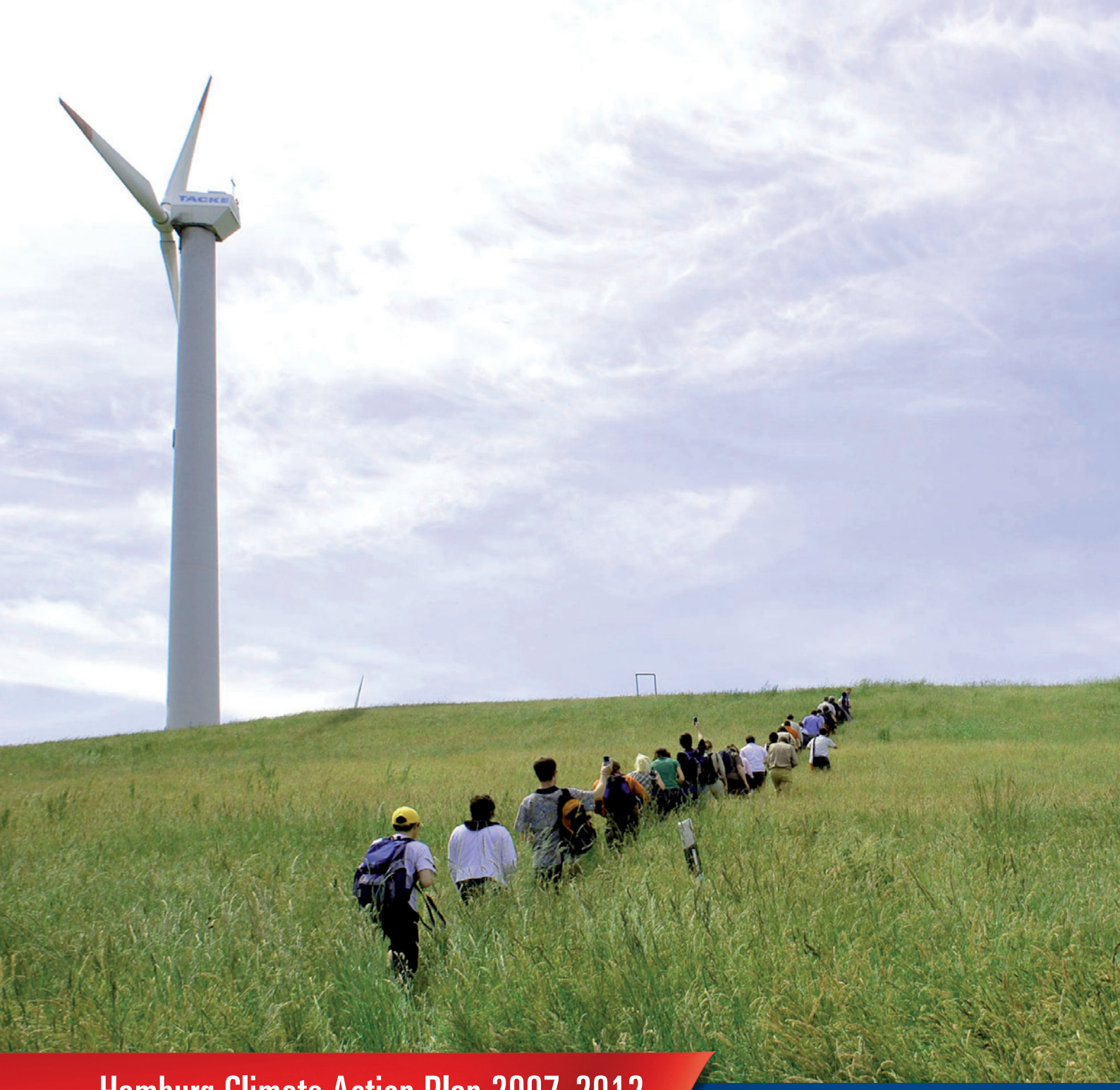


Hamburg Climate Action Plan 2007-2012

Update 2011-2012

Hamburg

Communication of the Senate to the Hamburg Parliament

"Update of the Hamburg Climate Action Plan 2007-2012"

Report on further development of programme, implementation of measures in 2011, and planned allocation of funds in 2012 (fourth update)

Contents

A. Reasons and content

The present document meets the Senate's annual reporting obligation.

In 2011, with the energy policy change following the reactor accident in Fukushima, it became evident that economic policy, energy policy and climate policy belong directly together, and that climate action is one of the key fields of policy action for Hamburg. That was also reflected in the climate action goals in the Senate's working programme of May 2011. There is increased awareness of the need to establish climate action in all areas of social responsibility, and to take proactive steps to mitigate climate change. Forward looking climate policy by the Hamburg Senate is clearly of the greatest significance, as a key to sustainable development of the city. Climate action was the motivation for numerous events and additional projects in Hamburg's year as European Green Capital 2011. Not the least important of these was the "Train of Ideas", which was an ambassador for climate action and its key role for sustainable development of cities.

The fourth update to the Climate Action Plan is taking place in a situation of changed conditions for climate action in Hamburg. These changes are due to the budgetary and government programme specifications of the Senate, and new requirements set by the Federal Government. The Senate aims at ambitious climate action, despite the tight financial situation. This means recognising and implementing climate action in administration and in public awareness as a regular task in all areas of responsibility and fields of action.

The Coordination Centre for Climate Issues has overall responsibility for coordination between the departments. It handles the funds approved for 2011, amounting to EUR 23.49 million in budget year 2011; all of these funds were in fact deployed. In addition, a further EUR 8.9 million were deployed from the EUR 9.97 million carried over from budget year 2010. The overall total was thus approximately EUR 32.4 million.

The central area for update of the Climate Action Plan is climate protection by energy-efficiency modernisation of existing buildings, measures for climate-friendly mobility, and increases in funding programmes which are important for climate action. The document shows the evaluation of the Climate Action Plan started in 2011 and the current results of carbon monitoring. In addition, new projects in the Climate Action Plan are presented. Further project presentations are shown at the website www.klima.hamburg.de.

The Senate aims for further development in 2012 of its climate action activities with this update of the Climate Action Plan, which is recognised at European and international level.

B. Hamburg's Climate Action Plan

I. Goals of Hamburg Climate Policy

Following the Fukushima nuclear disaster, the Federal Government initiated the energy policy change in spring 2011, making it clear that even without nuclear energy it is keeping to the goal of a 40% reduction in greenhouse gas emissions by 2020 and at least 80% reduction by 2050 (versus baseline 1990). The Federation also amended the Nuclear Energy Act, stipulating final stepwise exit from use of nuclear energy by 2022, and adopted further acts and funding instruments. In particular:

- The Renewable Energies Act (EEG) was amended with effect from 1 January 2012;
- New provisions were adopted in the “Energy and Climate Fund”;
- The Building Code (BauGB) was amended to reinforce climate friendly development in cities and municipalities;
- The Grid Development Acceleration Act (NABEG) was adopted; and
- The Energy Management Act (EnWG), the Offshore Installations Ordinance and the Award of Public Contracts Ordinance were modified.

The aim of the Federation with these measures adopted in June 2011 is to further increase the percentage of renewables (wind energy, biomass, photovoltaic) in energy production. It puts a special focus on offshore wind energy generating, and promotes the accelerated construction of wind turbines. Federal revenues from the auctioning of emission certificates are to benefit climate action, energy efficiency, building modernisation, etc. Climate action and adaptation to climate change are to be given increased importance in the overall building planning of cities and municipalities. The expansion of the distribution networks is to be moved forward faster.

The Federal stipulations are being included in Hamburg’s climate policy, taking account of the special features of the city state. Hamburg supports the Federation’s climate policy, and is committed to its goal of continuously increasing the proportion of energy generation from renewables, from 17% today to 35% by 2020, and in stages to at least 80% by 2050.

The Federal goals are the basic platform. The Senate made it clear in its working programme in May 2011 that Hamburg will make its contribution to achievement of the national climate action goals – 40% reduction of carbon emission by 2020 and at least 80% reduction by 2050, in order to limit global warming to 2 degrees Celsius.

The Senate has also set priorities for continuation of the Climate Action Plan and execution with priority of measures that are expected to give major savings in carbon emissions. The municipal company HAMBURG ENERGIE and the Hamburger Energy Agency HAMEA have an important part to play in this.

In addition to these direct indications, priorities will be set in renewable energies, energy supply/heating networks, housing construction, transport and research, and in the International Building Exhibition IBA in Wilhelmsburg.

The Senate has prepared the ground for the energy turnaround in Hamburg, in negotiations with the power companies Vattenfall Europe AG and E.ON Hanse AG. The intended acquisition of a 25.1% interest holding in the grid and network companies for electricity, gas and district heating will restore Hamburg’s scope for manoeuvre in climate and energy policy. That is underscored by the steps and projects agreed on 29 November 2011, such as the investment programme for the energy turnaround, the intended innovation power station (combined gas and steam power station, with integration of energy storage) and the commitment of the energy companies for further reductions in emissions.

The Parliamentary Resolution “Hamburg – Ready for the Energy Turnaround” (doc. 20/1229) of August 2011 takes up the Federal energy turnaround goals, and the goals of the Senate from the working programme, and puts them into concrete terms. It emphasises the need for a Hamburg energy concept for safe, inexpensive, and environment and climate friendly energy supply without the use of nuclear energy. The energy concept is to show the way to energy savings and efficiency improvement, to increased use of renewables, and to expansion of the

networks and development of storage technologies. The Hamburg Parliament also adopted key policies relevant to climate change mitigation and the Climate Action Plan.

At the beginning of the Climate Action Plan it set out the goal to reduce carbon emissions by an additional 2 million tonnes to 15.6 million tonnes by 2012 versus 2007 (17.6 million tonnes). In the second quarter of 2012, the Senate will present a Climate Action Master Plan, as the long-term development framework for Hamburg climate policy. It will set out the goals and framework for action in climate policy for the horizons 2020 and 2050. It will also specify the links in content and the organisational coordination of the tools for this purpose in climate action and in climate impact adaptation 'Master Plan for Climate Action – Climate Action Plan – Climate Impact Adaptation'.

II. Focal points in Climate Action Plan 2011-2012

The Climate Action Plan with its approved funding sets the focal points for the Senate's climate action activities for 2011, and will follow up in 2012, too, with focus on projects that give major carbon reductions and low avoidance costs. Fig. 2 (see section D) shows that in 2011 nearly 80% of the funds went to the sectors energy, buildings, mobility and industry & plant technology; i.e. the funds were put into activities and projects which directly serve these overarching goals of the Senate. The use of funds in 2012 (see Fig. 3) with a share of 80% again gives a strong focus of fund application in measures with high carbon reduction levels, especially in the building sector for modernisation of existing buildings, and in support to grant programmes. There are particularly effective carbon reduction activities in the energy sector (e.g. the CHP initiative – Combined Heat and Power Production, as set out in Parliamentary Resolution 20/1229 "Hamburg – Ready for the Energy Turnaround"). For the individual focal areas, see the details in the sector chapters.

The figures for CO_2 monitoring, which is effected in the framework of the Climate Action Plan, show the clear orientation of funding of the Climate Action Plan to the goals of the Senate. Of the activities funded from the Climate Action Plan, there are now figures for the carbon reductions achieved available for 116 activities (there were figures only for 62 activities in 2010). Further figures are currently being determined in cooperation with the project partners, so that the above figures give an interim status.

In order to optimise the available data in connection with carbon monitoring, the responsible authorities are examining whether recording of the energy requirements and if applicable the carbon reduction in building projects is possible via supplementary regulations to the Building Statistics Act, and whether it is appropriate in view of the effort involved for those required to give information.

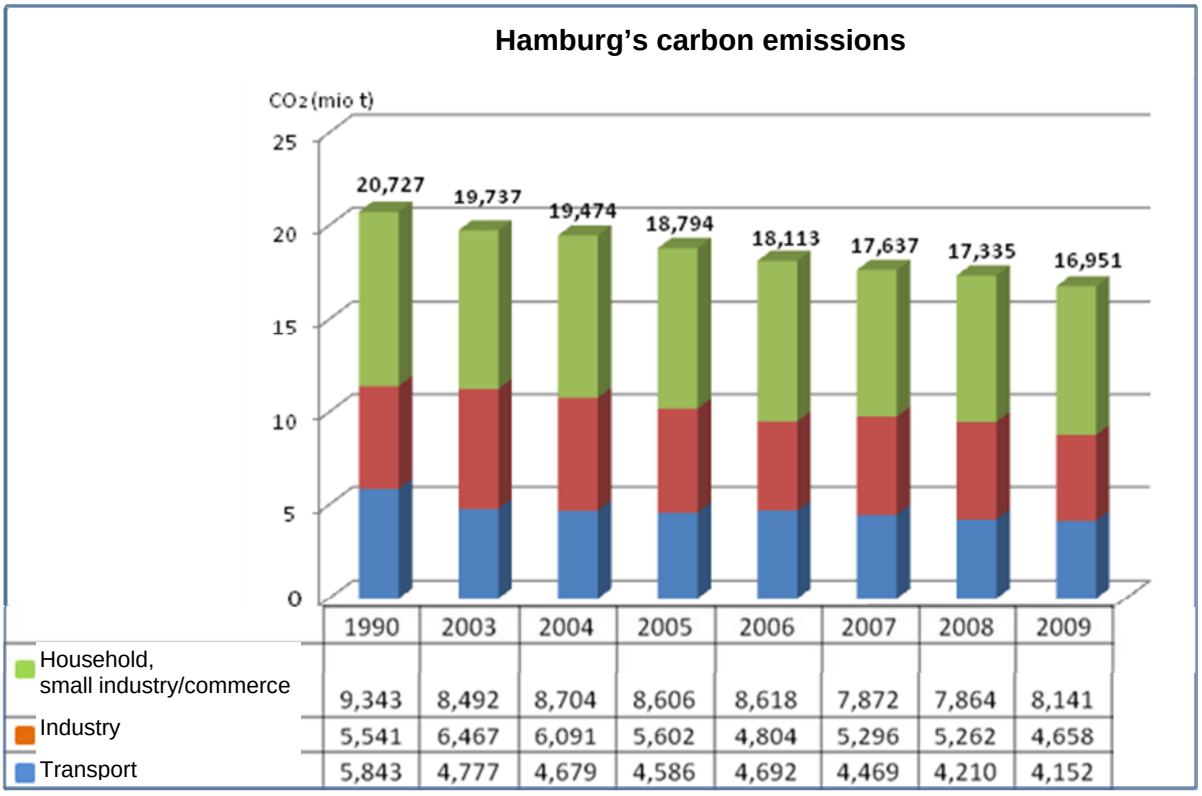
The Senate will present the overall inventory on target achievement for the Climate Action Plan for the period 2007 to 2012 with the final document in the second quarter of 2013.

III. Development of Hamburg carbon inventory

The development of carbon emissions in 2009 was very much influenced by the financial crisis. While the gross domestic product dropped by more than 2%, carbon emissions went down by 3.3%. This decline can be explained to a large extent by a decline in power consumption in manufacturing industry. At the same time, there were significantly fewer flights at Hamburg Airport, which likewise caused a substantial reduction in emissions.

The winter was significantly colder, but that only caused a relatively small increase in emissions from households and in industry. The carbon inventory shows sales-related emissions for each of the states throughout Germany. In 2009, consumers took more recourse than in 2008 to using up their stocks from the previous year, so that these consumptions were already in included in the statistics for the 2008 carbon inventory.

Fig. 1: Hamburg's carbon emissions



Source: Statistikamt Nord (status 2009, more recent data not yet available)

In the longer term, too, emissions in Hamburg are decreasing. The most important contribution to that is made by the Renewable Energies Act, which supports the construction of plant for power generation from renewable energies. The Hamburg power consumers have funded generating systems in this context, in Hamburg and in particular outside of Hamburg, leading to a reduction of more than one million tonnes CO_2 since 2003. On the other hand, there is a rising trend in power consumption in households and industry, trading and service companies.

A significant contribution to reduction of the carbon footprint is also made by industry. Carbon emissions have gone down by a total of 1.858 million tonnes in this sector since 2003. Half a million tonnes of this amount is due to a reduction in the use of fossil fuels. And energy consumption is also going down in the transport sector. At the same time, the increase in blending of biofuels also means a reduction in emissions.

IV. Evaluation and carbon monitoring for Climate Action Plan

The impact of the Hamburg Climate Action Plan, and in particular the budgetary funds used for it, will be checked by monitoring of CO_2 reduction and evaluation of the Hamburg Climate Action Plan.

1. Evaluation

The rough concept of evaluation was set out in the third update to the Climate Action Plan. On this basis, the Senate is having the whole of the programme, including a selection of individual measures of the Climate Action Plan evaluated by a consortium of independent auditing offices Bosch & Partner, EOP and Komment (programme and project evaluation). The purpose is firstly to assess the effectiveness of the Hamburger Climate Action Plan, and secondly to evaluate and assess the processes and impacts generated by the Climate Action Plan with a wide range of structural, process and impact criteria. That is important in the light of the central goals of the Hamburg Climate Action Plan, which include among other things achievement of directly measurable carbon reduction effects, and initiation of learning processes in society between the various players in Hamburg, and triggering of long-term structural effects. The evaluation is to be the basis for possible adjustment; the results will be available at the end of the first quarter 2012 and will then be included in the strategic design of the Climate Action Master Plans and the follow-up programme to the Climate Action Plan 2007-2012.

A steering group with representatives of six Hamburg ministries has been set up for continuous supervision and control of the evaluation process.

Status of work

The evaluation process is subdivided into three work packages:

1. **Preparatory work** with the goal of developing a fine concept for the overall evaluation procedure.
2. **Programme evaluation**, checking the organisations and structures for conduct of the programme, and identifying unused potentials and improvement suggestions for processes.
3. **Project evaluation** with the goal of making proposals alongside identification of improvement potentials, showing how to improve the framework conditions for projects with the programme, and what types of project are to get preference in future.

The preparatory work has been completed; programme and project evaluation are in preparation.

2. Carbon monitoring

As a major quantitative goal of the Climate Action Plan, the aim is to reduce carbon emissions by a total of 2 million tonnes per annum versus 2007. It comprises the following:

- 550,000 tonnes by measures of the Climate Action Plan;
- 500,000 tonnes by voluntary agreement with industry;

- 450,000 tonnes by Federal measures;
- 200,000 tonnes by awareness raising measures;
- 200,000 tonnes not yet specified;
- 100,000 tonnes by improvements in technology.

The reductions aimed at here are based on potential estimates, experience with the impact of measures taken so far, and ex ante calculations of possible savings. A plausibility check was conducted by the Wuppertal Institute for Climate, Environment and Energy at the beginning of the Climate Action Plan 2007. The Wuppertal Institute also developed the factual and methodical procedure for CO_2 monitoring of the Hamburg Climate Action Plan. In 2011 the Senate presented an interim status drawn up with the scientific supervision of a working group comprising the Wuppertal Institute for Climate, Environment and Energy and the Eco-Institute on the reductions in carbon emissions achieved so far by the Hamburg Climate Action Plan.

In view of the project data and the interim inventory, the Senate mandated the ministries to increase their efforts for CO_2 monitoring of the projects in the Climate Action Plan. This is to determine and document carbon emissions for projects regarded as capable of evaluation according to the interim evaluation of the CO_2 monitoring, and supported by funding from the Climate Action Plan, particularly with respect to CO_2 reduction.

The responsible ministry continued CO_2 monitoring in 2011 and provided further assistance for determination of CO_2 reduction in projects. All in all, it was possible to include extensive data of additional projects in the updated interim inventory (see Annex 4).

Of 387 measures of the Climate Action Plan (total without measures that are not continued, and which are transferred to other projects), about 155 are in principle capable of CO_2 monitoring without undue expenditure (status November 2011). Calculations by the project organisers of the emission reductions achieved are available for 118 measures, and data have been announced for 7 projects. The data records and status reports in the electronic documentation system of the ministries (eBIS-Klima) are an important basis for CO_2 monitoring.

