

# „Status-quo-report“ Hamburg

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## 0. Introduction

This status quo report of the Free and Hanseatic City of Hamburg gives a synopsis of current policies and activities in Hamburg which are an intermediate result of sustainable measures which have led to the Green Capital 2011; therefore the report is in main parts based on data of the Green Capital Award. These activities are set into the geographical, economic and environmental conditions of the city which build the indispensable framework and starting point for successful strategies and implementation further on – especially for the transformation towards a “Smart Energy City”.

The City context delivers boundaries, framework and selective conditions for key elements, key performance categories and key performance indicators.

We chose 10 Key Elements to characterize Hamburg. Focusing the subjects of energy, climate protection and environmental policy we prioritize 5 themes (key elements): Governance, Resource consumption, Urban and Environmental Policy, Climate Policy, Cooperation and Communication – referring to the PESTLE Approach (Political, Economic, Sociological, Technological, Legal, Environmental).

The next step will deliver key performance categories and key performance indicators from the chapters of the 5 prioritized themes. The report will also serve to identify in a first approach the strengths, weaknesses, opportunities and threats of Hamburg (SWOT).

## 1. Characteristics of Hamburg

The Free and Hanseatic City of Hamburg is a City-State (“Land”) and municipality in the Federal Republic of Germany, with a population of 1.8 million, making it the second largest city in Germany and seventh largest in Europe. The economic region ‘Hamburg Metropolitan Region’, which includes parts of Lower Saxony, Schleswig-Holstein and Mecklenburg-Vorpommern, has a population of about 5 million people ([www.hamburg.de](http://www.hamburg.de)).

The city area covers approximately 755 km<sup>2</sup>, large parts of which are made up of green spaces, waters and woodlands: More than 16% of the city area consists of vegetation, parks and recreation areas including agriculturally used landscapes on the outskirts of Hamburg. This might be seen as one of the reasons for Hamburg’s high quality of living and housing. Water covers a further 8% with streams, ponds and lakes such as the inner and outer “Alster”. About 74 km<sup>2</sup> of the city area are port spaces. But as well as being the core of the industrial port the river Elbe also defines natural segments of the city.

### *Economy*

Hamburg is well-known as a trading centre, this being rooted in its strategic location on the river Elbe between the North Sea and the Baltic Sea. The city is home of the third largest port in Europe and with respect to container traffic it is in the top twenty worldwide.

Industrial sectors in Hamburg include civil aviation, food processing and steel- and metalworking heavy industry. In the recent 20 years Hamburg has become a modern centre for logistics, technology, aviation, services, media – and tourism. Numerous international companies, agencies and enterprises all have their European head offices here.

### *Urban Planning, Traffic and Transportation*

Urban planning plays a key role in creating a sustainable city. There are major urban redevelopment projects in Hamburg which incorporate climate change actions: these include Europe’s largest waterfront re-development, “HafenCity”, as well as the urban renewal of derelict, more disadvantaged parts of the City such as the district of Wilhelmsburg. Here, some 60.000 inhabitants will benefit from the innovative projects of the International Building Exhibition “IBA” in 2013. At the same time by means of the International Garden Show “igs2013”, a new urban park is being created in Wilhelmsburg, with leisure, sport and relaxation facilities, to improve the quality of life for local people.

Hamburg has a sophisticated public transport network – with nearly 2 million passengers daily using S-Bahn and U-Bahn rapid transit rail systems and bus and ferry lines. Hamburg Airport has recently been completely modernised and expanded, with a new S-Bahn link to the city centre, and is used by about 13 million passengers a year. Hamburg is the most important intersection of motorway routes in the North Germany, with the A1, A7, A23 and A24, and is a bridge to Scandinavia. The metropolitan region is the most important railway junction area in Northern Europe, with the world’s largest marshalling yard in Maschen.

### *Environmental Policy*

For many years Hamburg has pursued policies with a strong regard for environmental issues and climate change.

Hamburg is committed to reducing its CO<sub>2</sub> emissions by 40% by 2020 and by 80% by 2050. CO<sub>2</sub> emissions per capita have been reduced by about 15% compared to 1990, with annual energy savings of some 46,000 MWh, no mean achievement for a metropolitan city with considerable trade and industrial activity.

