of the required high water protective actions and their effects. Furthermore, the overall subject matter is accompanied and supported by the university and the university of applied sciences of Münster by means of the project "Information logistics in situations of high water".

In order to improve protection of the forests of the city of Münster against hurricanes, only mixed forests have been developed for more than 20 years by now. Within the scope of the certification according to FSC (Forest Stewardship Council), particular importance is attached to sustainability in forest development. The success of this measure showed when the last hurricane Kyrill had struck. While there were heavy damages to the pine monocultures, damages in the mixed forest areas remained negligible.

The city attempts to be prepared for the climate change also in the selection of urban/roadside trees. Correspondingly, new kinds of trees supposed to be especially adaptable are checked for suitability in Münster within the scope of the urban/roadside tree test. Furthermore, optimum growing conditions are created based on large tree grids, sufficient planting pits, and optimal maintenance wherever this is possible in the existing population and in all new plans for green infrastructure.

The so-called green structures policy of Münster ensures sufficient quantities of fresh air to be channelled into the city centre also in case of extreme heat. This is because the green structures policy, by way of the land development plan, secures three green circles and seven green corridors stretching from the open landscape into the city centre, thus providing for a favourable climate within the city.



**1.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

**Listing of any activity aiming to evaluate the effectiveness of measures:**

**Additional information** for evaluation and the rest of the chapter can be gathered from the corresponding PDF files on the extra CD provided according to the numeration below:

0. Implementation climate policy lecture 2008
1. Energy and climate inventory taking 2000
2. Energy and climate balance 2005
3. European Energy Award since 2004 (awarded in 2005 the European Energy Award Gold)
4. Participation in various competitions such as climate capital Germany 1997 and 2006 (winner in the competition in each case), energy saving commune Germany 2005 (second place to Munich), solar federal league and/or state league annually, etc.
5. Evaluation of the support programme old-building renovation of the city of Münster
6. Evaluation of the specification of the NEH standard in municipal property purchase agreements
7. Climate protection concept 2020 for the city of Münster - catalogue of measures for accomplishing the climate protection target of CO<sub>2</sub> reduction by 40% by 2020
8. Environmental statement of the public utility company 2003/2007
9. Business reports of the public utility company 2006/2007
10. Certificate green electricity public utility company
11. Energy controlling public utility company (flyer)
12. Heat atlas public utility company 2000
13. Gas and steam cogeneration plant
14. Mobility analyses within the scope of household surveys every five years on average (1990, 1994, 2001, and 2007),
15. Development of the climate in Münster/Westphalia, thesis at the Westfälische Wilhelms-Universität Münster, Christoph Böwer, 2006

**Important drafts:**

16. Draft support programme energy saving and old-building renovation in the city of Münster 2007.pdf
17. Draft continuation of the low-energy house standard in Münster 2003.pdf
18. Draft heat insulation standards for new buildings in municipal property purchase agreements 1996.pdf
19. Draft saving energy and waste at municipal schools and daycare facilities for children 2007.pdf
20. Draft solar power plants on municipal roofs 2005.pdf
21. Draft continued energy-oriented urban land-use planning in Münster 2000.pdf
22. Draft climate protection programme and climate protection target 2007.pdf
23. Draft climate balance 1995.pdf

**Other documents for evaluation (excluding pdf):**

- The potential of the photovoltaic utilisation of roof areas as a contribution of trend-setting urban planning, as demonstrated using the example of the city of Münster (diploma thesis Westfälische Wilh. Universität Münster, Christian Prinz 2008)
- Possible effect of energy saving campaigns on the patterns of use in organisations - an empirical assessment using the example of the municipality of Münster (diploma thesis University of Lüneburg, 2008 Mareike Buskamp)
- Climate balance based on anthropogenic impacts such as livestock husbandry, waste management, etc. (diploma thesis Westfälische Wilh. Universität Münster, 1998)

**Additional data is available from the following websites:**

- [www.muenster.de/stadt/umwelt/klima\\_energie.html](http://www.muenster.de/stadt/umwelt/klima_energie.html)
- [www.muenster.de/stadt/umwelt/klima-sucht-schutz.html](http://www.muenster.de/stadt/umwelt/klima-sucht-schutz.html)
- [www.muenster.de/stadt/umwelt/klimainventur.html](http://www.muenster.de/stadt/umwelt/klimainventur.html)
- [www.muenster.de/stadt/umwelt/energie\\_abfallsparen.html](http://www.muenster.de/stadt/umwelt/energie_abfallsparen.html)
- [www.muenster.de/stadt/umwelt/altbausanierung.html](http://www.muenster.de/stadt/umwelt/altbausanierung.html)
- [www.muenster.de/stadt/umwelt/neubau.html](http://www.muenster.de/stadt/umwelt/neubau.html)
- [www.muenster.de/stadt/umwelt/ern\\_energien.html](http://www.muenster.de/stadt/umwelt/ern_energien.html)
- [www.muenster.de/stadt/umwelt/stromsparen.html](http://www.muenster.de/stadt/umwelt/stromsparen.html)
- [www.muenster.de/stadt/umwelt/klimaschutzpartnerschaften.html](http://www.muenster.de/stadt/umwelt/klimaschutzpartnerschaften.html)
- [www.muenster.de/stadt/awm/](http://www.muenster.de/stadt/awm/)
- [www.muenster.de/stadt/stadtplanung/publikationen-rad.html](http://www.muenster.de/stadt/stadtplanung/publikationen-rad.html)
- [www.muenster.de/stadt/stadtplanung/publikationen-bus-bahn.html](http://www.muenster.de/stadt/stadtplanung/publikationen-bus-bahn.html)

## 2. Local transport

2.1 Please describe the present situation and the development over the last five to ten years in relation to (max 1000 words):

2.1.1 Length of designated cycle lanes in relation to total number of inhabitants in the city



In Münster, bicycle transport is top priority. The entire municipal area is criss-crossed by a coherent network of safe bicycle trails, making the use of the bicycle as a means of travel so unique. In the German bicycle capital, there were designated bicycle lanes with an overall length of 304 kilometres in the year 2007. Three years before, this had been 270 kilometres, corresponding to an increment of 12.6%. Additionally, there are some 500 km of access routes including some 200 km of tracks through green spaces, serving the needs of pedestrians and bicyclists alike.

Year	Bicycle tracks along roads in Münster				Bicycle track signage	
	in total	thereof			in total	thereof theme tracks
		curbstone bicycle tracks	bicycle road	bicycling in bus lanes		
in km						
2003	270	264	4	3	170	140
2007	304	293	10	3	245	142

Übersicht: Radwege in Münster

The fact that the citizens of Münster make use of the area-wide bicycle lane network gladly and frequently is due to three factors:

- the manageability of the city, with its bicyclist-friendly topography
- the installation of 304 km of separate bicycle lanes along all main artery roads (resolution in principle),
- the car-free promenade of 4.5 km all around the old town which is reserved for cyclists and pedestrians and fulfils important functions as a link and distributor (up to 1,500 bicyclists per hour (at peak times) make use of this "bicycle highway").

The relation to the total number of inhabitants (280.000) to the designated cycle lanes is equivalent to 2,87 Meter per inhabitant.

Further important factors for network coherence are:

- the interconnection of the main artery roads with dedicated bicycle tracks
- the junction point solutions taking into account bicycle track routeing and dedicated signalling for bicyclists,
- the integration with all residential areas (with area-wide speed limit of 30)
- the integration within the city centre - with partially limited clearance of the pedestrian precincts for bicyclists, and
- the implementation of bicycle parking offers for short-term and long-term parkers.

### 2.1.2 Share of population living within 300 metres from an hourly (or more frequent) public transport service

The city of Münster boasts a high-quality connectivity in terms of local public transportation (ÖPNV, öffentlicher Personennahverkehr) and local rail transportation (SPNV, Schienenpersonennahverkehr). The 2nd transit plan city of Münster as agreed by the council of the city of Münster on September 21st, 2005, defines:

An equivalent connectivity (station catchment area and frequency) is to be strived for in all districts. Contiguous areas with more than 300 residents are to be developed in a station catchment area of 300 to 500 m. In the course of this, a corresponding detour factor is to be accounted for.

With respect to the offered frequencies, the 2nd local transit plan specifies:

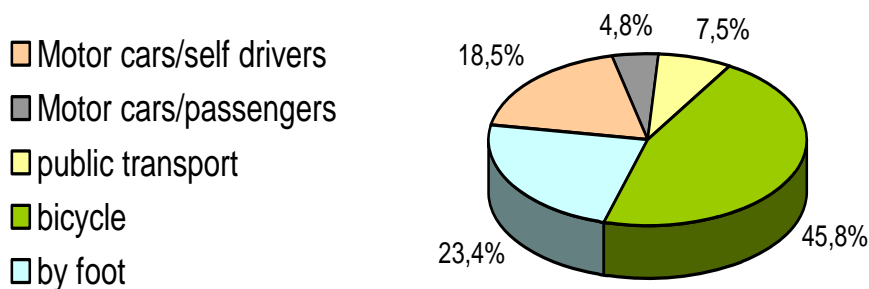


On weekdays from 6 a.m. to 9 p.m., the frequency in the main network lines is to be oriented on a 20 minute frequency, depending on passenger volume. On the ÖPNV main traffic axes, two lines at a time are to complement each other to yield a 10 minute frequency. From 9 p.m. to 12 p.m., the basic network is operated at a 30 minute frequency and, on particular lines, at a 15 minute frequency. In the weekday night traffic from 12 p.m. to 2 a.m. and on weekends, a 60 minute frequency with non-stop operation on Saturdays and Sundays is offered until early traffic sets in.

The ÖPNV daytime network is based on these specified standards. It ensures a maximum distance of 300 metres for more than 90% of all residents of Münster to walk to reach the next stop, with a frequency of at least once per hour. The only exceptions are splinter settlements and single homesteads.

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

Furthermore, the traffic behaviour of the citizens of Münster has been evaluated within the scope of a household survey in 2007. Based on these interviews, the Modal Split (Modal Share) has been determined in specific travel distance classes. As a result, the residents of Münster cover distances in the class 0 to 5 kilometres:



Modal split for all short journeys in the class 0 to 5 km

### 2.1.4 Proportion of public transport classed as low emissions

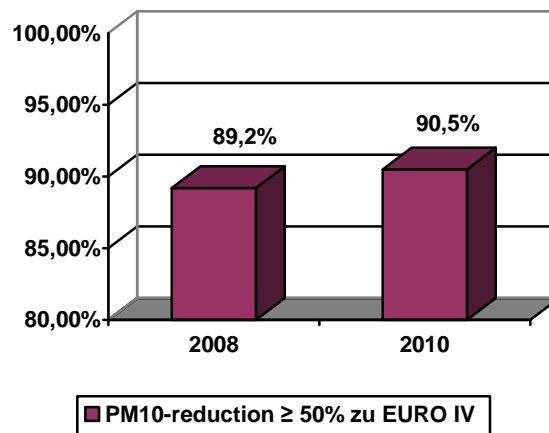
Transportation qualities were specified for the first time in the 2<sup>nd</sup> local transit plan in 2006. This is to allow the goal of ensuring the high quality of the ÖPNV in Münster. In particular, transportation standards include, beside the demands on the crew and service personnel as well as on customer information, demands on the vehicles. In this context, noise and pollutant emissions take centre stage. For instance, engines are required to be encapsulated

so as to avoid unnecessary noise pollution. Moreover, the vehicles are required to comply with the Euro IV standard or better.

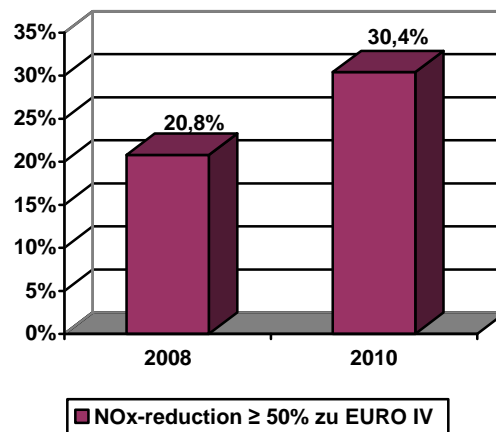


All buses of the communal transportations company Stadtwerke Münster (public utility company) are fitted with catalyst soot filters, the so-called CRT system (continuously regenerating trap) since 2004. Combined with the exclusive use of sulphur-free Diesel, all the buses of the Stadtwerke achieve emission levels already compliant with the **Euro 5 standard** for motor vehicles.

The Diesel-fuelled buses of the Stadtwerke (public utility company) have been fitted with a supplementary filter for quite some time (since 1998), eliminating particulate matter to a large extent. Thus, as regards PM10, all Stadtwerke buses are at least twice as effective as is required by the Euro IV standard. As few as 11% of the busses used in city bus traffic today (vehicles owned by private transportation companies) do not yet attain this level.



Nonetheless, this filter technology has an undesired drawback: NO<sub>2</sub> emissions increase. For this reason, new vehicles will be gradually purchased in the coming years, which will help minimise NO<sub>2</sub> emissions on the basis of supplementary technology (ad-blue). By 2010, more than 30% of the buses will be equipped with EEV (enhanced environmentally friendly vehicle) technology. In 2007 and 2008 the public utility company has sold 27 buses with this emission standard. The technology already conforms to **the Euro VI standard** which will probably become obligatory in the year 2013. At present, this is the most sophisticated European exhaust standard for buses and lorries. These particularly environmentally friendly vehicles surpass the exhaust quality as required by the Euro V standard, which will come into force for all new lorry and bus types in 2009. Correspondingly, over 20% of the busses currently employed are already twice as efficient as required by the Euro 4 standard in terms of NO<sub>x</sub> abatement; by 2010, it will be more than 30% of the busses. In the future, the public utility company will procure only such busses that are fitted with this high-quality technology.



**2.2 Please describe the measures implemented in the last five to ten years aimed at reducing the total transport volume and at changing the modal split in favour of alternatives to car transport (max 1000 words)**

For more than 20 years, traffic in Münster has been planned in a systematic way, with the aim of consolidating ecomobility and limiting individual transport. Depending on the specific question, numerous sectoral concepts and follow-ups for individual modes of transport (e.g. bicycle traffic concept, parking space concept, local transport plan) on the one hand and concepts for partial areas on the other hand have been elaborated while taking into account the overall concept. Here are a few examples for traffic concepts and infrastructural measures for all modes of transport:

- area-wide 30 Kmh zones since 1987
- implementation traffic concept old town 1994-1999
- implementation bicycle promotion programme since 1989
- implementation ÖPNV promotion programme 1991-1999,
- 1. and 2<sup>nd</sup> local transport plan ÖPNV city of Münster1999/2006
- 1. and 2<sup>nd</sup> local transport plan SPNV Special Purpose Association Münsterland (ZVM, Zweckverband Münsterland)
- bicycle traffic concept 2010
- parking space concept 2010.

Furthermore, within the scope of the land use planning follow-up, an authoritative target concept for bicycle traffic has been formulated, for the first time, in the overall spatial planning of the city of Münster.

**Development of total traffic in Münster**

In total, the trip and route volumes of the population of Münster has increased to roughly 1,064 million routes and trips daily in the past 25 years. This corresponds to an increment of about 130,000 routes and trips daily. Peculiar is the traffic behaviour of Münster's residents having changed noticeably since approx. 1990. This becomes evident when comparing the development of motor traffic vs. ecomobility. From 1982 to 1990, the trip and route volume of

Münster's residents increased by approx. 49,000 trips, 11,000 trips of which being attributable to motor traffic. The remaining trips and routes were attributable to ecomobility. In the subsequent years from 1990 to 2007, the traffic volume increased by another 82,000 trips daily. But the portion of motor traffic amounted to as little as 11,000 trips daily here also. 71,000 trips - virtually twice as many as in the previous period of time - could be attributed to ecomobility.

Verkehrsart	Münsteraner Verkehr			
	1990		2007	
	absolut	Modal-Split	absolut	Modal-Split
zu Fuß	208.285	21,2	165.998	15,6
Rad	333.060	33,9	400.097	37,6
ÖPNV/SPNV	64.843	6,6	110.665	10,4
Umweltverbund	606.188	61,7	676.760	63,6
Kfz	376.289	38,3	387.328	36,4
Summe	982.477	100,0	1.064.087	100,0

Traffic volume development of the citizens of Münster (personal transports/day)

According to this, Münster has succeeded in achieving a continuous improvement of its citizens' traffic behaviour - despite high mobility and expanding structures.

The concept for avoiding individual trips with private cars is based on modern ecomobility that rests on three mainstays: ÖPNV (public transport), bicycle transport, and mobility advice service.

### 1. ÖPNV (public transport)

In order to persuade traffic participants in Münster to choose an ecomobility-compatible mode of transport, the so-called ÖPNV promotion programme was developed and decided upon by the council of the city of Münster in the year 1993. A programme for speeding up buses along the ÖPNV main axes aimed, in particular, at rendering ÖPNV schedules more reliable, i.e. minimising late arrivals due to a high traffic volume during peak times in the morning and afternoon. A waiting hall programme was established so as to improve protection and comfort for the passengers. What's more, bike/ride and park/ride facilities have been implemented at all SPNV stations and important ÖPNV stops.



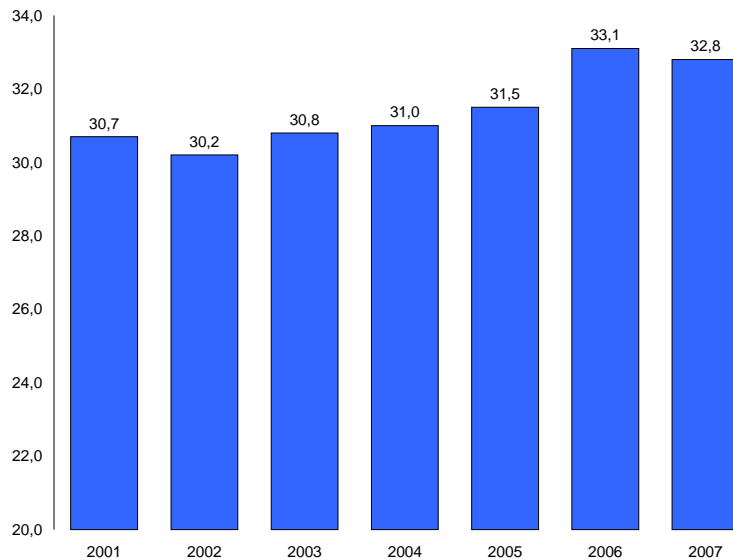
Prinzipalmarkt Münster  
72 persons with passenger cars, bus, and bicycles

Thanks to this programme, Münster possesses bus traps at several nodal points as well as extra lanes for buses in the forefront of nodal points. These allow for the buses to bypass any motor vehicle tailback. Furthermore, the buses are able to switch many traffic light installations. These measures result in an extremely effective acceleration of the bus traffic. Apart from this, there is a set of special regulations such as going straight on from right turning lanes etc.

From the onset of the ÖPNV stop programme, almost all of the bus stops have been fitted with bus shelters. Currently, approx. ten stops are furnished with bus shelters annually. The success of these measures can be seen directly from customer satisfaction analyses conducted by the transportation companies.

Authoritative statements on the service and development quality of the ÖPNV in Münster were specified for the first time in the 1<sup>st</sup> local transport plan of the city of Münster in 1999. These were further substantiated by the 2<sup>nd</sup> local transport plan in the year 2006.





Development of the passenger demand for the city buses (million passengers/a)



## 2. Bicycle traffic

Bicycle traffic is the embodiment of Münster's ecomobility. Bicycle traffic is a tradition both in Münster and in the Münsterland. As early as from the 1950s, the city of Münster has promoted bicycle traffic by means of planning and consistent implementation. But this has always been about a sound overall concept rather than about single measures. A successful bicycle traffic concept is based on bicycle traffic system design. It is interlinked and made up of the

- primary network for bicyclists

Here, the circular promenade encircling the old town has a distributing function, being a connecting link - between the bicycle tracks along the main artery roads (outside of the promenade) and the unobstructed thoroughfare through the old town (within the promenade).

- and a secondary network for bicyclists

All residential areas in Münster are 30 zones; dispersion within all residential areas with a connection to the primary network is ensured by attractive traffic-related measures such as bicycle gateways and priority lanes.

Bicycle sign-posting with its 245 km of signage makes use of the entire systematic network offering for bicyclists, being, in addition, linked to the neighbour communities. Tourist bicycle tours with bicycle sign-posting are also offered in Münster.



Germany's largest "bicycle parking garage" is situated in close proximity to Münster's central station. The bicycle station provides 3,300 boxes. Besides, it offers service all about the bicycle: a repair shop, a bicycle washing bay, a bicycle rental outlet, lockers, and much more.

Because of the great success (all boxes are used) a second one will be built at the opposite end of the railway station.



**The bicycle city map newly developed in 2002** implements a novel concept that is unparalleled in Germany in this form. The bicycle track network is developed so well that it comes natural in Münster to have bicycle tracks along the main artery roads. For this reason, only the missing and critical sections are marked in the bicycle city map. The bicycle city map is an indispensable guide for orientation and was reprinted in this bicycle-friendly concept for the



fifth time in 2007. The map is offered throughout Münster's shops and has already become a branded article in high demand.

An authoritative target concept specifically tending to bicycle traffic has been drafted in the **upgrade of the land development plan**. This means:

- closing of gaps in the bicycle track network
- upgrade of the existing infrastructure according to the latest standards
- a sound bicycle traffic infrastructure in development areas
- improved bicycle parking situation
- enhanced road safety for bicyclists
- signage for important bicycle traffic connections in the land development plan.



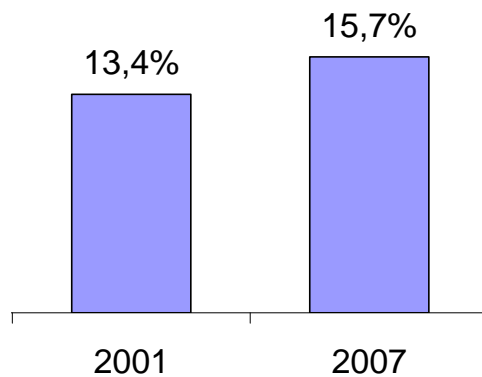
In 2004, the results of the **EU model project BYPAD** could be presented for the guiding principle "Bicycling in Münster in 2010". BYPAD (Bicycle Policy Audit) was instrumental for the analysis and evaluation of the policy of bicycle traffic promotion. It was aimed at readjusting the main action focuses in order to advance and promote bicycle traffic use. In the run-up, measures for infrastructural upgrade and concomitant assessments had been executed as far as possible within 12 years of work since 1992 - as outlined in the 3<sup>rd</sup> reprint of the "Bicycle-friendly city Münster" brochure. A new aspect was the moderated procedure including representatives of the citizenry, politics, municipality, and associations (NGO). Based on concerted consensual discussions, new quality objectives could be framed. An **action guideline with a future perspective up to 2010** was subsequently developed. Focuses are:

- upgrade and maintenance of the bicycle traffic infrastructure
- road safety
- communication, information, and service

Bicycle holidays in Münster and the Münsterland are to be considered as sustainable tourism, enjoying high popularity. One million bicycle tourists are on the road each year (plus 12 million day-trippers). All of them experiencing the bicycle traffic infrastructure in the bicycling park that is the Münsterland. The holiday-makers appreciate these offers. Public houses and hotels have adapted to catering for the bicyclists' needs. There are 715 bicycles for lease in Münster alone; in the Münsterland, it's as many as 4500. Based on the sustainable and health-promoting bicycle tourism offered, approx. EUR 290 million are produced annually. 6000 jobs can be secured directly and indirectly through bicycle tourism.