Assessment of the available data for measures in the Hamburg Climate Action Plan gives the following interim status for CO_2 reductions achieved (the data may still change in the course of further monitoring):

Year	2007	2008	2009	2010	2011	2012
t/CO_2	43,496	286,639	405,331	497,123	845,323	1,000,166

Source: eBIS-Klima Hamburg, calculations by Wuppertal Institute (tonnes CO_2 per annum)

* Data forecast on the basis of potential data from measures (status November 2011) or update of impacts from previous years

Without inclusion of the projects of the Climate Action Plan for changeover to green electricity, the interim status is as follows:

Year	2007	2008	2009	2010	2011	2012
t/CO_2	43,496	286,639	405,331	497,123	470,419	625,266

In addition, there are many households in Hamburg which have changed over to green electricity. Thus HAMBURG ENERGIE alone had some 50,000 green electricity customers by the end of 2011, which gives a reduction of 107,500t CO_2 emissions. This behaviour by households promotes expansion of the share of renewable energies in Germany. The sectoral analysis of savings achieved by measures in Hamburg shows – as already shown in 2010 – that there is a focal point in the energy sector, with funding of plant for energy conversion/heat production by means of renewables; in the industry and plant engineering sector; and in the building sector, particularly in building modernisation (especially funding programmes); and in the mobility sector (see Annex 4).

The first evaluation stage, conducted up to November 2011, giving about 845,000 tonnes, shows that it is possible to achieve the target set, that is total reduction of 750,000 tonnes CO_2 emissions (550,000t from measures of the Climate Action Plan and a remaining amount of 200,000t which could not be assigned to a specific area in 2007). Without considering the measures of the Climate Action Plan for conversion to green electricity, it is already possible to meet 63% of the emission reduction in 2011 with some 470,000 tonnes.

In 2012 there will be an overall analysis of goal fulfilment of the Climate Action Plan in terms of the intended CO_2 reduction goals, under the scientific supervision of the Wuppertal Institute.

C. Sectors

I. Reduction of greenhouse gases

1. Energy

a) Goal

Like other cities, Hamburg is faced with the challenge of making its energy supply sustainable and climate friendly, in order to achieve the ambitious goals of greenhouse gas reduction and at the same time ensure supply security and competitiveness of the city. That includes reliable provision of no-carbon or at least low-carbon energy for power and heating, obtaining an increasing proportion from renewables.

Energy savings for effective climate protection should be applied with priority where the main causes of climate damaging emissions are. In Hamburg that is in industry and plant engineering, mobility, and buildings.

Hamburg provides funding for renewables from biomass, thermal solar heating, wind power and geothermal energy. That also includes establishment of storage capacities and the inclusion of renewables in energy-efficiency modernisation of existing buildings.

Increasing energy efficiency is a key factor for climate action and for major reductions in carbon emissions. Hamburg is an important industry location, and intends to increase energy efficiency in the building sector and in production processes, while maintaining the performance level of industry in Hamburg.

b) Focal points of action

Hamburg's energy goals have led to definition of the following focal points of action, to achieve climate friendly energy supply for the city:

- **Strategic importance of Hamburg's interest holding in power grids**

The Senate wishes to regain a 25.1% interest holding in the distribution networks for electricity, gas and district heating, in order to get back scope for action in energy policy.

The Senate has reached agreement with the power companies Vattenfall Europe AG and E.ON Hanse AG on major contributions for implementation of the energy turnaround in Hamburg. A package solution was agreed between the Senate and the companies on 29 November 2011, for a series of steps and projects giving Hamburg a leading role in Germany in the implementation of the energy turnaround. The agreements include the following:

1. The energy companies Vattenfall, E.ON Hanse AG and the Hamburg Senate agree on concrete projects for the energy turnaround;
2. The two companies are to invest about EUR 1.6 billion in modern grids and energy generating;
3. Hamburg is to become the city in Germany with the greatest capacities for energy storage;
4. A new gas and steam power station is to replace the intended Moorburg project;
5. The city is to take a 25.1% share in the networks for electricity, gas and district heating.

The energy companies undertake to make a substantial contribution to reducing CO_2 emissions in Hamburg. The E.ON Hanse Group is to achieve a 15% reduction in its carbon emissions in operating processes versus 2008 by 2015; Vattenfall district heating intends to reduce emissions of the current generating portfolio by about 27%.

Further details are given in doc. 20/2393.

- **Expansion and conversion of district heating supply**

In order to meet the climate goals, low-emission fuels and renewables are to be used more for the future generating structure for district heating supply. More heat generated from renewables is to be fed into the district heating network at decentralised points. In addition, the existing energy storage potentials in the district heating structure are to be used.

- **Development of the renewables sector by the Hamburg Renewable Energies Cluster**

The Hamburg Renewable Energies Cluster ("Cluster EEHH") was set up on 27 September 2010 with establishment of the Association for Promotion of the Renewable Energies (EEHH e.V.); it has founded a limited partnership (EEHH GmbH), with which it has been conducting its operations since 1 February 2011.

Cluster EEHH is developing in accordance with the specified strategy, using the inputs from companies and other industry players at the local level. This strategy is based on Hamburg's strengths in management, distribution, research and development, and innovative services for the renewables sector. Cluster EEHH has developed very dynamically on this basis. After its

foundation with 57 members, EEHH e.V. increased its membership to 140 by summer 2011, and demand for membership continues unbroken. Further growth of Clusters EEHH is expected.

The Cluster intends to build on this initial success. Its dynamic start promises good developments for the future.

- **Expansion of wind energy utilisation**

All in all, Hamburg's wind turbines are feeding about 50 megawatts of power into the grid. In parallel to this, the Senate is examining designation of further appropriate sites. This is being done by the formal process of changes in land use plans and the landscape programme. Subject to acceptance of the resolution by the Hamburg Parliament for change in the land use plan, that provides sites for possible growth in rated power to more than 100 MW. That is to be done mainly by repowering (replacement of old wind turbines by new, more powerful ones). That will mean little change in the number of wind turbines in Hamburg, but could almost triple the power output by installation of improved technology. Possible sites for wind turbines have been designated for the port area (area where the Port Act is applicable) by the responsible ministries and the Hamburg Port Authority (HPA). On this basis, the HPA is examining sites for wind turbines that are in keeping with port usage, in cooperation with interested port industry companies.

- **Use of geothermal energy**

Deep geothermal energy

Geothermal energy is capable of use as an innovative and climate-friendly heating strategy, capable under optimal conditions of generating peak period electricity; this contributes to reduction of carbon emissions and thus to climate protection. A model project on deep thermal energy was conducted in Wilhelmsburg, with successful completion of feasibility studies and, in May 2010, seismic exploration of the usable aquifers. The cost-effectiveness of the deep drilling operation is currently being examined by a market survey on heat sales. The energy company HAMBURG ENERGIE is also conducting surveys on possible exploitation of geothermal heat in two potentially promising areas. By the end of 2010 a study was also conducted on geothermal use of potentially suitable Rhätsandstein formations, and an overview is being prepared of existing and possible user structures for geothermal energy. These two studies, providing indispensable baseline information for deep geothermal projects, are now available for the Hamburg area.

Near-surface geothermal energy

Particularly efficient heat pumps, using the soil and the groundwater and surface water as their heat source, are being funded as part of the support programme for renewable heating associated with solar thermal systems.

c) Exemplary activities

c1. Climate action programme “Renewable heating” (project no. 2011/025)

The challenges in conversion of energy supply and in expansion of the use of renewables can be met by a) using the high carbon saving potentials in replacement of heating systems in existing buildings; b) using the solar heating potentials of Hamburg’s roofs; c) making more use of other renewable energy sources such as wood; and d) promoting the efficient combination of different types of system.

Decentralised systems also play a major part in increasing the share of renewables in heating, particularly the use of solar heating systems. The existing funding programmes “Solar thermal energy and heating” (project no. 2007/100) and “Bioenergy” (project no. 2007/092) are to be combined under the title of “Renewable heating” in order to adapt them better to the challenges of the energy turnaround and climate action in the city, and will be continued in expanded form. The main focus of funding from 2012 onwards will be efficient combination of different sources of renewable energy, with inclusion of waste heat use where the conditions are right. District-related solutions and heating concepts will also be applied (mostly local heating networks).

Medium and large systems will have to be built more than in the past, in order to increase the share of renewable energy in heating. Producers and consumers will be linked via a local heating network, in order to set up efficient systems that make good economic sense. Existing buildings give the greatest potential in carbon savings. The climate action programme “Renewable heating” supports various solutions for improvement and modernisation of heating systems, and in particular it supports effective system combinations.

The “Renewable heating” climate action programme funds high-quality systems of sufficient size, and reduces the funding of smaller individual systems. The proven system of supporting qualified contractors, as used in the current programme “Solar thermal energy and heating” will be maintained and expanded. In future, too, the SolarZentrum Hamburg is to provide advice for the whole area of renewable heating, continuing expert education, and solar yield monitoring.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c2. Optimisation of waste management in Hamburg from the viewpoint of climate action (“Recycling initiative”, Project no. 2007/117)

Important activities in waste management moved forward in 2011 within the “Recycling initiative”, which helps to mitigate climate change by conservation of resources and development of cyclical material flows. The Hamburg Recycling Ordinance, which entered into force on 1 January 2011, extends the system of separate collection of paper for recycling and of organic waste from households. The existing private-sector system for collection of lightweight packaging from households in the whole of the city area was also widened on 29 May 2011 to include collection of non-packaging waste material made of metal and plastic (Hamburg recycling bin).

In order to optimise the recycling of organic and green waste, the existing Bützberg composting facility of SRH (Hamburg Waste) was expanded to include a dry fermentation plant, which went on stream in autumn 2011. The biogas obtained from fermentation of organic and green waste is processed and fed into a nearby natural gas pipeline.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

d) Newly adopted projects

This section gives details of projects newly added in 2011. These and other projects described previously are listed in table form in Annex 1.

d1. Load management in public buildings, using smart meters (project no. 2010/070)

Smart metres are intelligent electricity meters with associated sub-meter structure, for use in large buildings. They record and control where, for what purpose, and at what time electricity is used. The project needed a preparation phase in 2011, and is now to be implemented in 2012. Installation of smart meters in buildings is necessary for targeted, intelligent electricity management, with the goal of adapting power generation to specific consumptions, and to give an incentive for savings. The concept of conducting load management in public buildings by means of smart meters is to be broadened in an innovative way, by linking it with the efficient use of renewable energies in the existing buildings. Examples of the use of smart meters are in new building of large public buildings such as university buildings, and retrofitting in existing buildings. The new project aims to gain experience at an early stage of introduction.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

d2. Energy-efficient lighting concept for subways and tunnels of the 60s and 70s at the centre of Harburg (project no. 2010/039)

The appearance of the tunnels in the central area of Harburg is unsatisfactory, and these tunnels are to be given a facelift and upgraded. Planning is starting with the “Gloriatunnel”, which is a key component in the pedestrian routes at the centre of Harburg. Tunnel lighting is currently insufficient, making the tunnel look even worse. It gives the impression of an unsafe place, an unappealing tube during the day and a dark trap at night; pedestrians avoid it, which means they have to take long, roundabout routes. One of the components that needs improving is tunnel lighting. The District of Harburg wants to realise this by using an energy-efficient lighting concept (LED technology), which gives carbon savings compared with standard lighting. The goal “energy-efficient lighting with carbon reduction” goes hand in hand with the aim to increase pedestrian movements at the centre of Harburg. The expectation is that this will encourage the people of Harburg to walk rather than use their cars when going to the centre of Harburg.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

2. Buildings

a) Goal

Hamburg wants to increase energy efficiency in the building sector. The carbon reduction goals call for substantial reduction in energy consumption by buildings, in particular in heating and hot water requirements, and for the use of renewables and climate-friendly combined heat and power systems (CHP) for the remaining energy requirements. The basis for efficiency strategy in the building sector is funding for efficiency improvement measures.

b) Focal points of action

Requirements in the building sector at Federal level are set out in the Energy Efficiency Ordinance (EnEV 2009) and the Renewable Energy Heating Act (EEWärmeG), as amended in 2011. These standards have to be developed further in the course of transposition of the revised EU Directive on the energy performance of buildings (recast in 2010) (2010/31/EU). This transposition has to be effected by the member states by July 2012, and will most probably be effected by a further revision of the Energy Efficiency Ordinance. However, no draft has yet been published by the responsible ministry (Federal Ministry of Transport, Building and Urban Development). The rule for new buildings from 2021 onwards, as set out in the Energy Performance of Buildings Directive, is that only 'nearly zero-energy buildings' may be constructed, having very low energy requirements covered to a significant extent by energy from renewable sources. Where existing buildings are given major renovation, the overall energy performance must be improved and as far as possible high-efficiency alternative systems of energy supply must be used. The specific definition of 'nearly zero-energy building' and the requirements for overall energy performance are largely a matter for the member states. The Directive also increases the relevance of energy performance certificates and modernisation recommendations. Buildings in public ownership are expected in the Directive to lead the way – the nearly zero-energy standard is to be complied with as early as 2019 for public buildings owned and used by the public authorities. The public sector is expected to play a leading role in improving energy performance. This leading role of public buildings has already been included in German law with the amendment of the Renewable Energy Heating Act with respect to using renewables for heating and cooling. By way of deviation from the regulations of the Renewable Energy Heating Act, where the obligation to use renewables applies only to new buildings, public authorities are required to ensure reasonable use of renewables when effecting major renovation work on buildings. However, this obligation is subject to extensive scope for variation from one German state to another.

Climate friendly planning and building gives major potential for reduction of greenhouse gas emissions. Space use planning in Hamburg should therefore aim to achieve energy-efficient housing and transport space development in the city, and ensure high energy performance standards of buildings, with climate-friendly energy supply in the housing districts. The Senate has set itself the goal of playing a leading role here.

1. Funding programmes for energy performance improvement of existing buildings

Hamburg has a focal area in the building sector for measures giving direct carbon reduction, good cost-benefit efficiency and a wide range of impact. The Climate Action Plan now only funds projects with innovative character in the new building sector (climate model districts, IBA projects). The funding programmes for energy performance improvement are being continued and enhanced, and the pilot phases are moving into regular programme phases in 2012.

- **Thermal insulation in existing buildings**

The energy performance improvement of mainly owner-occupied buildings (single family and semi-detached houses, housing ownership groups) receives funding from the "Thermal insulation in existing buildings" programme. In 2008 about 4,000 dwelling units were funded, in 2009 more than 5,000 dwelling units, and in 2010 about 10,000 dwelling units. Approvals are granted by the housing loans association Hamburgische Wohnungsbaukreditanstalt (WK) on behalf of the responsible ministry. Up to March 2011 non-residential buildings were also included (on the basis of 70m² = 1 dwelling unit). Since April 2011, non-residential buildings have been funded in a separate programme (see Section 2).

In 2010 additional savings of 11,000 tonnes carbon emissions per annum were achieved by energy performance measures in buildings, supported by the funding programme. The building sector is the individual sector that gives the greatest savings potential. The building modernisation rate is to be increased in order to make use of this potential. The funding volume in the "Thermal insulation in existing buildings" programme is therefore to be increased by 50% in 2012, in order to stabilise or increase the proportion of energy performance modernisation, with further reduction in carbon emissions in existing buildings. Funding gives additional incentive for complete modernisation, with improved standards compared with the minimum requirements of the Renewable Energies Ordinance 2009. The key factors in the intended increase in funding in the "Thermal insulation in existing buildings" programme is the current uptake. There is an increase in demand for funding and a rise in the volume of funding applied for, despite the toughening of energy performance requirements (status October 2011). The data for 2011 will be collected in 2012.

The funding programme comprises information and advice (grant for preparation of the Hamburg Energy Performance Certificate), and funding of the building measures in the form of investment grants.

Housing modernisation for rented flats in multi-family buildings, by WK (housing loans association)

The extensive changes in modernisation funding in programme year 2010 have met with varying reception. Segment B (comprehensive modernisation with rental price and occupancy commitment) met with continued good uptake, despite a slight reduction in funding per dwelling unit, and the programme target of 1,000 dwelling units was almost achieved; Segment A (purely energy efficiency measures) showed a substantial drop in the uptake of funding for the time being.

That is due to the exceptionally good uptake of the modernisation programme in the two previous years, following increase in the upper rent level limit, in combination with anticipation

effects due to the entry into force which was then upcoming of the Renewable Energy Ordinance 2009. Apart from that there is evidently a drop in demand following introduction of the further development of the funding regulations. In particular, the ventilation measures required by the standard DIN 1946-6 (likewise in force since mid 2009), referred to in the funding regulations but still largely unfamiliar to architects and investors, cause additional cost and higher expenditure for tenants. So an additional module for funding of ventilation measures was introduced on 1 January 2011 to increase the appeal of the funding programme.

Table 1: Energy performance measures in rented housing funded in 2010

Segment	No. of dwelling units	Additional CO_2 savings (tonnes p.a.)	Present value* Total subsidy (EUR million)	Present value subsidy per t CO2 **
Modernisation from regular housing funding programme	2,277	6,186	6.89	37
Modernisation from regular housing funding programme with regulated occupancy	908	2,535	3.45	45
Total	3,185	8,721	10.34	39

* Present value factor: 6.5%

** Related to term of investment **30** years

Note: The term of the investment was reduced from **40** years to **30** years due to a change of system versus previous year, resulting from carbon monitoring for the Climate Action Plan.

2. Energy performance modernisation of non-residential buildings (Proj. no. 2010/031)

Energy performance modernisation is the exception for non-residential buildings with commercial/industrial or public use, as compared with residential buildings. That applies both to the building facilities and to the building envelope. Non-residential buildings account for 47% of all carbon emissions resulting from buildings in Hamburg. The responsible authority therefore selected and examined pilot projects in 2011, to see what specific modernisation measures could be applied in various types of non-residential building. This pilot phase was also funded with resources from the Climate Action Plan.

The results obtained in the pilot projects, particularly the definition of funding standards, are the basis for a new funding programme to be set up in 2012 for energy performance modernisation of building envelopes of non-residential buildings. The amount of funding depends on the amount of energy saved, and the reduction in carbon emissions. The new funding programme for non-residential buildings is aimed at energy performance modernisation of these buildings.

The goal of this grant programme is to establish an energy standard in existing buildings that is more ambitious than the statutory minimum requirements, and exceeds their carbon emission reduction effect. Hamburg's non-residential buildings account for a total heating energy demand of 6 million MWh per annum. Carbon emission reduction savings are proportionate to energy demand reductions, assuming that the energy source used remains the same.

Even where the substance of the buildings is good, the outside walls, roofs and windows are often not sufficiently insulated, and a large proportion of the energy used in space heating escapes to the outside. The specified heating standards reduces annual heating requirement for the building by up to 70%. With the exception of the roof, there is currently no statutory requirement to improve thermal insulation in existing buildings.

Energy performance modernisation of existing building up to the level of new buildings normally saves more heating energy costs than the costs of funding (interest and redemption) of the modernisation. The funding gives an additional incentive for complete modernisation, and for an improved standard compared with the minimum requirements of the Renewable Energy Ordinance 2009.

The funding programme for “non-residential buildings” is to be implemented as an integral part of the programme for promotion of energy efficiency in plant and industry “Companies for resource conservation”, as the target group is identical and that will prevent double funding. In addition, energy advice for non-residential buildings is to be supported, so that the building owners can get sound advice on the relevant combination of measures.

3. Discussions with the housing sector

The Senate has set itself the goal of achieving 6,000 housing construction starts per annum. 2,000 of these are to be subsidised housing, including dwellings for households with medium income. The Senate is relying on cooperation with the districts and the housing industry, and concluded the “Agreement for Hamburg new housing construction” with the districts in this context on 4 July 2011. It accepts the offers of the housing industry for a specific “Alliance for housing”. In September 2011 the parties concerned signed agreements for the alliance. The Senate and the housing industry also took advice from the Hamburg tenant associations, in order to take account of the interests of tenants.

The “Housing alliance” includes agreements on climate action. The signatory associations thereby commit themselves in principle to the climate goals of the Senate. In the interests of socially acceptable rent levels, these are to be achieved by energy saving, by appropriate measures for energy performance improvement, and by the increased use of renewable energies.

The housing associations will encourage their member companies to reduce average energy consumption (excluding hot water) in their housing to 133 kWh per annum per square metre of living space by 2020, and to reduce annual carbon emissions to 25 kg per square metre of living space in the same period. Older buildings, particularly those built before 1918, special-purpose housing and owner-occupied flats will be subject to separate consideration. Single-family and semi-detached houses are excluded from the Alliance. The Alliance partners will evaluate the goals in 2014.