The combination of a history of progressive policies and ambitious climate protection goals led to Hamburg being awarded the title “European Green Capital” in 2011.

### *Climate*

Hamburg falls within the mild temperate maritime climate zone: The warmest months in Hamburg are June, July and August, with high temperatures of 19.9 to 22.2 °C. The coldest months are December, January and February, with low temperatures of -1.4 to 0 °C.

## 2. Governance

### *Hamburg Parliament (Legislative) and Government (Executive)*

The city of Hamburg is one of 16 states of the Federal Republic of Germany, therefore the Mayor of Hamburg's office corresponds more to the role of a minister-president than to the one of a city mayor.

The “Bürgerschaft” is Hamburg's state parliament. It is made up of 121 members, who are elected every four years (from 2015 every fifth year). The Bürgerschaft makes decisions on legislation and the Hamburg budget and supervises the work of the Senate - Hamburg's government. The Mayor as head of government determines the major lines of policy.

The Ministers in Hamburg are called “Senators”. They are in charge of the respective Ministries of the City. Hamburg's government work is done through a total of (at present) ten Ministries, each headed by a Senator.

The City is geographically divided into seven administrative districts, which are subdivided into 104 urban quarters (“Stadtteile”). Districts are responsible for local government work. Each district is headed by a district Council Executive with its own district assembly; an elected district council participates in district administration.

In summary:

Hamburg is a republic, democratic welfare state and a constitutional state. At the same time Hamburg is a municipality, there is no separation between these two administrative tasks.

The power to create, amend and ratify laws (legislature) is given to the parliament. The government deals with all details of state politics and community politics.

As a German state government it is responsible for public education, the correctional system and public safety, etc.; as a municipality, it is additionally responsible for e.g. libraries, recreational facilities, sanitation, water supply and welfare services.

The basis of the political system are the Basic Constitutional Law of the Federal Republic of Germany and the Constitution of the Free and Hanseatic City of Hamburg.

### *Senate and Ministries*

In 2013, there are ten senators holding ministerial positions plus the head of state, the First mayor. A senator is the presiding minister for a 'government agency' ("Behörde"), which rather means "Ministry" in this case.

As an example, the Ministry of Urban Development and Environment ("BSU – Behörde für Stadtentwicklung und Umwelt") is responsible for such as:

- the state and regional planning policy for Hamburg, i.e.
  - the regional planning and regional collaboration with neighbouring states,
  - the town planning and the landscape planning in the interest of the whole city,
  - the urban and landscape planning concepts and projects, in particular those involved in the key project "Sprung über die Elbe",
  - the preparation and accompaniment of EU projects with territorial reference,
- advancement of environmental awareness and sustainable development,
- protection and cultivation of bodies of water as well as water supply planning,
- protection and regeneration of soil,
- examination and restoration of brownfields,
- waste industry planning and waste legislation authorization,
- green space planning and protection of nature,
- air and water pollution control planning as well as adequate authorization and monitoring tasks,
- energy supply planning as well as climate protection and energy policies,
- aircraft noise protection and noise reduction planning.

### *"Climate Action Plan" and "Masterplan Climate Protection"*

Between 2007 and 2012 the Ministry of Urban Development and the Environment has set up the "The Hamburg Climate Action Plan" as the main tool to tackle the effects of climate change in the city. It was monitored and updated annually. Nearly 500 different projects have been planned, started or realized during this period.

Besides the individual projects, the State own subsidy programs for energy efficient new buildings, the building stock renovation and the integration of renewable energies were major contributions for the implementation of climate protection measures.

In 2013 the "The Hamburg Climate Action Plan" will be replaced by a strategic "Masterplan for Climate Protection" focusing on all levels of energy demand and energy production in different sectors and offering a holistic approach to reach the CO<sub>2</sub> reduction targets.

Furthermore Hamburg is targeting a special environmental governance, a joint venture between local government and the commercial sector (see next chapter).

### *Direct democracy*

As opposed to national policy a plebiscite and a referendum are possible due to the Constitution of Hamburg. In the past several plebiscites and referenda happened in Hamburg. One very important plebiscite will take place at 22 September 2013 about power and gas networks/grids: it asks for rebuying and

municipalizing the gas and power grids for 100% (now 25.1%) by the City of Hamburg.