### 3. Pedestrians

The portion of pedestrians was regressive in Münster for a long time, as was the case in many German cities. However, the trend could be reversed by way of the consistently implemented planning approach of the "city of short distances". Last year's household surveys have documented an increase of the portion of pedestrians in Münster's population since 2001.



Portion of pedestrians in the modal split in Münster  
(results of the household surveys 2001 and 2007)

#### 4. Mobility advice service

At a relatively early stage, the city of Münster decided to inform and advise both its citizens and visitors on choosing an environmentally and climate friendly mode of transport. For this purpose, a mobility centre named “mobilé” – (service centre for a clever transport choice)“ was established in collaboration with the communal transportation company. Here, customers are provided with information on the best travel options, but also on potential alternatives. Further elements of the mobility advice service/offers include:

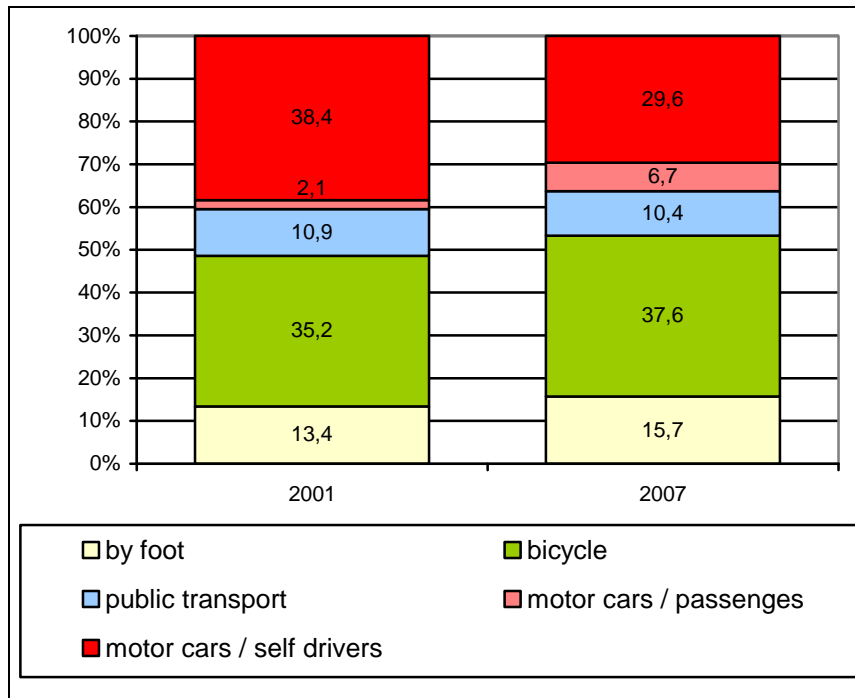
- “Smart number” - information on ÖPNV offers as regards road and rail traffic in North Rhine-Westphalia, accessible under one unified number.
- Job tickets and students’ tickets according to a reduced ÖPNV tariff.
- The road-rail joint tariff in the integrated public transport system Münsterland. With this ticket, all buses and trains can be used within the integrated public transport system. This offer alone has caused, in combination with the job ticket, the passenger volume in the Münsterland to skyrocket.
- The traffic subject bag for school projects. Subjects from the entire traffic field have been prepared in an age-appropriate fashion for traffic education. Teaching staff can borrow this subject bag at no charge, thus allowing them to arouse a consciousness for environmentally friendly transport choices in their pupils at a very early stage.

Another aspect of environmentally and climate friendly traffic planning is the internal mobility management with the municipality of Münster. The 3,200 municipality members of staff have to conduct a great deal of business trips. Here, the municipality of Münster has recognised a considerable potential for savings. The use of private motor vehicles for business trips, which was possible previously, has been restricted substantially. Instead of this, members of staff are urged to draw on the car-sharing offers for business trips. For this purpose, the city of Münster has become member in the Stadtteil-Auto GmbH, the local car-sharing supplier. In addition, staff bicycles have been provided for short distances; a user fee is paid for private bicycles, also the staff can use bus-tickets.

#### Conclusions:

Over the years, the measures pointed out here have led to an increase of ecomobility in Münster to the present 63.6%. Thereof, 15.6% are accounted for by pedestrians, 37.6% by bicyclists, and 10.4% by the ÖPNV (public transport).

In 2007, the proportion of bicycle traffic with 37.6% has surpassed the motor vehicle proportion of 36.4% for the first time. Thus, the pole position in Germany has been further consolidated.



Modal split of Münster's population in comparison 2001 vs. 2007

## 2.3 Please describe planned short and long term measures for (Max 1000 words):

The short term measures should include description of measures adopted, but not yet implemented, and budgets for future measures already adopted.

The long term measures should include a description of planned measures as yet to be adopted by local politicians.

### 2.3.1 Reduction of overall demand for transport

The essential basics for the planning of traffic prevention are:

- the city of short distances,
- developing residential buildings primarily at SPNV stations,
- a good provision of infrastructure in new residential areas by means of bicycle traffic, and
- the very early presence of ÖPNV in new residential areas.

In particular, the latter two aspects are intended to point out, at a very early point, some good alternatives for cars to the inhabitants of a new residential area.

The transport development plan (VEP, Verkehrsentwicklungsplan) is currently being updated in Münster. This is based on a differentiated description of the starting situation, from which concepts and measures are developed to handle the necessary traffic flow in a socially, municipally, and environmentally acceptable manner. Before all other transportation modes within the integrative approach, the potentials of ecomobility are to be particularly emphasised. But the transport development plan does not just specify the targets of transport development; it also frames, as a roadmap, the measures for urban land use planning and the specific implementation level.

The examination of the stipulations established by EU environmental law (noise abatement plan, clean air plans, energy legislation...) constitutes a focal point of the planned VEP Münster 2025. From this, new traffic-related requirements for the overall transport system in Münster can be deduced that are to be specified in the concepts and measures.

Consequently, the objective targets of the VEP are, in particular:

- Improvement of the Modal Split in the city/surrounding area traffic, There are good SPNV/ÖPNV networks; incentives for changing from MIV to ÖPNV/SPNV may be provided based on the corresponding tariffs.
- Consolidation and, if applicable, improvement of the Modal Split of the traffic participants in Münster. The consistent advancement of all ecomobility-compatible modes of transport - bicycle transport, ÖPNV, but also car-sharing and lifts as well as mobility advice services - continues to be the traffic planning target of in Münster.
- Increase in traffic safety,
- environmentally friendly handling of the necessary traffic flows, and
- securing a high-grade main artery road network.

### **2.3.2 Reduction of individual motorised transport / Promotion of less environmentally damaging modes of transport**

The bicycle transport concept 2010 is currently in force, updating the bicycle traffic standard achieved by now. The focal points are:

- development of the (supra-regional) bicycle track network and sign-posting,
- improved bicycle parking offers,
- improved and equivalent signalling for bicyclists,
- traffic safety activities at schools and universities,
- information for new inhabitants, and
- comprehensive public relations.

For the reduction of aerial pollution, the public utility company Münster will procure a total of 35 new buses from 2008 to 2010 which are fitted with the sophisticated EEV technology. Investment costs for active/passive measures in local transport can be but exemplified, since these costs are shared among a multitude of institutions inside and outside the municipality.

Budget:	annual costs for bicycle track maintenance:	approx. EUR 2,2 million
	annual investment costs for the installation	approx. EUR 2,0 million

of new bicycle tracks:

investments by the Stadtwerke in environmentally friendly buses from 2008 until 2010	approx. EUR 11,1 million
--	--------------------------

### **2.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

The General German Bicycle Club (ADFC, Allgemeiner Deutscher Fahrrad-Club), in co-operation with the Union for Environmental Protection and Conservation (BUND, Bund für Umwelt und Naturschutz), conducts the so-called bicycle climate test at regular intervals. Based on this survey, the most bicycle-friendly German city is nominated. After 1991, Münster was also awarded the title in 2003 and 2005 (no surveys were conducted between 1991 and 2003). Furthermore, the General German Automobile Association (ADAC, Allgemeiner Deutscher Automobilclub) awarded Münster - as the only city in the polled area -

the grade *excellent*. Whilst the cyclists themselves are polled in the course of the ADFC test, judgement is delivered by traffic experts in the case of the ADAC survey.

Due to the awards, the town planning office of Münster receives traffic planners from all over the world on a regular basis in order to demonstrate in practice how bicycle transport can be established in a smaller city as a working alternative to the car. For instance, delegations from Florence (Italy), Kristiansand (Norway), and Richfield (USA) came to Münster in 2007. Based on regular surveys, the city of Münster verifies whether the developed concepts and measures were successful in consolidating ecomobility and handling the entire traffic system in a municipally and socially acceptable fashion. Further controls that are well-proven in Münster include:

- mobility analyses within the scope of household surveys every five years on average (1990, 1994, 2001, and 2007),
- standardised ÖPNV passenger surveys (roughly biennial),
- customer satisfaction analyses (biennial with the municipal traffic companies);
- quality management bicycle traffic, BYPAD process (2003, 2004).

**Further information** to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. field report\_2\_NVP.pdf / field\_report\_2\_NVP\_appendix
2. field report-2\_NVP appendix
3. new traffic control system Münster
4. bicycle city map; 2007, 5th reprint
5. brochure: "Signals for bicycle traffic"; 2007
6. brochure "Bicycle capital Münster";2008
7. bicycles in the old town: measures for improving the parking options; foci of bicycle parking, 2005
8. second transit plan\_2.NVP
9. implementation bicycle parking between ideal and reality

**various drafts for the council of the city of Münster, for example:**

10. council guide bicycle-concept 2010.
11. council guide realignment of the transport development plan (VEP 2025)
12. council guide realignment of the transport development plan (VEP 2025) appendix
13. council guide 2. local transport plan Münster 2005
14. council guide traffic management system 2003
15. council guide 2. NVP 2005
16. council guide field report 2.NVP 2008
17. council guide bicycles in the old town 2005

**Additional data is available from the following websites:**

- [www.muenster.de/stadt/stadtplanung/verkehrsplanung.html](http://www.muenster.de/stadt/stadtplanung/verkehrsplanung.html)
- <http://www.muenster.de/stadt/stadtplanung/publikationen-konzepte.html>
- <http://www.muenster.de/stadt/stadtplanung/publikationen-rad.html>
- <http://www.muenster.de/stadt/stadtplanung/publikationen-bus-bahn.html>

### 3. Availability of green areas open to the public

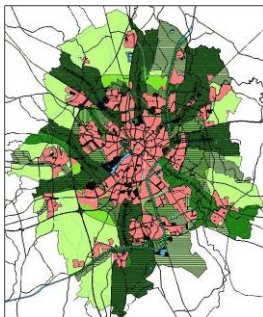
**3.1 Please describe the present situation and the development over the last five to ten years in relation to the percentage of citizens living within 300 m from public green areas and the total of square metres of public green areas (max 1000 words):**



#### **Münster - a green city**

The Promenade, botanical garden, the recreational park around the Aa Lake, numerous municipal parks and green corridors as well as large landscape parks and recreational landscapes provide for a high quality of life in the city. Last but not least, it is the green spaces that make Münster so liveable and loveable.

#### **The green ordinary Münster**



In 1965, Münster was one of the first cities in Germany to establish a green structures policy, a comprehensive conception for the development of open spaces that has a decisive bearing on the urbanistic development. It was advanced constantly - and still is until the present day. When it comes to making decisions as regards the development and utilisation of green areas and free spaces, the green ordinary of Münster constitutes a reliable basis for politics and administration. It provides for the development of green, leisure, and recreational areas as well as the area-wide supply of playgrounds, allotments, and cemeteries. It guarantees the city's ecological and climatic qualities to persist and even be expanded in the future. Furthermore, it is a substantial contribution to the land utilisation plan, thus establishing principles to base decisions on as to which open spaces have to persist at any rate, due to their significance for the city, and which ones are to be developed further.

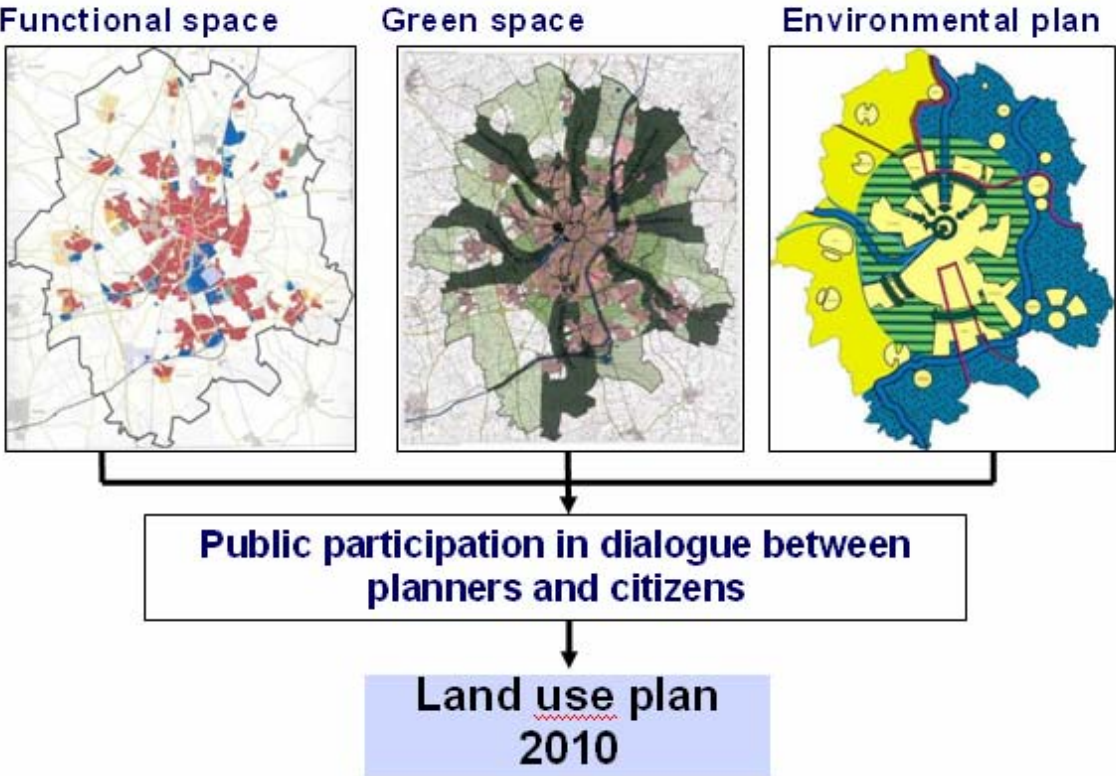
#### **Supply rate of the population with public green spaces**



The green structures policy aims at supplying green spaces according to the population's needs, and as comprehensively as possible. Roughly 95% of the resident population is in the position to reach a green space within 300 m. This is made possible, among others, by the parks, green structures and, in particular, by more than 300 public playgrounds dispersed throughout the municipal area. The few uncovered zones comprise some rather rural border areas of Münster which are directly situated in the so-called "Münsterländische Parklandschaft" - an agricultural man-made landscape characterised by hedges and landscaped elements. And what is more, some 60,000 street trees, contributing to the possibility of experiencing "green" directly in Münster.



# Integrated Strategic Planning System



As far as public green areas (parks, green structures, and playgrounds) are concerned, the supply rate per capita of the population amounts to approx. 14 m<sup>2</sup>. When including the more dedicated publicly accessible green areas (cemeteries, allotments, and sports facilities), this adds up to a per capita supply ratio of approx. 32 m<sup>2</sup>.

**The most important data in brief:**

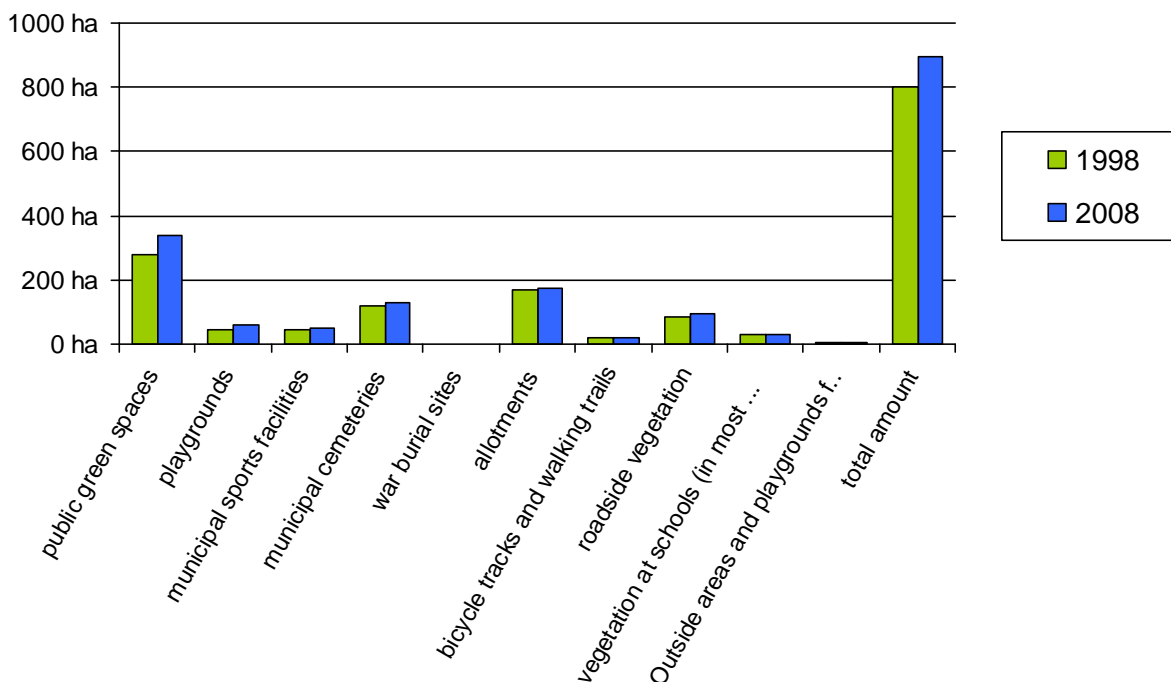
Overall area of all green spaces (2008):	approx. 898 ha
Portion of the resident population at a distance of not more than 300 m from a green area	> 95%
Publicly accessible green area per capita of the population	32 m <sup>2</sup>

**Urban green space development**

In 2004, the council of the municipality of Münster decided to introduce the integrated city marketing and urban development concept, aiming at cultivating Münster into a city with both maximum quality of life and of experience. In terms of this purpose, Münster is perpetually evolving also as regards both size and quality of its green spaces. In this context, the surface of public green spaces and playgrounds has been increasing, within the past decade, by a total of 23%.

Surface area data of all green spaces in detail:

	<b>1998</b>	<b>2008</b>
public green spaces	277 ha	336 ha
playgrounds	46 ha	60 ha
municipal sports facilities	47 ha	49 ha
municipal cemeteries	120 ha	127 ha
war burial sites	2 ha	2 ha
allotments	170 ha	172 ha
bicycle tracks and walking trails	19 ha	21 ha
roadside vegetation	84 ha	93 ha
vegetation at schools	30 ha	31 ha
(in most cases publicly accessible in the afternoon)		
Outside areas and playgrounds for kindergartens	7 ha	7 ha
	<b>802 ha</b>	<b>898 ha</b>



### Green corridors and green belts

In Münster, a systematic approach has proved its value in the projecting of green areas. The green structures policy of Münster defines a system made up of three green belts and seven green corridors stretching radially from the open landscape into the city centre. Moreover, the municipal area is crossed by the Dortmund-Ems Canal, offering, based on its proximity to the city centre, a particular “maritime” potential. This green system is providing for fresh air throughout the city. Additionally, a cohesive network of bicycle tracks and walking trails lets people exploit the offers of recreational facilities and spots of unspoiled nature across the whole area.





With its **promenade**, the **first green belt**, Münster boasts a complete green belt all around the city centre such as hardly any other city of this dimension can offer. The promenade, extending for a full 4.5 km, constitutes the core of the green system. It emerged as a garden after the medieval town fortifications had been razed. Nowadays, it is an outstanding architectural, archaeological, and garden monument. At the same time, the four-rowed lime tree boulevard with its former entrenchments that are landscaped nowadays, constitutes a green connecting link between old town and the adjacent city centre. The green belt offers tranquillity and rest to thousands of people as well as an unhindered track for bicyclists every day - right in the heart of the city.

The **Aa** river flows right through the centre of the old town. Combined with its concomitant bypath as well as an urban ecological trail, the waters offer a space for true natural experience. In addition, numerous squares and gardens in the old town offer excellent opportunities for relaxing.



The connection to the expansive recreational landscapes in the outskirts is established by **seven green corridors**. Based on both natural conditions and historical path connections, they unfurl, in the shape of green wedges, from the open landscape into the city centre. The „Westliches Aatal“ is an ideal type of green corridor, being directly connected with the ring promenade. Within lies the Aaseepark recreational area, which was awarded the title of “most beautiful park in Germany” in 2008. With its large expanse of water and a position oriented to the southwest, the lake also assumes a crucial function in producing a pleasant city climate. From the outside, other landforms protrude far into the city centre, offering rest and experiences of nature at close distance.

The **second green belt** encompasses the open space between the city centre and the outskirts. It links the green corridors on the border of the city centre to each other, acts as a climate belt, and ensures the connection to the Münsterländer Parklandschaft. Twelve individual landforms lie within the second green belt, including landscaped parks and parkways. These types of parks have been consciously tuned to the natural environmental situation. The landscaped parks have been furnished with characteristic elements in the style of the Münsterländische Parklandschaft. The parks offer diverse facilities for sports, games, and recreation; the Wienburg municipal park is considered to be a prime example and was awarded the title “ecological park of the month July” by the Deutsche Umwelthilfe in 2008. The **third green belt** incorporates ample scenic areas on the border of the city centre, thus ensuring the landscape-ecological context.

### Münster as a model



During the European competition “Entente florale” (hosted by the AEF - the European Association for Flowers and Landscape), Münster was awarded a gold medal in 2007 for its commitment to its green structure, which was also a core element in its being voted the

"World's most liveable city" during the LivCom-Award 2004 (hosted by UNEP – the United Nations' Environmental Programm).

### **3.2 Please describe the measures implemented during the last five to ten years aimed at increasing the size and quality of public green spaces (max 1000 words)**

#### **Measures for increasing the green space portion**



The portion of green spaces in Münster is increasing steadily. This is based on the target concept "leisure and recreation" as specified in the green structures policy. According to this, measures such as the construction and/or upgrading of parkways, district parks, and landscaped parks, are being implemented gradually. Moreover, Münster's challenge is also to develop new building areas and supply them with an array of premium green spaces which are integrated with the entire green system.

With the green space portion steadily on the rise, the city of Münster is required to render substantial maintenance and sustenance efforts. For this reason and for the efficient utilisation of municipal resources, maintenance intensity is attuned to the degree of demand. Intensively maintained parks in the city centre are opposed by extensively maintained landscaped parks on the periphery or between the city centre and the suburbs. The flora and fauna also benefit from this, finding their way back into the municipal space. The subsequent overview gives some insight into important elements of the green structure development during the last five to ten years.

#### Green structure development in development areas



In virtually any development of general residential building areas, in part even of industrial real estates, green spaces effective on a small scale are established in the direct living environment. The municipal green structure is made accessible by playgrounds, green links, squares and the associated path connections - directly outside of the front door. For this purpose, the existing population of trees and biotopes is integrated and protected to the largest possible extent.

#### Protection of existing open spaces by means of zoning law

Using the means supplied by zoning law, significant open areas within the green system are protected permanently and prevented from being drawn on for building purposes.