4. Establishment of climate change mitigation and climate adaptation as standard requirements in urban development – climate model districts (project no. 2008/025)

Climate change mitigation measures, and adaptation measures are to be developed in planning and building, in climate model districts, in such a way that the procedures, standards and know-how obtained can be transferred to planning of other districts in Hamburg. The goal is to include climate action and climate adaptation in urban development and ongoing planning procedures

as a standard requirement. The climate model districts are characterised by high standards of energy performance, going beyond the legal requirements, and by climate friendly energy concepts at district level. Targeted support is provided for concepts and planning which are in the responsibility of the districts. Planning of other players may also be selected as climate model districts, where they have a cooperation arrangement with the Hamburg administration. The districts reflect different geographical positions in the city; they take account of usage, density of building, and year of building, and also composition in terms of existing buildings and new buildings. Districts offer more opportunity for development of local climate action measures than individual projects. The areas within these districts have different energy and climate functions, which are coordinated with one another.

The climate model districts document the initiatives of the Senate on climate in the urban area. So far, 19 climate model districts have been identified together with the districts, and selected on the basis of a list of criteria. The projects are now in the planning phase, or getting close to the end of the planning phase. The climate model districts set high energy performance standards for the buildings for climate change mitigation, and in four cases they also pursue goals of adaptation to climate change. The projects are distributed in very different parts of the city of Hamburg, with at least two climate model districts in each district of Hamburg. In one case, the planning for a logistics centre has been drawn up and agreed as a model for “Sustainability in logistics”.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c) Exemplary activities

In addition, the following particularly important projects and measures in the building sector are conducted in the framework of the Climate Action Plan.

c1. Public buildings with high energy performance standards (project nos. 2011/09, 2011/010 and 2007/001)

In 2011 the Senate funded particularly suitable individual measures in the building sector. At the beginning of the year, exemplary building projects meeting the nearly zero-energy standard received grants from funds of the Climate Action Plan. These are new buildings of the Community Center Hohenhorst (project no. 2011/009) and the new building of the Niels-Stensen-Gymnasium, a grammar school in Hamburg-Harburg (project no. 2011/010).

Energy-efficient new buildings are the exception in non-residential buildings used for commercial or industrial or public purposes, unlike the situation in residential building, although these buildings account for a large proportion of Hamburg’s carbon emissions, making up 47% of all of Hamburg’s buildings. Both the properties mentioned comply with the “Passivhaus” nearly zero-energy standard. This standard not only limits heating demand to a maximum of 15 kWH per square metre, but also limits primary energy demand including household electricity to 120 kWh per square metre. That requires extremely good insulation of the building envelope, plus the installation of highly energy-efficient technical facilities.

The Niels-Stensen-Gymnasium is a private-sector grammar school run by the Catholic School Association in Hamburg-Harburg; the Community Center Hohenhorst is a community centre where different generations get together for a range of activities. Public buildings with nearly zero-energy standard have an exemplary function and make an important contribution to reducing carbon emissions. They input important experience into this ambitious building

standard and help to disseminate the experience gained. The public use of the building means that there are no data privacy obstacles to detailed collection of data, which is a problem with residential buildings. The facts and figures gained from the projects funded therefore provide important help in argumentation, planning and calculation for further projects.

The energy performance modernisation measures funded in the continuity of construction of public buildings to nearly zero-energy standard include the Bornheide Community Centre in Osdorf (project no. 2007/001), which is in the process of planning and building implementation. The Altona District Council Office intends to use the former Barlsheide school as a Community and District Cultural Centre in future. The individual sections of the school, which was built in the 60s, need a great deal of repair/renovation work. The energy performance modernisation will give a very high insulation standard at the Bornheide Community Centre, significantly better than the legal requirements for refurbished outdoor units, so that its thermal insulation gets close to the “passive house standard”. This cultural centre also fulfils the role model function of the city for energy-efficient buildings directly, in a manner which the local inhabitants can perceive, and helps to promote understanding on the part of many users (local residents, local district initiatives, associations, etc.) of climate action and the energy turnaround.

These measures contribute directly to reduction of carbon emissions (see Annex 4).

c2. Innovative projects in the framework of the International Building Exhibition (IBA) (project nos. 2008/059, 2007/021, 2008/053, 2008/054)

The IBA Hamburg 2013 (International Building Exhibition) with its projects and concepts is a firm component in the efforts by the city to live up to the responsibility which major cities have for climate action. One of the key themes at IBA Hamburg is “The city and climate change”. The Climate Action Plan for “Renewable Wilhelmsburg” includes realisation of heating networks for buildings, operating with renewable energies; it also includes the development of outstanding examples both in existing buildings and in new buildings, followed by long-term monitoring and evaluation of these projects. That includes consumption and generating data of the construction projects and the energy concepts, and also area-related analysis of the energy flows. It also integrates the aspects of user behaviour, user response and other individual technical examinations. The following are just a few of the many IBA projects in the building sector:

Building exhibition within the building exhibition: The “building exhibition within the building exhibition” has set itself the goal of giving answers for housing construction in the 21st century. There will be four model building areas in Wilhelmsburg Centre, setting new standards – houses that adapt to the occupants and their changing needs (“Hybrid Houses”); intelligent, sustainably planned “smart material houses”; attractively designed but still affordable “smart price houses”; and “water houses”, specially adapted to their waterside location. From the climate action viewpoint, the “smart houses” are of special interest, with use of façade integrated energy generating and a new type of heat storage (PCM = phase change materials).

“Gateway to the World” education centre: The “Gateway to the World” building project is one of the major projects to be planned, built and put into service in the framework of IBA Hamburg. In terms of design and function, it is for use by all children, young people and adults in the Wilhelmsburg district as a learning and community centre, offering programmes in education, sport and leisure activities. The “Gateway to the World” school comprises the school association

of the Elbe Islands, the Wilhelmsburg Speech and Language Therapy School, and the Kirchdorf-Wilhelmsburg Grammar School; it is a key component in the educational initiative “Leap across the Elbe”.

It is a new building project to nearly zero-energy standard, the additional costs being met from the Climate Action Plan; its energy concept has been recognised as one of the ten projects in various parts of Germany honoured by the Federal Ministry of Economics and Technology in its competition for “Energy Optimised Building”. Certification of the project has already been conducted by the DGNB (German Sustainable Building Society), giving the project a score of 1.33 (5-point scale where 1 is the best score) and awarding it a gold medal. The “Gateway to the World” stands for the leading function of the public sector, constructing public buildings with a very high energy performance standard.

Climate-friendly heating networks: The IBA has initiated three projects for climate-friendly heating of buildings in the western part of the Elbe Island, with the conversion of the old air-raid shelter as an “energy bunker”, the development of an open heating network as an energy grid for Wilhelmsburg Central, and the deep geothermal heating pilot project. This makes full use of local resources, and develops the first set of rules for an open heating network, helping to implement a low-emission, sustainable heating supply system which goes far beyond the scope of the IBA projects themselves. It is based on the use of efficient technology (combined heat and power), renewable energy sources, and industrial waste heat. Further synergies will become available from coupling of these three heating networks, as they continue to grow after 2013 and further building sites are developed in Wilhelmsburg.

Renewable Wilhelmsburg: The ideas put forward in the “Renewable Wilhelmsburg” project as part of the Climate Action Plan will be developed further beyond 2013, with the time horizons up to 2025 and up to 2050. This is an opportunity for Hamburg to try out the approaches put forward here in a varied and sufficiently large urban area, as an example for the city as a whole; they can be tested over a longer period, and applied to the overall urban situation and local conditions. That will help to decide how the approaches identified, developed and presented at IBA Hamburg 2013 can be further developed to address the “Future issues for megacities” following the final presentation in 2013.

The Climate Action Plan “Renewable Wilhelmsburg” and the associated action concept are presented by IBA Hamburg and documented in the “Wilhelmsburg Energy Atlas”, showing how the Elbe island of Wilhelmsburg-Veddel and the Harburg Inland Navigation Port can meet their power demand for buildings up to 2025 and their heating demand up to 2050 by using renewable and local energy sources. This brings together a large number of individual excellence projects for climate change mitigation, to be realised in the framework of IBA Hamburg and with the support of funding from the Hamburg Climate Action Plan by 2013. It presents for the first time an overall concept for a defined urban area showing the way into the post-fossil, non-nuclear age.

c3. Further development of funding regulations for energy-efficient building (project no. 2007/140)

From 1 January 2011 onwards, energy-performance funding also included the “WK Energy Performance House 40”, which meets virtually the same standard as “nearly zero-energy

houses". The spread of funding levels compared with the current minimum WK standard (KfW Efficiency House 70 relating to EnEV 2009, and previously KfW 40 with controlled ventilation and heat recovery, in force since 2008) was further increased by reduction of funding levels for the minimum standards, for which demand is very high.

Demand for the two top standards increased significantly (status end of September 2011 compared with previous year). So far, energy performance grants have been approved for a total of 1,069 dwelling units, with about one third of these going to the two top standards (nearly zero-energy house: 147 units; WK Energy Performance House 40: 214 units). In 2010 the figure at year-end was 199 dwelling units in nearly zero-energy standard, out of a total of 3,150 dwelling units. Most of the approvals are always given at year-end.

c4. Further development of standards for funding programmes for rented housing (project no. 2007/142)

From 1 January 2011, an additional funding module was introduced for ventilation in programme segment A, to increase the attractiveness of energy performance modernisation.

Where buildings have heritage façades which should be conserved, exceptions may be made from the energy requirements on presentation of good reasons, setting the highest energy-performance standard which can be applied under the given circumstances. To support the conservation of characteristic brick façades in connection with energy-efficiency modernisation, the funds of WK were increased substantially from 2011 onwards for aesthetically valuable, authentic façade materials (clinker facing brick and clinker full brick), rising from EUR 10 per square metre to EUR 25 per square metre for clinker facing brick, and from EUR 15 to EUR 50 per square metre for clinker full brick.

d) Newly adopted projects

This section shows projects which were added in 2011. These projects and projects previously described are shown in table form in Annex 1.

d1. Office and workshop building in the port area with "Plus energy standard" (project no. 2011/018)

The Hamburg Port Authority (HPA) is planning a three-storey office building at Spreehafen, in nearly zero-energy standard, with an adjacent workshop building to be built to a standard 30% better than the standard required by the Renewable Energy Act. The energy requirements within the building complex are to be reduced far enough so that the remaining energy requirement can be met from renewable sources. It concept uses a geothermal system with thermally active deep foundations, and also photovoltaic energy. It will also have a rainwater collection system to complement the resource conservation concept. This will be the first office building in Hamburg to meet the nearly zero-energy standard, and the first commercial complex to be implemented as a "Plus energy standard" building.

d2. Rieckhof Cultural Centre – energy performance modernisation (project no. 2011/021)

The Rieckhof Cultural Centre was purpose-built in 1984. It is owned by the Harburg District Council, and continues to be used as a cultural centre. The building urgently needs energy performance modernisation, which is to be conducted to a high standard of energy efficiency. The roof and the windows and doors are particularly in need of improvement. Rieckhof is an educational centre with a very prominent public position, and its energy performance modernisation is to demonstrate the leading position taken by public authorities in Harburg in energy efficiency for public buildings.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

3. Mobility

a) Goal

The Hamburg Senate sets the framework conditions for sustainable mobility in all areas of transport. The goal is to increase the proportion of environment friendly means of transport with low emissions. The measures taken here are intended to help increase and improve the availability of such transport. The Senate also supports low-emission propulsion technologies, and aims to improve public transport by expansion of the system and the network, by adapting the availability of transport, and by accelerating bus travel; it also wishes to expand and improve the cycling system and cycling infrastructure.

b) Focal points of action

The Renewable Energy Directive (2009/28/EC) sets a target of a 10% share for renewable energy in the EU transport sector by 2020. EU Regulation 443/2009, adopted in 2009, sets CO_2 emission targets of an average of 130 grams per kilometre for new passenger cars. EU Regulation 510/2011 sets requirements for the carbon emission performance of new light-duty vehicles, reducing average carbon emissions stepwise from 2014 to 2017 to 175 grams CO_2 per kilometre. For the period from 2020 onwards, subject to confirmation of feasibility, this Regulation stipulates a target value of 147 grams of CO_2 per kilometre.

Throughout Germany, the emissions from transport went down only slightly between 1990 and 2007, unlike other sectors. That was due primarily to the increase in traffic volume. This increase almost completely offsets the successes of vehicle specific emission reductions.

The “National Action Plan for Renewable Energy, pursuant to Directive 2009/28/EC for promotion of use of energy from renewable sources” (August 2010) assumes that the share of renewables in the transport sector will increase to 13.2% in 2020. It indicates the following driving forces for this increase:

- The energy efficiency quotas set out in the Federal Emissions Act (BImSchG) up to and including 2014;
- From 2015 onwards, the required minimum reductions in greenhouse gas emissions from the fuels used in transport, related to a reference fuel.

About 25% of the carbon emissions in Hamburg are due to transport (Statistikamt Nord 2009). Most of these come from cars, followed by smaller lorries.

The Hamburg Senate aims to shift mobility increasingly to cycling and walking, particularly for shorter distances of less than five kilometres. Nearly half the car trips in Hamburg fall into this category. The low operating temperatures of vehicles travelling short distances makes the specific emissions substantially higher for short trips than for longer ones. And increased attention will also be given to the longer trips, because they account for a large proportion of the kilometres driven in regional traffic and generate a corresponding volume of emissions. Urban parking space management and regional rail transport (including feeder systems) are to be used here. That means involving surrounding areas in planning. The main areas of the Climate Action Plan here are as follows:

1. Enhancement and further development of public transport, e.g.
    - Improvement of infrastructure, quality and availability, in order to make public transport more efficient, more attractive and lower-emission; e.g. by new S-Bahn and U-Bahn lines (S4 and U4) and modernisation and optimisation of the bus system.
2. Environment friendly technologies in transport, e.g.
    - Promotion of electric vehicles and other innovative propulsion systems. The Senate is working to keep Hamburg in the updated Federal Electric Vehicle programme. Hamburg is also entering the competitive process launched by the Federation for a “showcase” for electric vehicles.
3. Promotion of cycling
    - Further development of the Cycling Action Plan, with a focus on maintenance and optimisation of the cycling network;
    - Expansion of the cycling network, especially the velo route network.
      In particular:
        - Expansion of cycling infrastructure in regional focus networks, for example at the city centre, around the university, and in the central areas of Bergedorf and Harburg. The main target group in these areas is regular cyclists who cycle to school or university, to work, or for their everyday activities;
        - Expansion of cycling links used particularly by tourists.
    - Provision of cycle parking facilities.
    - Improvement in service and communication, e.g. by expansion of the StadtRAD cycle hire system, and increased public relations work to encourage cycling.
4. Maintenance of power supply from renewable energy sources for U-Bahn and S-Bahn (S-Bahn since 2010, U-Bahn since 2011).
5. Transport and mobility management, e.g.
    - Marketing campaigns;
    - Expansion of “e-ticketing” via Internet and mobile phone, and by conduct of a pilot test in Harburg and the surrounding district – electronic customer card in cheque card format, linked with lower fares; on payment of a basic charge of EUR 10 per month, the holder gets 25% discount on every individual ticket or day ticket purchased.

6. Measures for shipping and aviation, e.g.
   - Further development of the bonus for environment friendly ships;
   - Increase in environment friendliness of air transport at Hamburg Airport, e.g. by optimisation of process handling on the ground.

c) Exemplary activities

c1. Electric vehicles (project nos. 2008/052, 2010/065)

Alongside further development of existing expertise in hydrogen and fuel cell technology, the Senate attaches great importance to battery-powered electric vehicles. The Federal Government set the goal in its government programme on “Electric Vehicles” of 18 May 2011 for at least one million electric vehicles to be on the roads by 2020 and at least six million by 2030. In order to make Germany the lead market for electric vehicles in the next nine years, the Federal Government is following a strategy of cooperation between the business community, academia and government, for a wide range of measures from promotion of battery research to incentives for market launch.

Hamburg, together with partners from the energy industry, the automotive industry and mobility service providers, is one of eight model regions in Germany selected by the Federal Ministry of Transport, Building and Urban Development (BMVBS) for central city operation of electric vehicles as a model project, and for funding to establish charging infrastructure. The project partners received a total of about EUR 12.5 million in Federal funding in the project period from November 2009 to September 2011.

The first stage of the Hamburg Electric Vehicle Programme has now been realised. The charging infrastructure has been set up, not only on the sites of the companies involved, but also in public streets (a total of 200 charging positions each); 348 battery-powered electric cars, light-duty trucks, plus five diesel hybrid buses, are currently undergoing practical testing (year-end status), thus ensuring a certain visibility in this first testing phase. The vehicles are mainly used by Hamburg-based companies, institutions and authorities. Six of the vehicles are used in car-sharing schemes, so they are available to private individuals. 60 battery-powered electric vehicles and two fuel cell vehicles are being handed over at the end of 2011 to the city’s institutions such as ministries, agencies and public companies, and to municipal organisations of the Metropolitan Region of Hamburg, for use in everyday operation. These electric vehicles are being purchased as replacements for leased vehicles with conventional propulsion systems that are reaching the end of their contracts, and in a Hamburg-wide pool for public authority transport run by the Hamburg Finance Ministry.

The public charging points provide exclusively certified green power from renewable energy sources. Any power supplier in the market can deliver charging power to its customers there, provided that it is green electricity and that a corresponding usage contract has been signed with the owners of the charging points. That ensures non-discriminatory access to the charging infrastructure, for power suppliers and for users. The charging points in the public area are in standardised plain design which fits in with the general cityscape.

At the initiative of Hamburg, the Bundesrat (Upper Chamber of Federal Parliament) proposed an amendment to the Road Traffic Act on 24 September 2010, with the aim of giving priority use of parking spaces at charging points to battery-powered electric vehicles. This initiative was set out

in Hamburg's doc. 19/4906. The Federal Transport Ministry believes that a permanent statutory regulation is not needed, and recommends in its statement of 22 February 2011 (Federal Transport Gazette 2011, pp. 199 et seq.) that only the signage of charging points in public spaces should be regulated, without further regulation.

Hamburg continued its cooperation with Berlin (Chambers of Commerce, Senate Chancelleries, Ministries, Project Directors) on hydrogen and fuel cell technology and battery-powered electric vehicles in 2011. Various sub-committees were set up, giving an opportunity for exchange of experience and for discussion of possible strategic directions.

Hamburg will continue to participate in expansion and further development of electric vehicles as a model region in the BMVBS funding programme, and is also applying for a "showcase" role for electric vehicles in the Federation's competitive procedure.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c2. Eco-taxis for Hamburg: award of an environmental or climate label (project no. 2010/030)

This project aims to make the use of taxis in Hamburg greener and more climate friendly, by increased operation of low-emission vehicles. It introduced an environmental label for taxis in November 2010. Taxis awarded this label have the exclusive right to advertise with the slogan "Hamburg Eco-Taxi" and to use the "European Green Capital" logo.

By November 2011, 582 taxis had already been granted the environmental label; that corresponds to 17% of the Hamburg taxi fleet. 75 of these taxis operate with gas propulsion, 136 with combined gas/gasoline propulsion, 7 with hybrid propulsion, 2 with gasoline, and 362 with diesel propulsion. Further applications are expected, because the operators are increasingly going for climate-friendly systems when purchasing new taxis. However, it remains to be seen what impact the toughening of conditions for granting of the label will have from January 2012 onwards; a taxi will qualify for the label only if its carbon emissions are below 130g per kilometre (previously below 150 g CO_2 per kilometre). The label is granted for a two year period, and then has to be renewed. Eco-taxis are a project for Hamburg as the European Green Capital 2011, but the project continues beyond 2011. That is why the conditions are being updated.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c3. Implementation of Cycling Action Plan (project no. 2008/083)

Cycling has a key role to play in the transport system in big modern cities. It is not only emission-free, but also flexible, fast and space saving. The Cycling Action Plan shows a long-term perspective with a range of measures which could increase the share of cycling in traffic from 9% in 2002 to double than in 2015. According to the survey of "Mobility in Germany" the share is already more than 12% and still increasing (status: summer 2008). However, the backlog of work needed on the cycling network, which has grown up over decades, cannot be dealt with in just a few years; that is work which will need to be done step by step. Investments in the cycling network are therefore focused on the main traffic areas; in 2011 to 2012, three

velo routes are to be realised (City – Eimsbüttel – Eidelstedt; City – Billstedt – Bergedorf; and City – Wilhelmsburg – Harburg) with a total length of 46 kilometres, plus a number of improvements at individual points in the velo route network.

The districts also receive support in preparation of local cycling concepts, and in repair and maintenance of important cycle tracks.