The plebiscite has been organized by important NGOs.

Generally civil society in Hamburg is active on different fields and in various organizations (church's involvement, trade unions, social groups etc.). One important NGO is called 'Future Council Hamburg' which tries to achieve more sustainable development – a network with more than 100 organizations.

### 3. Economy

#### *Hamburg Port*

The port city is a major industrial and commercial location, and generates a gross domestic product (GDP) of about €50,000 per capita. The port of Hamburg is the second largest in Europe, after Rotterdam, and is of key significance for the German economy. It makes the city a major international trading and transshipment site, as well as an attractive location for shipbuilders.

Since 2005, the Hamburg Port Authority has brought together all the port-related responsibilities of the Hamburg authorities in a single public law institution. The aim of this combination is an efficient and future-orientated port management provided by one organisation. The Hamburg Port Authority is responsible for the entire port infrastructure, the port railway and for the safety of shipping traffic. With some 1,800 employees, it is on-hand all around the port to ensure safe and economic processes.

Around 11,000 ships sail into the port every year, owned by over 100 shipping companies. The port's management understands that economy and ecology go hand in hand, and the infrastructure surrounding the port reflects this philosophy. For example, saving energy not only conserves the environment, it also cuts running costs. This makes Hamburg an attractive destination, reflected in the way the port and its logistics have developed over the past few years.

In February 2010, international container shipping companies voted Hamburg the best out of eight North European ports (Hamburg, Rotterdam, Antwerp, Bremerhaven, Zeebrugge, Amsterdam, Felixstowe and Wilhelmshaven). This helps to explain why, despite the global economic crisis, in 2010 the port achieved further growth of 9.8%, handling a total of 121 million tons of cargo.

#### *Other sectors*

Other important industrial sectors in Hamburg include civil aviation, food processing, and steel- and metalworking heavy industry. Hamburg's manufacturing companies employ some 83,000 people, primarily in air and spacecraft and engineering, and in Europe's largest copper smelting plant. Industrial companies invest about €50 million a year in measures to care for the environment.

But industry contributes only a total of 16% of total gross value added. The service sector is dominated mainly by transportation and commerce, tourism, information technology, and media.

The media sector is one of Hamburg's biggest employers, with some 15,400 companies providing work for more than 70,000 people. Daily and weekly newspapers, radio, TV and film all have a strong presence in the area. The city is also a centre for digital media, advertising and creative design.

Tourism plays a significant role in the city's economy. The tourism sector employs more than 175,000 people full-time and brings in revenue of €9.3 billion, making the tourism industry a major economic force in the Hamburg Metropolitan Region. The port has the capacity to accommodate even the largest cruise liners, like the Queen Mary 2.

In 2010, 104 big ships brought 250,000 visitors to the city. In 2015 (?), vessels will have the facility to plug in to less-polluting onshore electricity supplies.

### *Future challenges*

As an industrial centre with a growing population, Hamburg has to confront a range of environmental challenges. But wise use of natural resources, coupled with an innovative policy for 'Responsible Growth', has helped to make the city an example of environmental best practice.

A discussion on "Greening our Economies" has been launched, to identify further untapped efficiency improvement potentials in industry. The Hamburg Senate and the business community are cooperating for rapid implementation of voluntary measures for resource efficiency, going beyond the legal requirements.

Hamburg has made real efforts to cut back on CO<sub>2</sub>, with a Municipal Climate Protection Act, adaptation and research programs. The climate protection program, approved by the local government in summer 2007, identifies 10 areas of action covering over 450 individual measures. The city invests up to €22.5 million a year in these measures.

A significant partnership program, called 'Enterprise for Resource Protection', has already completed about 1,000 projects. The aim is to encourage voluntary investment in increasing energy and resource efficiency in enterprises. For each €1 invested by local government, participating companies contribute €10. This has generated total private investment of €146 million matched by municipal support of €15 million. In total, the enterprises currently save 134,000 tons of CO<sub>2</sub> emissions each year.

The Hamburg ECO-Partnership, a joint venture between local government and the commercial sector, encourages companies to go beyond statutory requirements to take additional ecofriendly measures. Serving as a platform for information and networking, the partnership also offers free on-site consultations for Hamburg-based firms, supporting clients in implementing projects in the fields of environmental management and climate protection.