#### Peace park Loddenheide (15 ha)

Green corridor within a high-quality business park in a fallow former military range. Inaugurated by the Dalai Lama in 1998.

#### Landscape park Boniburg (9 ha)

Revitalisation of a historical landscaped park from the 19th century as a nature-oriented recreational facility to be maintained extensively. The old groves, valuable from a dendrological point of view, remained intact. In addition, new sight associations to the Werse river have been created.

#### Landscape park Mecklenbeck and green corridor Mecklenbeck-Mitte (54 ha)

Development of a richly structured parkland including a pathway system on a former agricultural crop land. The park incorporates both landscaped elements including a renaturalised brook, and intensively used sports and leisure facilities.

### Green finger Gievenbeck (17,5 ha)

Creation of a spacious new green corridor with integrating functions between settlement and landscape, offering a plethora of recreational opportunities. The park evolves in a tiered fashion, from the extensively used landscaped portion all the way to an intensively used leisure sports facility including a skater facility in the part close to the settlements.

### Green corridor Offerbach (12,5 ha)

Connection of a district centre with a settlement extension including water renaturation and the integration of ecological compensational measures.

### Hochzeitswald (3 ha)

Plantation of a wood park, the trees of which being donated by bridal couples from Münster.

### Bridle paths

Implementation of 11 pathways with some 34 km of bridle paths until late 2007. Extension by another 7 pathways with 45 km of bridle paths until late 2010.

### Cemetery Angelmodde (2,3 ha)

New installation of a municipal cemetery (1st stage of construction) on the outskirts.

### **Other figures of interest relating to open spaces:**

- 100,000 single trees (60,000 urban street trees)
- 4,670 ha of woods
- 14,900 ha of agricultural areas
- 68 ha of compensational spaces for building areas/biotopes
- 890 ha of water surfaces
- 8,770 ha of landscape conservation areas
- 2,010 ha of nature protection areas and protected landscape elements
- 1,700 ha of FFH areas and bird sanctuaries
- 330 natural monuments

### **Measures for improving the quality of existing green spaces**



Beside the quantitative setting, the high quality of the green areas is a significant concern of the municipality. The foundation stone for a high-quality green space adjusted to the needs is laid as early as during the projecting stage. Here, the future users are involved in the planning in an early phase. In particular, children's and adolescents' demands are accounted for - as well as the needs of handicapped persons. This gives rise to playgrounds and green spaces that are both appropriate for children and barrier-free. Utilisation of environmentally friendly materials is a matter of course here.

The persistent quality of the green spaces can be ensured only by high grade maintenance and sustantation, which is guaranteed by a modern green space management by the Office of Green Space and Environmental Protection. An annual budget (product costs) of approx. EUR 9 million is dedicated to the maintenance of the municipal green spaces. The following paragraph gives an overview of the wide variety of measures during the past years that aimed at sustaining, improving, and restoring green space quality.



### Rearrangement Engelschanze

Representative rearrangement of a historically founded parkway adjacent to the promenade. Carried out in 2003/2004, this measure is a part of the comprehensive redevelopment of the promenade, the main focus of which was as early as in the 1980ies.

### Extensions Wienburgpark

The Wienburgpark is an attractive recreational area for the northern suburbs of Münster. Several years ago, a sports and leisure area for adolescents and young adults was established at the western border of this ecological parkway. Recently, the park was granted an award by the Deutsche Umwelthilfe.



### Aasee-Park

The Aasee-Park, being of importance for Münster, is constituted by the Aa Lake and its precincts. During the last years and decades, it has been continuously developed further and adapted to the various user requirements. Through the construction of the "Aaseeterrassen", a representative entry area to the park was developed just recently, including a lake stage, aquatic sports facilities, and gastronomy. In 2008, the Aasee-Park was nominated "most beautiful park in Germany".

### Playground redevelopment

High visitor flow and acceptance is assured by the continuous reconstruction of the playgrounds. For this reason, numerous playgrounds are refurbished with new equipment and adapted to the respective requirements - year by year. Playground sponsors attend to "their" playground, feeling accountable for it.



### Münster takes a stand

Contribution of the city of Münster within the framework of the "Entente florale" competition (hosted by AEFP – the European Association for Flowers and Landscape). Upgrading of both municipal and private green spaces on the basis of high civic commitment.

### Project Citizen Trees (Promenade/Castle)

Plantation of 210 large trees (*Tilia cordata*). The trees were all donated by citizens of Münster so as to eliminate damages wrought by the hurricane Kyrill (value: EUR 210,000).

### Sculpture projects 2007

Integration of the international art exhibition staged decennially since 1977 in public green areas. The permanent sustenance of numerous sculptures in the public space is giving rise to an open air art collection that is equalled by none other in Germany.

### Green area sponsoring (2007/2008) "With Growing Enthusiasm"

Münster-based enterprises support efforts made by the municipality for the benefit of a green image. So far, in excess of EUR 200,000 have been procured by them for green area redevelopment and maintenance.

### 3.3 Please describe planned short and long term measures for the establishment of green areas open to the public (max 1000 words):

The short term measures should include description of measures adopted, but not yet implemented, and budgets for future measures already adopted.



The long term measures should include a description of planned measures as yet to be adopted by local politicians.

Münster uses a variety of planning instruments in its resource-conserving, environmentally friendly city development, including its renowned "Grünordnung". In conjunction with the Land Use Plan 2010, already in effect, the "Raumfunktionales Konzept 2010" (Functional Space Concept Münster), the Altstadt Framework Plan and the city's Environmental Plan, a wealth of comprehensive planning concepts are available to Münster for its long-term spatial development.

#### **Short-term measures**

The projected short-term and long-term measures are based on the principles of the green structures policy of Münster. They aim at the development of green, leisure, and recreational areas as well as the comprehensive supply of playgrounds, allotments, and cemeteries. At the same time, they guarantee the ecological and climatic qualities of the city to persist and even be expanded in the future.

The following measures will be implemented at short notice or are already under construction.

#### Park house Sentmaring

Rearrangement and opening of a 19<sup>th</sup> century parkway which had formerly been part of a monastery and was heavily battered by hurricane Kyrill.

#### Green connection Kleihorststraße/Weseler Straße

Creation of an inner-city green corridor with link to the Aasee-Park and ecological upgrade of a water while incorporating playgrounds.

#### Parkway Kinderbachtal/Gievenbeck

Foundation of a parkway in the western municipal area including intensive and extensive recreational areas. Ecological upgrade of the areas.

#### District park Wolbeck

District-associated parkway in the surroundings of the course of a stream, critically linking development areas to the centre.

#### Landscaped park Lütkenbeck

Development of a landform in the eastern municipal area for recreational activities, implemented by the construction of a path network as well as supplementary playgrounds and leisure facilities.

#### Landscaped park Vennheide

Development of a landform in the southern municipal area for recreational activities, implemented by the construction of a path network as well as supplementary playgrounds and leisure facilities.

### Landscaped park Lechtenberg

Construction of a landscaped park in the southern municipal area without any intensive infrastructural installations. Upgrading of the ecological connections and development of the footways and bicycle tracks.

### Utilisation concept Aasee

Adaptation of the Aasee-Park to the increased pressure and changed patterns of use. Structural enhancements such as a connection to the landscaped park Mecklenbeck situated to the west.

The total budget for each categorie can only be exemplified. There are many different departments and institutions in Münster contributing money and manpower. A lot of them do not belong to the City of Münster, so we do not know exact figures.

### **Budget:**

annual product costs for green spaces maintenance:	approx. EUR 9 million
annual investment costs for the installation of new green spaces from 2009:	approx. EUR 4 million

### **Long-term measures**

The following projected measures are based on the green structures policy of Münster: By the integration into the land development plan that is binding for public authorities, the development objectives for these plannings have been drafted precisely. No tangible implementation horizon can be identified for the time being.

### Parkway Hoppengarten/Mauritzheide

Parkway with intensively usable facilities such as playgrounds for all ages, supply of green spaces to the adjacent residential quarters.

### Landscaped park Sentrup

Projected landscaped park in the western municipal area with connection to three districts. The landform is intended to be developed more comprehensively for recreational purposes, being enriched with dedicated green areas (such as cemetery, allotment).

### Landscaped park Gasselstiege

Supplementation of the existing leisure and recreational centre by public green spaces (playground, parkway) while keeping a smooth transition to the landform.

### Landscaped park Gremmendorf/Angelmodde

Projected landscaped park in the eastern municipal area with connection to two districts. Optimisation of the development associated with a fairground and optionally further leisure and recreational installations.

### Landscaped park Loddenheide

Projected landscaped park in the south-eastern municipal area with connection to three districts. Internal development including footpaths and bicycle trails, bridging over the Dortmund-Ems Canal.

### Landscaped park Kanalinsel

Projected leisure and recreational centre in the Hilstrup district. Supplementation to the existing recreational area Hiltruper See.

### Various district parks

District parks conduce to near-residential recreation within or at the border of the living quarters. There are long-term plans for approx. 5 of such parkways.

### **3.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

The activities of the municipality of Münster in projecting, installing, and maintaining its green spaces can be documented based on comprehensive plans, reports, political decisions, and interviews as well as a comprehensive presentation in the internet.

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. business report 2007.pdf
2. Entente Florale Gold Medal.pdf
3. LivCom Award 2004.pdf
4. Gruenordnung Recreation system.pdf
5. Gruenordnung Green structures policy.pdf
6. Gruenordnung conservation system.pdf
7. Gruenordnung nature areas system.pdf
8. Green spaces 300meters.pdf
9. natural cemetery.pdf
10. public relation campaign exampel.pdf
11. playgrounds 2007.pdf
12. Wedding forrest.pdf
13. puplic relation example Green FingerGruener.pdf
14. lecture environmental plan-ppt (engl.).pdf
15. Green Ecological businesspark.pdf

Additional data is available from the following websites:

<http://www.muenster.de/stadt/umwelt>

<http://www.muenster.de/stadt/farbe/>

<http://www.muenster.de/stadt/livcom/index218.htm>



## 4. Quality of ambient air

4.1 Please describe the present situation and development over the last five to ten years in relation to(max 1000 words):

4.1.1 Number of days per year EC limit values were exceeded for PM10 (daily mean)

4.1.2 Number of days per year EC limit value/long term objective was exceeded for ozone (8h mean)

4.1.3 Annual mean concentration of NO2 and PM10

The air quality in Münster is polluted with nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>), just as in many other major European cities. In Münster, measurements and mappings have been carried out for many years by the North Rhine-Westphalia State Agency for Nature, Environment, and Consumer Protection (LANUV), the Westphalian Wilhelms-University, and the municipality of Münster in order to collect data on air pollution situation and its spatial distribution. These findings are used for measures as to air pollution control that are tailored to fit the various sources of air pollution, and for urban development. In particular, the nitrogen dioxide (NO<sub>2</sub>) pollution is considerably higher in the surroundings of some specific roads.



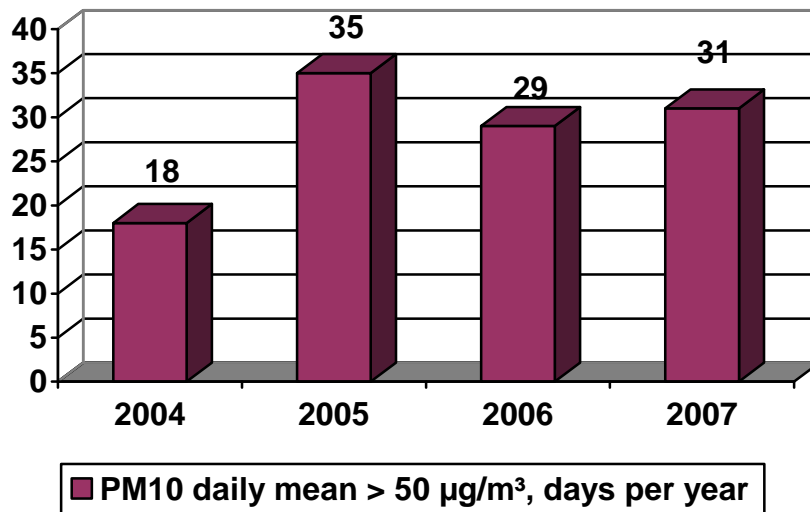
Air pollution in Münster is caused, to a large degree, by road traffic. During the past years, pollution due to some traffic-related pollutants has levelled off in Münster at a high level; this is due to the increase in road traffic. In 1987, an air measuring station was introduced to monitor urban air pollution. As a first step, a rough screening of air pollution along the main road network in Münster was carried out in the 1990ies. At that time, noxious substances such as benzene, diesel soot, and nitrogen dioxide were in the main focus of attention. As a second step, a precision screening was performed for more critical sectors, calculating immissions more accurately on the basis of a pollutant diffusion model. On the one hand, the results provided guiding principles for overall spatial planning; on the other hand, they constituted the basis for the measuring stations installed in the third stage.

### Results of the aerial pollutant measurements

1. Particulate matter/PM<sub>10</sub>

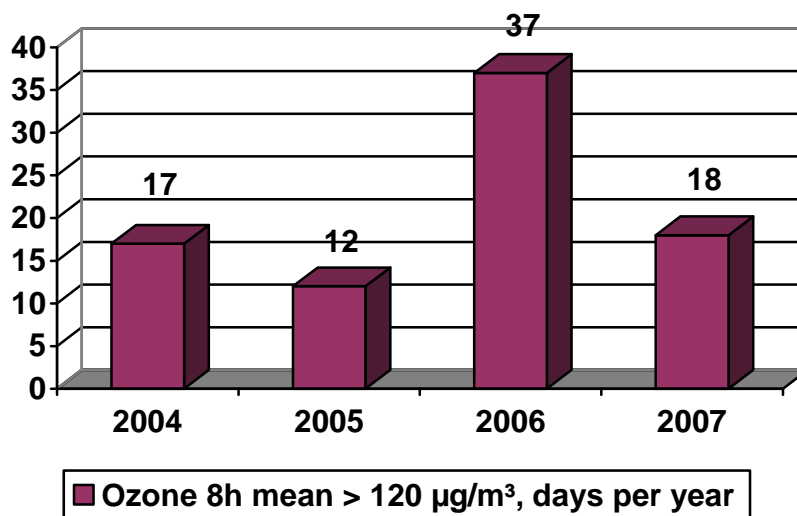
For PM<sub>10</sub>, an EU daily limit value of 50 µg/m<sup>3</sup> has been applicable since 2005. This value may be exceeded on a maximum of 35 days annually. This hasn't happened in Münster until now. In the year 2007, the limits were exceeded 31 times at the "Weseler Straße" traffic measuring station (traffic hot spot). Since this frequency is veering toward the threshold to the limit value, this pollutant is accounted for within the scope of the conceptual designs for reducing air pollution in Münster.

The annual mean value for PM10 of  $40 \mu\text{g}/\text{m}^3$  has been clearly complied with so far (2002:  $34 \mu\text{g}/\text{m}^3$ , 2007:  $32 \mu\text{g}/\text{m}^3$ ).



## 2. Ozone

The 8h mean value for ozone as measured at the urban background station "Münster-Geist" exceeded the target value  $120 \mu\text{g}/\text{m}^3$  as specified in the DIRECTIVE 2002/3/EC on 37 days in the year 2006. Apart from that, the target value could clearly be adhered to in the last years.



## 3. Nitrogen dioxide

In 2007, the annual mean value for nitrogen dioxide was  $64 \mu\text{g}/\text{m}^3$  at one point in Münster at the "Weseler Straße" traffic measuring station (traffic hot spot). Thus, the limit value including a tolerance margin of  $46 \mu\text{g}/\text{m}^3$  (22nd BImSchV) was clearly exceeded in the year 2007. For this station, there are no measurements available from past years. The value confirms, however, the screening-based calculations. Thus, nitrogen dioxide turns out to be the current major pollution factor for Münster in a few hotspots.

## 4.2 Please describe the measures implemented in the last five to ten years in order to improve air quality, including for example (max 1000 words):

### 4.2.1 Existence and level of implementation of an air quality management plan

### 4.2.2 Information to the public (both inhabitants and tourists) on air quality levels (e.g. web pages, information screens) in order to increase awareness and change behaviour.

Prior to the coming into effect of the EU directives, there was no legal obligation to draw up a formal clean air plan. Nevertheless, the municipality of Münster has voluntarily undertaken comprehensive measures for improving the air situation. The below-mentioned measures will also assume an important role in the clean air planning initiated in 2008. Furthermore, they are supplemented with additional measures so as to get a grip on the specific pollution factors in Münster.

#### Previous and ongoing measures

- establishment of a municipal air measuring station at Stadthaus 1,
- ozone warning service including introduction of a free environmentally friendly ticket for use with the local public transport in case of ozone alarms,
- persistent promotion of bicycle traffic and local public transport for improving the ecomobility share in the Modal Split,
- furnishing of streets with light-signal systems fitted with traffic-adaptive controls; the objective is to steady motor car traffic in order to minimise pollutant emission,
- furnishing of the local public transport (buses) and the garbage collection trucks with an exhaust fume standard (EEV standard) considerably exceeding the legal emission standard. The modern buses of the public utility company of Münster are all equipped with highly effective exhaust gas cleaning systems and run on sulphur-free Diesel. The most recent technology is called "AdBlue" and operates on the basis of a non-toxic urea solution. Beside particulate matter, it helps especially in reducing nitrogen oxides by up to 85%. This technology already conforms to **the Euro 6 standard** which will probably become obligatory in the year 2013.
- Specification of emission standards for the initial purchase of vehicles in the procurement guideline of the city. The city of Münster also relies on car sharing for official trips,
- ECOPROFIT - a co-operative project between the commune and the economy contributing to environmental relief and cost reduction for enterprises. The consulting and qualification programme with its modular structure supports businesses of all types and sizes in introducing and improving an internal environmental management.



#### Gas and steam turbine cogeneration plant



The city of Münster has been running a state-of-the-art combined heat and power plant (gas and steam turbine cogeneration plant) since 2006, replacing the previous coal-fired power plant. Energy production in the gas and steam turbine cogeneration plant works based on the resource-friendly principle of combined heat and power generation. In conventional condensation power stations, heat accrues as a "waste product" and is not exploited.

Quite different as far as the cogeneration plant in Münster is concerned. Here, power is produced by means of two gas turbines, one steam turbine, and the associated generators. The heat accruing from the cooling circuit and the flue gas is not just released to the environment as a "waste product", but is used as a valuable form of energy. By combining power generation and heat recovery, an unrivalled efficiency factor of 88% is achieved, with the dust emissions being reduced by almost 90 percent by the conversion of the fuel from coal to gas.

The building alterations of the combined heat and power station of the University of Münster (2003) has also decreased immission load.

### **Public relations**



In Münster, the population has been informed on the current air status for many years. While this was done by way of press releases via the local media as well as quarterly reports in the 1990ies, air quality values collected by the air monitoring stations in Münster are nowadays available on the internet, both as statistical values and as up-to-date half-hourly values.

But the city is also undertaking small-scale measures to improve the air situation. These include regular consultation hours where citizens can turn to experts from the administration department for advice, e.g. about the proper use of heaters and furnaces.

### **4.3 Please describe planned short and long term measures for improvement of air quality (max 1000 words):**

The short term measures should include description of measures adopted, but not yet implemented, and budgets for future measures already adopted.

The long term measures should include a description of planned measures as yet to be adopted by local politicians.

#### **Clean air plan Münster**

A clean air plan is currently being drawn up for the city of Münster as the most important element for a sustainable air quality improvement. This is necessary, since in 2006, exceeding of the NO<sub>2</sub> limit value in force was identified in the course of immission measurements carried out by North Rhine-Westphalia State Agency for Nature, Environment, and Consumer Protection (LANUV).

The competent district government Münster has installed a task force for the elaboration and set up of the clean air plan Münster. Therein, the following institutions are represented: the LANUV, the concerned departments of the municipality of Münster and the district government Münster as the supreme road traffic authority, the State Enterprise Road Construction NRW, the public utility company Münster, the competent chamber of commerce and industry, the Westphalian Wilhelms-University, and the National Office of the Nature Conservation Organisations NRW. The police headquarters Münster will participate in the further elaboration. The specification of the projected measures is carried out under broad participation of the public.



The clean air plan is currently in the design phase and is anticipated to be passed in the year 2009. The aim is to specify, after comprehensive analysis of both pollution situation and pollution factor, an appropriate package of measures so as to avoid the persistent exceeding of the permissible limit values in the years to come, in particular for the noxious substance NO<sub>2</sub>. Adequate measures remain to be developed in co-ordination with the ongoing traffic development planning.

As a matter of course, the successful measures initiated by the city of Münster to reduce the pollution will be integrated into the conceptual design. For example, the city of Münster is both nationwide leader in bicycle traffic (highest share of bicycle traffic in Germany) and federal capital in climate protection 2007 (cf. local transport/climate change).

### Measures within the scope of the clean air planning



Development of the air quality in Münster is pursued systematically, based on the clean air plan and the traffic development plan; measures for air quality improvement are developed and implemented. The clean air plan Münster is currently being set up and will become legally binding in 2009. In its draft, it specifies a package of measures that are principally suited to reduce air pollution. These remain to be assessed by the authorities and political panels involved. Examples from the package of measures:

- traffic control by means of overall spatial planning
- designation of a low emissions zone with traffic limitations
- optimisation of the parking space management
- traffic-adaptive control, “green wave”
- speed limit
- setting up/updating of an itinerary concept for lorries
- promotion of the local public transport (ongoing)
- further optimisation of vehicle technology within the scope of local public transport
- promotion of vehicles incorporating natural gas technology
- promotion of bicycle traffic
- promotion of pedestrians
- development of car sharing
- improvement of construction site logistics (requirements for demolition etc.)
- intensified controls by police authorities
- information about existing promotional possibilities and public relations regarding the subject areas climate, air, and energy

Further measures entailing positive consequences for air pollution control in Münster can also be gathered from chapter 1 (local climate protection) and 2 (local transport). The measures outlined there develop synergies which have a significant impact on air quality as well.

Investment costs for air protection measures can be but exemplified, since these costs are shared among a multitude of institutions inside and outside the municipality.

The ongoing clean air planning will result in a tangible package of measures from the year 2009. Currently, expenses cannot be specified yet. The already specified investments in an environmentally friendly bus fleet show in an exemplary manner that the air quality subject is addressed vigorously in Münster.

**Budget:**

Product costs for air pollution control in office for green spaces and environmental protection per year: (mainly man power)	approx. EUR 61.000
Example investment costs: investments by the public utility company in environmentally friendly buses 2008 to 2010	EUR 11.1 million

**4.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

Measures for air quality improvement are bundled and documented in the clean air plan and the traffic development plan. The documents may constitute a basis for the second phase of the evaluation. Irrespective of this, all of the above-mentioned measurement readings and measures can be corroborated based on documents.

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. council order PM10 2008.pdf
2. dissertation PM10 2008.pdf
3. dissertation PM10 2007.pdf
4. dissertation PM10 2006.pdf
5. Final report PM10.pdf
6. council order ozon situation 2003.pdf
7. council order air quality 2003.pdf
8. council order air analysis.pdf
9. climat atlas 2000.pdf
10. report measure catalog 2002.pdf
11. report air analysis2001.pdf
12. council order ambient air.pdf
13. council order air quality 1998.pdf
14. GUD-steam and gas facility flyer.pdf
15. public utility company business report 2007.pdf
16. public utility company environmental declaration 2007.pdf

Additional data is available from the following websites:

<http://www.muenster.de/stadt/umwelt/luft.html>



## 5. Noise pollution

**5.1 Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):**

**5.1.1 Share of population exposed to noise values of L (day) above 55 dB(A)**

**5.1.2 Share of population exposed to noise values of L (night) above 45 dB(A)**

### **Noise - an issue in Münster**

The most significant source of noise in Münster is road traffic. Loads in excess of 70 dB (A) during the day and 60 dB (A) at night, respectively, may occur, particularly in the city centre and along the main roads. The highest noise levels due to road traffic occur at times of weekday commuter traffic. The large number of commuters in Münster is one cause. Noise abatement has been given high priority in Münster for years. The city, in keeping with the national and European Immission Protection Act, has advanced analyses and plannings for noise protection over the past years.