Other activities include in particular the 1,000 cycle stand programme for improvement of cycle parking, and the continuous expansion of the cycle hire system. Public relations work for cycling is also to be increased in 2012.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c4. Guidelines for procurement of vehicles with low pollutant and carbon emissions in public authority vehicle fleets (project no. 2010/073)

A set of guidelines entered into force in July 2011, regulating the conditions for procurement of new and replacement cars for the general public authorities vehicle fleet with respect to pollutant and carbon emissions. Upper mid-class vehicles are permitted a maximum emission level of 160 grams CO_2 per kilometre, and other vehicles an average of max. 120 grams CO_2 per kilometre. In addition, 70% of newly purchased vehicles are to have alternative propulsion systems, or gasoline engines which meet the Euro-6 standard.

The overall result is purchase of vehicles which keep emissions as low as possible, taking account of the current state of the art.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c5. Green Shipping Practice Forum – possibilities for implementation of energy-efficiency, environment friendly measures in shipping (project no. 2010/052)

One third of the world's container shipping fleet is in German ownership. So greater acceptance and implementation of energy-efficiency and other environment friendly measures could make a significant contribution to climate change mitigation. In April 2011 a "Green Shipping Practice Forum" was held by the responsible authority and the Federal Ministry of Economics and Technology, in cooperation with the German Shipowners' Association (VDR), the Ocean Engineering Association (VSM) and the German Engineering Federation (VDMA). The Forum helped to promote the dialogue between shipowners, shipyards, equipment suppliers, scientific institutions, banks and government, in order to show challenges, possibilities and problem solutions for the use of emission reduction technologies and energy-efficiency measures in shipping. It presented practical possibilities for implementation of energy-efficient, environment friendly measures in shipping, and discussed them with participants. It informed them of the regulations to be expected for emission regulation and for more environment friendly operation. It also gave an overview of the state of the art and availability of the relevant systems. The event also presented the funding of measures for more environment friendly shipping, in particular with presentation by the Kreditanstalt für Wiederaufbau (KfW-Bank) of its funding programmes.

d) Newly adopted projects

This section shows the projects added in 2011. These and projects already described in previous documents are listed in the table in Annex 1.

d1. Parking space management and monitoring (project no. 2011/015)

In its meeting in May 2011 the Hamburg Parliament adopted the parliamentary request “Fair and effective parking space management, with priority for low-emission vehicles” (doc. 20/254). The parliamentary request comprises examination of a concept for parking space management with a view to fair charges, effectiveness and systematic parking space monitoring without increase in parking charges. A report is scheduled for the first quarter 2012.

d2. Extension of testing of battery-powered electric vehicles (project no. 2011/024)

This project is to stimulate and implement the changeover of the municipal vehicle fleet to battery-powered electric vehicles. The approach on which this project is based is not tied to particular manufacturers or technologies, so it is in line with the promotion concept of the Senate, aimed at evaluation of different types of electric vehicles and the associated infra-structure as a complete system in everyday operation.

The funds from the Climate Action Plan are used in conjunction with complementary third-party funding from the Federation. It is expected that 160 electric vehicles will be purchased in 2012 and another 160 in 2013.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

d3. Increasing appeal for pedestrians, creation of an attractive pedestrian link in the Langenfort Park (project no. 2011/029)

The Langenfort Park in Barmbek is the most important walking link between the residential area, two schools next to the Park, a play house, and the local shops in Fuhlsbüttler Strasse. This project is aimed at creating a central pedestrian path through the Park. The creation of an attractive, safe, accessible, direct pedestrian link is to enable the local residents to make their everyday trips without using their cars, thus reducing the number of short car trips.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

4. Industry and plant technology

a) Goal

Activities for company environment and climate protection are to be intensified in cooperation with all the important players of the Hamburg business community, the companies, the chambers and guilds. The necessary cooperation structures established between the Senate and the business community are to be maintained and developed, and established as a long-term strategy going beyond 2012. The main goal is to save energy, particularly in production processes, and to increase energy efficiency.

b) Focal points of action

“Greening our Economies” is the heading of a discussion in Germany, which is also receiving widespread international attention, on how to achieve previously untapped efficiency gains in industrial and commercial companies, giving ecological and economic benefits. The strategy is based on consulting, networking and funding programmes. It can help to achieve further energy savings in industry and commerce, to constantly improve the energy efficiency of the plant used by means of successive replacement investments, and to design products to be more energy efficient, and better for the climate and the environment, and to make increasing use of renewable energies in industrial plant. In this context, a “Climate Protection Dialogue for Industry and Government” was also conducted at Federal level. The final report, published in February 2011, showed that a policy based on environmental protection and resource conservation is also an innovation and growth strategy. The report reaches the conclusion that Germany will continue to maintain its leading role in the global growth market for climate technology, provided that industry and government cooperate.

About 50% of Hamburg’s total carbon emissions are caused by industry and small business, trade and services (Inventory of polluters 2009, Statistikamt Nord). The industrial sector thus has a key role to play in the Hamburg Climate Action Plan 2007-2012, for realisation of concrete, rapidly measurable steps to reduce carbon emissions, often with major reductions.

Emissions trading was started in 2005 in Germany, and has a limiting effect with respect to half the carbon emissions from the high-emission sectors energy and industry. 29 companies in Hamburg participate in emissions trading.

The Senate has been working with Hamburg’s companies for many years for rapid initiation of effective voluntary resource efficiency measures in the companies, going beyond the legal requirements. The strategy is based on the following main points:

- Environment Partnership between Senate and industry, setting concrete additional environmental goals and controlling implementation;
- Creation of financial incentives (subsidy programmes) for initiation of resource efficiency measures in companies;
- Establishment of efficiency networks to communicate know-how, experience and contacts between the companies and other expert players;
- Provision of extensive consulting sessions for key areas in environmental management systems, renewable energies and integrated product policy;
- Conduct of awareness raising measures;
- Implementation of voluntary self-commitments by energy-intensive companies.

This strategy is succeeding in reaching a wide range of different Hamburg companies with a high proportion of them in the basic production industries, and is launching a broad based, long-term development.

The growing market for environmental and efficiency technologies for certain sectors of the economy is also gaining in economic importance. Hamburg companies in the renewable energy sector are encouraged to invest at locations in Hamburg, in the framework of the Renewable Energies Competence Cluster.

c) Exemplary activities

c1. Carbon inventories and climate protection strategies of public-sector companies with relevant CO_2 emissions (project no. 2010/019)

The Senate has mandated public-sector companies, which are responsible for a substantial amount of carbon emissions, to report on their climate action strategies (with short-term, medium-term and long-term goals) and on their carbon inventories. Recommendations were given to the companies on how to implement the Senate mandate, in order to ensure consistent methodological approaches.

At present climate action strategies and carbon inventories have been submitted by eighteen of these companies. Evaluation of the documents shows the bandwidth of the public-sector companies, and also very different quality of results. The climate action strategies of the companies are mainly in line with the time perspectives of the respective company goals. Many of the companies are simply not able to assess the medium-term and long-term situation in terms of the Hamburg climate action goals (short-term 2012, medium-term 2020 and long-term 2050).

According to the documents available, the public-sector companies will probably reduce their carbon emissions by about 49,000 tonnes in 2011. Subtracting the individual projects separately shown in the Climate Action Plan and the projects funded by the “Companies for resource conservation” funding item, this project makes a carbon reduction contribution of about 29,000 tonnes.

There are numerous activities in the public-sector companies to increase energy efficiency, to save energy and to practise sustainable management. But in many cases the activities cannot (yet) be directly shown in terms of their greenhouse gas reduction.

For example, the Association of Hamburg Childcare Centres (Vereinigung Hamburger Kindertagesstätten gGmbH), which runs about 180 childcare centres, aims to reduce carbon emissions by about 500 tonnes by 2012 through energy performance optimisation of building envelopes and heating systems.

The Hamburg Port Authority (HPA) is conducting various climate and environment relevant activities, e.g. to improve traffic flow in the Port of Hamburg, and to optimise the port railway system. The HPA has started introduction of a new IT system to improve road traffic flow. It comprises advanced controlling systems to combine IT networks, in order to coordinate the various modes of transport in an overall system, thus reducing energy consumption and CO_2 emissions of the HPA network. In July 2011 an environmental component was introduced in the port dues payable by seagoing vessels, as an incentive for customers. The Port Railway rewards the use of environment friendly shunting locomotives.

It is hard to give precise figures for the reduction in carbon emissions by the railways of HVV (the Hamburg public transport company which runs the underground and light rail systems U-Bahn and S-Bahn). The absolute energy input is not a relevant figure, because it is the aim of the company to expand its services and increase its appeal, in order to gain more passengers and thus change the modal split in favour of public transport. Absolute emissions in public transport have increased, but at the same time improved service has reduced road traffic. The relative carbon emissions related to carriage kilometres by public transport railways were down by 4.6% from 1990 to 2010, and CO_2 emissions per passenger-kilometre have remained relatively constant, despite extensive quality improvements. Passenger numbers have increased by about 10% in the last four years.

HAMBURG WASSER has also conducted extensive projects for CO_2 emission reduction since 2007, e.g. district heating supply to Tollerort container terminal, bio-natural gas feed-in at Köhlbrandhöft, and conversion of the aeration system at the Dradenau sewage treatment plant, with savings of about 22,000 tonnes CO_2.

HAMBURG ENERGIE is involved among other things in the expansion of renewable energy use in Hamburg, for example in construction of a CHP power station at HAMBURG WASSER, installation of solar arrays and wind turbines on the Georgswerder Energy Centre and the Wilhelmsburg Energy Bunker. Savings of about 23,000 tonnes are forecast by measures realised up to the end of 2011. In addition, HAMBURG ENERGIE aims to gain about 50,000 green electricity customers in the Hamburg area by the end of 2011.

The Hamburg Agency of Roads, Bridges and Waterways forecasts savings of about 5,350 CO_2 emissions by the end of 2011, mainly by energy performance optimisation of traffic lights and street lighting.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c2. Increased use of CHP in companies in production, services and housing (project no. 2008/031)

The initiative for increased use of CHP (combined heat and power) in industrial operations and housing, in cooperation with Hamburg business, has been operating since 2008, and was continued with success in 2011. A study shows heat generating plant with thermal output of more than 1 MW in industrial companies, and examined whether the use of CHP is economically viable. Preliminary planning of CHP power stations was prepared for 26 plants with suitable conditions. These preliminary plans help the plant operators, giving them a decision making aid for investments in CHP plant. CHP systems can be operated cost-effectively in the order of magnitude indicated. The CHP initiative tells plant operators about the relevant technology, and communicates the results of the study. It provides concrete support for initiation of investment in CHP plant – “CHPChecks” to determine the individual technical operating conditions for CHP plants in the companies. To ensure that these checks are affordable to companies, two thirds of the costs are borne by HAMBURG ENERGIE and E.ON Hanse AG. Subsequent installation of plant is eligible for funding from the Climate Action Plan.

The CHP checks available through the “Companies for resource conservation” programme give the plant operators a reliable basis for decision on use of CHP plant.

The CHP initiative has increased interest in CHP by Hamburg companies and the housing sector. 27 CHP plants have been set up or are currently in construction. These plants generate total electric power output of 13.5 MW and reduce carbon emissions by 35,000 tonnes per annum thanks to their high-efficiency energy production. The positive commitment of companies is continuing. At present, plans are being drawn up for about 10 new plants with estimated electric power output of more than 20 MW.

The Senate will continue to maintain its support for this project, as a contribution to carbon emission reduction by increased use of CHP, helping to mitigate climate change.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c3. Further development of the Environment Partnership (project no. 2007/064)

In the framework of the Hamburg Environment Partnership, Hamburg businesses and the Senate have agreed to give strong support to environment friendly, resource-efficient management in Hamburg. The organisers, alongside the Senate, are the Hamburg Chamber of Commerce, the Hamburg Chamber of Crafts, the Hamburg Industry Federation, and the Port Companies Association.

The working programme of the Environment Partnership aims to recruit a total of 1,000 companies as Environment Partners by 2013, and another 5,000 environmentally committed companies. By 30 September 2011, the number of Environment Partners was increased to about 810 companies, and the number of environmentally committed companies to about 3,600. The programme “Companies for resource conservation” can be seen as an indicator for the impact of the Environment Partnership, in environment protection and climate action (see c4.).

Intensive public relations work was conducted by the Environment Partnership in 2010 and 2011, in the context of Hamburg’s role as the European Green Capital 2011. These activities generated strong demand by companies for participation in the Environment Partnership, and for the right to use the logo of the European Green Capital. Between 1 October 2010 and 31 March 2011 alone, 93 new companies were recruited as Environment Partners, and in the whole year from 1 October 2010 to 30 September 2011, 138 Environment Partners were added. The number of environmentally committed companies increased by about 570 in this period. Companies which have implemented a number of qualified voluntary environment activities were entitled to a joint project logo of the Environment Partnership and the European Green Capital. This logo has so far been awarded to 87 companies.

All in all, the activities in the European Green Capital year mobilised a larger number of companies, and inspired them to additional environmental activities. The Environment Industry Summit 2011, which was well attended with 450 company delegates, was fully focused on the European Green Capital.

The Senate plans to maintain and develop the programmes and projects of the Environment Partnership, within which companies make voluntary contributions to climate action, environmental protection and resource conservation, and to improvement of resource efficiency. The practical work will continue in 2012, and there will be a focus on an agreement for continuation of the Environment Partnership and preparation of a working programme for the period from 2013 to 2018.

c4. Companies for resource conservation (funding programme) (project nos. 2007/069, 2007/070, 2007/072 - 2007/077)

Studies by leading industrial and scientific institutes assess the current energy saving potentials still available to industry and business today at about 20-30%. The Senate is therefore making every effort to help reduce the existing barriers and restrictions.

The “Companies for resource conservation” programme as part of the Environment Partnership is the contact point for Hamburg business for efficient technologies to save resources such as energy, water and raw materials. This programme is run by the city as a contribution to climate action, giving companies incentives for initiation of voluntary, rapid-result investments in resource-efficiency measures. It is delivering results, by a combination of expert advice, extensive networking and targeted funding. Since October 2001, companies have taken up the

programme offers with more than 1,750 projects, 960 of these since 2007. That induces extensive investments, cutting carbon emissions by about 146,000 tonnes per annum, and saving about 432,500 MWh energy and about 687,500 cubic metres of water, and avoiding more than 26,400 tonnes of waste. The measures completed within the programme enable Hamburg companies to reduce their operating costs by about EUR 20.5 million per annum.

This extensive efficiency network involves not only the cooperation partners (Chamber of Commerce, Chamber of Crafts, Hamburg Industry Federation, guilds and professional associations), but also more than 2,000 companies and other players, permitting intensive communication between the companies and with expert advisers. These contacts with experts of all technical disciplines, specialist planners, scientists and manufacturers are decisive for successful efficiency measures. The know-how and experience from more than 1,150 completed efficiency measures is continuously compiled, evaluated, and made available to other companies via the network.

The programme provides a range of different checks with expert support: FirstCheck, LightCheck, HeatCheck, ColdCheck, ServerroomCheck, CHPCheck, and EfficiencyCheck; they are ideal for many companies, and are often their first project to optimise energy and resource efficiency. They give companies targeted analyses by qualified engineering bureaus or specialist companies, at very favourable prices, showing savings potentials and indicating how to implement them.

Financial support to reduce the payback period is often the decisive incentive to implementation of the measures. Regardless of the size of the company and the sector, the amount of funding is dependent on the environmental and climate impact actually achieved, i.e. the amount of carbon emissions avoided, or savings in water consumption, or reduction in raw material consumption.

In 2011 the city entered this programme in the “Municipal Climate Action Competition 2011” with this programme – it is a competition run by the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU). The programme won the prize in category 2, “Innovative, exemplary strategies for implementation of municipal climate action”.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c5. Voluntary self-commitments by industrial companies (project no. 2007/051)

In September 2007 eleven Hamburg industrial companies signed voluntary self-commitments (Letters of Intent) vis-à-vis the Senate, undertaking to reduce their carbon emissions in the period 2008-2012.

This self-commitment is an important element in the Hamburg Climate Action Plan, with target savings of 500,000 tonnes CO_2 per annum by 2012 – corresponding to 25% of the reduction goal. It comprises reduction of carbon emissions by individual measures or a CO_2 reduction programme. It does not refer to the overall carbon inventories of the companies.

The companies play an active and cooperative part in implementation of the goal of reducing CO_2 emissions. At the present time (September 2011), the self-commitments permit forecasts of an interim status for 2011 of CO_2 savings of about 456,000 tonnes. Subtracting the measures conducted in the “Companies for resource conservation” programme, or shown as individual

measures in the Climate Action Plan, that gives about 423,000 tonnes. That is a substantial contribution to achievement of the goal set. The companies also announced further measures for reductions in CO_2 emissions. The methodical adaptation of the results to the CO_2 monitoring of the Climate Action Plan could lead to changes in the figures in 2012. In addition, the conversion factors used since 2007 for calculation of CO_2 emissions, e.g. for electricity (German national electricity mix) or district heating could also lower the CO_2 reductions achieved by some of the companies.

The Senate intends to continue the successful method of self-commitments by industry, with changed conditions, beyond 2012, and if possible to include further large companies. Activities for 2012 include not only support for self-commitments, but also preparation of an agreement for continuation of the self-commitments, with more intensive monitoring, in order to increase energy efficiency in industrial companies still further.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c6. Increase in the scope of the climate action programmes with active involvement of companies that previously did not participate, through business institutions (HK Energy Guides/ZEWU-mobilplus) (project no. 2007/068)

The existing environmental and energy counselling services provided by the Chamber of Commerce and Chamber of Crafts are to be supplemented by special counselling units, that is the HK Energy Guides (Chamber of Commerce) with two staff members, and ZEWU-mobilplus (Chamber of Crafts) with four members of staff. The goal is free-of-charge on-site consulting on energy-efficiency matters, especially for small and medium-sized enterprises (SME) in manufacturing industry and craft trades, and energy-intensive companies from other sectors.

This counselling activity with the companies was launched in February (ZEWU-Mobil) and October 2008 (HK Energy Guides). By 30 September 2011 a total of 2,192 on-site consultations, 181 in-depth consultations and 211 telephone consultations had been conducted. 1,484 on-site consultations were conducted by “ZEWU-Mobil” on behalf of the Chamber of Crafts, and 708 on-site consultations were conducted by “HK Energy Guides” from the Chamber of Commerce.

To get an impression of the effectiveness of the counselling and the measures then implemented, the HK Energy Guides conducted a survey with 159 companies to find out which of the measures recommended were in fact implemented. 94 companies implemented measures or were in the implementation phase. These companies invested about EUR 270,000.

Sample inquiries showed that investments worth about EUR 2 million have so far been initiated on the basis of the counselling. They include for example conversion of the heating system to biomass, installation of photovoltaic modules, purchase of new cooling systems, and replacement of electric lamps.

The project is an important part of the Environment Partnership, and runs initially up to the end of 2012. Continuation beyond 2012 is planned.

c7. Deichtorhallen – replacement of the lighting system (project no. 2010/058)

The Deichtorhallen are one of the few surviving examples of Hamburg's industrial architecture from the transitional period from Art Nouveau to the forms of expression of the 20th century. They comprise two exhibition halls for photography and contemporary art. The Northern Hall, which in itself comprises 3,800 square metres of exhibition space, and in the Southern Hall, the present lighting system is fitted with incandescent lamps and metal vapour discharge lamps (quartz). The intention is to replace and supplement these by LED metal vapour discharge lamps (ceramic) in order to reduce energy consumption and carbon emissions. A specialist light planning office has developed a new artificial light concept in the preliminary planning phase. The newly developed lighting system reduces consumption by about 205,000 KWh per annum, corresponding to about EUR 70,000 in electricity costs, and reducing total maintenance cost by about EUR 9,800 per annum. The measurements and empirical results of the newly developed lighting system for Deichtorhallen could serve as an example for other exhibition centres in Hamburg and nationwide.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

d) Newly adopted projects

This section lists projects which were newly adopted in 2011. They and projects described previously are shown in table form in Annex 1.

d1. Compressed-air aeration at Köhlbrandhöft Süd sewage treatment plant (project no. 2011/012)

Energy savings and increase in energy efficiency are fully in the interest of public-sector companies, because this not only contributes to climate change mitigation, but also cuts operating costs. In this context HAMBURG WASSER conducted an extensive energy analysis for the Köhlbrandhöft/Dradenau sewage works association, and identified a range of appropriate measures. One of these is replacement of the aeration system at the Köhlbrandhöft Süd sewage treatment plant. The existing rotary aerator is to be replaced by a more energy-efficient compressed air system. The planning indicates energy savings (electricity) of about 6 million kWh per annum, which can be realised from 2013/14. The emission savings potentials are assessed at 3,450 tonnes CO_2 per annum.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

d2. Heating network in "Companies for resource conservation" programme (project no. 2011/014)

The "Companies for resource conservation" funding programme is to be further developed with establishment of a heating network. The goal of this project is to boost reduction of carbon emissions from space heating of buildings, contributing to climate change mitigation by initiating specific projects. Technical improvement in heating systems in non-insulated and insulated multi-family homes and industrial buildings gave average energy savings of 22% and 28% respectively. This project aims to establish a specific heating network for more intensive communication with building owners. The network takes high priority as a supporting measure for the "Alliance for housing". Funding beneficiaries include private-sector owners of industrial

buildings and rented multi-family buildings, and housing ownership associations, in order to develop efficiency potentials with heating systems in existing buildings on a broad basis. The network presents best-practice techniques, with events and workshops to disseminate appropriate technologies and implementation strategies among building owners, in order to overcome the existing barriers to heating system optimisation.