A self-commitment has been signed by eleven industrial companies, for reduction of their carbon emissions in the 2008-2012 period. The targeted savings potential for 2012 is 500,000 tons CO<sub>2</sub> per annum, corresponding to 25% of the total savings goal of the Climate Action Plan.

Now this self-commitment will be expanded: 15 important enterprises signed an agreement to continue the commitment and to save additional 150,000 tons CO<sub>2</sub> per annum from the end of 2018.

Beyond that, a separate energy cooperation project with the big private power and heat suppliers exists to save additionally 300,000 tons. Altogether from 2008 to 2018 about 950,000 CO<sub>2</sub> p.a. shall be saved by the industrial sector in Hamburg.

#### 4. Standard of Living

As a major industrial centre, Hamburg confronts all the environmental challenges which other European cities face also – searching for ways to combine industrial activity and the employment with a good standard of living for inhabitants.

This could make Hamburg a role model. However Hamburg has forged the connection between building one of the world’s most ‘liveable’ cities and expanding as an industrial metropolis and hub for trade and transportation. It has already made good progress in environmental protection and intends to increase its efforts in future. Hamburg is in no way an “environmental paradise”, where all ecological problems are already solved.

In 2007 Hamburg residents' total ecological footprint was calculated to be **9,110,565 ha** or **5.17 ha per capita**. This is almost equivalent to the ecological footprint of the average German resident of **5.08 ha per capita** in the same year. The question “*How many planets would be needed to support the global population, if everyone lived like an average Hamburg resident?*” can be addressed. In the case of Hamburg the Planet Index answer was **2.90**, almost equivalent to German average of **2.85**.

The breakdown of the ecological footprint into components facilitates a better understanding of the size of resource demands associated with various aspects of consumption. The components analysed for this ecological footprint were:

- Nourishment: 33% (household food and drink consumption and food waste),
- Shelter: 15% (direct household energy),
- Mobility: 24% (personal transport),
- Services: 6% and
- Goods: 22% (all other material and product consumption including Government and industry).

*These components are strongly connected to production and consumption of energy*

To reduce the ecological footprint, the city implements all aspects of European environmental policy, ranging from energy policy, climate protection and improving air quality to water management and nature conservation. The environmental problems experienced in cities such as Hamburg are multifaceted, as is the potential available to solve them.

But furthermore it means a broad discussion about *shaping our individual lifestyle*.

Hamburg is a rich city (GDP € 50.000 per capita), but on the other hand 12.5 % of the citizens get social welfare benefits. Even more, the city districts show important social differences.

The access to reasonably-priced housing or energy is a basic question for an urban strategy towards a Smart City.

In the city, the population was spread out with 15.7% under the age of 18, and 18.8% were 65 years of age or older.

Recent estimates put the number of people with a migrant background at 30% (515,000). Immigrants come from about 180 different countries (e.g. 6.3% Asian, 5.3% Turkish, 2 % African).



## 5. Resource consumption

The development towards a resource-conserving city has started in Hamburg several years ago. It is based mainly on the increase of resource-efficiency, the substitution of finite resources by renewable ones and the increased awareness of consumers in Hamburg.

Related to the ‘Hamburg Climate Action Plan’ there were CO<sub>2</sub>-reductions of about 2 million tons p.a. by 2012 compared to 2007.

In recent years Hamburg has undergone a significant change in its energy policy with respect to energy production and use to achieve climate policy goals: After privatizing the energy supply in the last decades Hamburg now aims to regain influence on the energy production and use. Supported by impulses of the Parliament, Hamburg implements the change in energy policy by the Triad of “Efficiency”, “Networks” and “Renewable energies” – the latter with a special cooperation with the Northern States of Germany.