### **Noise reduction planning**

As one of the first communities in North Rhine-Westphalia, Münster initiated investigations pertaining to noise reduction planning (according to the Federal Immission Protection Act) in 1997. Results and experiences have been incorporated into the work of the federal state of North Rhine-Westphalia. For Münster, these data have turned out to be a valuable basis for evaluation as regards:

- issues of immission control in urban development plannings,
- environmental impact assessments and approval procedures,
- large scale plannings within the city area, thanks to the almost area-wide approach of the noise reduction map.

### **Results in 2000:**

in the daytime (6 a.m. - 10 p.m.):	approx. 88,000 residents living in houses with at least one façade being exposed to a noise level <b>in excess of 55 dB(A)</b>
at night (10 p.m. - 6 a.m.):	approx. 113,000 residents living in houses with at least one façade being exposed to a noise level <b>in excess of 45 dB(A)</b>

### **B. Noise level mapping according to the Guideline for Community Noise**

In the federal state of North Rhine-Westphalia, the city of Münster ranks among the communities for which noise immissions at main roads are being mapped (according to the guideline for community noise/RL 2002/49/EC). In the process, only such areas are being determined where noise exposure is particularly high (roads > 6 million motorcars/year). Based on this, a noise action plan is developed.

**Results in 2008 (areas subjected to major exposure only):**

in the daytime (6 a.m. - 10 p.m.) approx. 25,000 residents living in houses with at least one façade being exposed to a noise level **in excess of 55 dB(A)**

at night (10 p.m. - 6 a.m.) approx. 20,000 residents living in houses with at least one façade being exposed to a noise level **in excess of 45 dB(A)**

The figures from 2000 and 2008 should not be compared directly, since they refer to different periods of investigation; furthermore, evaluation periods and calculation methods are divergent. Even though the numbers aren't comparable in detail, they show a clear tendency of noise reduction.

**Data and facts:**

Share of the residential population exposed to loads >55 dB(A) daytime/45 dB(A) at night (road traffic).

2000 (noise abatement planning high coverage)	30 %	40 %
2008 (community noise only main artery roads)	9 %	7 %

**5.2 Please describe the measures implemented during the last five to ten years in order to reduce noise (max 1000 words):**

Some 10 years ago, noise abatement planning was introduced in Münster, an area-specific instrument for noise abatement, in order to cope with the noise problem. Being a strategic planning, it is clearly different from the installation-specific approaches of traffic and approval plannings. Plannings comprise the sources of noise in road and railway traffic, business and industrial complexes as well as sports and leisure facilities.

Pre-emptive noise control has been implemented into the procedures of the preparative and authoritative urban land use plannings and proceedings on the granting of permission for many years now, and it is enforced also. The city of short distances and a residential development in particular at stations of the regional rail network constitute principles of planning that have been implemented in the current land development plan. The traffic planning of the city of Münster is just as important an element in noise control as is urban land use planning (see chapter 2: local transport).



In Münster, more than 150 municipal residential areas were transformed into 30 Kmh-zones by the late 1990ies. In addition, there are several, often more recent building areas that incorporate zones with traffic-calming devices. In this manner, the objective of area-wide traffic calming for all major and coherent residential areas within the city centre and the suburbs has been realised. The measures package of the municipality of Münster also includes the introduction of a traffic management system ensuring fluent traffic at low speed levels along the major axes.

Further measures for abating noise exposure in Münster include:

- monetary support for the installation of soundproof windows along the most heavily affected main artery roads during the past five to ten years
- financing of soundproof windows and, as the case may be, ventilators by the municipality of Münster if a corresponding legal entitlement exists
- high-grade asphalt coating for the main road network
- noise control investigations in the course of road reconfigurations

- construction of noise protection installations in connection with the implementation of the urban land-use plans
- installation or improvement of the noise control measures (noise protection walls) at highways in the course of road construction
- furnishing of the A1 federal motorway with noise control measures in the course of the six-lane upgrade in the area of existing and projected residential areas
- noise reduction measures at heavily used railways (Deutsche Bahn)
- consistent boosting of the share of local public transport as well as of bicycle and pedestrian traffic in the Modal Split.

In order to tackle the diverse tasks within the scope of immission control and, in particular, of noise protection, the municipality of Münster considerably increased personnel to currently eight persons, who are directly concerned with the immission/noise control subject.

The most important measures of the past five to ten years in brief:

- development of a strategic plan for noise abatement
- implementation of noise control into overall spatial planning
- orientation of the city planning according to the “city of short distances” principle
- promotion of the share of local public transport as well as of bicycle and pedestrian traffic in the Modal Split
- introduction of a traffic management system
- installation of noise protection structures as a precautionary measure
- support of the citizens in the implementation of individual measures
- consistent public relations
- establishment and upgrading of a competent environment management

### **5.3 Please describe planned short and long term measures aimed at reducing noise (max 1000 words):**

The short term measures should include description of measures adopted, but not yet implemented, and budgets for future measures already adopted.

The long term measures should include description of planned measures as yet to be adopted by local politicians.

Based on a solid foundation, the municipality of Münster intends to further reduce noise exposure by way of short term and long term measures in the future. The prospective measures rest upon an integrative and synergistically acting approach - to an even broader extent than before. In a first stage (analysis phase), the main problem areas and methods of resolution are identified before tangible measures (action plan) are pointed out and realised in a second stage. The noise problem is to be resolved in tight connection with air pollution and traffic development.

In the short term, the successful package of measures for noise control will be continued in the years to come. For this purpose, the necessary funds will be made available in line with the requirements. Additionally, highly effective instruments such as a traffic management system with network-adaptive control will be introduced to liquefy the traffic flow (see also local transport).



Changes effective on a long-term basis will be substantiated in connection with the strategic plannings of the transport development plan (VEB), the clean air plan, and the noise action planning of the 2nd stage. Currently, the transport development plan is being updated in Münster. This is based on a differentiated description of the starting position, from which concepts and measures are developed to handle the necessary traffic flow in a socially, municipally, and environmentally acceptable manner.

Within the integrative approach towards all means of transportation, the potentials of ecomobility will be particularly emphasised here. The examination of the stipulations established by EU environmental law (noise abatement, air pollution control, energy...) constitutes a focal point of the planned VEP Münster 2025. The plannings concerning ambient noise and the clean air plan initiated simultaneously comprise a description measurement peaks, analysis of those responsible, consideration of the anticipated development of the exposure situation, and the identification of appropriate measures. 2nd stage noise action planning will be concerned in particular with traffic control measures. Key issues of the above-mentioned plannings include, moreover, traffic management improvement, ecomobility shift, and an increase in the share of local public transport. Concerning the clean air plan, the passing of a resolution is intended for 2009, and for 2010 concerning the transport development plan. The noise action plan will be issued for decision-making by the council of Münster in 2013.

The most important short term and long term measures in brief:

- continuation of the proven package of measures
- establishment of a noise action plan
- re-establishment of the transport development plan
- strategic measures for traffic control
- introduction of a traffic management system
- public relations, e.g. "Anti-noise day".

The total budget for each categorie can only be exemplified. There are many different departments and institutions in Münster contributing money and manpower. A lot of them do not belong to the City of Münster, so we do not know exact figures.

**Budget:**

Product costs for noise control only for the office for green spaces and environmental protection: (without investment costs)	approx. EUR 60,000 EUR/a
Example: annual investment costs for noise control by the Civil Engineering Office:	EUR 0.8 million
Example: investment costs for noise control A1 motorway by "Roads NRW" until late 2008:	EUR 10.4 million

**5.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

The activities of the municipality of Münster as regards noise protection can be documented on the basis of comprehensive reports, political resolutions, and surveys. At the same time, the surveys serve the evaluation of the objectives, e.g. with a view to ecomobility consolidation.

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. council order noise reduction plan.pdf
2. public relation example noise the problem.pdf
3. report noise reduction 2007.pdf
4. council guide realignment of the transport development plan (VEP 2025).pdf

Additional data is available from the following websites:

<http://www.muenster.de/stadt/umwelt/laerm.html>

## 6. Waste production and management

### 6.1 Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):

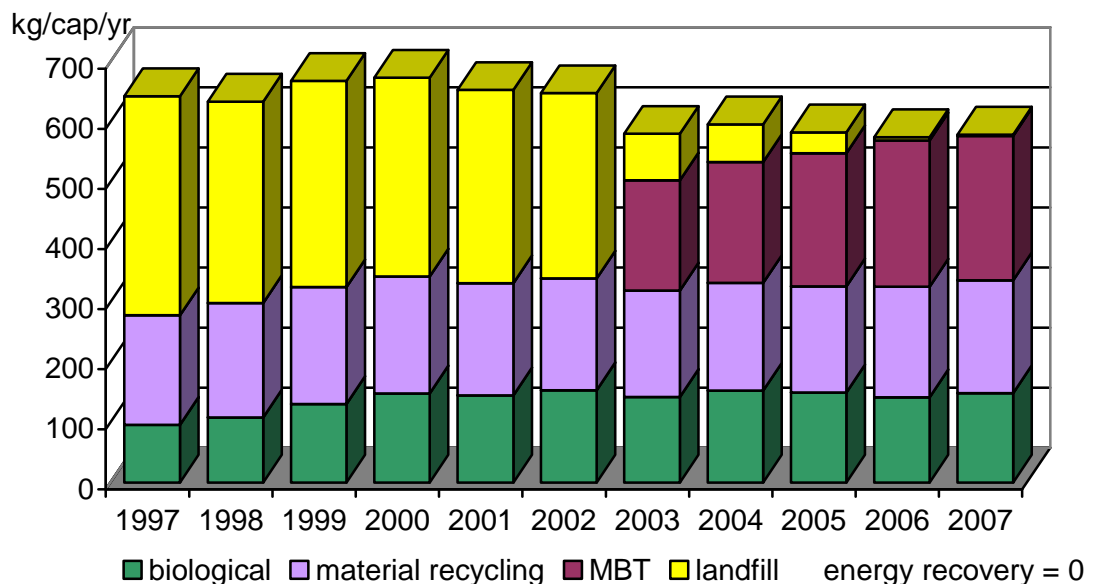
#### 6.1.1 Amount of waste per capita



In 1996, the largest portion of waste was still deposited on waste heaps. Based on its waste management concept, the city of Münster intended to put an end to this, also in order to comply with the legal requirements. Ten years later, this has been accomplished: In 2006, 83,000 tonnes less waste was deposited as compared with 1996. In return, the utilisation ratio has increased from 50% to 84%. This is due to two causes:

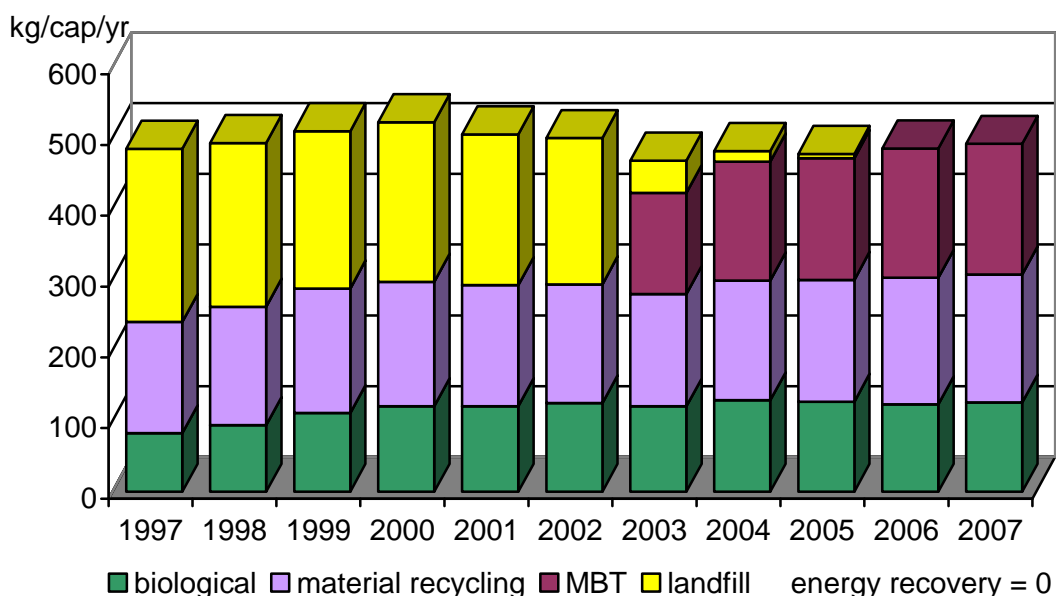
- Development of a system for differentiated collection directly in the premises. Biowaste, paper, and packaging are directly separated by the citizens of Münster. This is supplemented by recovered glass waste collection and the possibility to deliver one's waste to as many as 10 recycling centres. In this manner, the accrued quantities of residual waste are a priori substantially lower than in 1996.
- The mechanical-biological waste treatment plant (MBT). Here, further recyclable material is extracted from the accruing residual waste, leaving reduced quantities of material to be deposited - which is, moreover, polluted to a lesser extent.

In relation to waste generation (municipal) per capita, specify:





In relation to waste generation (household) per capita,specify:



Construction rubble is not included in these figures. It is treated in two private sorting plants (approx. 100.000 tonnes/year) and utilised as recycling construction materials.

### 6.1.2 Proportion of total/biodegradable waste sent to landfill

From as early as 2003, residual waste has been passing through the first treatment step, the mechanical preparation of MBT, in which potential recyclable material is sorted out. In 2006, also the biological stage entered into year-round full operation. Thus, the quantity of residual material to be deposited could be further reduced in 2006, although the total accumulation of municipal waste had slightly increased in comparison to 2005.

This has resulted in an impressive drop in the proportion of total waste to be deposited, as well as of biodegradable waste sent to landfill.

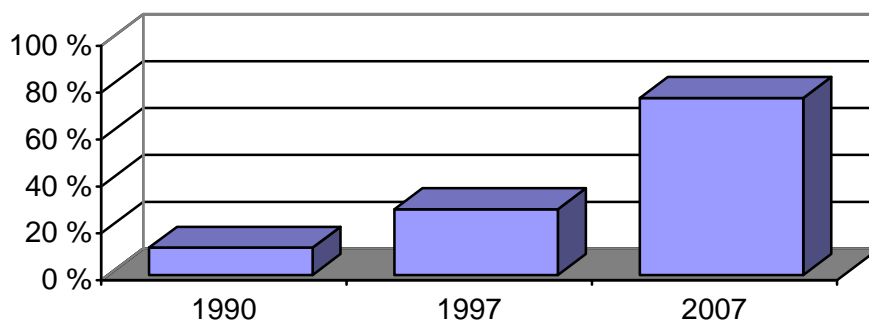
Proportion of biodegradable waste sent to landfill:

Landfill biodegradable waste											
year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
biological %	4,3	1,8	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Due to the residual waste being pre-treated, including the fermentation of the biogenic substances, no biological substances are deposited any more. The proportion of total waste sent to landfill can be seen in the graphic "municipal".

### 6.1.3 Percentage of recycled municipal waste

Neither does the development as regards recyclable municipal waste fail to impress:



Specify percentage of packaging of municipal waste:

packaging recycling / incineration											
year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
recycling %	12,5	13,3	13,0	13,0	13,2	13,6	14,5	13,8	14,1	14,7	14,0
incineration %	0	0	0	0	0	0	0	0	0	0	0

#### Collection of hazardous waste

The collection of hazardous household waste is carried out via the area-wide network of recycling and recyclable waste facilities. During the opening hours, the collection takes place via a mobile collection system for toxic substances (except Eulerstrasse and Zum Heidehof). Small businesses have the additional option of disposing of waste on the premises of the AWM at the Rösnerstrasse.

In addition to this, the collected problem waste will be temporarily stored on the premises at Rösnerstrasse in two interim storage facilities until the final disposal in compliance with the legal requirements.

The disposal and/or recycling of the individual problem waste is carried out in co-operation with private waste management companies.

#### Electronic Waste

Due to the Electronic and Electrical Act which came into force, the manufacturers of mobile and old appliances are obliged to remove the goods free of charge.

Any person from a private household who owns an old appliance may deposit such appliances at the recycling centres which are located in the city of Münster. Furthermore, large electric appliances are collected together with the bulky waste directly at the premises on a monthly basis.

Five different types of appliances will be accepted separately at the collection points:

- Large household appliances such as washing machines, stoves, etc.
- Small household appliances such as toasters, vacuum cleaners, electric toothbrushes, alarm clocks, etc
- Entertainment equipment such as radios and televisions, video recorders, cameras,
- Information and communication equipment such as notebook computers, telephones, answering machines, computers and printers.
- Refrigerators, iceboxes and neon-lamps

### **End-of Life Vehicles**

All entities involved in the disposal of end-of-life vehicles are obliged by the corresponding regulations (Regulations on End-of-life Vehicles) to take into consideration concerns of environmental law.

The owner or last registered keeper of an end-of-life vehicle to be disposed of may relinquish it to a certified establishment only (point of acceptance, dismantling company, shredding company) for subsequent utilisation.

Such companies are required to allow for all concerns of environmental law by complying with the requirements defined in the appendix of the Regulations on End-of-life Vehicles. Such companies are attested compliance with these requirements by an independent approved certifier.

The owner/last registered keeper is delivered a certificate of utilisation documenting the proper disposal, which is to be supplied to the authorities on request.

Any infringements are defined as administrative offences and punished by a fine.

These requirements ensure that end-of-life vehicles are properly disposed of and a high percentage of the components ( $\geq 80\%$  weight per cent) is utilised.

Implementation and supervision of these regulations is carried out by the lower waste authority in the Office of Green Space and Environmental Protection.

### **Used batteries**

Due to the battery ordinance which has been in effect since 1998, shops are required to take back used batteries and rechargeable batteries. The AWM collect additional batteries via the recycling yards and in public utilities. The used batteries are collected as according to requirements. A foundation created by the producers accepts the batteries collected by the AWM and organises the return in compliance with the battery ordinance

## **6.2 Please describe the measures implemented the last five to ten years aimed at reducing the amount of waste produced and the amount of waste sent to landfill, especially biodegradable waste, including awareness programmes (max 1000 words)**

### **Implementation of the EU directives**

The waste management company (Abfallwirtschaftsbetriebe Münster, AWM) are acting already in compliance with the EU Landfill Directive. In Germany, the disposal of packaging in compliance with the EU Packaging Directive is governed by the "Duales System Deutschland" (DSD) (Dual System Germany). The city of Münster is affiliated to this system. Observance of this regulation has to be guaranteed by the DSD and others.

### **Waste management concept**



The city of Münster has been aiming to implement an ecological waste management system for a long time now. The main items here are the waste management concepts (Abfallwirtschaftskonzepte, AWK) 1999 and 2002, which document the measures underlying this objective. The achieved successes are highlighted by annual waste balances. The AWK gives information as to waste avoidance, waste recycling, and waste disposal.

For organic waste, residual waste, and landfill gas, thermal utilisation options have been investigated and implemented if worthwhile. Measures for avoiding waste and, in particular, waste to be deposited are therefore based on a well-founded overall concept. The waste management concept is updated quinquennially and approved by the council of the city of Münster as well as the state authorities. Officials (works committee) are informed on the implementation and the status quo within the framework of a quarterly reporting system and the annual waste balance.

The quantity of waste to be deposited has been reduced to a minimum of inorganic matter, in particular by the commissioning of the MBT. By organic waste composting and fermentation as well as residual waste fermentation in the 2nd stage of the MBT, the portion of deposited biological material equals zero.



Within the scope of the AWK, CO<sub>2</sub> reductions based both on the fermentation of biological waste and biogenic substances from residual waste, and on the collection and utilisation of landfill gas have been achieved in the waste management sector. The gases recovered in the process are converted to environmentally friendly electric power in the city-owned block heat and power plant. Furthermore, there are approx. 2 million KWh of solar power generated by means of the photovoltaic plant.

### **Incentive system**



The basic system of waste disposal relies on the premise that the citizens of Münster sort their waste into four different categories. Four separate waste bins, each with its own colour are provided for residual waste, biowaste, paper and plastic and aluminium and tin-plate. Waste glass can be put in containers standing in residential areas. Ten recycling points accept all sorts of waste, large amounts of garden waste, batteries, waste metal etc. and provide a proper disposal of these materials.

Unwanted household goods as well as garden waste, larger electrical appliances and furniture are collected once a month directly from the citizens' homes.

The AWM have created incentive systems for waste avoidance based on bin size and type. A gratuitous paper bin has been introduced to minimise residual waste. For the latter, there is a very small and thus cheap bin for residual waste (35 litres). Consequently, consumers can reduce their residual waste - and thus costs - to a minimum. Additionally, in order to reward waste separation, the bio-waste container is subsidised as opposed to the residual waste bin.



### **Waste reduction by public relations/campaigns**

A functional waste management depends on the participation of all citizens. The waste-conscious behaviour is crucial for the volume and type of waste to be disposed of in Münster. The recycling facilities can only be operated problem-free if waste containers and recycling facilities are properly used. The presentation of recycling products creates an additional motivation to participate in the overall system. For these reasons, the public relations regarding the transparency of the waste management is an important building block.

### Brochures and information material

Brochures covering all topics related to the avoidance and separation of waste are vitally important for the information of Münster citizens.

At the end of each year, all citizens will receive a waste disposal calendar that includes the collection schedules for the bio-waste container, yellow bag, residual waste container and paper container but also other important information.

### Flyers :

- „Tonne, Sack und Co.“ (waste separation),
- „Zu groß für die Tonne“ (bulky waste)
- „Wo geht´s zum Recyclinghof“ (which way to the recycling facility?)
- „Sortiertafel“ (sorting table) in 7 different languages

### Campaigns and activities:

- campaign "Clean City" 2003/2004/2005
- campaign "We and You" 2006/2007
- Starwaste campaign 2007
- workshop Major Residential Complexes since 2003
- children's city Atlantis
- campaign "A Spot for the Bin"
- composting days
- wash mobile
- business consultation service
- school project "Max the Dustbin"
- open day.

In addition to this, there are numerous further AWM publications dealing with different waste issues produced in co-operation with the press and information office of the City of Münster. A film that is available for everyone on DVD introduces the different areas (collection, city cleaning) of waste management in Münster. This DVD presents the different waste paths – from the collection through to the recycling and/or disposal.

### Garbage hotline

You can call the waste hotline number should you have any general or specific questions regarding waste management, correct waste separation and disposal. The hotline registers approx. 20,000 customer contacts each year.

### Waste education



The AWM provides different services to support schools and nurseries, clubs and associations and others who want to teach about waste management. In addition to the personal or telephone consultation, there is information available in class sets as well as a library which contains technical literature. Moreover, you can rent material boxes on different topics. They contain books or videos for all age groups to be used in class. Resources to be used for project weeks or special promotion days can be rented.