For implementation of the measures, the building owners can make use of advisor pools, targeted counselling offers and financial support. The network offers high-quality HeatChecks by specialist companies and planners at subsidised prices, with financial support from the responsible ministry and from E.ON Hanse AG. The checks provide the necessary data on costs, savings and cost-effectiveness for investment decisions. Financial support is provided in order to make the measures economically more worthwhile, especially in the case of rented properties.

Energy performance modernisation of heating systems can make a contribution to climate change mitigation within a very short period - not only in buildings where thermal insulation of the envelope is not possible.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

d3. Heat supply from CHP waste heat, using mobile latent heat storage (project no. 2011/020)

A latent heat storage system on wheels is used to store and transport heat. The heat storage system is taken to a heat demand point (heat sink) and replaces the previously required primary energy consumption or power consumption there up to 100%.

Heat sources such as steel mills, waste incineration plants and CHP power stations provide the previously unused process heat or waste heat. The waste heat energy of an existing CHP power station with an output of 3x400 kW_{el} is 3x600 kW_{th}, and is stored in a patented latent heat storage system. The storage system is based on a container with an internal water circuit and a storage medium comprising the salt sodium acetate, with a storage capacity of 2.5 MWh. The storage unit is charged with hot water at a temperature of up to 110°C at the heat source. The functional principle is based on process heat which is generated on the change in state from liquid to solid. Discharge of the storage unit at the heat sink can be interrupted several times without significant losses, which enables it to be used in accordance with demand. Transport and logistics are handled by a local company, in order to keep the travelling distance to the heat source as short as possible. In order to achieve high efficiency, the heat sinks should be located in a radius of 15 km around the sources. A heat exchanger, pipes and an operating position for one more containers are needed at the heat source and at the heat sink.

The CHP generates so much usable waste heat that at least two containers can be charged simultaneously, that is 8-10 containers per day. Heat supply to buildings and other heat sinks by unused waste heat can be conducted on this principle using the Old Elbe Tunnel at Steinwerder, owned by the Hamburg Port Authority (HPA) as a pilot project which can be launched at short notice. The HPA also has many other suitable heat sinks within the radius mentioned, in the port area.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

d4. Master Plan for Crafts (project no. 2011/023)

The Master Plan for Crafts was signed by the Mayor of Hamburg and the President of the Chamber of Crafts on 2 September 2011. It covers not only a wide range of commercial subjects, but also close cooperation between the Senate and the Chamber of Crafts in climate action and environmental protection. That includes consultation in preparation of the Master Plan for Climate Protection and the Climate Action Plan. Great importance is attached to the advisory bodies in climate action, including the company advisory service funded from the Climate Action Plan (for craft companies that is ZEWU-mobilplus).

II. Adaptation to climate change

Climate impact management

a) Goal

As a major city in an areas subject to storm flooding, Hamburg will have to face up to changes in the course of climate change, and to take account of them in advance, in the interest of its citizens. The Senate is preparing a strategy for adaptation to climate change for this purpose. It is to recognise the risks, and to implement the necessary measures.

b) Focal points of action

Global climate change is one of the greatest challenges of the 21st century. Climate action is based on two pillars: avoidance of climate damaging emissions, and adaptation to the consequences of climate change.

It has become clear, at the latest on presentation of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2007) on climate change and its conclusions, that climate change is happening now, and that it will in future affect every region of the planet. Activities at international, European, national and regional level will therefore be stepped up significantly in the coming years.

In December 2008 the Federal Government created a national framework with the German Strategy for Adaptation to Climate Change (DAS). This strategy is the foundation stone for a national process which identifies step by step the impacts of global climate change, assesses the risks, sets out the actions needed, and develops and implements measures for adaptation. The “Action Plan for Adaptation” was adopted by the Federal Cabinet on this basis, on 31 August 2011. This supports the German Adaptation Strategy with specific activities, and comprises four areas of action:

1. Providing knowledge, informing, empowering, involving
2. Framework setting by the Federal Government
3. Activities in direct Federal responsibility
4. International responsibility.

Adaptation to the impact of climate change is an important element in Hamburg’s climate policy. Based on the Federal activities, Hamburg is developing a strategy for adaptation to climate change, to identify the adaptation needs in the various activities of government activity and to set out the initial concepts, a plan of action, and a monitoring system for adaptation measures.

The first step in this process was shown in an expert report on “Climate change and climate impact in Hamburg – orientation framework”, indicating the scope and extent of the changes to be expected. It analysed a medium scenario and an unfavourable scenario for the middle and end of the century. The results range from a temperature rise of 1°C rise on annual average (medium scenario, mid-century) to 4.7°C on annual average (unfavourable scenario, end of century). This range of climate change expectations is the basis of the Hamburg adaptation strategy.

The Hamburg climate change adaptation strategy will cover the following fields of action:

- Coastal defence and flood protection, as ongoing tasks. Protection from storm flooding is of existential importance for Hamburg. So improvement and strengthening of flood defences has always been a continuing task for the city.
- Water management in Hamburg. In future it will have to adapt to a rise in sea level, and also to two different extremes: on the one hand an increase in severe rainfall events, and on the other more frequent occurrence of heat waves and dry periods.
- Protection from summer heat and dealing with heat waves in future. The parks and other places that give shade will have a vital role to play, as recreational areas within walking distance from housing areas. These areas are also important to ensure fresh air in densely populated areas, and thus to give cooling at night.
- Urban climate modelling. One of the major challenges in climate change for Hamburg is the expected impact on the urban climate, e.g. overheating in the city centre in summer periods when there is little exchange in the atmosphere, and changes in precipitation and wind conditions. It will be important to assess such changes at an early stage and respond to them, for example in urban planning and the planning of open spaces with the landscape programme, so urban climate modelling will be an important way of preparing for different situations. This is to be done in cooperation with the University of Hamburg, leading expert assessment agencies, and the German Meteorological Service (DWD). Hamburg is one of the leaders in Germany, with outstanding expertise in urban climate research.
- New functional requirements for green spaces and green structures in Hamburg, due to climate change and the resulting change in urban climate. Examinations are being conducted to determine the requirements in this context, and to identify what characteristics are needed with respect to urban planning and landscape planning.

c.) Exemplary activities

c1. KLIMZUG-NORD (project no. 2007/177)

KLIMZUG-NORD – strategic approaches for adaptation to climate change in the metropolitan region of Hamburg – this is a group financed by Federal and State funding, comprising recognised and reputed partners from universities, research centres, public authorities, establishments closely related to the authorities, and companies. It also includes further associated partners and supporters from all eight rural districts of Lower Saxony and six districts of Schleswig-Holstein that are within the metropolitan region of Hamburg. It brings together urban and landscape planners, architects, engineers, biologists, agricultural scientists, meteorologists, geographers and climate researchers for interdisciplinary exchange in the development of solutions for adaptation to climate change. Key areas of this research are estuary management, integrated urban and spatial planning development, and sustainable

cultivated landscapes. It also addresses issues of economics, nature conservancy, education and governance. KLIMZUG-NORD is the largest German KLIMZUG project, and is well tailored to the strong concentration of research institutions in the Hamburg area. KLIMZUG-NORD is a lead project of the Metropolitan Region of Hamburg, promoting dialogue between science, administration, business, professional associations and the general public. It develops and tests strategies and measures for adaptation to climate change in exemplary form, using model areas within the Metropolitan Region of Hamburg (e.g. the Elbe Island of Wilhelmsburg, and the catchment area of the River Wandse). It examines specific regional challenges and problems of the Metropolitan Region of Hamburg, e.g. handling of severe rainfall events, storm flood risks, and thermal islands in urban areas, and the question of construction techniques suitable for urban areas, and develops appropriate solutions. Close dialogue is conducted at the level of the model areas between the local residents, professional associations and administration, to identify the impact on different groups within the population, and to describe the potentials for adaptation.

The key result of the project is a “Climate Adaptation Manual – Options for the Metropolitan Region of Hamburg”, showing the recommendations for action for adaptation to climate change consequences in the Metropolitan Region of Hamburg.

c2. Flood defences (project nos. 2007/112 und 2007/113)

Climate change is expected to cause higher, and faster rising sea levels, and this has to be taken into account in further planning. The reference water levels therefore have to be re-examined for future storm flood resistance of the dikes, and if necessary to be revised. The authorities responsible for the dikes will cooperate closely on this with the research units and university departments in Hamburg and the Metropolitan Region that specialise in climate change impact assessment and climate modelling.

The coastal states of Hamburg, Lower Saxony and Schleswig-Holstein are currently developing an external framework to take account of climate change with respect to the reference water level. A draft proposal, bringing together the results of the coastal states, is available for Hamburg. It seems that a common value can be specified, with reference to Cuxhaven.

It is also necessary to transpose into national law the European Floods Directive (2007/60/EC). It requires among other things the assessment of flood risks, the preparation of flood risk maps, and by 2015 also flood risk management plans, to be developed with participation of the population. For Hamburg, the expected increase in severe rainfall events is a challenge which has to be faced. Measures for decentral rainwater management have to be implemented in order to reduce flood run-off peaks.

c3. Low-water events (project no. 2010/020)

Alongside issues such as “rise in sea level” and “severe rainfall problems” which are already at the focus of water management, climate change will also lead to ever longer-lasting dry-weather periods. That can have serious consequences, especially for smaller watercourses – the reduction in water causes an increase in pollutant concentration, with a reduction in oxygen content. In extreme cases, the bed of the waterway can even dry up, and fish mortality will be more frequent and more extensive. Examples of particularly vulnerable watercourses in Hamburg are the upper reaches of the Tarpenbek, the Kollau, the Stellau and the Scheidebach.

The responsible ministry will analyse the climate-induced low-water events by mid-2012, and conduct systematic reviews of the timing and extent of such low-water periods, and possibilities of forecasting low-water flows. The concept comprises the following components:

1. Identification of the watercourse sections affected;
2. Analysis of low-water events by assessment of precipitation and run-off data;
3. Establishment of numerical precipitation models in the catchment areas concerned;
4. Improvement of the “interface” between the hydrology of the waterways and the sewage system of Hamburg Wastewater (HSE);
5. Preparation of a programme of measures to even out run-off events;
6. Advice on emergency measures if and when needed.

c4. Development of overall urban strategies and measures for sustainable securing and development of natural cycle functions as a basis of climate protection (project no. 2010/040)

Climate change will be reflected in the ecology of the city and landscape, in changes of the natural cycles. Expected effects include a shift in precipitation frequency from summer to winter, a reduction in the amount of water available in summer, and long-lasting dry periods with serious drying-out of the soil and dry stress for vegetation, increased evaporation due to higher temperatures, and changes in the range of species. That leads to changes, for example impairment of the growth conditions for plants, of the soil structure, reduction in water quality, and impairment of the quality and usage of open spaces.

Spatial planning has to respond to these climate-induced changes by a change in use planning for open spaces. That calls for new approaches, assessments and planning goals.

The landscape programme is to be updated on the basis of the climate scenario 2050 and the urban climate review, examining in summary form the functions and processes of the natural cycles (soil, water, flora and fauna) and their interaction with the changed climate conditions, with an assessment and presentation of climate relevant activities and plans for the whole of urban and landscape planning. The results will be available in a digital information system.

A review of the urban climate situation in Hamburg was presented by the responsible ministry at a specialist conference on 11 May 2011. A detailed analysis of the climate functions in the whole of the urban area was presented with the aid of a model calculation. A future scenario

was also presented, showing what further changes are to be expected, and what strategies would be possible to mitigate the impact of climate change. The results will be included in the update of the landscape programme.

c5. Hamburg Strategy for Adaptation to Climate Change (project no. 2008/080)

The work on development of a Hamburg Strategy for Adaptation to Climate Change included a regional conference of the Federation and the North German coastal states, held in Hamburg on 30/31 March 2011, on "The future of the coastal region – strategies and measures for adaptation to the consequences of climate change". It showed the actions needed in the key fields of activity for coastal areas – coastal defence, coastal tourism, and housing development. An important purpose of the conference was to raise awareness of the vulnerability of the region to climate change. It addressed in particular the politicians. A panel discussion and press conference were held with participation of the North German environment ministers and representatives of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). It laid the foundations for close cooperation in Northern Germany in all issues of climate adaptation and climate knowledge, especially as all the North German KLIMZUG projects and the Lower Saxony research association KLIFF were closely involved in preparations. The results were published in documentation of the regional conference.

Another module in the Hamburg Strategy for Adaptation to Climate Change and for control of the adaptation process is an economics report, analysing the costs of climate change and the adaptation measures by comparison with the costs resulting in the event of doing nothing.

d) Newly adopted projects

This section gives details of projects newly added in 2011. These and other projects described previously are listed in table form in Annex 1.

d1. My tree, my city – planting of street trees in the framework of "Hamburg – European Green Capital" (project no. 2011/013)

This project involves planting about 2,600 street trees in Hamburg. That closes gaps in the existing tree stock, caused by felling trees for reasons of road safety. Planting of street trees in Hamburg has been largely discontinued since 2003 in favour of funding remedial projects to save existing trees. The planting campaign and the whole of the preparatory phase were accompanied by intensive public relations work. This drew people's attention to the tree plantings, encouraged them to participate, and motivated them to adopt trees, that is to make a financial contribution to the costs. For every EUR 500 given in donations for a tree, Hamburg gave the remaining EUR 500. By the end of the donation campaign in 2011, it enabled planting of 2,599 trees, that is 2,011 funded by the City of Hamburg and 588 funded by donations.

This programme is a contribution to adaptation to climate change, improving the urban climate by shade, ventilation and cooling as summers get hotter. Trees also absorb CO_2 and use it to form wood, by means of photosynthesis and the downstream processes. So the planting campaign also helps to achieve long-term binding of CO_2 in trees. The combined effect of the urban trees is very important – the trees filter large quantities of particulate matter, bacteria, fungus spores and other harmful substances out of the air. They also humidify the air, as trees

produce evaporation. Thus the planting campaign is a contribution to clean air and to public health in Hamburg.

d2. Rainwater management in urban development – best practice and visions for urban development with water (project no. 2011/027)

The predictions for Northern Germany are for longer dry periods in the summer half-year, coupled with individually more intensive severe rainfall events and rising groundwater levels in the winter half year. Both the dry periods and the severe rainfall events will not only cause damage to the waters, but in the event of flash flooding can also cause serious damage to property. In this context, it is also important to consider smaller waterways in the Geest areas, because they can overflow their banks within a very short time. Work for climate impact adaptation has to include planning for housing and residential estates, designing them at an early stage in such a way that they can cope with extremes of climate, that the consequences are reduced, and that they are appropriate for changed conditions.

This programme takes specific areas and projects as examples of possibilities for forward looking rainwater management, and presents them in a brochure. It is to help present developments, raise awareness, and to promote acceptance of appropriate building regulations. The target group is the political decision makers and the people of Hamburg.

III. Generally applicable sectors and subjects

1. Awareness raising, consulting and qualification

a) Goal

It is essential to communicate all aspects related to climate change mitigation and the causes and consequences of climate change, raising awareness in the general public, and delivering the relevant education, training and consulting provisions. Climate action and climate change are important for people’s everyday lives. The provision of information for the general public on climate action is to be made more systematic and considerably increased.

b) Focal points of action

Climate action is aimed at reducing greenhouse gas emissions (mitigation) and making changes to take account of the unavoidable consequences of climate change (adaptation). These goals can be promoted by government regulations and by economic incentives. But in order to actually achieve the goals, awareness and action is needed on the part of ordinary people and the interest groups that represent them.

That is why awareness raising is the third component in climate protection, alongside funding and regulatory measures. A nearly zero-energy house will only work properly if used with the appropriate climate awareness, e.g. with appropriate ventilation. People will change to cycling or use public transport only if there is a change in their awareness. The consumption of regional products requires a change in behaviour both on the supply side and on the demand side.

Awareness on the part of users and the companies is essential specifically in energy saving. Activities by individuals are particularly desirable and effective in this area. Energy saving has to become established on a broad base. Together with the Consumer Advice Bureau and other players, the project is to run motivation campaigns, dialogue marketing or other communication forms to get direct access to the relevant target groups (including migrants).

It is important to work in all areas of life, starting with pre-school and school education and further education, and including counselling and information in all phases of life, in order to achieve sustainable change in behaviour.

“Alliance for housing”

The “Alliance for housing” was set up by the Senate in cooperation with the housing sector to promote climate-efficient optimisation of user behaviour by providing appropriate information, e.g. through training of planners and contractors, also pursuing the goal of further reduction in carbon emissions.

The City of Hamburg and the housing associations jointly support the following activities:

- Provision of advice to investors and to tenants; training; quality assurance;
- Continuing education;
- Campaigns and programmes aimed at landlords and tenants;
- Joint concepts for district-related low-carbon energy supply.

Childcare centres and schools

Childcare centres are places of education that make a special contribution through their teaching to imparting environmental awareness and promoting children’s ability to shape their lives and their actions. They help the children to achieve self-reliance. The children can learn that their own actions can play a part in changing the world. Contact with practice and learning from experience, role models and personal experience, are important elements on the way to behaviour that is right for the climate. Awareness raising for climate action and the responsible use of resources are also among the goals of education for sustainable development (ESD), which has been included prominently in the revision of educational recommendations planned for spring 2012, to be incorporated more in the work of the childcare centres.

Practical activities and learning from experience are also essential parts of school education, the best way to encourage behaviour appropriate to mitigate climate change. It is important to create collective awareness of the fact that people can change the world by their own actions, provided that these actions become the norm. It must be made clear to people that the apparent conflict between quality of life and climate action does not apply, by showing alternatives and presenting role models to them at an early age.

Adult education

The programmes in private and vocational education and training should contribute to improvement in the availability of advice for private individuals and for commercial users.

The non-vocational education work of the Volkshochschule (Adult Education Institute), Consumer Centre and the Hamburg Energy Agency (Hamea) aims to provide information on energy issues.

Continuing vocational education is also important. It has the goal of promoting appropriate decisions in the interest of climate action, and of enabling companies, particularly in the small industry sector, to update their services to the latest state of the art, making this expertise available to the end users.

Climate action as a key subject in education for sustainable development

In 2005 the Senate launched the “Hamburg Learns Sustainability” initiative, a contribution to the UN Decade of Education for Sustainable Development 2005-2014. A Hamburg Action Plan published annually lists exemplary educational projects in the initiative “Hamburg learns sustainability”. About one third of the subjects are concerned with climate action – energy saving – energy-efficient, sustainable building – sustainable consumption. That shows the great relevance of this key subject for Hamburg’s educational institutions. The publication series “Hamburg learns sustainability” includes the brochure “HaBiNa – Sustainability training and continuing education for contractors”, aimed at disseminating energy-efficiency and sustainability in practical training in the building sector. “Gut Karlshöhe” has been modernised as an out-of-school education centre. A “Heating showcase” has been set up to demonstrate the latest technologies; and the “jahreszeitHAMBURG” exhibition invites visitors to find out about nature, energy and climate in the changing seasons. Together with the states of Schleswig-Holstein, Mecklenburg-West Pomerania and Lower Saxony, the 4th NUN Conference was conducted in Wolfsburg in September 2011 (NUN stands for North German Partnership to Support the UN Decade of Education for Sustainable Development), addressing the subject of “Cities on the move – contributions to education for sustainable mobility”, with an impact on all sectors of education.

c) Exemplary activities

c1. fifty/fifty-junior (project no. 2009/063)

“fifty/fifty” is a long-running energy saving project for schools, which delivers savings of more than EUR 3 million and CO_2 reductions of more than 10,000 tonnes per annum. fifty/fifty-junior is to transfer this concept to more than 1,000 Hamburg pre-school centres. The present consumption data of some 200 childcare centres suggest that the savings potentials dependent on user behaviour are similar to those achieved at the 450 Hamburg schools. fifty/fifty-junior will be launched by the end of 2011 with the support of a number of large supporting organisations and umbrella organisations (Vereinigung, Soal, Caritas, AWO, etc.), which represent a total of about 500 childcare centres.