Among the more than 60 individual measures and projects for efficiency, networks and renewable energies the following are particularly relevant:

- Establishment of a city-owned energy supplier “Hamburg Energie” with a strong focus on environmentally friendly energy supply, its production and energy related services
- Cooperation with established power companies, e.g. Vattenfall, and integration of energy suppliers in the process of energy change
- Increasing the City’s share in the energy network (now 25.1 %)

Additional examples are:

- Construction of an innovative power plant:
  - Construction of an efficient cogeneration plant (CHP) for Hamburg’s district heat supply
  - Integration of a wind-to-heat plant
  - Heat accumulators for storage of renewable energies
  - Substituting old coal-fired power plant
- Restructuring Hamburg’s power grid:
  - Grid automation
  - restructuring for integration of renewable energies
  - improving supply quality
  - installing Smart Meters
  - energy portal
- Use of renewable energy in the urban area:
  - Designation of areas for wind power plants and repowering
  - Expanding use of photovoltaic, e.g. citizen bonds for Hamburg Energie GmbH
  - Geothermic tests in Hamburg

These measures result in

- a 1.6 billion Euros investment volume through cooperation resulting thereof
- Guaranteed revenues for the city from network business
- Renewable energies as economic factor:
  - Competence Cluster Renewable Energies Hamburg
  - Hamburg as „Capital of Wind Energy“
  - Location for renewable energy companies

Hamburg supports activities in this field with favourable loans from the Housing Loans Association (WK). These loans are linked to energy saving requirements which are even more ambitious than corresponding legal regulations in general. Within the scope of the International Building Exhibition experts created an Energy-Atlas (“Future Concept Wilhelmsburg”) which represents a holistic approach towards sustainable, climate-friendly urban living.

To discover and visualize the potential for the integration of solar energy within the city boundaries a “Solar-Atlas” was developed and published in 2011.

Thereupon a project was launched with the aim of installing new solar power with a capacity of 10 MW and the participation of citizens via assets.

It is planned to increase the capacity of wind energy in the energy mix of the city up to 100 MW by repowering of existing production sites and the exploitation of additional sites via changes in the land utilization plan. Hamburg also seeks to increase the energy production from biomass.

The cooling of the German Climate Computing Center serves as a good example of a single very effective efficiency improvement. The cooling of its extremely high performing computers lead to very high energy consumption, but this could be reduced with an innovative concept by 10% – 20%.

Following this idea Hamburg has set up an advisory program for in-plant energy efficiency for companies, which covers the consumables energy, water, chemicals and waste.

In summary:

Hamburg shows commitment to enhance efficiency-measures by the expansion of intelligent grids, heat supply with minimal greenhouse gas emissions, storage solutions and virtual power plants. Consequently Hamburg established the municipal renewable energy supplier HAMBURG ENERGIE in 2009 who tackles these challenges in cooperation with the city.

### *Waste and Water*

Further potentials for efficiency are made accessible by innovative processes which are implemented to recover energy from waste and waste water.

Hamburg applies recycling and incineration procedures to minimize the amount of landfill waste. Public awareness campaigns were carried out to elevate the motivation for waste separation in households and businesses.

Waste prevention is the best thing people can do for the environment, and yet it is not always easy to avoid waste. So Hamburg’s Recycling Offensive is an important contribution to climate protection and conserving resources. It works on two levels: on the one hand, the total volume of waste is considerably reduced through recycling, and on the other, precious raw materials are returned to the production cycle. Numerous activities are under way to improve local waste management. Furthermore, current savings of around 1 million tons of CO<sub>2</sub> a year in Hamburg, through recycling and waste management, should increase by a further 100 000 tons from 2012 onwards.

High investments in water infrastructure are made for maintenance, modernization and the reduction of leakage. Control of per capita water consumption via meters shall support moderate consumption.

The showcase project “Hamburg Water Cycle” enables sewage disposal which is energy self-sustaining and neutral for the climate with nutrient reclaim”.

## 6. Traffic and Transportation

Hamburg attracts over 300,000 commuters every working day. The city has been developing its public transportation system for over a century: The Hamburger Hochbahn has been operating since 1911. The Hamburger Verkehrsverbund (“HVV”) is one of the world’s oldest integrated public transport systems and now covers a major area of the metropolitan region. Today, almost all residents have access to public transportation within 300m of their home – a higher proportion than in other European cities.