The subject of "Saving energy and refuse in schools and daycare centers for children" has been tackled from 1997- with sustainable success: While there were 15 facilities initially partaking in this programme, 101 schools and daycare centers are participating by now, comprising more than 25,000 children. For example, all these institutions reduced the amount of residual waste by seven million litres from 2003 to 2007 alone, thus having avoided considerable disposal costs at the same time. The success of the project, however, is to be seen not only in the relief of the communal budget, but first of all in the relief of the environment. And what's more, it was great fun for the children. At the same time, they have brought exemplary waste handling into their families, taking on the role of multipliers

### Waste management centre and recycling facility tours

The AWM offers guided tours to school classes, clubs, associations and interested groups to tour waste management facilities. Depending on age and interests, the different facilities can be visited using different didactic means to explain the topic in an easy and understandable manner as possible. This is carried out in a more playful manner for our younger participants.



### Internet

The Internet has become an indispensable medium for citizens to gather information. Since September 2001, the AWM are present on the Internet with a comprehensive site that is constantly being updated and extended which can be found online at the following address: [www.awm.muenster.de](http://www.awm.muenster.de) (in German).

### Proactive campaign

Within the framework of two campaigns, the AWM are tackling the issue of a clean city and try to persuade the citizens to take more responsibility for a clean city using humour and information. A third campaign for 2008 is in preparation.

It should be made clear to the general public that a clean city is not just dependent upon street cleaning which is financed by taxes, but is also dependent upon the behaviour of each and every citizen.

First and foremost, the initiative of the population should be re-motivated once again with the campaign so that no further reinforcement of AWM activities do not have to be financed again by taxes.

The problems which are posing the most trouble with regards to the cleanliness of Münster will be seized upon:

#### Littering

Incorrect filling of the yellow bag

Placing the yellow bag out for collection at the incorrect time

Bulky waste: The incorrect objects are placed outside for collection, dumping

Dog excrement

Fly tipping

Large events (Christmas Market, Carnival on Shrove Monday)

In another campaign, those who have previously caused pollution due to inadvertence or thoughtfulness are to be primarily targeted.

A third campaign is being planned for 2008. The cleanliness of the city will also be the key area of this campaign.

### **Energetic utilisation**

Münster prioritises material utilisation. The MBT concept also includes energetic utilisation, though. Approx. 30% of the sorted out recyclable material (with a high calorific value) is exploited energetically. A part of the plastic components (approx. 10%) is exploited energetically as well. In the biological stage of the plant, 2,388,000 m<sup>3</sup>/a of biogas is produced. A portion of this is used directly in the plant as a substitute for primary gas. The rest is converted to approx. 1,750,000 kWh/a of electric power in the block heat and power plant (BHKW). Therefore, its energetic potential is exploited to the largest extent.

The organic household waste in Münster is salvaged in a fermentation plant for organic waste. The throughput rate amounts to approx. 18,000 t/a. In 2003, approx. 2,650,000 m<sup>3</sup> of biogas was produced from 18,000 tonnes of organic waste and utilised in the BHKW. The organic wastes of the city of Münster are composted.



Landfill gas is also exploited energetically in Münster. Vertical gas wells have been installed for collection. All of the gas is transferred to the BHKW by means of a system of collection and transport piping. In this manner, 4,350,000 m<sup>3</sup> of gas was produced in 2002.

A large photovoltaic plant on the service buildings of the waste management companies with an installed capacity of over 277 kWp is providing for the environmentally friendly generation of electric energy.



### 6.3 Please describe planned short and long term measures for the reduction of the amount of waste produced and waste send to landfill, especially biodegradable waste. (max 1000 words)

The short term measures should include description of measures adopted, but not yet implemented, and budgets for future measures already adopted.

The long term measures should include description of planned measures as yet to be adopted by local politicians.

#### Retaining top-rate performances



Based on the MBT, the quantity of waste to be deposited has been reduced to a minimum of inorganic matter. At present, further reductions are technically impossible. Thanks to organic waste composting and fermentation as well as residual waste fermentation in the 2nd stage of the MBT, the portion of deposited biological material equals zero.

Within the scope of the waste disposal advice service and public relations, the waste management companies attempt educating the citizens and specific target groups about optimal waste separation on an ongoing basis.

#### Back to nature: recultivation



In 2005, the new third tract of the central landfill II in the waste disposal centre Münster was commissioned. Older tracts can now be recultivated gradually. The first two tracts comprising a total area of approx. 65,000 m<sup>2</sup> are planned to be recultivated in 2007. 3.6 million m<sup>3</sup> of waste were deposited there from 1980 to 1992. Now, a 2.50 m layer of consolidated made ground and built-in widths of plastic and drains are intended to keep precipitation water from encroaching on the landfill mass and, as a consequence, contaminated seepage water from reaching the ground-water.

Furthermore, a modernised venting system collects the methane gas generated from putrefaction processes. It is utilised in an environmentally friendly way. Ultimately, the whole area is replanted in order to return it to nature as far as possible. The AWM anticipate the measure to be completed in late 2008. The next one is intended to be initiated subsequently; a total of seven tracts will be recultivated up to the year 2013.

The total budget for each categorie can only be exemplified. There are many different departments and institutions in Münster contributing money and manpower. A lot of them do not belong to the City of Münster, so we do not know exact figures.

#### Budget:

- |  |         |                  |
|--|---------|------------------|
| 1. budget AWM 2008                       |         | EUR 46.2 million |
| 2. recultivation of the first two tracts | approx. | EUR 4 million    |

Guidelines and objectives of the waste management companies Münster

AWM commitment for the environment will be determined by specified targets and guidelines also in the future. A few excerpts:

#### Always for the environment

Legal regulations as well as governmental charges and requirements relating to environmental protection constitute minimum standards for the AWM. Taking into account economical conditions, we strive, however, for an even higher level of environmental compatibility and sustainability in all fields of action. For example: since February 2008 the AWM bought only vehicles with the so called ad.blue technology which applies with the coming Euro 6 emission standard.

### Sustainability

The AWM represent sustainability - not only in the economical, but also in the ecological and social meaning. Be it waste management concepts, utilisation and disposal facilities or vehicle fleets, the AWM orientate toward higher ecological standards. But in order for waste management to be socially sustainable, we also vouch for it to be affordable. We are keeping an eye on this as regards waste disposal fees, but also directly on location in the residential areas.

### Quality of living

Offering safe disposal, cleanness, and ecological waste management, the AWM want to make a contribution to the high quality of living in Münster.

## **6.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

In 1997, the AWM were certified according to the Ordinance on Specialized Waste Management Companies for the first time. This was supplemented by a certification according to the quality management system DIN EN ISO 9001:2000 in 2002. In 2005, the certification according to the quality management system DIN EN ISO 14001:2004 was conducted. Based on these certification systems, the business processes of the AWM are continuously verified in an objective manner. In order to continuously improve the achievements in the field of occupational health and safety, the system for the management of industrial safety has been introduced, being for now the last element in an integrated management system. The first issuance of the certificate according to OHSAS 18001 dates from September 12, 2006.

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. waste management concept.pdf
2. Business report 2006 waste company.pdf
3. Business report 2007 waste company.pdf
4. company guidelines.pdf
5. waste balance 2006.pdf
6. waste bylaws 2008.pdf
7. public relation example 1.pdf
8. public relation example 2.pdf
9. public relation example 3.pdf
10. public relation example 4.pdf
11. public relation example 5.pdf
12. public relation example 6.pdf
13. public relation example in 7 language english.pdf

Additional data is available from the following websites:

<http://www.muenster.de/stadt/awm>

<http://starwaste.cynapsis.de/buergerliste.php>

<http://www.muenster.de/stadt/livcom/index218.htm>

## 7. Water consumption

7.1 Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):

### 7.1.1 Proportion of urban water supply subject to individual water metering



Drinkable water supply in Münster is ensured by five city-owned waterworks of the public utility company Münster as well as a supply agreement with a neighbouring water distribution company. About 65% of the water demand is therefore furnished by own water resources, and 35% based on the long-term agreement with the waterworks Haltern.

The public utility company (Stadtwerke Münster) supplies 97% of the municipal households with water. Only 3% of the potable water supply is based on private water provisioning with wells.

### 7.1.2 Water consumption per capita

The public utility company Münster supplies its customers with some 17 million m<sup>3</sup> annually. The per capita potable water consumption is 45 m<sup>3</sup>/year (2007). Supply to private customers including business has decreased by 1.8% in 2007 as compared to the previous year. In general, it can be observed that water consumption has been stagnating or even retrogressive during the last years although the number of inhabitants has increased moderately.

#### Specify water consumption (l/capita/year)

Specify water consumption							
year	2001	2002	2003	2004	2005	2006	2007
liter/cap/year							
private	51830	51465	51830	50005	49275	49275	48180
commercial	9125	9125	10220	10585	10585	10950	10585

#### Specify percentage of water meters installed for households and business

Specify percentage of water meters installed for households and business							
year	2001	2002	2003	2004	2005	2006	2007
water meters							
private	100	100	100	100	100	100	100
commercial	100	100	100	100	100	100	100

### 7.1.3 Water loss in pipelines

The length of the supply network has increased by 12.0 to 978.5 km in 2007. By this, the public utility company has made substantial provisions for the future potable water supply, as was the case in previous years. The line loss of as little as 3.9% does not fail to impress either.

## 7.1.4 Compliance with the EU Drinking Water Directive

### Drinking water quality



The EU Drinking Water Directive (98/83/EC) was implemented according to German legislation with the Drinking Water Ordinance in 2003. Drinking water supply in Münster (five water works owned by the public utility company) and the supply of water by the water works Haltern) is persistently compliant with the standards of the Drinking Water Ordinance. The drinking water supplied meets all physical, chemical, and microbiological requirements.

The high standard in drinking water abstraction and quality is guaranteed by a quality management system in line with DIN ISO 9001:2000.

To protect groundwater in Münster and the surroundings, the public utility company has been co-operating with agriculture in the catchment area of the water works since 1991. The chief objective is to minimise nitrogen immissions from the agricultural sector. For this purpose, the public utility company has been funding the engagement of an agricultural adviser for fertilizer planning.

## 7.2 Please describe the measures implemented in the last five to ten years to reduce water consumption and water loss in pipelines, including e.g (max 1000 words):

### Maintenance

Piping network maintenance is carried out according to the occurred damage and type of material. Water leakage is minimised to a very large extent by acoustical leak detection and continuous piping network review.

### Communal saving



The city of Münster monitors water consumption for all municipal buildings. Evaluation of the registered monthly consumption yields a very good and dense data record. Users are informed of their consumption indices once a year. Municipal building management takes action either on own authority or by way of the building managers.

The project "Saving Energy and Refuse in Municipal Facilities" commenced in 1998 - with success: with the users having adjusted their behaviour, 15,000 m<sup>3</sup> of water have been saved from 2002 to 2006. 101 schools and daycare facilities comprising more than 25,000 children are participating currently.

### Energy consumption due to water supply



Roughly 6 million kWh of electric power are spent each year for water recovery (including ground water replenishment, infeed, and pressure increase). Relating to the output usable by the end customer, this amounts to some 0.35 kWh/m<sup>3</sup> (2006). This is an appropriate value, since network hydraulics control is partly rather difficult, given the dimensions of the network area (urban area=302 km<sup>2</sup>). Measures for improvement are continuously implemented during scheduled maintenance and servicing works, e.g. by further optimising and adapting pump performances.

## General advice services

Consultation hours for the consumers offered by the public utility company and the municipality of Münster are generally well attended. More hints on water saving can be found on the website of the public utility company. Moreover, the public utility company offers special technical consultation services on request from interested customers and designers.

## Campaigns



In 1998, the municipal Environmental Agency launched its perennial campaign "Saving water is efficient - at once". The city of Münster has also been promoting rain water utilisation in the context of the support programme "Green against grey" until 2002. Furthermore, customers may visit water works during the annual "Water Day" and obtain information on water recovery and water saving. The last nature trail so far was installed in 2008, offering information on the subject of ground water protection.

The city of Münster has been conducting ECOPROFIT projects in collaboration with regional partners since 2001. ECOPROFIT supports enterprises in reducing operational costs by environmental protection measures. Up to the present, 62 companies have been participating in five projects within the scope of the ECOPROFIT programme. In the process, a total of more than 110,000 m<sup>3</sup> of Water has been saved annually. The Zoo of Münster alone was able to save 44,000 m<sup>3</sup> of water by way of technical optimisation.

## Public relation

Public awareness is raised based on guided tours and open days at the waterworks! In addition, info brochures on the subjects of water quality, water supply, and water saving are offered. Information is supplied through the Internet presence. Comprehensive press releases are published and auctions are offered (e.g. Day of the Water, Day of the Environment). In this year, the new nature studies path in Münster's largest water protection area has been inaugurated in order to update the population on this sensitive area.

## Transparency for the customer base

In their yearly water bills, customers would invariably find their personal consumption of the previous year for comparative purposes, supplemented by average consumption data of typical user categories. This is aimed at motivating them to save water.

## Tariff structure

Drinking water tariffs are based on specific consumption and support water-saving behaviour, e.g. by linear tariffs for all consumption groups, by precipitation fees calculated on the basis of the built area, and by separate drinking water/waste water fees. Those who save water will notice it in their purse.

## 7.3 Please describe planned short and long term measures on reducing water loss (max 1000 words):

The short term measures should include description of measures adopted, but not yet implemented, and budgets for future measures already adopted.

The long term measures should include description of planned measures as yet to be adopted by local politicians.

Despite the already realised very high piping network standard with only 3,9% of leakage, the public utility company Münster will invest in optimisation measures also in the future. For this reason, large portions of the network will be exchanged in the coming years.

The spheres of activity of the coming years will lie in the climate change-oriented evaluation of the water management monitoring data, the application of simulation models for the water economy to allow for region-specific statements, the development of the technical fundamentals of planning, and innovative infrastructural concepts.

**7.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. Business report 2006.pdf
2. Business report 2007.pdf
3. enviromental declaration 2007.pdf
4. enviromental declaration 2003.pdf
5. steam and gas facility.pdf
6. Water analyse 2007.pdf
7. public relation example water.pdf
8. public relation example water2.pdf
9. damage statistic water pipeline 2006.pdf

Additional data is available from the following websites:

<http://www.stadtwerke-muenster.de/privatkunden/trinkwasser.html>

## 8. Waste water treatment

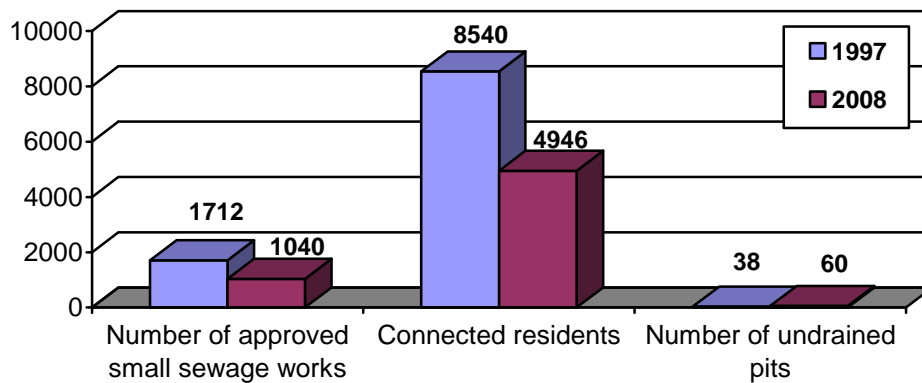
### 8.1 Please describe the present situation and development over the last five to ten years in relation to proportion of total waste water treated in accordance with the Urban Waste water Directive (max 1000 words)

Taken together, the Civil Engineering Office of the city of Münster, which is responsible for all belongings of waste water treatment, operates

- approx. 1,586 km of channels
- 6 sewage treatment plants
- 86 pumping stations
- 235 small pumping stations.

100% of the waste water produced in Münster is treated in line with the European Urban Waste Water Directive. In Münster, more than 98% of the population are connected to centralised sewage treatment plants. The waste water of 4,966 inhabitants, i.e. approx 1.8% of the population, is disposed of locally via small sewage works or undrained pits. As compared to 1997, the number of residents not yet connected to sewage treatment plants has been almost halved:

Year	1997	2008
Number of approved small sewage works	1712	1040
Connected residents	8540	4946
Number of undrained pits	38	60



During the past 10 years, private small dischargers have been consistently connected to the public sewage treatment works, in particular in water protection areas, according to the wastewater disposal concept of the city of Münster. Obsolescent private sewage treatment plants outside of water protection areas have also been connected.

Since 2001, 89 connection measures have been carried out in total, with an overall volume of approx. EUR 1,500,00. In so doing, approx. 3,600 persons have been connected to the public sewage water system especially in areas essential for drinking water recovery. The city of Münster has therefore completed the programme for the connection of small dischargers.

Households not connected to the public sewage water system have either small sewage treatment plants or undrained pits. Owners of small sewage treatment plants are monitored in respect of their complying with the maximum discharge values and the constructional condition of the plants. Sewage sludge is shipped to the main sewage treatment plant by way



of transport vehicles, where it is cotreated in the sludge treatment stage. The same holds true for undrained pits. The sludge accruing there is cotreated in the main treatment plant as well.

The waste water disposal concept, which is set up for five years at a time, defines the global objective targets for the waste water disposal sector. It is approved by the regulatory authority. Thus, the specified targets and resulting measures become authoritative. The waste water disposal concept currently in force includes the following targets:

- to protect and improve both ground water quality and quantity
- to achieve water quality class II-III in the intermediate term and water quality class II in the long term
- to ensure the drainage-related development of residential, business, industrial, and road areas
- to allow precipitation water to seep away locally (priority of local solutions)
- to reduce the flow of rainwater into lakes, rivers and streams both by retention and by measures carried out in proximity to lakes and rivers (installation of polders or meadows)
- to shut down small sewage works in sensitive areas (water protection areas) and to connect users to the public sewerage system.

From these objectives, the following measures have been decided upon:

- to shut down inefficient sewage treatment plants and to connect to the main plant
- to treat the drained precipitated water
- to improve waste water treatment in dispersed settlements
- to build further economical and high-performance urban drainage plants
- to install rain retention basins and to renaturalise waters.

Beside these greater objectives and measures, further measures are being carried out, e.g. for reducing the portion of percolating water.

For example, two rather inefficient sewage treatment plants have been decommissioned since 1999, while the waste water has been directed to the high-performance main plant. The quality and environmental management system according to DIN EN ISO 9001 / DIN EN ISO 14001, introduced into the municipal water management, makes sure that all legal requirements are adhered to. The system is assessed for effectiveness by external auditors on a regular basis. Until now, both the initial auditing and the recurring follow-up auditings have been passed successfully. One of the aspects achieved by means of this management system is that not a single monitoring value has been exceeded in the last 10 years. Compliance with the legal requirements is therefore 100%.

### Treatment stages

The city of Münster is currently operating 6 sewage treatment plants. Treatment plant capacities can be gathered from the table below:

	EW
Main treatment plant	300,000
Treatment plant Loddenbach	45,000
Treatment plant Hiltrup	30,000
Treatment plant Geist	18,000
Treatment plant Mariendorf	12,000
Treatment plant Häger	500



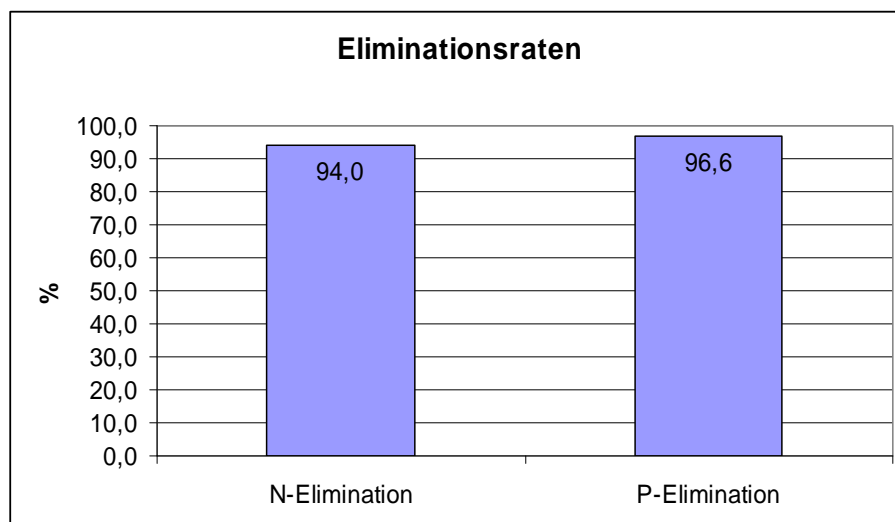
All sewage treatment plants of the city of Münster are fitted with three treatment stages: In plants with integrated subsequent sludge treatment, the first treatment stage is made up of the process stages rake, grit channel, and primary treatment. Primary treatment is omitted in plants lacking in proper further sludge treatment (treatment plants Geist and Häger). The sludge coming from these plants is transported to the main plant and cotreated. The second treatment stage consists in all plants of a biological stage for carbon elimination and nitrogen oxidation.

The third treatment stage in the form of nitrogen elimination (denitrification), phosphor elimination and/or maturation pond is also integrated into all plants.

All sewage treatment plants were fitted with the relevant technologies at an early stage already. The presented status was already achieved, in essence, when the main treatment plant was extended in 1994. For this reason, no further measures for upgrading and extending the treatment plants were required in the past 10 years.

### P and N elimination

Since the city of Münster is operating 6 sewage treatment plants in total, the elimination rate has been calculated as weighted average, resulting in the following degree of purification:



## **8.2 Please describe the measures implemented in the last five to ten years to improve waste water treatment (max 1000 words): Text**

### **Quality management**

There has been a certificate for an integrated quality/environment management system in the sector of pumping stations and sewage works since 2001. It has been valid for the entire urban drainage system since 2005. Due to the high performance standards, the urban drainage in Münster has now been successfully certified according to the standards DIN EN ISO 9001:2000 (quality management) and DIN EN 14001 (environmental management). At present, the quality and environmental management is being introduced throughout the Civil Engineering Office Münster. At the same time, with the extension of the management system to cover the entire civil engineering office, an occupational health and safety management system according to OHSAS 18001 is being implemented and included into the existing system

Among others, the following measures are being implemented:

- The rules as set up in the summary of the requirements are binding as to who is accountable for the implementation of which standards.
- first environmental external audit and review of the environmental aspects
- ongoing evaluation of the environmental aspects by means of allocated reference numbers (e.g. related to energy consumption, energy generation, consumption of resources, accumulation of precipitants, flocculants, and waste)
- determination, analysis, and evaluation of potential hazards that may entail disruptions and emergencies as regards the environment
- definition of the required precautions for avoiding such situations (e.g. plant maintenance, precautionary servicing, safety equipment check at regular intervals)
- provision of emergency backup generators
- The balance score card assigns commensurable annual targets to the basic principles formulated in the environmental and quality-related policy. These targets are pursued on an ongoing basis; any advancements are documented, correcting and prophylactic measures are implemented.

### **Contribution to the Water Framework Directive**

As early as in 2004, an agreement was made with Münster's local government as the relevant approving authority to decommission the sewage treatment plant Mariendorf in the year 2011. The decision resulted from the fact of the sewage treatment plant Mariendorf discharging into the Werse river. The Werse river does not yet meet the flowing waters requirements as defined in the Water Framework Directive A noticeable improvement in water quality is supposed to be achieved when the discharge is eliminated. The city of Münster will incur expenses amounting to approx. EUR 3,000,000 by the implementation of this measure.

### **Waste water treatment**



Thanks to a multitude of measures, the treatment results have been improved in the existing treatment plants. For example, online analysers have been installed in all treatment plants, allowing for the persistent monitoring of the treatment process. A part of the measurement results is directly used in the EDP-based process control systems for control and governing. This automation guarantees a persistently high treatment performance.