Climate action has to be worthwhile at the end of the day for the organisations bearing the cost, especially as their financial scope has been reduced substantially by a new funding procedure. In other words fifty/fifty-junior will be successful only if it can be integrated with very few problems and little expenditure into the administrative structures of the organisations which run the centres, and promises “bottom line” financial benefits.

The procedure for calculation of savings is complicated, because energy consumption in schools and childcare centres is dependent not only on user behaviour, but also on various other changing factors (e.g. technical factors, building design). They have to be recorded and calculated constantly in order to prove the subjective saving successes. If that is not possible, or is not possible at reasonable cost, the project will quickly lose credibility and support, as shown by various examples

So the aim of the fifty/fifty-junior project is to transform the administrative and data management know-how acquired in 15 years of fifty/fifty into an easy-to-understand, easy-to-use model package, which ensures direct continuation of the concept by the organisations involved, and also enables other school and childcare centre organisations to adopt it, not only in Hamburg. The core of the package is an easy-to-manage, transparent database. The concept work is up to project management, which gets its funding from the responsible ministry.

The project team also includes two climate action advisers funded by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Climate Action Plan. Its main responsibility is to support the childcare centres, including

- General administrative work such as collecting and updating the basic administrative data (names, addresses, functions, etc.), sending brochures and questionnaires, making loans of measurement equipment, etc.;
- Calculation of bonuses – the annual calculation is done with the aid of the database which has already been developed;
- Advice to childcare centres “on site” – technical advice in the form of a “tour of the building”, identifying the energy-efficiency problems together with the staff responsible for the building equipment (caretaker, centre management, environment adviser) and discussing possible ways of optimising the system (e.g. settings of the heating system) or remedying the problems. The pedagogical advisers work with the teachers and other staff at the centre. The purpose is to gain their support for the concept and to get them to include simple, basic issues of proper use of energy in everyday teaching work at the childcare centre;
- Conduct of regional continuing education courses;
- Public relations work – regular, quarterly publication of an information brochure with experience, ideas and tips; organisation and conduct of a central “fair” at the beginning of the second half-year (after billing/beginning of heating period), giving awards for outstanding achievements, presenting materials, and providing opportunities for exchange of views, etc.

c2. Energy advisers for public-sector properties – fifty/fifty-Admin (project no. 2008/033)

The energy consumption of administrative buildings is influenced to a very large extent by everyday behaviour of the users. Improvement of the building envelope and the use of energy-efficient equipment should therefore be supported by intensive advisory work and motivation of users to adopt energy-efficient behaviour.

The Hamburg administration has a leading function to play in the way it operates in public buildings; the successful fifty/fifty project used in schools is being adapted to administrative buildings and transferred to them. This gives good multiplier effects and provides financial savings.

The first step in order to reach the employees in the administrative buildings was to appoint energy advisers for a number of properties owned by various public authorities. The responsible ministry conducted a series of introductory and continuing training events for these advisers, and set up a platform for exchange of information.

The next step is to add a financial incentive concept to the project. That is to increase the motivation of staff for attentive behaviour in order to use energy more sparingly and more efficiently and thus make a contribution to climate change mitigation and simultaneously cut costs. A further side effect is expected to be transfer of the knowledge obtained by these staff to their home environment.

The ministry is launching the project together with fifty/fifty from 2012 onwards, in about 20 administrative buildings. The energy savings determined will be allocated with a ratio of 30:40:30. That is 30% of the savings are to be kept by the participating authorities, 40% go to the funding title for energy saving measures with the responsible authority in order to fund further energy saving measures in the buildings involved, and the remaining 30% are to be invested in symbolically important projects (e.g. setting up/enlarging a photovoltaic array at Georgswerder energy centre). Participation is voluntary. Calculation of the savings is to be by means of the database available at the responsible ministry for energy controlling of public buildings. There will be no additional costs incurred in the pilot project.

c3. Climate action at schools (project no. 2008/082)

Hamburg schools are working on this with the slogan “Climate – we are taking action!” They are developing their school’s own climate action plans, and systematically implementing the measures included there in the following years. So far, Hamburg is the only city in Germany where climate action at schools is a regular part of activities. It is controlled by a modern planning tool, and is established in a framework that extends beyond the project period. Schools can draw on support from a comprehensive range of teaching materials and technical support for climate action and environmental education. That includes a workshop series specially developed for the participating schools, training climate action advisers for schools, and providing teaching materials and facilities, further education courses, on-site consultation by climate advice staff, and cooperation projects.

A climate action plan describes the climate goals in teaching, in energy efficiency and in building equipment, and the measures to be implemented by the school together with its stakeholders (teachers, students, caretakers, other school staff, parents, regional partners), to contribute to reducing carbon emissions. The school will set the goals and programmes for the coming years up to 2020, and work on implementation of the measures related to the building equipment in close cooperation with Schulbau Hamburg and GWG Gewerbe.

The main focus is on awareness raising for climate action by establishing it in everyday teaching at the school. There is plenty of potential in the schools, for example in electricity, heating, mobility, food, and purchasing. It is possible to cut energy consumption by 15-20% by change of behaviour alone, if the whole school community joins in.

The first 24 general education schools were awarded the quality label as “Climate School” by the Hamburg Institute of Teacher Training and School Development (LI), valid for two years. These first climate schools have adopted binding climate action plans at their schools. The climate action plans enable the Climate Schools to conduct structured, transparent, results-based activities for climate change mitigation. The school climate action advisers exchange their

knowledge and experience in a network. Altogether, the first 24 Climate schools want to save about 2,000 tonnes of CO_2 by 2020, with more than 700 individual activities. That corresponds to the average carbon emissions from the heating energy and power used by about five medium-sized schools.

Since February 2011 another 24 schools have been working out their climate action plans. The next cycle is to start in February 2012 with another 20 schools. The project team gives support to every individual school in preparation of the climate action plans, with training and promotion of exchange of information and experience between the schools.

c4. Hamburg Climate Week 2011 (project no. 2010/029)

The third Hamburg Climate Week was held in the central area of Hamburg from 23 to 30 September 2011, with the aim of presenting issues of climate change mitigation, climate research, sustainability and climate adaptation to end consumers of all ages, in an easily understandable, attractive form. The Hamburg Climate Week was organised by TuTech Innovation GmbH in close cooperation with the Coordination Centre for Climate Issues and the responsible authorities.

The Hamburg Climate Week was opened by the Senator of the responsible Hamburg ministry and a Member of the European Parliament. The event, under the patronage of the EU Energy Commissioner, showed the strengths of the Metropolitan Region of Hamburg in climate research and renewable energies. It showed the general public and the decision makers the urgency and the feasibility of concrete actions and adaptation measures for mitigation of climate change. The events included not only the most important players in this area in Hamburg, but also the United Nations Environment Programme and the Federal Chancellery with its project “People’s dialogue for sustainability”.

The highlights of this year’s Climate Week were the Climate Night, the Climate Concert, the educational programme for school students, the ElectroMobility Promenade, the sustainability market of the regional initiative “From the region – for the region”, and the open-air Bio-Event in City Hall Square.

More than 100 players were involved from scientific organisations, administrations and businesses, presenting their exhibits and events on climate change from the Central Station to the Europa-Passage shopping centre right through to City Hall Square; the heart of the event was the interactive theme park in the Europa-Passage.

More than 500,000 people attended the Climate Week, according to an estimate by the organisers.

2. Research

a) Goal

Hamburg is pursuing the goal of further advancing its scientific excellence in research and teaching in the area of climate and climate impact research, and increasing their international visibility. The current scientific focal points in climate research, in both adaptation and mitigation, are to be enhanced and focused even better.

b) Focal points of action

The Hamburg area is one of Germany's most important centres of climate research. It has a unique research scene, outstanding research institutions, and excellent interdisciplinary research groups. Climate research in Hamburg enjoys a good international reputation and is one of the scientific flagships of this city and Germany. One of the focal areas in climate research is further development of the Hamburg Climate Campus and extension of the outstanding basic research associated with it. The leading national and international position established by Hamburg for example with the Climate Campus and the CliSAP excellence cluster is to be maintained and developed.

The Senate supports in particular the further implementation and the efforts to continue the excellence cluster CliSAP in the framework of Excellence Initiative II conducted by the Federation and the States; in Hamburg it involves 17 university institutes, 3 non-university research facilities (Max Planck Institute for Meteorology; Helmholtz Centre Zentrum Geesthacht, Centre for Material and Coastal Research; and the German Climate Computing Centre) and 18 partner facilities from the Hamburg region. An application for continuation of this work was submitted in August 2011, and the result is expected in June 2012. The Cluster, which was launched in October 2007, is currently supported over a five-year period with a total of EUR 34 million from research funds of the Federal Ministry of Education and Research (BMBF) (75%) and the City of Hamburg (25%). The exchange of research-based information and data, and interdisciplinary combination of specific knowledge on climate issues is to be intensified by active cooperation in a number of research networks.

Basic research and in particular applied research in and around Hamburg are to be strengthened and expanded, especially in renewable energies and energy efficiency. The aim is to establish the expertise and activities of the Hamburg universities and research institutions in energy research as a central component in the Hamburg Renewable Energies Cluster. Targeted combination of scientific and business expertise within the Cluster can generate synergies and enable joint research projects and better transfer of research results to practical application. The responsible authorities have got together with the Hamburg universities (Hamburg University, Hamburg University of Technology, Helmut-Schmidt University – University of the Bundeswehr, HafenCity University Hamburg, and the University of Applied Sciences), with involvement of the Renewable Energies Cluster, to start the process of focusing energy research expertise.

The goal is to identify key areas in the concept for a Hamburg energy research group, where the greatest potential is seen for future research in these areas in Hamburg. An association of this kind strengthens the inter-university, inter-disciplinary cooperation, and increases the visibility of Hamburg energy research in the business community and with the general public.

c) Exemplary activities

c1. CliSAP (project no. 2007/170)

The excellence cluster "Integrated Climate System Analysis and Prediction" (CliSAP) of the University of Hamburg is funded in the framework of the excellence initiative of the Federation and States with about EUR 34 million over a five year period. This Cluster gave the initial impulse for the partners to get together as the Hamburg Climate Campus. It is at the centre of these activities, and gives rise to even closer interdisciplinary cooperation. Research at the

Climate Campus (within the CliSAP excellence project) is structured in the four key areas climate analysis, climate variability, climate and human beings, and regional effects and risks.

To examine these issues on a long-term basis, new groups of researchers have been set up and the post-graduate “School on Integrated Climate System Sciences” created for long-term training of experts.

In summer 2011 an extension application for the Cluster was submitted in the framework of the excellence initiative of the Federation and states. Based on the knowledge and experience gained during CliSAP-1, the key questions addressed in CliSAP-2 will be as follows:

- What feedback effects and dynamic processes within the global carbon, water and energy cycles are the key factors for climate variability and climate prediction?
- What effects will global climate change have on sensitive regions, relevant climate zones and climate phenomena?
- How does the interaction work between climate and human beings in terms of global governance, communication, safety, markets and cultural aspects?

These questions will be addressed in three different research areas:

- Climate dynamics and variability
- Climate manifestations and consequences
- Climate change and social dynamics

The decision on continued funding of the Cluster with a total of EUR 30 million is expected in June 2012.

c2. Model project environment friendly air-conditioning (project no. 2007/168)

The Hamburg University of Technology (TUHH) has been operating the model project for climate-friendly air conditioning since 2008. It was funded with nearly EUR 1 million by the Federal Ministry of Economics and Technology (BMWi) from 2008 to 2010. The model project is to demonstrate that environment friendly air conditioning of buildings is possible. A “geothermal and sorption-supported air conditioning” test system is installed in the HafenCity area, to demonstrate air conditioning with natural heat sinks by use of near-surface geothermal resources. It became clear during the trial that solar and sorption-supported air conditioning should be examined as an additional line in parallel to geothermal and sorption-supported air conditioning, because an even greater user group is seen for it, which means more savings of carbon emissions. This part of the trial is supported with funds from the Climate Action Plan. Further funding from the BMWi has been applied for the parallel line with geothermal and sorption-supported air conditioning. Operation of the plant is to continue in 2012 at the location of the Hamburg University of Technology, in order to conduct long term tests.

This measure contributes directly to reduction of carbon emissions (see Annex 4).

c3. Establishment of new research areas at universities (project nos. 2007/172, 2007/173, 2007/175, 2008/044)

New project focal points have been set up at various Hamburg universities, and also master courses and graduate courses for promotion of young talents.

The following activities are examples of this:

- Establishment of a Hamburg graduate school “C1-Chemistry in Resource and Energy Management” at Hamburg University:

  The graduate school “C1-Chemistry in Resource and Energy Management” is funded by the Excellence Initiative of the City of Hamburg. Researchers of the University of Hamburg (UHH), the Hamburg University of Technology (TUHH), the Hamburg University of Applied Sciences (HAW) and the Hamburg Institute of International Economics (HWWI) form the basis of the graduate school. The aim is to set up this graduate school with a programme having a good international reputation, with various researcher groups doing interdisciplinary work on all aspects related to C1 molecules (for example capture, storage and conversion of greenhouse gases such as methane, carbon dioxide and carbon monoxide). This training and the doctoral theses are to advance understanding of the functioning of these processes and make them usable in industry.

- Further development of the interdisciplinary focal subject “Climate friendly energy and environmental technology” and its inclusion in the flagship “Center for Green Technologies” at the Hamburg University of Technology (TUHH):

  The research focal subject “Climate friendly energy and environmental technology”, one of a total of eight research focal subjects of the TUHH, addresses the development of energy supply concepts which are particularly climate friendly and resource efficient, while still ensuring reliable operation. TUHH has carefully nurtured structures and built up strengths which are ideal for this research focal point, with nationally and internationally recognised research institutions particularly for decentral energy supply. This good knowledge base enables the institutes participating in the research focal point to examine effectively the whole chain of energy conversion steps from primary energy all the way to final energy and identify possible improvement potentials. The focal point was evaluated in 2011 by an expert committee comprising internal TUHH experts and external experts from the German Research Community (DFG). They were in favour of continuation. This focal point will be combined with three others to make up one of the two new flagships of the Hamburg University of Technology, under the name “Center for Green Technologies”.

- Establishment of a “Competence Center for Renewable Energies and Energy Efficiency” (CC4E) and establishment of a focal point of research “Energy Independence Technology” at the Hamburg University of Applied Sciences (HAW):

  The “Competence Center for Renewable Energies and Energy Efficiency” (CC4E) combines the wide ranging capabilities and competences of the HAW in renewable energies and energy efficiency in an interdisciplinary organisation – i.e. with cooperation of faculties, including engineering, natural sciences, social sciences and communication skills – for “360° competence” of HAW in renewable energies and energy efficiency. The continuing aim is to establish these competences in the existing Master and Bachelor courses, and to set up new Bachelor and Master courses.

  The research focal point “Energy Independence Technology” (EIT) was set up in 2008, for research and development of environment friendly processes for generating and using energy, thus reducing dependence of the region on energy imports.

Both CC4E and the EIT research focal point have been supported by funds from the Climate Action Plan. That has made it possible to initiate further research projects and to acquire third-party funding from the Federation and the EU.

- Establishment of a research focal point “Resource Efficiency in Architecture and Planning” and a Master Programme with the same title at the HafenCity University Hamburg – University of Architecture and City Development (HCU):

  This research focal point and the Master course focus on in-depth study and specialisation in “Resource Efficiency in Architecture and Planning” (REAP) (Master of Science) and create an excellent basis for qualified engineering activities in sustainable planning and construction. The research and teaching programme addresses this problem field not only in terms of technical issues, but also from the perspective of cultural, social, design and economic issues.

d) Newly adopted projects

This section gives details of projects newly added in 2011. These and other projects described previously are listed in table form in Annex 1.

d1. Energy research group (project no. 2010/066)

Development of the concept for the Renewable Energies Cluster has shown the clear need to concentrate research and development expertise in Hamburg. Intermediary work by the responsible authorities has made it possible to reach a consensus of all the relevant Hamburg universities (Hamburg University, Hamburg University of Technology, HafenCity University, University of Applied Sciences) and work together in the project for better networking at this research location. The Hamburg Senate explicitly supports this project.

d2. Battery testing laboratory (University of Applied Sciences) (project no. 2011/032)

This project comprises establishment and equipment of a battery testing laboratory for vehicle batteries and storage/buffer batteries in smart grids.

Research and teaching at this laboratory is conducted on the key technology “new batteries”. The main focus of this research is engineering support for accelerated application of these technologies in the following fields:

1. Electric vehicles, especially in commercial transport and logistics;
2. Energy grids with a high proportion of renewable energy sources, using local buffer storage to handle feed-in with substantial fluctuation.

These fields are the key issues in energy efficiency and climate change mitigation policy. An important subject of the planned work is to ensure the dependability, operating reliability, cost-effectiveness and development of optimised battery management and battery monitoring

sensors. The work in the planned laboratory comprises tests, experiments and trial series with various battery types and technologies.

The planned battery testing laboratory of HAW is to support various research and development projects as a technical platform and infrastructure.

3. National and international cooperation

a) Goal

Hamburg uses its networking activities at regional, Federal, European and international levels to present itself a climate protection centre, and at the same time to gain benefits from the exchange of experience and knowledge for further development of its own Climate Action Plan. Hamburg wishes in future to work for climate action in its bilateral cooperation with twin cities, to address adaptation to climate change, and to conduct joint projects.

b) Focal points of action

Hamburg successfully pursued its goals in national and international cooperation in climate and energy projects in 2011. The key elements in this development were the nationally and internationally respected Hamburg Climate Action Plan, and Hamburg's active engagement in international, national and regional networks.

Publication of the English version of the Hamburg Climate Action Plan 2010/2011 led to numerous invitations to European specialist conferences, which were taken up by the Coordination Centre for Climate Issues and the responsible ministry as far as possible.

At regional level, project work was continued intensively in the Climate Action Working Group in the metropolitan region of Hamburg, coordinated by the Coordination Centre for Climate Issues. At international level, Hamburg was particularly active in the networks Covenant of Mayors and METREX. In parallel to this, Hamburg pursued activities as the European Green Capital 2011.

c) Exemplary activities

Outstanding activities in 2011 were the preparation of a Sustainable Energy Action Plan (SEAP) in the framework of the Covenant of Mayors process, continuation of the project EUCO2 80/50, and specific measures for successful conduct of the programme for the European Green Capital 2011.

c1. SEAP for the Covenant of Mayors (project no. 2007/106)

By joining the Covenant of Mayors, Hamburg undertook to submit a Sustainable Energy Action Plan (SEAP). The European Commission already indicated in advance that it would recognise the existing updated Climate Action Plan of the Coordination Centre for Climate Issues as the basis of a SEAP. The updated Hamburg SEAP was formally submitted on 31 March 2011.

c2. Scenario workshops of project EUCO2 80/50 (project no. 2007/203)

The European project EUCO2 80/50 is coordinated for the Metropolitan Region of Hamburg by the Coordination Centre for Climate Issues. The participating regions wish to develop strategies for 80% reduction of regional carbon emissions by 2050.

Carbon inventories were prepared in accordance with UN specifications in 15 European cities in 2009. After General Electric became the official sponsor of the project in December 2009, scenario workshops were conducted in all the partner regions in 2010. Leading representatives of business, government, administration, universities and non-governmental organisations (NGOs) were able to enter joint assumptions in the programme, and they could see immediately the impact on carbon emissions. Another 20 scenario workshops were conducted in the Metropolitan Region in the second half of 2010 and in 2011.

A 40-page summary of the results of all 50 European scenario workshops was published in August 2011 and can be downloaded from www.euco2.eu. The complete brochure is available there, as presented at the Hamburg METREX Conference in October 2011.