The public transport services are provided by HVV in an area covering 8,700 square kilometres – that is not only the whole area of the Free and Hanseatic City of Hamburg, but also all of the bordering counties in the regional states of Schleswig-Holstein and Niedersachsen (Lower Saxony). The HVV service area is home to approximately 3.37 million residents. On average, around 2.2 million passengers travel on these services each workday. In Hamburg, 17% of all trips are made on public transport services. For trips to and from work this in fact rises to 34%. And in the city area public transport accounts for approximately 67% of the modal split.

A network of rapid transit and regional rail services converge at the city centre: four U-Bahn underground lines, six S-Bahn suburban lines and nine regional rail services ensure rapid and direct connections. At the weekend and on public holidays, selected buses and train services operate all night.

In November 2011 the fleet of small taxis (Smart cars) was expanded, with lower rates and fewer CO2 emissions.

There are six ferry lines serving the harbour and the River Elbe.

In 2003, when Hamburg started to trial fuel-cell powered buses, there were 535 million bus and train passenger journeys. Today there are more than 650 million per year. Hamburg is home to the world’s largest fleet of hydrogen-fuelled buses – and it is still expanding. Each of the nine existing vehicles contains 1,920 individual fuel cells converting hydrogen into electric power, and they will soon be able to pull into Europe’s biggest hydrogen filling station, in the port, producing hydrogen from solar or wind power generation. The almost noiseless, 200-kilowatt engines emit steam, rather than harmful emissions that contribute to climate change, improving Hamburg’s air quality.

Hamburg already has 1,800 km of cycle paths. The aim is to increase bicycle traffic from 12% of total road use in 2008 to 18% in 2020, through additional bike lanes and cycle-hire schemes. Since July 2009, the “StadtRAD” bicycle scheme has developed a network of 123 stations around the city, with 1,650 bikes and 130,000+ registered users.

To minimise the environmental impact of trade on the local area, Hamburg Port distributes seven out of ten container loads for long-distance transport by rail – more than most other ports worldwide. Some 12% of German goods transported by rail begin or end up in Hamburg. This represents up to 220 trains in the port each day. Within the port, an increasing quantity of goods is transferred from one terminal to another not by road, but by water, on regular port and river barges and on specially developed container taxis, which also transport city waste. To further strengthen this environmentally friendly approach, each of the three competing tenders to build a new central terminal in the Steinwerder district of Hamburg proposes a lorry-free system, with options for solar energy and kinetic energy recovery.

The Hamburg Port Railway is going to break new ground. In a pilot project, a new geothermal railroad switch heating system is being tested on one of the 880 switches in the port of Hamburg. The novel heat pipe system is selfregulating.

## 7. Urban and Environmental Policy

Over the last 30 years, Hamburg has switched its expansion policy away from greenfield development, which creates urban sprawl, more roads and traffic and destroys landscapes and natural habitats. Instead, the city is regenerating brownfield urban areas:

HafenCity, one of the prime urban development projects in Europe, will expand the existing city centre by 40% – in the spirit of combining a high degree of urbanity with the highest standards in sustainability. The former port and industrial area is transformed into a new type of downtown, with a mixed use spatial structure for 12 000 residents, more than 45 000 jobs and thousands of daily visitors. What provides the basis of high quality urbanism after 10 years of development also offers an example of best practice for sustainable city development.

The physical structure of the new city stands on a new, raised flood-proof level created by underground parking and establishing an interesting landscape of private and public spaces.

The ‘Leap across the Elbe’ means opening up an arc of urban development in the centre of Hamburg, comprising Europe’s largest river island, including HafenCity, the islands of Wilhelmsburg and Veddel, and the Harburg Upriver Port to the south. To support this long-term strategy and foster its development, an International Building Exhibition (“IBA”) and an International Garden Show (“IGS”) are taking place in the area in 2013.

For more than a century, building exhibitions in Germany have been examining the future of human co-existence. In more ways than one, an IBA is not an ordinary exhibition. It demonstrates innovative approaches and model solutions to urgent contemporary questions on the urban future, that are developed and implemented at the end of a complex process lasting a number of years, and are open to evaluation by both experts and citizens. The IBA Hamburg has three key themes:

- adapting to climate change;
- turning the diversity of an international urban community into a strength;
- making transitional spaces into liveable places.

For the International Garden Show in 2013, a new urban park is being created in Wilhelmsburg, with leisure, sport and relaxation facilities, to improve the quality of life for local people.