### Precipitation water treatment

The mixing system has been converted into a modified separation system over approx. the last 30 years. The goal is to separate rain and waste water at an early stage. The portion of the separation systems in new building areas already amounts to 95%. Wherever possible when the sewers are repaired, they are converted to environmentally friendly separation systems. For all notable business and industrial areas, rain water treatment plants have been installed which can also be found in the forefront of discharges into stagnant and/or sensitive areas of water (Lake Aa).

### Tariff system

In Münster, there has been a billing system based on the split fee schedule as early as from 1990. This means that the rain water fee is calculated according to the dimensions of the paved area (causer principle). When applying ecological approaches (leaching, area unsealing, planting of vegetation on roofs, rain water utilisation etc.), the rain water fee is reduced. Therefore, there is a financial incentive to leach rain water and promote ground water build-up.

Based on specific programmes - "Green against grey" and the "Initiative ecological and sustainable water management NRW" - seepage measures were promoted additionally.

Tariffs for wastewater are based on fresh water consumption. Therefore, using the water resources economically also results in a financial incentive, as expenses for both wastewater and fresh water can be saved.

For commercial and industrial indirect dischargers, a charge for extreme pollution in addition to the waste water fee has been levied since 1993. This additional charge for extreme pollution acts as a control measure that has resulted in the indirect dischargers getting proactive at the point of waste water accrual already and installing pre-treatment plants. The success of this strategy is yielding impressive results: While there were twelve companies subject to surcharge originally, it is just seven today. This aspect is particularly significant for the city of Münster, since 100% of the sewage sludge is utilised in agriculture, and thus ought to be kept as ecologically compatible as possible.

### Sewage sludge



Following waste water treatment, a top-quality natural fertilizer is left over in the treatment plants of Münster - sewage sludge. The Association for Quality Assurance Utilisation of Agricultural Waste (Verband der Gesellschaft für Qualitätssicherung Landbaulicher Abfallverwertung) has awarded the QLA seal of quality (QLA: Qualitätssicherung Landbauliche Abfallverwertung).

To re-introduce the material into the natural cycle makes sense both from an ecological and economical point of view - if the sludge is of high quality and low contamination, as is the case in Münster. With some 28,000 tonnes of sewage sludge annually, the city of Münster is one of the major German producers of natural fertilizer. 100% of the sludge is utilised in agriculture in North Rhine-Westphalia and in adjacent Lower Saxony. The sewage sludge management system takes into consideration all engineering and administrative activities affecting sewage sludge quantity and quality, from monitoring the indirect dischargers to the application of the sewage sludge.

### Energy efficiency

At present, there are multiple projects to save energy in the sewage treatment plants of Münster. For example, the main sewage treatment plant will be renovated for EUR 2.1 million in 2009. In the course of the digestion tower renovation, the energy-intensive agitation by way of pumps will be replaced by energy-efficient internal mixers.

Furthermore an external engineering office has been commissioned to conduct an energy analysis in the main plant. Possible savings are identified by rough analysis. In terms of consumption indices, the main sewage treatment plants falls into the range designated in the literature as good for plants of this dimensions. It is planned to have a detailed analysis performed based on this, of which concrete measures for saving energy may be derived. The project is supposed to be extended to other sewage treatment plants.

Additionally, a neuronal network has been installed there, controlling the treatment processes in terms of treatment results and energy expenditure on the basis of EDP. Two main objectives are pursued in implementing the neural network. One objective is to improve the drainage values of the main treatment plant, in particular in the case of extraordinary events (heavy rain). The second objective is to effect energy savings by means of optimised machinery control.

For the implementation of a neural network, a virtual model of the biological treatment stage of the plant was first set up on the basis of historical data. During operation, this model is subsequently provided with current measuring data, calculating procedural suggestions for plant operation while taking into account the target function "compliance with the limit values and efficient use of energy". This ensures only those machines to be in operation and consequently to spend energy that are actually required.

The system is currently undergoing the test phase, i.e. the suggestions are implemented manually by the operating personnel. For the future, the system is planned to automatically implement the suggestions in connection with the existing process control technology.

According to first estimates by the system supplier, a minimum of 10% of the energy input (approx. 750,000 kWh per year) may be saved. This is a rather defensive estimate. Possibly, savings of up to 15% may be achieved. If these predicted savings can actually be realised, the system will be assessed for use with other sewage treatment plants.

The city of Münster regularly partakes in benchmarking projects in order to compare to other operators. In these projects, the issues of energy use and energy efficiency are also addressed. Although the city of Münster is well positioned here as well, further potentials for optimisation may be tapped. The regular participation in benchmarking projects is therefore intended.

A sewage treatment plant for 18,000 residents was fitted with a solar hot water treatment system. Moreover, a 5kW photovoltaic plant has been installed on a pumping station building of the city of Münster.

As a rule, aggregates with low energy consumption are used when carrying out technical modifications on existing plants. Further potential applications for renewable energies are evaluated at regular intervals.

### **8.3 Please describe planned short and long term measures for reduction of water loss (max 1000 words):**

The short term measures should include description of measures adopted, but not yet implemented, and budgets for future measures already adopted.

The long term measures should include description of planned measures as yet to be adopted by local politicians.



In accordance with the legal requirements, the entire sewerage system is inspected systematically by means of camera examinations in 15-year cycles. Identified damages are eliminated according to a list of priorities: Severe damages are rectified promptly; less severe damages are rectified in the medium to long term. In this manner, leakages are eliminated, preventing the ground water table from falling due to percolating water ingress into the sewerage system.

Investment costs for waste water treatment measures can be but exemplified, since these costs are shared among a multitude of institutions inside and outside the municipality.

The total budget for each categorie can only be exemplified. There are many different departments and institutions in Münster contributing money and manpower. A lot of them do not belong to the City of Münster, so we do not know exact figures.

An essential measure in improving the waste water system in Münster is the renovation of the main sewage treatment plant, which was decided upon in 2008 and will be implemented in 2009. EUR 2.1 million will be spent to renovate the digestion towers and to optimise the technical equipment in particular.

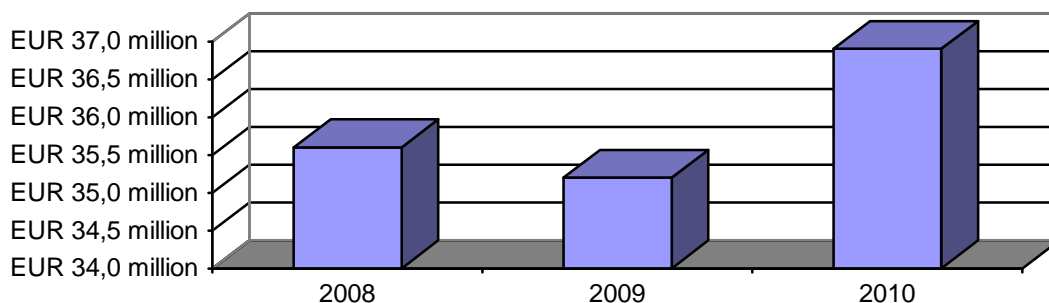
The measures e.g. for sewerage renovation that are contained in the wastewater disposal concept and its upgrades are projects for the implementation of the EU Water Framework Directive. Expenditures in the wastewater disposal sector will amount to an estimated EUR 300,000,000 up to the year 2025.

Medium-term funds amounting to EUR 3,000,000 are available for measures carried out close to and in waters. These are measures for the implementation of the EU Water Framework Directive as well.

**Budget:**

1. Annual budget for waste water treatment (the civil engineering office) EUR 43.5 million
2. Investment costs for sewage treatment plants and the channel system 2008-2011:

2008	EUR 35.6 million
2009	EUR 35.2 million
2010	EUR 36.9 million
2011	EUR 36.4 million



**8.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

All activities in the quality and environmental management system (QUM, Qualitäts- und Umweltmanagementsystem) sector are documented and published in an annual report.



Furthermore, an external audit report is drawn up. Special attention is paid to the observation of all relevant legal provisions. The observation of the provisions is documented within the scope of the QUM report.

Furthermore, the Civil Engineering Office participates in benchmark projects on a regular basis. Based on the findings, measures are deduced that can be checked, after conclusion, for efficiency during the next benchmark project. In addition, the effectiveness of the waste water disposal processes is checked using an internal reference number system.

A supplementary quality management system has been introduced in particular for the agricultural utilisation of sewage sludge. The system serves the quality control in sewage sludge utilisation, being supervised by external auditors. Successful auditing is a prerequisite for applying the seal of quality. This certificate was handed to the city of Münster for the first time in 2004.

A permanent transparent system audit is guaranteed by the above-mentioned control mechanisms.

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. Draft resolution for the wastewater disposal concept 2004
2. Draft resolution for the renovation of the digestion towers on the main sewage treatment plant and the backfitting of the technical equipment, 2008
3. Draft resolution for decommissioning the sewage treatment plant Mariendorf, 2008
4. EMAS certification 2007
5. certification sewage sludge 2006
6. Energetic analysis main sewage treatment plant, city of Münster 2008
7. Modelling sewage treatment plant concluding report, city of Münster 2007
8. Report on the 4<sup>th</sup> updating of the ABK (2004)

Additional data is available from the following websites:

<http://www.muenster.de/stadt/tiefbauamt/stadtentwaesserung.html>

<http://www.muenster.de/stadt/tiefbauamt/qualitaetsmanagement.html>

## **9. Environmental management of the municipality**

**9.1 Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):**

**9.1.1 Number of municipal departments with certified environmental management systems (ISO 14001/EMAS)**

### **Environmental management in the general administration**

Environmental management in the municipality of Münster aims at continuously improving and developing the working processes based on self-defined objectives and external monitoring. Operational procedures and processes are documented, the achieved is compared to the objective targets, and working processes are reorganised. In so doing, the city of Münster is in a continuous improvement process.

The environmental management system allows for all municipality members to be involved in the areas of energy, mobility, and procurement. The city of Münster is the sole owner of all companies and establishments listed in the appendix that have implemented a certified environmental management system.

The city of Münster has been putting emphasis on municipal climate protection for more than 15 years. In 1992, it established an advisory committee for climate and energy; a panel of scientists commissioned to draw up recommendations for abating the CO<sub>2</sub> emissions by 25% until 2005. In order to build up an effective energy management system, the city installed the coordination site for climate and energy in 1995 (see chapter 1 for detailed information).

### **Local Agenda 21**

In the years 1997 to 1999, the city conducted a wide participatory process for compiling a Local Agenda 21. In 1999, the results were subsumed in a council draft resolution and integrated into the scopes of responsibility of the individual administrative departments. In 2004, the consolidation with the efficiency control of the integrated urban development and urban marketing concept to an integrated urban development report (ISM: Integriertes Stadtentwicklungs- und Stadtmarketingkonzept) was resolved upon. The sustainability report issued annually is drawn up based on a wide participatory process between the civic Working Group Local Agenda 21 Münster and the municipality. The following groups are members of the Working Group Local Agenda 21 Münster:

- Eine-Welt-Forum
- FrauenAktionsBündnis
- Friedensforum Münster
- Projektgruppe Zukunftsfähiges Münster
- Umweltforum Münster

The municipality's model functions were also called in, and the resulting introduction of an environmental management system was suggested.

### **Environmental guidelines**

In order to accomplish this objective, the council of the city of Münster adopted environmental guidelines in 2001. "The municipality of the city of Münster is aware of its

accountability for a gentle handling of nature as well as the sustainable utilisation of resources. With the implementation of the EC Eco Audit, the municipality of Münster takes on this accountability, introducing an environmental management system that aims at continuously reducing environmental impacts of the day-to-day administrative tasks. Based on the compliance with all relevant requirements and standards of environmental law, the actions of all protagonists are orientated to the following guidelines: (being listed under 9.2). Subsequently, an environmental management manual was drawn up explaining all environmentally relevant responsibilities including the competent persons.

The results of the environmental management system are documented in business reports and environmental statements as well as in the sustainability report.

### **Tendering and award policies**

“Taking environmental protection into consideration in award procedures” has been required by the municipal tendering and award policies since 1999. Therefore, eco-labels such as Blue Angel, Energy Star, TCO are, wherever they are available, consistently applied to the greatest possible extent. For instance, only copiers with the “Blue Angel” or verifiably equivalent criteria have been purchased since 2004.

However, this is no longer possible in the IT sector due to the invitations to tender being pan-European today. Certificates such as the Blue Angel that are awarded in Germany only may not be advertised any more. Throughout the EU, only the certification according to ISO may be specified. Blue Angel, Nordic Swan, Energy Star etc. are no legally binding standards and can only be demanded on a national level. But as regards content, the environmentally relevant requirements are adopted in the functional requirements of the invitations to tender. In the field of office furniture and office swivel chairs, PVC may not be used within the scope of the tender, synthetic materials are required to be recyclable, chipboards of the E class 1, and no flame retardants may be included.

In terms of procurement, the municipal canteens pay attention to predominantly local products. Furthermore, some products are procured from ecological cultivation and/or fair trade. Potatoes (100%) Münsterland-Knolle from ecological cultivation; vegetables (30%) from ecological cultivation; coffee, tea, and cocoa (100%) from ecological cultivation and fair trade.

### **Energy management**

The environmental guidelines require an energy management system to be established: in order to reduce the environmental impact of the administrative offices, measures are taken to bring about sustainable resource management, cost reductions, and therefore long-term sustainment, e.g. through efficient energy management.

This principally aims at continuously monitoring the more than 300 objects (schools, daycare facilities for children, swimming pools, and other public facilities). At present, data on the consumption of the 250 primary buildings are collected in the areas of electric power, heating energy, water on a monthly basis, allowing for a quick weak spot analysis in the case of negative discrepancies, and rectifying the damages directly.

Based on a wide variety of investment and non-investment measures, the average heating energy consumption of 165 could be abated to 120 kWh/m<sup>2</sup>/a, thus saving more than EUR 1.5 million annually. The aim is to reduce consumption to 100 kWh until 2015.

In order to document the good standards also to third parties and to comply with the requirements defined in the “EU Directive on Building Energy Efficiency”, “energy performance certificates” will be installed in all buildings until June 2009.

In terms of power consumption, the results failed to turn out impressive, following the general negative trends also in Münster. That notwithstanding, consumption values could almost be kept constant: while 14,5 Mio kWh of electric power were spent in 1995, it is 15 Mio kWh today. The consumption in school buildings is to amount to as little as 15 kWh/m<sup>2</sup>/a in 10 years.

Another possibility to minimise energy costs is to reduce floor areas and the reasonable centralisation of administrative units. With the abandonment of energetically poor buildings, the last years saw some success also in this respect. Further floor area minimisation has been outlined as being possible by a management consultancy company and is assessed by the municipality at present.

In 1997, the pilot project "Saving energy and waste at schools and daycare facilities for children" was initiated, in particular to achieve behavioural adjustments as regards energy consumption - with sustainable success. Today, approx. 100 facilities are participating under the title "Climate protection is catching on".

Another project to effect behavioural adjustments is the "Power Devourer" campaign advertising energy-efficient power handling in all administrative departments by means of various methods.

### **Mobility management**

With the introduction of an externally operated full service official car pool of the local mobility service provider "Carsharing Stadtteilauto Münster GmbH", the municipality of Münster has been treading, since July 2002, a till then unique path for a master plan of managing internal mobility. This externally operated pool of official cars is a primary central component of an overall package of measures for establishing an ecologically/economically reasonable mobility mix.

The change-over from the main focus of operative mobility being on the private passenger cars of the members of staff to a mobility mix made up of private cars, official vehicles, and vehicles in car-sharing pools was an essential part of the master plan.

Furthermore, measures have been introduced to accomplish business trips, which were mainly carried out using passenger car until now, increasingly based on ecomobility, first and foremost by bike (bicycle pool Townhouse 3).

Consequently, a continuous decrease of the kilometres travelled (more than 90% are covered within the city centre) is to be noted since 1998. In total, the kilometres travelled in personnel private cars have been reduced by approx. 750,000 km (approx. 42%) since 1998. When considering the last six years, this alone results in a reduction of CO<sub>2</sub> emissions amounting to approx. 135 tonnes annually.

Based on parking space management and the introduction of alternative mobility solutions for accomplishing business trips, the number of officially required parking spaces could be cut down by 62% from 602 (as by 1998) to 233 parking places. Many staff members could be diverted to the short-distance public transport system based on the public utility company concurrently offering major contractor subscription options.

### **The locations**

In 2001, auditing of the individual locations was initiated in addition to the municipal environmental management.

The civil engineering office led the way in 2001 with its sewage treatment plants and pump stations being audited. In 2003, the forest cemetery Lauheide, with its 83 hectares being the

main municipal cemetery in Münster, was the second location to be validated. The advantage here was the existence of all environmental aspects that accrue at internal locations. The results can be translated to any other locations later on.

### Waste water system

There has been a certificate for an integrated quality/environmental management system in the sector of pumping stations and sewage works since 2001. It has covered the entire waste water system since 2005. Due to the high performance standards, urban drainage in Münster has now been successfully certified according to the standards DIN EN ISO 9001:2000 (quality management) and DIN EN 14001 (environmental management).

At present, quality and environmental managements are being introduced throughout the Civil Engineering Office Münster.

Among others, the following measures have been implemented:

- The rules as set up in the requirements summary are binding as to who is accountable for the implementation of which standards.
- first environmental external audit and review of the environmental aspects
- ongoing evaluation of the environmental aspects by means of allocated reference numbers (e.g. related to energy consumption, energy generation, consumption of resources, accumulation of precipitants, flocculents, and waste)
- determination, analysis, and evaluation of potential hazards that may entail disruptions and environmental emergencies
- definition of the required precautions for avoiding such situations (e.g. plant maintenance, precautionary servicing, safety equipment check at regular intervals)
- provision of emergency backup generators

The balance score card assigns commensurable annual targets to the basic principles worded in the environmental and quality-related policy. These targets are pursued on an ongoing basis; any advancements are documented, amendatory and prophylactic measures are implemented.



### Forest cemetery Lauheide

The forest cemetery was audited and subsequently certified by an external reviewer (EMAS register: D-156-00077) in 2004. The forest cemetery Lauheide was recertified in December 2007. Various measures have been implemented here:

- reduction of organic waste, representing the largest portion in quantitative terms, by 45% as compared to 2004, among others by mulching, composting, and making use of meadows as pastures
- installation of a paved composting area
- where required, protection of the soil from contamination by substances that are hazardous to water by means of collecting trays, e.g. in the surroundings of the Diesel tank and in the Motomix filling area
- installation of small sewage works for the waste water from the administrative building and visitors' wing
- power consumption reduction by 25% as compared to the year 2004, among others by optimising the heating system, and by using energy-efficient lamps
- installation of a new 80kW wood chips heating installation providing 90% of the required heat

- reduction of Diesel fuel consumption by 25% as compared to the year 2004 by the optimisation of routes
- manifold public relations campaigns: The Day of the Cemetery regularly attracts several thousand visitors. The “Third Sunday in the month” series of events attends to ecological subjects in the cemetery very successfully. In addition, a broad public is informed by means of flyers, notices, and newspaper articles.



#### Administration Building Stadthaus 2

The 12-storied administration building Stadthaus 2 with its five-storied annex has a useful area of 6,491.00 m<sup>2</sup> with a gross floor area of 11,319.00 m<sup>2</sup>. Here are working more than 300 people. After a life span of almost 40 years, this building was in principal need of restoration and was core redeveloped in 2000. The site was certified by a public auditor according to EMAS in 2006. The focus here was on examining and optimising the environmental aspects of paper and electric power consumption in office rooms, as opposed to the internal locations.

Among others, the following measures were implemented:

- power requirement reduction by 5%, among others by behaviour changes on the part of the users and by replacing old computer screens with energy-effective flat screens
- achieving an annual heating consumption of 41 kWh/m<sup>2</sup> (previously 140 kWh/m<sup>2</sup>) on the basis of an energy report set up previously
- decrease of operating expenses and maintenance costs
- renovation of the windows using a wood/aluminium design featuring permanent ventilation elements, integral sun and glare shields as well as sound insulation



#### Maintenance Yard Höltenweg (2007)

The maintenance yard Höltenweg is the central contact point for green and sports area maintenance in Münster. At the same time, nearly 160 motor vehicles are repaired here. With the certification according to EMAS, important measures in environmental management were implemented:

- reorganisation of waste deposition, improved sign-posting and information of staff members on the novel separation system; the success: residual waste has decreased by more than 40%.
- fuel is saved by optimised travel routes
- new collecting trays protect the soil in the affected areas from contamination by substances that are hazardous to water
- no pesticides are employed for green space maintenance; in many areas, green spaces are maintained extensively



#### Waste management companies (2005 and 2007)

The waste management companies of the city of Münster (AWM, Abfallwirtschaftsbetriebe der Stadt Münster) became certified refuse plants in 1997. The AWM were certified throughout their operations according to DIN ISO 9001:2000 in April 2002. This certificate documents the fact that all operating areas have committed themselves to supply their respective services in a consistently high quality. The AWM have also been certified in the occupational health and safety sector (OHSAS 18001) since 2006.



### Public utility company

An integrated management system, i.e. quality, environment, and occupational safety management, has been introduced by the public utility company of Münster and documented in the form of a reference book system. Dedicated operating manuals are available for the area of “generation of district heat and electric power“ as well as for the other areas.

These include regulations for organisational processes, competences, and responsibilities within the scope of internal environmental protection. Procedural-organisational regulations governing functions, activities and procedures that impact or might impact the environment are precisely specified in codes of practice and operating instructions.

The first registration according to EMAS took place in 1997, the follow-up certifications occurred in 2000 and 2007.

### **9.1.2 Percentage consumption of eco-labelled, organic and energy-efficient products measured as share of the total consumption by municipalities of products in the same category/type**

The municipal tendering and awarding guidelines have been stipulating to “take environmental protection into account in the awarding procedures” since March 1999. For this reason, eco-labels such as the Blue Angel, Energy Star, and TCO are used to the farthest possible extent wherever they can be applied. For instance, photocopiers with the “Blue Angel” or other criteria proven to be equivalent have been purchased exclusively since 2004. In the IT sector, however, this is not possible any more due to EU-wide invitations to tender. Certificates such as the Blue Angel that are awarded in Germany only may not be advertised any more. Throughout the EU, only the certification according to ISO may be specified. Blue Angel, Nordic Swan, Energy Star etc. are no legally binding standards and can only be demanded on a national level. But as regards content, the environmentally relevant requirements are adopted in the functional requirements of the invitations to tender.

### **9.1.3 Energy consumption of municipal buildings per square meter**

The average consumption of all public buildings amounts to approx. 120 kWh/m<sup>2</sup> of heat and 15 kWh/m<sup>2</sup> of electric power. Several buildings, including some communal administrative buildings have been refurbished during recent years. 80% of all employees work in these three buildings. Consumption in the administrative buildings adds up to 43 kWh/m<sup>2</sup> of heat in the “Stadthaus 2” or 83 kWh/m<sup>2</sup> of heat in the “Stadthaus 1”.

The specified limit value of the annual heat consumption for the construction of new municipal buildings must not exceed 50 kWh/m<sup>2</sup> (decision of the city council).

## **9.2 Please describe the measures implemented in the last five to ten years in relation to (max 1000 words):**

### **9.2.1 Developing an overall policy for environmental management of municipal activities**

The council of the city of Münster passed environmental guidelines and the introduction of an environmental management system for the entire municipality of Münster in September 2001. The guidelines consistently build on the objectives and basic principles of the Local Agenda 21 and the Charta of Aalborg, which was signed by the city of Münster. The city of Münster is also aware of its role model function towards its citizens.