EUCO2 80/50 presents clear key results for achievements of the 80% goal for European average levels. About 25% of the emissions can be saved by making the European power network 100% carbon-free by 2050. The private households and the service sector can contribute a further 25% by energy efficiency in buildings, industry can contribute 10% by increasing energy efficiency, and transport the other 20% by a change to electric and hydrogen powered vehicles.

The results of EUCO2 80/50 will be included in discussion for formulation of the Climate Action Master Plan.

c3. European Green Capital 2011 (project no. 2008/013)

As the European Green Capital 2011, Hamburg acted as a Europe-wide platform for the exchange of urban visions. Hamburg devised a modern, interactive exhibition in the “Train of Ideas”, to show people in an exciting and informative way what can be done to make our cities liveable and sustainable in the future. The exhibition in the “Train of Ideas” took up the issues of urban development and housing, mobility, energy and climate action, nature and urban green spaces, resource conservation and industry, and consumption; it made the problems and opportunities comprehensible and exciting for a wide ranging international target group. Other cities took the opportunity to present their innovative environment projects in this exhibition, too. 17 cities, including Warsaw, Malmö, Copenhagen, Brussels, Vienna, Barcelona and Marseille got on board the “Train of Ideas”. A number of events were held to analyse the important issues on the way to the city of the future.

Green Capital Dialogues showed by way of example how the new city is being created in Hamburg. The events worked on selected, key aspects of comprehensive change. The participants were the interested public, specialists, and stakeholders from business and administration – all who wished to take part in this Hamburg Future Debate. Best-practice examples from other European cities were also presented and discussed. A three-day Youth Environment Summit brought together 400 young people in Hamburg's Stadtpark, to discuss environmental issues, and to formulate visions and wishes for the city of the future. Numerous events such as the International Environmental Law Conference, the ICLEI Annual Conference (International Council for Local Environmental Initiatives) in Brussels, the Hamburg Climate Week, the METREX Conference, the Intelligent Cities Expo and the closing conference of the European Green Capital "Environment and the Future" in cooperation with the weekly newspaper DIE ZEIT took up energy and climate protection subjects. Encouraged by the guidelines for "Events – making them green", many of the players organised their events to be environment- and climate-friendly. An extensive overview of the climate events is given in the programme brochure for the Green Capital at http://umwelthauptstadt.hamburg.de and http://hamburggreencapital.eu. That gives an overview of the environmental tours, where the Green Capital partners showed their commitment to climate action. The tours gave insights into environmental protection and climate action in Hamburg. There was a central pavilion giving information on additional projects in Hamburg, and opportunities to act for climate protection, both in the permanent exhibition and in the changing special shows. Information was also provided at ten Infopoints in Hamburg and the Metropolitan Region.

c4. INTERREG Project "Co_2ol Bricks" (project no. 2008/113)

The proposal by the Hamburg Heritage Preservation Department for a transnational INTERREG project "Co_2ol Bricks – Climate Change, Cultural Heritage & Energy Efficient Monuments" in the Baltic Sea region was approved by the Monitoring Committee on 16 September 2010. With a total of 17 national and international project partners from practically all the Baltic Sea states and Belarus, the Heritage Preservation Department is now preparing for the start of this three-year project as lead partner.

"Co_2ol Bricks" aims to harmonise the different requirements for climate action and protection for heritage buildings. The goal is to improve the energy performance of heritage buildings, without losing their identity. The project is to identify conflicts and analyse solutions at the technical, administrative and political level, and in the training for contractors. It is to work together with the partners from the Baltic Sea region, who are faced with comparable challenges, and provide exchange of experience and also develop cross-border concepts and strategies, and implement and evaluate pilot projects. It also aims to develop cross-border training modules. The results for heritage buildings can also be transferred to parts of the city which are characterised by red-brick clinker buildings. The project was launched in accordance with plan in 2011, with a large number of meetings and with the development of position papers, and runs until the end of 2013.

D. Budget impacts

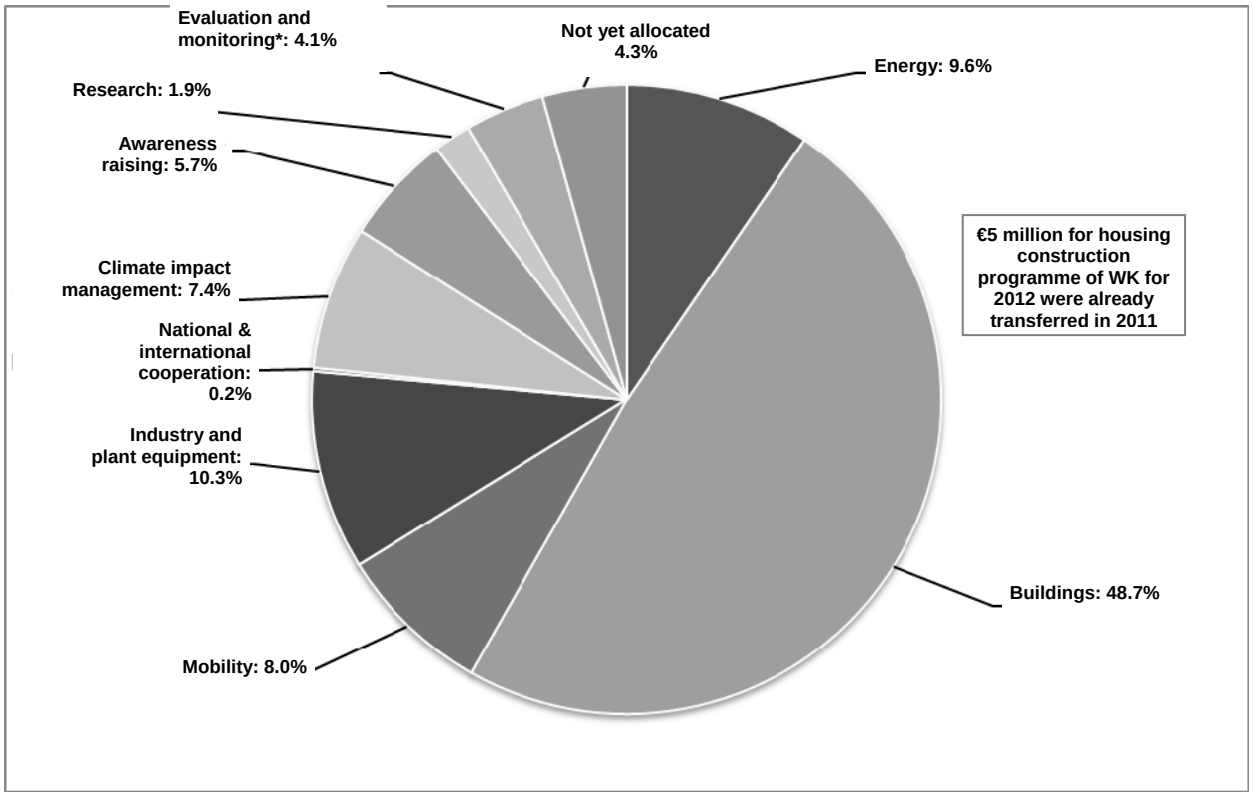
I. Report on fund use and funding efficiency in 2011

In its 2010/2011 budget, the Hamburg Parliament approved total fund allocation of EUR 23.49 million and a commitment appropriation for EUR 12 million from titles 6800.971.19 (consumption title) and 6800.893.19 (investment title) “Hamburg Climate Action Plan 2007-2012” for implementation of the measures in 2011. In 2011 there were also remaining amounts of about EUR 9.97 million still available from the 2010 allocation. In addition, in the course of 2011 there were returns of funds transferred in 2010 and 2011 amounting to about EUR 410,000. That meant that in total there were about EUR 33.9 million in 2011 for funding of the measures of the Hamburg Climate Action Plan in titles 6800.971.19 and 6800.893.19.

The present Communication of the Senate to Parliament documents the use of funds for 2011. There are differences between the planning forecast of fund allocation for 2011 in doc. 19/8311 (“Budget 2011”) and the fund allocation actually realised in 2011 by budget transfer to the specific titles (“Actual 2011”), due to transfers between individual measures, due to project-specific developments (obstacles and delays in some projects, faster readiness for planning and implementation than expected for other measures). There were also a number of new measures with a high level of political urgency funded in the current budget year, in some cases leading to significant shifts compared with the original planning (details see below).

The main areas of expenditures in 2011 were characterised by greater focus on projects with direct CO_2 savings.

Fig. 2: Fund allocation 2011



	Energy	Buildings	Mobility	Industry & plant tech-nology	National & international cooperation	Climate impact management	Awareness raising	Research	Evaluation and monitoring*	Not yet allocated	Total**
%	9.6%	48.7%	8.0%	10.3%	0.2%	7.4%	5.7%	1.9%	4.1%	4.3%	100.0%
EUR	3,239,180	16,485,282	2,696,973	3,472,365	65,000	2,495,000	1,921,950	650,000	1,385,000	1,462,874	33,873,623

* Funds include about EUR 1.1 million for workplaces funded by the Climate Action Plan

** EUR 23,490,000 funds 2011 plus EUR 9,969,843 remaining from 2010 plus EUR 413,780 returns

The actual distribution of funds in 2011 versus forecast distribution of funds for 2011 was as follows:

Allocation was shifted between sectors, due to new projects which received funding from the Climate Action Plan additionally to or instead of the projects set out in doc. 19/8311.

This is particularly significant in the Climate Impact Management and Building sectors. Originally, 1.9% of the funds (EUR 445,000) were intended for Climate Impact Management, but in fact 7.4% of funds (EUR 2,495,000) were allocated to this area. This shift is due to adoption of the project “My tree – my city” for planting of street trees as a project within the “Hamburg – European Green Capital 2011”, providing funds of EUR 2.3 million. The Building sector was originally intended to receive EUR 7.6 million in 2011 (32.2%). Additional provision of EUR 5 million cash allocation for the housing subsidy programme of WK led to allocation of a total of EUR 8 million from Climate Action funds in 2011. Thus total funding in the building sector was about EUR 16.5 million (48.7% of all funds).

By the end of 2011, about EUR 32.4 million has been implemented of the total funding available, that is approx. EUR 33.9 million (2011 funds EUR 23.49 million + transfer of remaining funds from 2010 approx. EUR 9.97 million + returns to titles of the Climate Action Plan approx. EUR 410,000).

It is likely that about EUR 1.5 million will no longer be able to be used in 2011. This amount is then available for the coming budgetary year, subject to decision on transfer of the remaining amounts.

The details are shown in Annex 2.

II. Impact on budget year 2012

1. Funding volumes

The implementation of measures in many areas is effected within the framework of the budgetary assessments set or with third-party funding. The present Communication of the Senate to Hamburg Parliament specifies the allocations for the two titles of the “Climate Action Plan Hamburg 2007-2012” – consumption title 6800.971.19 and investment title 6800.893.19 – for 2012. The following allocation is applicable:

Title	**Description**		**Estimate 2012**
			-EUR thousands-
6800.971.19	Hamburger Climate Action Plan	KM VE	7,000 4,000
6800.893.19	Hamburger Climate Action Plan -Investment expenditure-	KM VE	13,000 8,000
Total		**KM** **VE**	**20,000** **12,000**

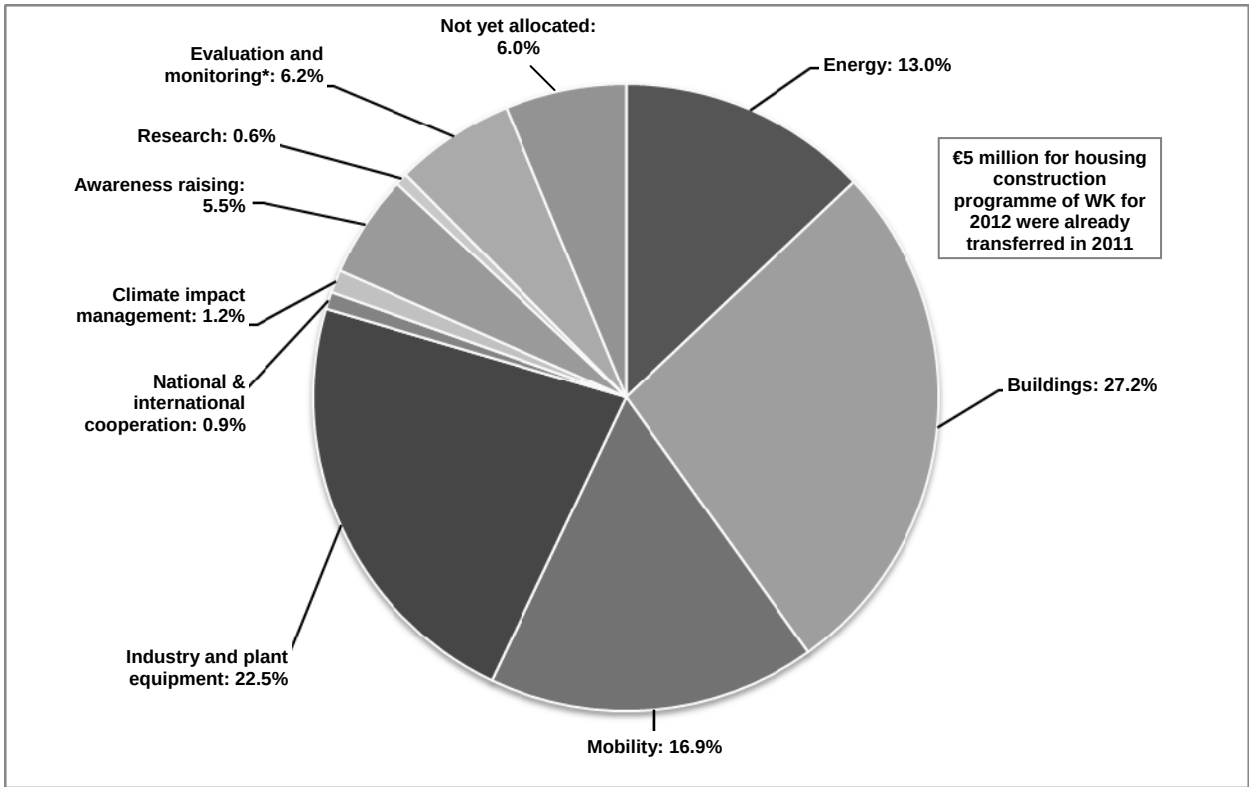
KM = fund allocation
VE = commitment

2. Intended funding allocation in 2012

Focal areas of expenditures have been set for 2012, in accordance with setting of the main strategic areas of the Hamburg Climate Action Plan for the coming years. This strategic approach puts the focus on direct carbon reducing measures and projects, and support for the subsidy programmes For details of the focal points of action, see the indications for the individual sectors

For project related details, see Annex 2 to this Communication.

Fig. 3: Forecast fund allocation 2012 from the Hamburg Climate Action Plan



	Energy	Buildings	Mobility	Industry & plant tech-nology	National & international cooperation	Climate impact management	Aware-ness raising	Research	Evaluation and monitoring*	Not yet allocated	Total
%	13.0%	27.2%	16.9%	22.5%	0.9%	1.2%	5.3%	0.6%	6.2%	6.2%	100.0%
EUR	2,590,000	5,434,000	3,386,598	4,502,365	176,703	235,000	1,064,948	127,000	1,235,000	1,248,386	20,000,000

* Funds include EUR 1.1 million for workplaces funded by the Climate Action Plan

3. Funds already approved for 2012

The cash funds amounting to EUR 20 million for 2012 are already to a large extent tied by commitment appropriations from the years 2010 and 2011.

In 2011 commitment appropriations were approved for EUR 10.8 million for fund allocation in 2012 and subsequent years; EUR 10.4 million of this is for 2012. Allocation to individual programmes is shown in Annex 3.

In addition to these EUR 10.4 million, a further EUR 1.1 million are appropriated to human resources capacities already approved.

That means about EUR 8.5 million remain for other projects for 2012. Even greater priority was attached to CO_2 reduction measures compared with previous years, as was already the case in 2011.

4. Human resources expenditures

It was possible to implement some of the measures only by employment of additional temporary human resources. They were funded from Climate Action Plan funds. In addition, coordination of plan implementation required material expenditure for control purposes. In the previous years, funding available for human resources was EUR 1.2 million and EUR 1.25 million respectively. This estimate was increased to EUR 1.375 million in 2011 (including computer workplace allowances); about EUR 1.1 million of this amount was used; exact figures will not be available until January 2012 after entry of the actual costs. In 2012 the estimate is reduced to EUR 1.1 million again. This amount is included in the estimated total of EUR 20 million. No new staffing positions are funded from the Climate Action Plan.

The human resources funds correspond to about 5.5% of the total fund expenditure resulting from doc. 19/8311. Funding is effected from title 6800.971.19.

E. Request

The Senate requests the Hamburg Parliament

to take note of the present Communication updating and further developing the Hamburg Climate Action Plan.

F. Annexes

1. Project list in short form
2. List of projects funded
3. List of funds allocated in 2012 on the basis of commitment appropriations
4. Interim report on carbon monitoring for Climate Action Plan

Annex 1 – Project list

Climate Action in Hamburg

Update 2011/2012

Project List
for Hamburg Climate Action Plan 2007-2012

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
ENERGY SECTOR					
Energy	2007/019	**Renewable energy systems (esp. photovoltaic) on schools - "Climate action at school"**	In progress	KM: 100.000	
Energy	2007/039	**District heating from Köhlbrandhöft sewage treatment plant to Container Terminal Tollerort**	Completed		
Energy	2007/084	**Renewable energies and fuel cell technology cluster**	In progress		
Energy	2007/086	**Large-area thin-film solar arrays on industry hall roofs (subsidy programme)**	Completed		
Energy	2007/088	**IBA: Renewable energies in the framework of IBA - "Wilhelmsburg biogas project"**	Discontinued		
Energy	2007/089	**IBA: Renewable energies in the framework of IBA - "Georgswerder energy hill"**	In progress		
Energy	2007/090	**IBA: Renewable energies in the framework of IBA - "Wilhelmsburg energy bunker"**	In progress	KM: 1.350.000	
Energy	2007/092	**Promotion of use of biofuels**	Transferred to another project (2011/025)	KM: 200.000 VE: 100.000	
Energy	2007/094	**Model trial for wood collection**	In progress		
Energy	2007/097	**Renewable energy supply to island of Neuwerk**	In progress		
Energy	2007/100	**Climate programme "Solar thermal energy and heating"**	Transferred to another project (2011/025)	KM: 500.000	
Energy	2007/117	**Optimisation of waste management in Hamburg with a view to climate action (Recycling initiative)**	In progress		
Energy	2007/145	**Designation of additional sites for wind power systems in port area**	Completed		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Energy	2007/160	**Energy savings in buildings with high peak load**	In progress		KM: 1.000.000 VE: 1.000.000
Energy	2007/161	**Solar water heating**	Completed		
Energy	2007/205	**Energy generating from waste water**	In progress		
Energy	2008/028	**Examination: changeover to green electricity on expiry of contracts, instead of separate tendering of RECS certificates**	Completed		
Energy	2008/030	**Examination: costs and consequences of public ownership of energy networks**	In progress		
Energy	2008/038	**Examination: provision of municipal sites for CHP**	In progress		
Energy	2008/040	**Identication of suitable sites for local power stations**	In preparation		
Energy	2008/041	**Enabling repowering of existing wind turbines**	In progress		
Energy	2008/042	**Identification and designation of sites for new wind turbines**	In progress		
Energy	2008/053	**IBA: Energy Association New Centre Wilhelmsburg**	In progress	KM: 200.000 VE: 335.000	KM: 335.000
Energy	2008/054	**IBA: Climate action concept Renewable Wilhelmsburg**	In progress	KM: 285.000 VE: 255.000	KM: 255.000
Energy	2008/061	**IBA: Model project Deep Geothermal Energy**	In progress	KM: 200.000	