Hamburg is built on a radial or ‘axial’ model, extending out from the central Rathausmarkt, which facilitates residents’ access to rural areas outside the city. At the same time, a network of green links (“Grünes Netz”) creates a series of green belts connecting the landscape axes, at various distances from the city centre. The green network covers the whole of Hamburg, forming a link between urban parks and playing fields, narrower green areas and larger spaces, from the outskirts to the city centre. Two inner loops and several landscaped axes together form an almost seamless grid, constituting a unique green urban leisure area.

The objective of the city's landscape planning policy is to link parks, leisure and sports areas, playgrounds and even cemeteries, to make it possible for people to travel from the city centre to the outskirts, on foot or by bicycle, without coming into contact with traffic. The green network is also key to the 'connectivity' of wildlife habitats – enabling animals and other species to move freely from one place to another.

[Supplement: Air pollution control plan 2012]

## 8. Climate policy

Climate change is a threat to the future of the City of Hamburg – for the health and safety of its people, for its economic and social structure, and for the natural spaces and wildlife of the metropolitan region.

Hamburg aims to achieve a substantial contribution, to the national goal of a 40% CO<sub>2</sub> reduction by 2020, and a 80% reduction by 2050 compared to the emissions level in 1990. The Climate Action Plan 2007-2012 is a first step towards fulfillment of these targets.

Furthermore, the city will draw up a Climate Masterplan for these purposes, setting the long-term strategy for a future framework of steps, with quantified goals. A baseline report drawn up for this purpose shows the options for actions to achieve them. The public are to be actively involved in the discussion on planned regulations and measures. The results of these processes have been put into the Masterplan and updated versions of the Climate Action Plan for the coming years.

Overall, 13 goals for sustainable climate action are set:

- Power supply,
- Energy saving,
- Renewable energies,
- Energy efficiency improvement,
- Building modernisation,
- Industry and plant engineering,
- Exemplary function of Hamburg administration,
- Mobility,
- Evaluation and monitoring,
- Communication of climate change,
- Research for climate change,
- Adaptation to climate change,
- National and international cooperation.

KlimaCampus is the name we have used since 2007 to signify the network of climate research experts in the Hamburg area. This includes scientists from 18 different institutes of the University of Hamburg as well as non-university partners such as the Max Planck Institute for Meteorology, the Helmholtz-Zentrum Geesthacht and the German Climate Computing Centre.

The nucleus of the KlimaCampus is the Cluster of Excellence „Integrated Climate System Analysis and Prediction“(CliSAP) of the University of Hamburg, which is funded in the framework of the Excellence Initiative of the German federal and state Governments. CliSAP has succeeded in bridging the gap between natural sciences, economics and humanities: meteorologists, oceanographers, geophysicists and ecologists work closely together with other disciplines.

In addition to that, excellent local services make up further building blocks for the climate research network: the German Weather Service, the Federal Maritime and Hydrographic Agency and the Climate Service Center (CSC).

In this context two climate projects are to be emphasized: KLIMZUG-NORD (provides information on climate change, its possible consequences and adaptation strategies) and RISA (Rain InfraStructure Adaptation) setting the regulations for management of rain. The project is also to integrate water management measures into urban and landscape planning and transport planning. It is also preparing a legal framework for decentralized water management in new building areas.

Another important research area is the modeling of the urban climate: Established methods and models can be used to assess whether certain building programmes are climate-friendly. Local aspects also include those changes which are caused by the city itself, for example by changes in its land use plan: for example, whether a densely built city is better for the urban climate than a widely spread urban area. A numerical model "METRAS-urban" has been created by KlimaCampus for simulation of land use changes.

## 9. Resilience

Ecosystem resilience is the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes. "Resilience" as applied to ecosystems, or to integrated systems of people and the natural environment, has *three defining characteristics*:

- The amount of change the system can undergo and still retain the same controls on function and structure
- The degree to which the system is *capable of self-organization*
- The ability to build and increase the capacity for learning and adaptation

The *complementary* subject to resilience is the character of *vulnerability*, where a system or a community could be harmed by natural/ecological, social or economic 'hazards' or impacts.