### **Environmental guidelines for the municipality of Münster**

“The municipality of the city of Münster is aware of its accountability for treating nature with respect and utilising resources sustainably. By implementing the EC Eco-Audit in the municipality of Münster, it faces up to this accountability, introducing an

environmental management system which aims at continuously reducing environmental burdens due to the day-to-day administrative activities. By observing all relevant requirements and standards within the scope of environmental law, all protagonists act according to the following guidelines:

### **1. Consequences of the present work**

Based on appropriate methods, the environmental impact of the administrative work is to be determined and evaluated at regular intervals. Beside evaluating the environmental impact, measures for avoiding and reducing environmental loads are to be implemented and controlled with all technical, organisational, and planning-related measures available. For legal reasons, this has to be done by means of the best technology available in order to ensure the application of minimum standards.

### **2. Measures**

In order to reduce the environmental impact of the administrative work, measures are taken to sustainably manage and save the resources in particular, maintaining them in the long term, e.g. by

- effective energy management,
- avoidance of waste and promotion of material recycling,
- reduction of preventable emissions,
- procurement of materials and objects of utility according to ecological aspects,
- optimising passenger and service traffic and by shifting to environmentally friendly modes of transportation.

### **3. Advance planning**

The environmental impact and the concerns of environmental protection are to be taken into account in future activities, operational procedures, and investments already during the planning phase. The system is supported by the rules already in existence (noise abatement planning, buildings standards for municipal buildings, and other self-commitments).

### **4. Motivating and informing the staff members**

Active environmental protection can be implemented only if staff members on all levels are aware of their responsibilities. In order to live up to this requirement, the members of staff are to be motivated by means of training measures and advice services to act actively and in an environmentally friendly manner.

### **5. Informing the public**

By way of consistent public and press relations, citizens as well as associations and other interested parties are to be informed on environmental impact, environmental objectives, the intended measures, and projected activities. Furthermore, an exchange with other municipalities is to take place.

### **6. Environmental protection on the part of contractors**

Contractors and suppliers are to be included in the environmental activities - as far as this is realisable within the scope of the possibilities of a municipality. Environmentally relevant requirements are included in tenders within the framework of the legal possibilities.

### **7. Introduction of an environmental management system**

The city of Münster will establish an environmental management system for its administration, governing all environmentally relevant processes and specifying the

environmental responsibilities and accountabilities of the administration and the communal institutions. An essential element of this system is the regular assessment and disclosure of what has been achieved, as well as the implementation of the intended environmental objectives.”

The entire municipality is required to take into account environmental protection when awarding contracts. This has been stipulated by the tendering and awarding guidelines since March 1999. For any awards, procurements, and, if possible, also for tenders, the environmentally compatible or environmentally friendly characteristics of products and procedures are to be taken into account. The budgetary basic principles of economic efficiency and frugality do not preclude the preference of environmentally compatible or environmentally friendly products, even if these are more expensive than other deliveries and services. If two suitable services are equally costly, the more environmentally friendly service is to be preferred at any rate.

Consequences of this commitment include, for example:

- Only paper with the “Blue Angel“ is procured,
- The use of CFC, PVC, and tropical wood materials is abandoned,
- Spray chemicals (pesticides) are not used any more,
- Separation of recyclable materials is mandatory,
- The annual heat consumption of new municipal buildings may not exceed the value of 50 kWh/m<sup>2</sup> (decision of the city council),
- In the case of new acquisitions, natural gas vehicles are procured if available on the market, and Diesel vehicles are fitted with soot filters,
- Municipal buses are fitted with state-of-the-art Ad-Blue- and EEV technologies, respectively.

Furthermore, products made with exploitative child labour are off-limits according to the municipal awarding guideline (in the sense of the ILO convention no. 182 on the most fatal forms of child labour). For products from Asia, Africa or Latin America, this is to be substantiated by the certification (“seal/label”) through an independent organisation. There are some products that are manufactured, according to experience, also by exploitative child labour, which cannot be proven to be “free of child labour” by certification (“seal”). In such cases, comparable objective evidence of the production is to be defined and stipulated in the awarding documents.

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



The proportion of eco-label products for some products the procurement of which is paramount amounts to almost 100% by now. 90% of the recycling paper, for example, has been procured with the “Blue Angel” from the early 1990s already. An increase of the portion to 100% by 2010 is envisaged due to the high quality of new recycling papers. Furthermore, an attempt is to be made to increasingly minimise paper consumption. The procurement of copiers with the “Blue Angel” has also been mandatory since 2004, with the portion amounting to almost 100% today. Computer and screens have been required for many years to be certified according to Energy Star 4.0 or an equivalent standard. The portion of this equipment is 100% by now.

### 9.2.3 Increasing energy efficiency of municipal buildings

The city of Münster is increasing the energy efficiency of its buildings by numerous measures, e.g.

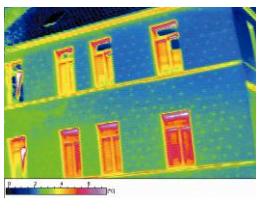
- the annual heat consumption of new municipal buildings may not exceed the value of 50 kWh/m<sup>2</sup> (decision of the city council),
- the project "Saving energy and waste in schools and daycare facilities for children" has been sustainably successful since 1997. 101 schools and daycare facilities have been participating until now, comprising more than 25,000 children. All the institutions have saved in excess of 3.5 million kWh of heat energy from 2003 to 2007 alone. Within a period of five years, CO<sub>2</sub> emissions amounting to 1,000 tonnes were saved.
- municipal administrative buildings housing more than 80% of the employees have been renovated during recent years. In the process, heat consumption has been reduced to 41 kWh/m<sup>2</sup> in the Stadhaus 2 (previously 140 kWh/m<sup>2</sup>/a) and to 83 kWh/m<sup>2</sup>/a in the Stadthaus 1.
- the daycare facility for children Loddenbach has been constructed as a pioneering project in passive house (15 kWh/m<sup>2</sup>/a) architecture in 2001,
- municipal consumption of electric power, heat, and water is registered within the scope of a monthly monitoring measure,
- the employees have been motivated by the power saving campaign "power devourers" to adjust their behaviour, saving energy, and last but not least
- the city of Münster is supplied with approx. 2 million kWh of green electricity, living up to its model role also in this context.

### 9.3 Please describe planned short and long term measures for improving environmental management of the municipality (max 1000 words):

#### Short-term measures

All municipal building yards and accommodations of green and sports area maintenance will be included into an environmental management system and certified according to EMAS and ISO, respectively, by late 2009. Energy consumption is to be reduced by 10% and waste quantities by 15%. In the same fashion, the storage of substances hazardous to water is to be safeguarded at all sites.

Power consumption is to be reduced continuously in the administrative buildings. Alongside some technical measures, the campaign "power devourers" will contribute to this as well.



#### Long-term measures

Public housing will be renovated according to a list of priorities, among others in the heat sector. Until 2015 average consumption values are to be decreased below 100 kWh/m<sup>2</sup> within a period of five years. Based on technical measures and a comprehensive campaign, power consumption is to be reduced by 20%. Further locations will be included in the audit according to EMAS each year.

#### Budget

The ongoing budget (product costs) for the environmental management as part of overall environmental protection in the municipality amounts to approx. EUR 810,000 annually. Future investment costs for implementation measures are not included here, since these costs are distributed on various budgets (e.g. energetic renovation of buildings) or cannot be quantified for the time being.

**9.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words):**

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. allocation guidelines.pdf
2. Council order guidelines enviromental management 2001.pdf
3. ECOPROFIT 2008.pdf
4. ECOPROFIT short Info 2008.pdf
5. education waste and energy project2007.pdf
6. Lokale Agenda report.pdf
7. Enviromental declaration Lauheide.pdf
8. Enviromental declaration Stadthaus 2.pdf
9. Enviromental guidelines city of Münster.pdf

Additional data is available from the following websites:

<http://www.muenster.de/stadt/livcom/index218.htm>

[http://www.muenster.de/stadt/entente-florale/index\\_en.html](http://www.muenster.de/stadt/entente-florale/index_en.html)

[http://www.muenster.de/stadt/umwelt/pdf/organigramm\\_en.pdf](http://www.muenster.de/stadt/umwelt/pdf/organigramm_en.pdf)

## 10. Sustainable land use

### 10.1 Please describe the present situation and development over the last five to ten years in relation to (max 1000 words):

#### 10.1.1 Proportion of new developments on brownfield sites

For the assessment of sustainable land use in Münster, spatial settlement structures as well as population and employment development are to be drawn on. Since the communal restructuring measure in 1975, the urban spatial structure of Münster has comprised, on the one hand, the compact city centre with the historical old town accommodating 113,500 residents. Adjacent to the city centre lie self-contained quarters which are delineated by the ideal type of green system and accommodate between 3,500 and 10,000 inhabitants. Furthermore, there are three districts of considerably larger dimensions (Kinderhaus, Gievenbeck, Hilstrup), with Hilstrup with its 25,000 residents already reaching the size of a middle order centre. Taken together, Münster is thus the prototype of the European city (compact-urbane-green). The share of settlement and traffic areas in the total area of Münster has increased only slightly during the past ten years (1997: 30.2%; 2006: 31.0%).



Being an attractive scientific, service, and administrative centre, Münster has maintained its residential population on a stable level during the last decade (1997: 280,419 residents, 2007: 280,199 residents), while the number of employees subject to social insurance contribution has increased by 11.5% to 133,399 employees in the same period of time. Thus, Münster ranks among the strongest-growing cities in North Rhine-Westphalia.

Taken together, Münster, as a solitary high level centre, is embedded in a very dynamic region (“Münsterland”). Therefore, Münster lost some 43,000 residents who moved away to the circumjacent districts Warendorf, Steinfurt, and Coesfeld between 1996 and 2006. This caused the surplus of commuters to increase to 56,931 commuters by 2004, entailing a corresponding traffic volume.

For this reason, Münster is intent on creating the framework requirements to offer an appropriate residential supply to the requesting households within the city. This is not just due to socio-political and demographics-oriented reasons, but even more to ecological ones. The citizens of Münster use cars clearly more infrequently, resorting to bicycles instead, while living in considerably smaller premises. In this manner, also the climate protection objective is accounted for.



The spatial urban development planning for Münster is oriented on the model of sustainable settlement development. The urban structure, comprising the compact city centre as well as the self-contained quarters with their functional district centres, offers suitable prerequisites for this. A guideline is the centre-oriented city of short distances. The basic principle “inner development before outer development” is of high significance here. For instance, Münster has reactivated almost 150 ha of conversion areas (previous military sites) within the scope of settlement development since the mid-1990s.

In addition, the reorganisation of the former port area according to the “Master Plan Municipal Ports” has been initiated. The conversion of the port area of approx. 100 ha primarily for businesses and use by the tertiary sector is controlled based on this master



plan. Initial successes of the restructuring measure can already be seen at the Municipal Port.

With regard to overall house building, approx. one third is carried out amongst the structures already in existence (in addition to measures in areas to be restructured), i.e. outside of newly developed areas, e.g. by using gaps between buildings, hinterland development or conversions. Given the dynamic development of the population and economy, all these measures are still insufficient, though. More free space has to be occupied in order to create the framework requirements for a supply that suits demand, and to avoid suburbanization processes.

The urban development of Münster is intent on saving resources and responding to demographic requirements in time - which is true also in settlement area development. It is oriented on existing central structures as well as available and reactivable railway stations. For district development, residential building sites and district-oriented business areas are attached in the fashion of "onion skins" to existing settlement areas so as to make use of available infrastructures to full capacity.

Due to the structural change within the administrative sector, the city of Münster aims at consolidating the commercial/industrial basis, and at supplying appropriate spaces for this. Beside the district-oriented business areas, this is based in particular on the reactivation of the 88 ha military site Loddenheide. Here, 63 ha were converted since the late 1990s. A total of 2,450 people are working now in this area.

Moreover, the city of Münster has ordered redensification measures in existing business areas to be assessed within the framework of the model project "Cities of the Future". Areas that are principally suited for activation primarily consist of derelict parcels of land (approx. 10 ha in total) and unused space in private property (approx. 14 ha). However, this is clearly insufficient given the demand and location qualities required.

A shortfall of more than 200 ha of industrial and commercial areas was identified in Münster as early as in 1993. In particular, locations with a distinctly supraregional appeal are hard to find. Although Münster is a city of services primarily, these services do live on production. For this reason, the Hansa Business Park in Münster-Amelsbüren is currently being developed. This area of 57 ha is supposed to meet coming demands by commercial/industrial investors who are dependent on an adequate advantage of location (motorway connection, access to canals and railways). Further location factors similar to those in Amelsbüren are not available in Münster, in particular as regards transport connections.

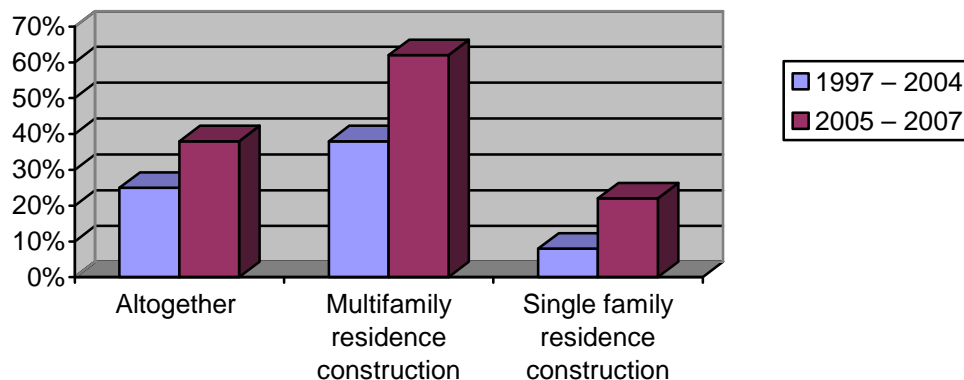


Following the utilisation of the former military areas, urban development has been focussing on the reactivation of post areas, car parks, sports fields, railway areas and reorganisation zones in the last years.

The following table gives the share of derelict land in the supply of residential building capacities for the years 1997 to 2004 and from 2005 to 2007, respectively:

Residential building areas on derelict or reorganisation areas:

	1997 – 2004	2005 – 2007
Altogether	25 %	38 %
Multifamily residence construction	38 %	62 %
Single family residence construction	8 %	22 %



Approx. 25% of the residential building areas (1,825 dwelling units) were provided in derelict or reorganisation areas during the period from 1997 to 2004. This share has risen to more than 38% from 2005 to 2007. Considerable residential building capacities could be provided in derelict and reorganisation areas, in particular for multifamily residence construction:

1997 - 2004: 38%  
2005 - 2007: 62%.

In doing so, the urban structure was consolidated according to the model of the “centre-oriented city of short distances”. The share of derelict land capacities was substantially increased also in single family residence construction:

1997 - 2004: 8%  
2005 - 2007: 22%

Efforts made by the city of Münster to ensure a sustainable urban development in the area of conflict between ecological demands, social requirements, economical claims, and functional requirements related to high level centres have gained recognition both at federal and state levels in multiple ways in the last decades:

- 1997 – 2002: model city in the federal model project "Cities of the Future - Strategies and Measures in Sustainable Urban Development"
- 1999: awarding of a prize to the "Car-free settlement Weißenburg Plus" in the regional competition "Implementing Sustainable Urban Development Projects"
- 2000: awarding of a prize for the inhabitant-oriented and ecological upgrade of buildings Breul in the regional competition "Implementing Sustainable Urban Development Projects"
- 2004: model project “Garden Settlement Merschkamp” in a former sports field within the scope of the REGIONALE 2004 (Deutscher Bauherrenpreis 2007)
- 2006 participation in the regional competition 2006 “Young Quarters for Living at Old Age” with the project Schulstraße/Kreuzviertel

- member in the responsible body “Alliance for Areas” in the Ministry for Environment and Nature Conservation, Agriculture and Consumer Protection of the State of North Rhine-Westphalia since 2006.

### 10.1.2 Population density for new developments



Due to the settlement structure of the city of Münster (compact old town and city centre, respectively, and self-contained suburbs delimited by green corridors), the habitat density for new developments has to be developed based on the specific local situation of the existing circumjacent settlements. In principal, rather rural structures can be differentiated from highly compacted structures in the city centre. This is highlighted by the substantially varying population density, ranging from 0.1 to 196 inhabitants per hectare.

For example, a density of 125 inhabitants/ha was reached in the reactivation of the “Barrack Area Lincoln”, and a density of 88 inhabitants/ha in the “Garden Settlement Merschkamp”.

## 10.2 Please describe the measures implemented in the last five to ten years in relation to (max 1000 words):

### 10.2.1 Minimising the total area of derelict and contaminated land

The share of contaminated areas or areas suspected to be contaminated has been increasing by approx. 12% from 1997 to 2008. Currently, 289 old waste deposits, 305 abandoned industrial sites, and 13 cases of old and inherited pollution related to armaments and the military are registered. These comprise a total area of 1,343 ha. From these contaminated and partially derelict areas, a total of approx. 400 ha, i.e. approx. 30% of the total area, have been reclaimed. As a qualification for subsequent use, almost 95% of the areas have already undergone an assessment of their noxious potential.



By the conversion process taking place since the mid-1990s, approx. 150 ha of high-grade residential building and commercial land have been emerging in the areas formerly used by the military within the urban area of Münster.

Other areas such as the territory of the former airport Münster-Handorf or the former sewage fields have developed into valuable biotopes. The sewage fields previously used for waste water irrigation are a pre-eminent European bird sanctuary today.

### 10.2.2 Renovating urban land



The conversion of military real estates is of great importance for the re-use of municipal brownfields. Almost 150 ha have been made available for re-use in the past years. Interference with open space could thus be minimised. Here is an overview of the conversions and the subsequent uses:

## Designation of the area

Barrack	Size (ha)	Reuse
Loddenheide	88	business/services
Porthmouth	18	dwelling
Winterbourne	17	business/administration/services
Nelson	8	military/dwelling
Von-Einem	8	colleges
Lincoln	7	dwelling
<b>total</b>	<b>146 ha</b>	



In addition further large areas such as the slaughter house or the canal harbour have been or will be completely reconstructed. These areas are planned to be put to residential or office use.

### 10.2.3 Increasing the number of inhabitants per ha of urbanized land area

With its 303 km<sup>2</sup>, Münster is the third largest city by surface area in North Rhine-Westphalia, displaying a greatly diversified settlement structure. An across-the-board specification of the “inhabitants/ha” indicator would not do these structures justice. Relating to the 174 urban clusters, population density is between 0.1 inhabitants/ha in the outskirts and 196 inhabitants/ha in the city centre. With approx 925 inhabitants/km<sup>2</sup>, the overall population density of the city has remained unchanged to a large extent between 1997 and 2007.

### 10.3 Please describe planned short and long term measures on sustainable land use (max 1000 words):

The short term measures should include description of measures adopted but not yet implemented and budgets for future measures already adopted.

The long term measures should include description of planned measures not yet adopted politically.

Short-term measures are specified in the building land programme 2008, which is used by the municipality of Münster to control building land development. For example, the re-use of land will focus on the conversion of car parks, sports fields, and market gardens/tree nurseries. In addition, there is only one major commercial brownfield; former military areas will not be available for conversion any more prior to 2015.

Given the lack of large-area reactivation potentials, the fact that, based on the building land programme 2008-2012, capacities of 58.3% for multifamily residence construction and 15.2% for single family residence construction were made available on brownfields and reorganisation areas, is a major success.

In the long-term perspective, the following measures for land re-use have been projected:

- reuse of the commercial brownfield OSMO in the area of the master plan “Municipal Ports” (approx. 500 WE),
- conversion of the previous Manfred-von-Richthofen barrack,
- follow-up use of two British barracks (from 2015),
- district development promotion within the scope of the workshop "Living in Münster" and by the strategic concept "Demographic Change".

The strategic concept "Demographic Change" is currently undergoing parliamentary consultation. It emphasizes once more the significance of a demographics-sensitive and district-related development. Furthermore, the demographic closing of ranks is strived for with the hinterland in order to avoid a disastrous area-consuming competition for residents.

For the time being, no tangible budget can be specified for the above-mentioned measures. Future restructuring measures will require, as much as the measures already completed, substantial expenditures, though. Münster will face up to this due to the specific city-planning interest.

**10.4 Please describe how the above issues can be documented should your city be shortlisted for participation in the second phase of the evaluation (Documentation should not be forwarded in this phase) (max 600 words)**

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. Schultheiß, Hartwig (2006): Münster managt Fläche strategisch (Münster manages space strategically) In: MUNLV NRW (ed.): documentation launch event Allianz für die Fläche (Alliance for Space). Düsseldorf, pp. 39-54.
2. City of Münster (1997): Münster im Jahr 2010. Konzeptionelle Grundlagen zur Fortschreibung des Flächennutzungsplans. (Münster in 2010. Conceptual basics for the follow-up of the land use plan.) Münster.
3. City of Münster (2000): Münster auf dem Weg in das 21. Jahrhundert. (Münster on its way into the 21st century.) Planen und Bauen. (Planning and Building.) Münster.
4. City of Münster (2005): Wohnbaulandentwicklung 2005. Beiträge zur Stadtforschung Stadtentwicklung Stadtplanung. (Residential building land development 2005. Contributions to urban research, urban development, urban planning.) Münster
5. City of Münster (2008): Baulandprogramm 2008. Münster (Building land programme 2008 Münster)
6. Demographic change in Münster - progress report 2005
7. Draft strategic concept demographic change in Münster 2008
8. Local Agenda sustainability report
9. Annual statistics 2003-2006 Sustainability/Local Agenda
10. lecture environmental plan-ppt (engl.)
11. Schowe, Christian (1999): Innenentwicklung – Potenziale im Bestand nutzen (inner development\_page 21-33) Münster in 2010. Conceptual basics for the follow-up of the land use plan.) Münster.
12. LivCom award (engl.) 2004

Additional data is available from the following websites:

<http://www.muenster.de/stadt/stadtplanung/stadtenwicklung.html>

[http://www.muenster.de/stadt/umwelt/boden\\_abfall.html](http://www.muenster.de/stadt/umwelt/boden_abfall.html)

## 11. Other measures

### 11.1 Please describe any effective and interesting measures taken to improve the urban environment of your city not covered by the above indicators (max 2000 words):



#### **Awards and prizes since 1998**

The city of Münster has been participating in various competitions for many years. But this is not just about collecting medals and awards, but rather about comparisons with other national and international cities, about learning from each other and passing on our own knowledge.