Hamburg shows a specific vulnerability of flood tides in its history and has therefore developed a high quality flood management – as a resilience factor:

Hamburg will be substantially affected by the impact of climate change. That is shown by the Climate Report for the Metropolitan Region of Hamburg, which was presented by the Climate Campus and partners in 2010. The researchers believe that sea level could rise by up to 40 cm by 2050. Precipitation in winter could increase by about 40%, with longer dry periods in summer.

Hamburg has to be prepared for higher flood tides, and has to take action for balanced water management.

Hamburg will adapt to the rise in sea level not only by increasing the height of the dikes. It will also work with the strategies of the Tidal Elbe Concept developed by the Hamburg Port Authority to counteract the progressive changes in the river system- it will create more retention space, develop concepts for the Elbe estuary, and optimise sediment management. It will take various preventive measures to deal with the severe rainfall events which are expected in the future and are already becoming apparent. For example designation of retention spaces to reduce water run-off in the event of floods; and restoration measures for marshes and water meadows, to retain the water in shallow areas so that it is available in

dry periods. These water management measures also help to preserve nature and soils. Similar considerations are also going into urban and landscape planning. Changing rainfall patterns linked to climate change, and an increase in sealed urban areas, mean adapting the sewage and drainage system to prevent sewer overflow and flooding. The EU project Urban Water Cycle (2004-2008) examined the entire water cycle with the aim of upgrading local drainage systems through decentralised storm water management. A second Competence Network project (2007-2009) brought together local authorities and universities, to come up with technical and planning tools for storm water management in Hamburg. The city is now developing ambitious plans for dealing with excess storm water involving a range of partners including local authorities, policy-makers, researchers, architects and landowners. This is happening within the project RISA (RegenInfraStrukturAnpassung – Rain Infrastructure Adaptation), which promotes a new way of dealing with storm water in Hamburg.

To meet current challenges, the city's approach is to complement the centralised system of drainage (discharge) and storage with more innovative solutions for decentralised storm water management. The project aims to establish sustainable storm water management practices throughout Hamburg.

*[More difficult and complex subjects are **social and economic resilience/vulnerability**, but they are important for SEC and the TA of energy structures]*

*[Will be delivered later]*

## 10. Cooperation and Communication

Hamburg participates in European networks related to energy efficiency, regional and urban planning and climate protection like EUROCITIES, Covenant of Mayors, ICLEI, POLIS, METREX etc.

As a member of the city network Eurocities Hamburg participates in several working groups e.g. air quality, climate change & energy efficiency, clean cities, green areas and biodiversity, greening the local economy, metropolitan areas, noise and the project NiCE (networking intelligently represent cities for energy efficiency).

As a former Green Capital 2011 Hamburg has various relationships to the other Green Capitals. Hamburg is also well networked in the Baltic Sea cooperation and the cooperation with Denmark and the Öresund region. One example of the collaboration is the STRING cooperation. There are the five partner regions Schleswig-Holstein, Hamburg, Seeland (Denmark), capital region of Copenhagen (Denmark) and Skåne/Scania (Sweden) in the STRING-cooperation. The political representatives of the STRING-partner meet once a year for a "political forum".

In addition, Hamburg maintains intensive contacts with its sister cities. Hamburg is twinned with Dresden, Marseille and St Petersburg in Europe.

Since 1985, Hamburg is represented in Brussels through the "Hanse-Office". Extensive contacts with all EU institutions enable the Hanse-Office to incorporate the interests of Hamburg into European decision making processes. Furthermore Hamburg is represented in the European Parliament, the Committee of the Regions and the Conference of Länder Ministers of European Affairs.

Hamburg coordinated the METREX project EU CO<sub>2</sub> 80/50 (see [www.euco2.eu](http://www.euco2.eu)) to look at different ways of reaching the 80% CO<sub>2</sub> reduction target by 2050 through stakeholder workshops involving 14 metropolitan cities. A recent result of METREX is "reMac": a tool for stakeholder involvement that shows both the





financial implications and the decarbonisation outcomes of regional energy efficiency investments and increase of renewable energy production, all based on actual demographic, economic and cost data.

Hamburg is very active in projects in the North and Baltic Sea regions, for example as coordinator of CO2OLBRICKS a project looking at how to make historical building more energy efficient.