- 2008: The loveliest park in Germany - Aaseepark Münster (Briggs and Stratton)
- 2007 Entente Florale Europe/gold medal (AEFP- the European Association for Flowers and Landscape)
- 2006: Entente Florale Germany/gold medal (AEFP- the European Association for Flowers and Landscape)
- 2006: Climate capital of Germany – national champion in the area of climate protection (German Environment Aid)
- 2006: National competition “Allotment in urban development“ gold medal (Federal Ministry of Transport, Building and Urban Affairs)
- 2006: Winner of the solar federal state league of North Rhine-Westphalia for cities (German Environment Aid)
- 2005: European Energy Award in gold (Ministry for Economy, Middle-class and Energy)
- 2005: Second prize in the national competition “Cities saving energy“ (German Environment Aid)
- 2005: Most bicycle-friendly city of Germany (German Bicycle Club)
- 2005: Winner of the solar federal state league of North Rhine-Westphalia for cities (German Environment Aid)
- 2004: The most children-friendly city in Germany Bild newspaper and A Heart for Children registered association
- 2004: International Award for “Liveable Communities” – gold (IFPRA-International Federation of Park and Recreation Administration)
- 2004: Bicycle capital of Germany (German Bicycle Club)

- 2004: Climate Star  
(Europaen Climate Alliance)
- 2003: 3 x Local Agenda Best Practice Project:
- renovation of old buildings' subsidies programme
  - saving energy and waste at schools and day nurseries project
  - energy and climate protection inventora
- 2003: Most bicycle-friendly city of Germany (as in 1997)  
(German Bicycle Club)
- 2002: National competition "Allotment in urban development" gold medal  
(Federal Ministry of Transport, Building and Urban Affairs)
- 2001: National champion with the "münster.mobil" concept with respect to the issue of the  
"Accessibility of city centres" (New approaches, visions, concepts)
- 2001: Gold badge in the state competition "Small allotments in North Rhine-Westphalia"  
(State Department of Transport, Building and Urban Affairs)
- 2000: Award for the best advertising concept with to the climate protection 2000
- 2000: Award for the resident-oriented and ecological upgrading of buildings  
Breul in the regional competition „Implementing sustainable urban development  
projects"  
(Ministry of Urban Design, Housing, Culture and Sport of the State of North Rhine-  
Westphalia)
- 1999: Awarding of a prize to the "Car-free settlement Weißenburg Plus" in the regional  
competition  
"Implementing sustainable urban development projects"  
(Ministry of Urban Design, Housing, Culture and Sport of the State of North Rhine-  
Westphalia)
- 1999: International award "Local agenda 21 process"
- 1999: First prize in the "Consumer information" assessment category within the framework  
of the VCD National competition "Royal conditions in trains and buses"  
(Automobile Association Germany)
- 1998: National competition "Allotment in urban development" gold medal  
(Federal Ministry of Transport, Building and Urban Affairs)

## **Plannings and knowledge transfer**

### Environmental data register Münster

As regards numerous environmental aspects (e.g. water, soil, climate, air), the city of Münster has an archive of extensive space-oriented data which has been maintained by way of a geographical information system from as early as the 1990s. The growing interest - also on the part of the public - in environmental information and novel technical possibilities in the internet sector has prompted the city of Münster to tread a new path: the environmental data register Münster.

The extensive environmental data inventory is made available to a broad public with the environmental data register via the internet and is being expanded continuously. The



environmental data register 2003 has set new standards both for interested citizens and as a persistent companion for administrative works (<http://ukat.stadt-muenster.de/website/uebersicht/viewer.htm>).

### Environmental plan Münster

The environmental plan Münster represents, in plans and an environmental target concept, ecologically important areas within the municipal area. Correspondingly, it supplies working, decision-making, and planning assistance to the municipality in the fields of soil, water, air, and climate. Its standard and its temporal direction until the year 2010 are oriented on the follow-up of the land use planning. The land use planning is made up of various individual plans, from the basic evaluation via problem analysis to the development concept.

### ZUFO



Based on the conviction that resolving urgent environmental issues requires an intensified interdisciplinary approach to research, the Centre for Environmental Research, as the central scientific institution of the Westphalian Wilhelms-University of Münster, was founded in June 1991. In particular, the ZUFO considered its task to be the creation of an institutional framework, in order to promote and permanently ensure the dialogue between the medical-scientific and the socio- and humanitarian branches of study.

ZUFO has continuously and systematically recorded and published the extensive environmental research works and teaching programmes conducted at the University of Münster. This allows for the improved exploitation and concentration of the resources, consolidating the prominent position of the university in the environmental sector. At the same time, ZUFO has contributed, on the basis of active knowledge transfer, to intensifying the exchange of relevant findings between research and practice (business, environmental administrations, social organisations and associations). The Centre for Environmental Research was closed for organisational reasons in November 2007.

### **Nature conservancy and biodiversity in the city**

#### Supportive measures for nature conservation

Support of the local nature conservation organisations (NABU/NABU Naturschutzstation Münsterland) since 1996 with some EUR 1.2 million €, projects for the conservation and support of biodiversity in Münster (installation and restoration of lakes and rivers, installation and maintenance of orchards, development of neglected grasslands and heath land, etc.).

#### Near-natural cultivation of the municipal forests

The communal woodland is cultivated in full compliance with the FSC (Forest Stewardship Council) certification requirements. This means the renouncement of the mass felling of trees, the preservation of dead wood, the priority of natural rejuvenation, the renouncement of using chemicals, the arrangement of wood borders, etc.

#### Nature education site Emshof



The Emshof is a site for learning in the sense of the Local Agenda 21. Many children and adolescents, in particular in the cities, can hardly relate any more to nature, agriculture, and nutrition. The Emshof lets them experience and understand the cycles of both natural and cultural landscapes. There are courses about nature and agriculture for school classes and other groups.

At the Emshof, children, adolescents, and adults explore the ways of how ecological, economical, and social issues are interlinked - based on tangible examples from agriculture and natural history, autonomously and together with others. Multipliers from school and youth education become acquainted with the contents of an education for sustainable development, putting their methods to the test. The programme comprises the fields "hands-on agriculture", "intercultural learning", and "nature all around the Emshof". Within the framework of the model project "people with and without handicap experience agriculture and nature", the Emshof is closely co-operating with schools in order to adjust the programme also to such children and adolescents who require special support.

### **Environment house - supporting non-profit organisations**



By the mid-1990s, the municipality of Münster placed the house on the Zumsandestrasse at the disposal of the environmental institutions (biological station, the Association for the Environment and Protection of Nature in Germany, the German Society for Nature Conservation, the German Bicycle Club, the Automobile Club, the forest school, the World Wide Fund for Nature, the Group for Energy Transformation Münster, Greenpeace, etc.) as the central environmental site in Münster. The municipality financially supported the institution with over 330 000 € per year.

Before the house was ready for occupancy, it was refurbished according to ecological aspects with the expert support of numerous voluntary helpers. Today, it is the central intra-urban contact point for citizens in the matter of nature conservancy.

### **Water**

#### Restoration of the Aasee

In collaboration with the institute of hygiene of the university hospitals Münster, research and development projects as well as measures for improving the water quality of the Aasee have been carried out since 2005. The aim is to reduce the phosphate pollution so as to prevent toxic cyanobacteria from spreading. For this purpose, ferric chloride was intermixed as a precipitant into the tributary river of the Münstersche Aa. These measures have been carried out to great success. Water quality has improved substantially, allowing for the unrestricted recreational use in and beside the lake.

#### Water renaturation

Lakes and rivers are of high significance for Münster. Therefore, the city strives to steadily improve the quality of the municipal lakes and rivers. Examples for commensurate measures include:

- near-natural restoration of the Aa (EUR 1.3 million)
- near-natural restoration of the Emmerbach (EUR 1.1 million)
- bypass brook Pleister Mühle/fish ladder Werse

#### Ground water protection

The intensive livestock husbandry with its concomitant increased share of nutrients in the municipal area leads, in part, to high nitrate values in the ground water. This situation is particularly problematic in the water protection areas situated to the north of Münster. With a view to water resources management, farmers have to change the way how they employ fertilizers in order to improve ground water quality in the long term. This is the starting point for the co-operation between water resource management and agriculture in Münster; during the past five years, great effort has been put into the sustainable improvement of the ground water quality. For this, the public utility company Münster is providing approx. EUR 75,000 annually. These funds are drawn on to support various measures for water protection. It is to be assumed that these measures, in their entirety, will mean a substantial improvement for

water protection in the future. For instance, considerably reduced quantities of fertilizer are deployed within the water protection areas by now.

## **Collaborations and partnerships**

### ICM Process / Lokale Agenda



There are two outstanding civic processes which have significantly influenced the development of Münster and will continue to do so in the future: Lokale Agenda 21 and the “Integrated City Development and City Marketing Concept”.

From 1997 to 1999, Münster conducted an agenda process with the broad participation of the population, for which the city has received international recognition and acclaim. The results of this process provided the basis for our all-encompassing discourse on the Integrated City Development and City Marketing Concept.

In a debate lasting over two years, the people of Münster established the signposts for Münster’s future. More than 1,000 individuals actively participated in this process, from every sector and walk of life including politics and administration, the populace at large, the social sector, trade and the economy, art and culture, science and education, sport and leisure and, of course, nature and the environment. Together the citizens have formulated a “Duty for the Future”. Under the profile “Science + Lifestyle”, 7 guidelines have been compiled. They were approved by the City Council in May of 2004, and they represent the orientation and standards for everything the city undertakes in the future.

### Environment advice service

In the Environment Office, the municipal environmental advice service gives advice and offers information to the citizens on all environment-related questions. There have been some 150,000 customer contacts during the past ten years. Each contact represents a little step toward environment improvement in Münster. In addition, information that is worth knowing and useful is provided by way of a comprehensive internet service.

### Healthy Cities Network

The city of Münster is a member in the Healthy Cities Network, accommodating the appurtenant secretariat (public health department). The Healthy Cities Network of Germany sees itself as a part of the “Healthy Cities” movement of the WHO. In the *healthy city*, health, physical, mental, and social wellbeing take centre stage in all - last but not least political – decisions. Therefore, the network aims, among others, at permanently bringing health promotion as a social task to the mind of the public. This objective is pursued in close co-operation with experts from the health care, welfare, and educational departments, the work areas of environment, housing, and urban development by means of initiatives, projects, and the self-help movement. Networking is an important working principle here, facilitating the transfer of incentives and experiences. ([www.gesunde-staedte-netzwerk.hosting-kunde.de](http://www.gesunde-staedte-netzwerk.hosting-kunde.de))

### Collaboration with local institutions

Close cooperations with partners, e.g. in climate protection, with the chamber of handicrafts, the district craft guild, associations, the consumer advice centre, the chamber of commerce and industry, energy consultants, architects.

## International projects

The municipality of Münster supported different international groups in climate protection projects:

- energy neighbourhoods are saving energy for climate protection
- Cool Region - energy efficient cooling technologies in office buildings
- German-American/Japanese town twinnings in climate protection
- measures for energy efficiency in Central and East European housing construction
- regional cooperation EUREGIO

## ECOPROFIT



ECOPROFIT supports enterprises in reducing operational costs by environmental protection measures. Up to the present, 62 companies have been participating in five projects within the scope of the ECOPROFIT programme. In the process, they have scored the following annual results:

- cost reduction by 1.6 million EUR/a
- in excess of 110,000 m<sup>3</sup> of water saved
- waste reduced by 1,200 tonnes
- almost 11 million kWh of energy saved
- saved 1,200 tonnes of CO<sub>2</sub> for climate protection
- amortisation of the investment costs (approx EUR 2.2 million) already after 1.4 years on average

A few enterprises have used the ECOPROFIT project to build up or support an environmental management system (e.g. as per DIN 14001 standard). **In 2008**, Münster will launch the 6th ECOPROFIT project.

## **Urban ecology**

### Digital soil contamination map

Up to now, the attention in soil protection has focussed on the identified cases of previous and inherited pollutions. Statements as to the large-scale soil status were possible but to an inadequate degree.

Based on the digital soil contamination map, the entire urban area has been extensively surveyed for the first time. Thus, the soil conservation authority has a well-founded base at its disposal.

Further information to supplement this chapter can be gathered from the following PDF files on the extra CD supplied additionally.

1. InfoClimateCapital-english.pdf
2. certificate german solarleague.png
3. certificate capital city.jpg
4. LivCom Award 2004.pdf
5. Entente Florale Gold Medal.pdf
6. ECOPROFIT 2008.pdf

7. Lokal agenda report.pdf
8. Climate-star.2005.jpg

Additional data is available from the following websites:

[http://www.muenster.org/umweltforum/programm/con\\_veranstaltungsprogramm.html](http://www.muenster.org/umweltforum/programm/con_veranstaltungsprogramm.html)

<http://www.aaseepark.de>

<http://ukat.stadt-muenster.de/website/uebersicht/viewer.htm>

<http://www.emshof.de/media/emshof-flyer.pdf>

<http://www.gesunde-staedte-netzwerk.hosting-kunde.de/>

## 12. Programme for dissemination of experiences and best practises

### Introduction

Münster is popular with city tourists. Conventions and trade fairs, major cultural and sportive events attract guests both domestic and foreign to the Westphalian metropolis on a regular basis. Münster's colleges and universities regularly attract teachers and students from all corners of the globe. But what is unbeknown to most: There is hardly a single week passing without both national and international special technical groups from the various sectors of a municipality looking over the shoulders of their colleagues in Münster. Politicians and representatives of national institutions like to get a personal picture of Münster's qualities as well.

They want to know how the german climat capital is addressing the global subject on a local level. They want to learn, in the bicycle capital, how to motivate more than 45% of the population to cover the daily distances by bike or on foot. They want to obtain information on the various parenting services in the most child-friendly city in Germany.

And what's more, it's not just the guests learning from us - we always learn from them as well. An exchange that has even intensified since Münster was awarded two international gold medals (LivCom-Award 2004 as the "most liveable city in the world", Entente Florale Europe 2007).



In this context, we have learned that such competitions constitute a valuable supplement to the perennial technical co-operation in the various networks, because they are up-to-date and of high publicity. For many years, Münster has been member in different international organisations such as the Europäisches Klimabündnis (European Climate Alliance), International Federation of Park and Recreation Administration (IFPRA), International Council for Local Environmental Initiatives (ICLEI), Eurocities, and Council of European Municipalities and Regions (CEMR).

We see the European Green Capital Award as an extraordinary opportunity to exchange ideas and experiences related to the environmentally compatible city. Ultimately, there are also weak spots to struggle with, for which we gladly adopt know-how from elsewhere. Based on the objective clearly catering to the planners and deciders, and last but not least on the renown of the competition hosts, methods of resolution can be discussed and implemented in a technical and results-oriented manner on a European level.

Here, an essential role is assigned to the European Green Capital as an ambassador, moderator, and model. Münster will gladly accept it. The rough concept to be set up in 2009 and - taking the award for granted - to be implemented in 2010 will show the way.

So much is conceded that the ambitious programme cannot be realised based on the regular municipal resources alone. For this reason, we are planning collaborations with the Westphalian Wilhelms-University Münster, the University of Applied Sciences Münster as well as the state and federal governments as well as the EU and NGOs. Furthermore, Münster is going to draw on support options offered by the state and federal government as well as the EU on all levels. And last but not least, Münster will rely on the support of those that make a city come alive in the first place: the people living here.



## 1. Internet



The internet, being a widely used medium by now, is ideally suited for the purpose of guaranteeing international exchange and dialogue. After all, it is interactive, offers unlimited capacity, and is independent of daytime and labour times on location.

In order to ensure exchange between the nations, all essential contents, activities, etc. are drawn up and implemented in both English and German. Furthermore, selected information shall be made available in French as well.

### 1.1 Environment portal (extranet)

The environment portal will become the central communication platform for active participants on the subject of "Green Capital". Communes, companies, associations, societies, etc. may use it via a sign-in identification. This guarantees the continuous open exchange of initial ideas, complex topics, projects and their development stages as well as failures.

- Possible applications and objectives of the environment portal:
- joint development of guidelines,
- preparation of events, workshops, and conferences,
- discussion of publications,
- compiling joint working papers,
- preparation and coordination of press releases,
- supply of contents for the internet presence,
- discussion and exchange via chats, blogs, bulletin boards, etc.
- formation of work groups for technical subjects (e.g. climate, water, waste),
- concerted planning of target dates.

### 1.2 Green Capital on the internet

The internet presence for the European Green Capital is being conceived in the form of a portal yielding an extensive supply of information and services. Beside own editorial contributions, the output from the environment portal serves as a source.

In order to ensure the procurement of information to be specific and attractive despite the broadness of the material supplied, website visitors will be able to adapt it according to their individual needs and interests by means of appropriate tools.

The internet service will comprise, aside from the classic reference information:

- "environment tickers" (breaking news, newsflash, headlines only, PC)
- Twitter (newsflash, abstracts, info transmitted to mobile phone)
- RSS feed (more comprehensive than Twitter, text is transmitted to PC),
- podcast (extensive information, download to iPod),
- tagging (indexing of website contents by visitors, improved indexing of topics, creation of a - "tag cloud", PC),
- bulletin boards (active composition and creation of texts by the web user, dialogue with other users, PC),



- blogs, moblogs, vlogs (text and video features by web users, PC, mobile phone, camera),
- chats, expert chats (electronic communication between web users and, possibly, experts in realtime, PC).

The technical possibilities of the internet allow for a differentiated, target group-specific address in text, design, and usability (e.g. podcast for “young people” equipped with iPod and the corresponding word and visuals selection).

### 1.3 Virtual exposition

Interested persons can visit environmentally relevant locations on a virtual city map of Münster. They are supplied with visual and technical information at each station.

### 1.4 Environment WIKI, WIKIA GREEN

Incorporation of Green Capital subjects and features from the environment portal into Wikipedia ([www.wikipedia.de](http://www.wikipedia.de)) and, in particular, into Environment Wikipedia ([umwelt.wikia.com](http://umwelt.wikia.com)) and the novel WIKIA GREEN ([green.wikia.com](http://green.wikia.com)).

### 1.5 Google Earth

Own pictures can be set on showcase projects (e.g. environmentally friendly landfills, wind power plants, solar stations, bicycle parking garage). It has to be checked whether there is the option of an own European Green Capital category.

### 1.6 Social Networks (facebook, studiVZ)

Social networks are currently coming in; especially young people make use of these group-specific chatrooms. Adolescents and young adults could exchange thoughts on current environment topics in Europe in a pan-European group “Network European Green Capital”.

## 2. Events

### 2.1 International Opening Conference - Learning from each other



Invitation of all European cities with more than 200,000 inhabitants. This includes 182 cities currently. The convention is supposed to conduce to the exchange of information environmentally relevant on a communal scale, and to the distribution of instruments and measures that are already proven. For this purpose, the European Environmental Capital as well as the other contender cities will present their best practise examples. All cities will be given the opportunity to show, on a "market of possibilities", the way how they work on individual environment subjects, which technical possibilities they employ or are about to develop.

Field trips on location allow for gaining practical insights in selected environment sectors. There will be sufficient occasions for individual requests and in-depth discussions.

### 2.2 The Green Dream Camp

People in Münster like to live here, appreciating the cultivated and inviting ambience, the ample green, the short distances with the omnipresent bicycles, the living quality, and the air of a students' city. That's what they have attested to municipal statisticians in one of the regular citizen surveys in September 2008.

A praise we are as proud of as of the national titles of climate capital, bicycle capital or most child-friendly city. That's because however competent a jury might be, the people that spend

their everyday life here are our most critical jurors. It is solely because of them identifying with Münster and standing up vigorously for a green and liveable Münster, that we are able to keep up this quality of life also in the future.



We feel confident that what works at the decision-making level is also an ideal medium at the citizen level to disseminate the rules of a Green Capital across national borders. For this reason, we want to invite people from throughout Europe who are active in environment and citizen workgroups. They have found creatively successful ways to get involved in environmental protection and the improvement of the quality of life in their cities. Ideas that we would like to see adopted elsewhere. They can introduce them to each other in the GREEN DREAM CAMP.

### **2.3 Push Event**



For the start in 2010, a push event is to take place with the most effective publicity possible. This event, which hasn't been specified any further yet, is supposed to yield an image for the press and the media based on which the awarding or the title "EUROPEAN GREEN CAPITAL" is communicated throughout Europe. For example, the logo or the Green Capital script nameplate could be modelled in a Münster-specific fashion with thousands of bicycles, thus creating an impressive photo motif for aerial photography.

### **2.4 Environment and future celebration**

Münster is going to celebrate the Green Capital Award with an environment and future celebration, making it even more well known throughout Germany. All communal societies, associations, institutions, and companies involved in the environment sector will participate in arranging the programme. The city will present the meaning of the application criteria of the award in a popular manner.

### **2.5 International workshops**

There are year-round international workshops related to a wide variety of topics. Aside from the exchange of technical information, these conduce to the establishment of networks which allow for the communes to exchange thoughts informally on a pan-European level.

### **2.6 Guided tours**

Münster will offer special guided city tours focussing on environmentally relevant subjects to specialists from other European cities. Such offers may be advertised, among others, in a complete package of hotel chains which are present throughout Europe.

### **2.7 Summer Academy**

The Westfälische-Wilhelms-Universität of Münster and the University of Applied Sciences of Münster are arranging an international interdisciplinary series covering environmentally relevant subjects. Here, students from all over Europe are given the opportunity to come together on a scientific level, to collectively discuss strategies of sustainability, and to identify solutions.

## **2.8 Ambulatory exhibitions**

Best practise examples of Münster which were pivotal in winning the title of “EUROPEAN GREEN CAPITAL” will be presented by way of an ambulatory exhibition. It will be rented to other European cities.

## **2.9 Closing event and documentation**

This event will present the experiences and successes gained during the competition year in their full diversity. As a conclusion, the baton will be handed over symbolically to the Green Capital 2011.

A conclusive report - according to the start slogan “Learning from each other” - will draw a conclusion and will be made available internationally.

The aim of the technical networking efforts throughout the competition year is to develop guidelines for a more effective urban environmental protection work in Europe in cooperation with the participating cities. This could be codes of practice for subjects such as energy-efficient residential building, ecological procurement regulations or air pollution prevention. These will be published also.

## **3. Advertising for the Green Capital**

### By the commune

In order to make the prize of the Green Capital awarded for the very first time more known, it is imperative to position the logo and the name in a multifarious way. Thus, the competition logo will be placed in different media such as notepaper, seals, postcards, posters, banners, websites, post-it notepads, web banners, flyers, t-shirts or flags.

### By companies and institutions

In winning the LivCom award in 2004 it showed already that a liveable, green, and healthy city is a definite location advantage for commerce, economy, and science, which is gladly communicated by enterprises and institutions as well.

In this manner, companies active at the international level are to be won over to identify with the European Green Capital. For example, they might place the corresponding advertising trailers on their websites or link their product ads to the Green Capital Image. In particular such companies that are committed to environmental protection can emphasise their dedication with this model city.

## **4. Media relations**

During the entire competition year, media such as press, radio, television, and internet are continuously provided, via different distributors, with up-to-date information on events and activities, but also with background information on specialised subjects. In the process, reporting will take place in word, vision, and sound, as well as multilingually if required. The material is supplied via

- national (dpa, Reuter, etc.) and international press and agency distributors
- national expert boards (such as the Association of German Cities and Towns, Conference of the Directors of the Horticultural Departments)
- international technical boards (such as the Council of European Municipalities and Regions)

- international technical press, also of associations (such as the International Federation of Park and Recreation Administration (IFPRA), Association Européenne pour le Fleurissement et le Paysage (AEFP), National Geographic).
- European umbrella associations (United Cities and Local Governments, Cities Alliance, the International Council for Local Environmental Initiatives (ICLEI)).

#### 4.1 Motion picture



A multilingual motion picture about the European Green Capital will graphically present the possibilities of communal environmental protection work. It is intended to give a practical example for communal environmental protection work in European communes and at international conventions and back up decision makers in implementation processes.

Furthermore, it will be supplied to commercial tv stations for free broadcasting.

#### 4.2 Publications

Flyers, brochures, and other print media such as posters, stickers, and postcards will be designed for the competition year. They will advertise the idea of the Green Capital and document how a commune can face up to both local and global environmental requirements, and not with any finger-wagging, but with facts and the wow factor. (see also 2.8. Concluding event)

### 5. Trade fairs, conferences

Münster, as the “EUROPEAN GREEN CAPITAL”, will live up to its ambassador role for communal environmental protection also at international conventions and environmental events.

Additional data is available from the following websites:

<http://www.uni-muenster.de/de/index.html>

<https://www.fh-muenster.de/index.php>

<http://www5.stadt-muenster.de/schriften/67liste.cfm>