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Energy	2008/093	**Establishment of an "Energy research group"**	Discontinued		
Energy	2008/101	**Sustainable energy supply concepts for large housing estates**	In preparation		
Energy	2008/102	**Subsidy programme: measures to increase share of renewables in Hamburg energy mix**	In progress		
Energy	2008/103	**Competition: energy efficient city**	In progress		
Energy	2009/016	**Grants for micro-CHPs**	In progress		
Energy	2009/020	**Study on development of heat supply in North Germany**	In progress		
Energy	2009/023	**Feasibility studies: geothermal boreholes**	Completed		
Energy	2009/024	**Expansion of a photovoltaic plant on works and storage hall of Rahlau depot**	In preparation		
Energy	2009/030	**Former Röttiger barracks, new housing in Neugraben-Fischbek**	In preparation		
Energy	2009/038	**Photovoltaic array for Sporthalle Hamburg**	In preparation		
Energy	2009/041	**Photovoltaic array for District Council Office Hamburg-Nord**	In preparation		
Energy	2009/074	**Wind turbine on Dradenau sewage treatment plant**	Completed		
Energy	2009/075	**Sewage gas treatment and feed-in at Köhlbrandhöft sewage treatment plant**	Completed		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Energy	2009/078	**Photovoltaic systems of Hamburg Waste (SRH)**	Completed		
Energy	2010/037	**IBA: New Hamburg Terraces Heating network**	Discontinued		
Energy	2010/038	**Implementation of projects in the framework of the Renewable Energies cluster Hamburg**	In preparation		
Energy	2010/039	**Energy-efficient lighting concept for subways and tunnels of 60s and 70s in central locations in Harburg**	In preparation	KM: 20.000	
Energy	2010/045	**Smart Power- intelligent load management project (Demand Side Management) and power-controlled micro CHPs in connection with heat storage in city infrastructure**	In progress	KM: 264.180	
Energy	2010/054	**Building and operation of small wind turbines at Georgswerder site with scientific support**	In progress		
Energy	2010/060	**Solar Potential Analysis II Expansion to the whole of Hamburg**	In progress	KM: 120.000	
Energy	2010/069	**Heat supply to St.Katharine's Church (North Elbe Church)**	Discontinued		
Energy	2010/070	**Load management in public buildings with smart meters**	In preparation		KM: 300.000
Energy	2011/003	**Development of action recommendations for "Climate action in Hamburg retail trade"**	Discontinued		
Energy	2011/025	**Grant programme "Renewable heating"**	In progress		KM: 700.000
Energy	2011/034	**Building efficiency schools (Hamburg University of Applied Sciences - HAW)**	Discontinued		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
TOTAL ENERGY				**KM: 3.239.180** **VE: 690.000**	**KM: 2.590.000** **VE: 1.000.000**

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
BUILDING SECTOR					
Building	2007/001	**Urban building projects (housing, industrial, district centres) in the districts - Bürgerhaus Bornheide**	In preparation	VE: 900.000	KM: 900.000
Building	2007/002	**Urban building projects (housing, industrial, district centres) in the districts - Mittlerer Landweg**	In preparation		
Building	2007/005	**Städtebauliche Vorhaben (Wohnungsbau, Gewerbe, Stadtteilzentren) im Bezirk Mitte - Pestalozzi-Quartier in St. Pauli**	In progress		
Building	2007/008	**Urban building projects (housing, industrial, district centres) in the districts - Jenfelder Au (formerly Lettow-Vorbeck Barracks) in Jenfeld**	In preparation		
Building	2007/018	**Project "No school over 200"**	In progress		
Building	2007/020	**Hamburg South model: construction and management of schools in "Public Public Partnership projects"**	In progress		
Building	2007/021	**IBA - Educational Centre "Gateway to the World"**	In progress	KM: 4.238.932	
Building	2007/023	**Exemplary project "School modernisation to zero-emissions standard"**	In progress		
Building	2007/027	**Energy savings potentials in historic buildings**	In progress		
Building	2007/028	**Energy-efficiency modernisation of public buildings - building envelope modernisation (police and fire stations)**	In progress	KM: 1.209.600	
Building	2007/041	**Inter-district definition of specifications in zoning plans**	Completed		
Building	2007/095	**Grant programme: Thermal insulation in existing buildings**	In progress	KM: 1.000.000 VE: 1.000.000	KM: 1.500.000 VE: 1.500.000

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Building	2007/140	**Grant programme: New housing programme of Hamburgische Wohnungsbaukreditanstalt (WK)**	In progress	KM: 2.000.000	
Building	2007/142	**Grant programme: Energy-efficiency modernisation of rented housing of Hamburgische Wohnungsbaukreditanstalt (WK)**	In progress	KM: 6.000.000	
Building	2007/159	**Energy-efficiency modernisation of public buildings - modernisation of building equipment**	In progress		VE: 1.300.000
Building	2007/183	**Energy eficiency in new building of HafenCity University Hamburg**	In progress		
Building	2007/187	**Energy-efficiency optimisation of terminal building of Cruise Center II**	Completed		
Building	2007/188	**Urban building projects (housing, industry, district centres) in the districts - Südlicher Brookdeich**	In progress		
Building	2007/189	**Further development and extension of certification procedures for sale of municipal land**	In progress		
Building	2007/190	**Urban building projects (housing, industrial, district centres) in Central District - administrative building of Ministry of Urban Development & Environment**	In progress		
Building	2007/197	**Funding of installation of modern electricity and gas meters (Smart Metering)**	Discontinued		
Building	2007/210	**IBA - urban building projects (housing, industrial, district centres) in the districts - climate houses Haulander Weg**	Discontinued		
Building	2007/211	**IBA - urban building projects (housing, industrial, district centres) in the districts - Open House - Vogelhüttendeich**	In progress		
Building	2007/213	**New building of swimming baths / open-air pool Neuenfelder Strasse**	In progress		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Building	2008/001	**Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Öjendorfer Weg 4**	In preparation		
Building	2008/002	**Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Eddelbüttelstrasse 9**	In preparation		
Building	2008/003	**Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Eckermannstrasse 3**	In preparation		
Building	2008/004	**Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Sanitasstrasse 11**	In preparation		
Building	2008/005	**Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Paul-Roosen-Strasse 24**	In preparation		
Building	2008/006	**Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Rotenhäuser Damm 90**	In preparation		
Building	2008/007	**Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Wohlers Allee 40**	In preparation		
Building	2008/008	**Investment agreement for energy-efficiency modernisation of social infrastructure - school Sterntaler Strasse 42**	In preparation		
Building	2008/009	**Practical example Lokstedt Lohkoppelweg**	Completed		
Building	2008/012	**Energy optimisation of Hamburg House in Eimsbüttel**	Completed		
Building	2008/025	**Climate action and climate adaptation in urban development - Climate model districts**	In progress	KM: 200.000	KM: 200.000 VE: 150.000
Building	2008/033	**Deployment of energy advisers for public buildings – fifty/fifty-Administration**	In progress		
Building	2008/055	**IBA - Schlossinsel/Harburg Binnenhafen - sub-project Veritaskai**	Discontinued		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011 KM = fund allocation VE = commitment	Funds 2012
Building	2008/057	**Veringhöfe heritage buildings spaces for art**	In preparation		
Building	2008/059	**IBA - experimental housing in Island Park Wilhelmsburg**	In progress	KM: 189.000 VE: 690.000	KM: 690.000 VE: 460.000
Building	2008/060	**Urban building projects (housing, industrial, district centres) in Districts of Bergedorf - South Brookdeich**	In preparation		
Building	2008/069	**Introduction of energy component in rent scale**	In progress		
Building	2008/114	**Town Hall Forum Harburg**	In progress		
Building	2008/115	**Urban design and climate action; development of a criteria, district and building typology catalogue**	In progress		
Building	2009/002	**Investment agreement for energy-efficiency modernisation of social infrastructure - Öjendorf Comprehensive School, Öjendorfer Höhe 12**	In preparation		
Building	2009/003	**Investment agreement for energy-efficiency modernisation of social infrastructure - Horn Comprehensive School, Snitgerreihe 2**	In preparation		
Building	2009/004	**Investment agreement for energy-efficiency modernisation of social infrastructure - Changing rooms at public sportsground Öjendorfer Weg**	In preparation		
Building	2009/005	**Investment agreement for energy-efficiency modernisation of social infrastructure - Changing rooms at public sportsground von-Elm-Weg**	In preparation		
Building	2009/006	**Investment agreement for energy-efficiency modernisation of social infrastructure - Changing rooms at public sportsground Grunewaldstrasse 74**	In preparation		
Building	2009/008	**IBA - Neue Hamburger Terrassen, Baufeld 1**	In progress		
Building	2009/017	**Economic stimulus programme of Federation: Hamburger theatres; here: Deutsches Schauspielhaus**	In progress		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Building	2009/018	**Economic stimulus programme of Federation: Hamburger theatres; here: Thalia Theater**	In progress		
Building	2009/026	**Energy modernisation and refurbishment projects in Mümmelmannsberg**	In progress		
Building	2009/034	**Urban building projects (housing, industrial, district centres) in Bergedorf District - South Centre: Haus der Jugend - Oberer Landweg 2**	In preparation		
Building	2009/035	**District depot - Marmstorfer Weg 31**	In preparation		
Building	2009/042	**Energy performance certificates for all own smaller facilities of District Council Office Hamburg-Nord (Youth Centres)**	In preparation		
Building	2009/046	**Former old people's and nursing home Finkenau / Oberaltenallee – carbon-neutral energy-efficiency district**	In progress		
Building	2009/047	**Am Weissenberg – establishment of a carbon-optimised housing area on about 12.5 ha between Sengelmannstrasse, Maienweg, Suhrenkamp and JVA Fuhlsbüttel**	In preparation		
Building	2009/048	**Dieselstrasse / Schlicksweg – development of a carbon-optimised housing area on land of former Model Ship Testing Facility**	In preparation		
Building	2009/051	**Energy-efficiency recording and optimisation of public authority buildings (Eimsbüttel district council)**	In progress		
Building	2009/057	**Investment agreement for energy-efficiency modernisation of social infrastructure - school in Potsdamer Strasse, specialist class tract**	In preparation		
Building	2009/058	**Investment agreement for energy-efficiency modernisation of social infrastructure - school Sander Strasse, sports hall**	In preparation		
Building	2009/059	**Investment agreement for energy-efficiency modernisation of social infrastructure - school Altonaer Strasse, sports hall**	In preparation		
Building	2009/068	**Pilot project new building of childcare centre in Rissen to nearly zero-energy standard (North Elbe Church - NEK)**	Completed		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011 (KM = fund allocation, VE = commitment)	Funds 2012
Building	2009/069	**IBA - Harburger Schlossinsel - housing on Schlossinsel (building phase 2)**	In preparation	KM: 320.000	
Building	2009/072	**Complete examination of buildings**	Completed	KM: 8.300	
Building	2009/076	**Climate action and building: energy performance standards for public buildings**	Completed		
Building	2010/011	**Measurements for examination of building project Schlettstadter Strasse**	In progress	KM: 19.450	
Building	2010/017	**Summer thermal protection in Energy Performance Ordinance (EnEV)**	In preparation		
Building	2010/031	**Pilot projects for funding energy-efficient non-residential building**	In progress	KM: 500.000	KM: 1.500.000 VE: 1.500.000
Building	2010/047	**Ecological housing estate Hausbruch 35**	In preparation		
Building	2010/053	**Energy-efficiency in extension at Finkenau Art and Media Campus**	In preparation		
Building	2010/061	**Grant programme: urban design and climate action (Brick building fund) and implementation of demonstration projects**	In preparation	KM: 400.000 VE: 400.000	KM: 400.000 VE: 400.000
Building	2011/002	**Examination mandate: co-financing of energy-efficiency modernisation of Hamburg police and fire stations in keeping with modernisation concept of Police & Fire Service Real Estate Management Company (IMPF) via HGV**	Completed		
Building	2011/006	**Presentation of condition of Hamburg regulations on climate change mitigation versus energy standards for housing construction and modernisation in EU and Federal regulations**	In progress		
Building	2011/009	**Community Center Hohenhorst**	In progress	KM: 200.000	
Building	2011/010	**Niels-Stensen-Gymnasium (grammar school) nearly zero-energy standard**	In progress	KM: 200.000	

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Building	2011/018	**HPA office and workshop building Spreehafen in Plus energy standard**	In preparation		KM: 150.000
Building	2011/021	**Rieckhof Cultural Centre in Harburg Energy saving by roof insulation and replacement of windows and doors**	In preparation		KM: 94.000
Building	2011/033	**Energy-efficiency modernisation of student accommodation Grandweg 16**	Discontinued		
TOTAL BUILDINGS				**KM: 16.485.282** **VE: 2.990.000**	**KM: 5.434.000** **VE: 5.310.000**

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
MOBILITY SECTOR					
Mobility	2007/119	**Development of diesel hybrid buses of HVV or comparable systems ready for series production (National Innovation Programme Hydrogen and Fuel Cell Technology - NIP)**	In progress		
Mobility	2007/124	**Increasing appeal of walking to encourage pedestrians**	In progress		
Mobility	2007/126	**Extension of Park&Ride facilities**	In progress		
Mobility	2007/127	**Increase in Bike&Ride facilities**	In progress	KM: 246.875 VE: 52.000	KM: 52.000
Mobility	2007/128	**Traffic management**	In progress		
Mobility	2007/129	**Extension of traffic-related network control**	In progress		
Mobility	2007/130	**Extension of flow control on motorways in Hamburg**	In progress		
Mobility	2007/131	**CarSharing**	In progress		
Mobility	2007/132	**Car-free Sundays**	Completed		
Mobility	2007/133	**Commuter Portal**	In progress		
Mobility	2007/134	**Creation of new roundabouts**	In progress		
Mobility	2007/135	**Energy optimisation of traffic lights**	In progress		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Mobility	2007/136	**Optimisation of street lighting and replacement of illuminated road signs**	In progress		
Mobility	2007/137	**Reinforcement of inland navigation**	In progress		
Mobility	2007/153	**Examination of reduction in pollutant emissions of ships in port - climate-neutral energy supply**	Completed		
Mobility	2007/164	**Climate action at Hamburg Airport**	In progress		
Mobility	2007/165	**Shifting transport from road to inland waterways and feeder vessels**	In progress		
Mobility	2007/200	**Carbon emissions offset for official travel (air travel)**	In progress		
Mobility	2008/021	**Development of shore power concept (examination: development of common environmental standards in port)**	In preparation		
Mobility	2008/022	**Introduction of budget-neutral bonus for climate-friendly ships**	Completed		
Mobility	2008/052	**Development of programmes for innovative propulsion technologies in motor vehicle transport (e.g. electric vehicles)**	In progress		
Mobility	2008/083	**Implementation of cycling strategy of Cycle Forum**	In progress	KM: 2.000.000 VE: 2.000.000	KM: 2.000.000
Mobility	2008/084	**Improvement of cycle carrying facilities in public transport (HVV)**	Completed		

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Mobility	2009/033	**Electric vehicles in the port**	Discontinued		
Mobility	2009/061	**P&R facility at Ochsenzoll U-Bahn station**	In preparation		
Mobility	2009/071	**Eco-mobile from the fleet "HH = more" ("Hamburg ModelRegion for Electro-Mobility")**	Discontinued		
Mobility	2009/084	**Carbon emissions offset for official travel (rail travel)**	Discontinued		
Mobility	2010/003	**Study on Wind-Hydrogen (Nationales National Innovation Programme Hydrogen and Fuel Cell Technology - NIP)**	Completed		
Mobility	2010/012	**Uniform regulations in Road Traffic Act for charging stations for electric vehicles**	In progress		
Mobility	2010/027	**Continued operation of the fuel cell powered Alster boat "Alsterwasser" of ATG**	In progress	KM: 65.000 VE: 50.000	KM: 50.000
Mobility	2010/030	**Eco-taxis for Hamburg: award of an environment or climate label**	In progress		
Mobility	2010/033	**Coordinated green traffic lights for cyclists**	Discontinued		
Mobility	2010/034	**Implementation of existing feasibility study for improvement of cycle routing in selected streets**	In progress	KM: 310.000 VE: 500.000	KM: 500.000
Mobility	2010/035	**100 cycling streets programme**	Discontinued		
Mobility	2010/042	**Cycle station Harburg Railway Station (zero-energy building)**	In preparation		KM: 400.000

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Mobility	2010/052	**Practice Forum on Green Shipping - possibilities for implementation of energy-efficient, environment friendly measures in shipping**	Completed		
Mobility	2010/057	**Promotion of cycling by creation of a model district**	In preparation		
Mobility	2010/062	**Antares DLR H2 (motor glider with fuel cell drive)**	In progress		
Mobility	2010/063	**Cabin technology and multifunctional fuel cell**	In progress		
Mobility	2010/064	**"Airport 2030"**	In progress		
Mobility	2010/065	**Electric vehicles - pilot project introduction of E-Smart ED**	In progress	KM: 75.098 VE: 190.723	KM: 75.098 VE: 115.626
Mobility	2010/073	**Guidelines for purchasing of low-emission vehicles for public authorities vehicle fleet**	Completed		
Mobility	2011/001	**Change in modal split in public transport and cycling**	In progress		
Mobility	2011/015	**Parking space management and monitoring**	In preparation		
Mobility	2011/024	**Expansion of trials of battery-powered elecric vehicles**	In preparation		KM: 160.000 VE: 160.000
Mobility	2011/029	**Increasing appeal for pedestrians, creation of attractive pedestrian link in Langenfort park**	In progress	VE: 149.500	KM: 149.500
TOTAL MOBILITY				**KM: 2.696.973** **VE: 2.942.223**	**KM: 3.386.598** **VE: 275.626**

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
INDUSTRY AND PLANT TECHNOLOGY SECTOR					
Industry and Plant	2007/037	**Examination of adaptation of charge scale for withdrawal of cooling water**	In preparation		
Industry and Plant	2007/038	**Waste water disposal process "Hamburg Water Cycle"**	In preparation		
Industry and Plant	2007/048	**National Innovation Programme hydrogen and fuel cell technology (NIP)**	In progress		
Industry and Plant	2007/051	**Implementation of voluntary self-commitment of industrial companies (LOI)**	In progress		
Industry and Plant	2007/052	**Integration of climate action in retailing concepts**	Transferred to another project (2011/003)		
Industry and Plant	2007/064	**Extension of Environment Partnership to 2013**	In progress		
Industry and Plant	2007/068	**Increase range of climate action programmes by active inclusion of companies previously not involved, via business organisations: (HK Energy Guides / ZEWU-mobilplus)**	In progress	KM: 222.365 VE: 222.365	KM: 222.365 VE: 460.000
Industry and Plant	2007/069	**"Companies for resource conservation" - Energy and thermal concepts for Hamburg industry**	In progress		
Industry and Plant	2007/070	**Extension of programme "Companies for resource conservation"**	In progress	KM: 2.000.000 VE: 500.000	KM: 1.500.000 VE: 1.500.000
Industry and Plant	2007/071	**"Companies for resource conservation" - Climate action loan of Hamburgische Wohnungsbaukreditanstalt**	In progress		
Industry and Plant	2007/072	**Grant programme: "Companies for resource conservation" - HeatCheck**	In progress		
Industry and Plant	2007/073	**Grant programme: "Companies for resource conservation" - LightCheck**	In progress		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Industry and Plant	2007/074	**Grant programme: "Companies for resource conservation" - Efficiency initiative**	In progress		
Industry and Plant	2007/075	**Grant programme: "Companies for resource conservation" - DriveCheck**	In progress		
Industry and Plant	2007/076	**Grant programme: "Companies for resource conservation" - New technology-related programme focal points; High-efficiency lighting for industry and households**	In progress		
Industry and Plant	2007/077	**Grant programme: "Companies for resource conservation" - Network for cooling efficiency Hamburg**	In progress		
Industry and Plant	2007/147	**Investment promotion for energy savings in horticulture and agriculture**	In progress		
Industry and Plant	2007/150	**Hamburg Environmental Award for Logistics**	In progress		
Industry and Plant	2007/162	**Energy saving contracting**	In preparation		
Industry and Plant	2007/195	**Energy optimisation for Köhlbrandhöft/Dradenau sewage treatment plant group**	Completed		
Industry and Plant	2007/196	**Conversion of aeration system at Dradenau sewage treatment plant**	Completed		
Industry and Plant	2008/031	**Grant programme: KWK Initiative - Implementation of a programme to increase CHP (combined heat and power) with Hamburg companies in production, services and housing sectors**	In progress	KM: 500.000	KM: 500.000 VE: 500.000
Industry and Plant	2008/035	**Certification of public companies with the goal of carbon reduction in public buildings**	Discontinued		
Industry and Plant	2008/062	**Companies for resource conservation - reduction of energy consumption for information and communication technologies**	In progress		
Industry and Plant	2008/073	**Subsidy programme for climate action in product development for technological innovations in energy generating and conversion**	In progress	KM: 750.000 VE: 1.000.000	KM: 1.000.000 VE: 300.000

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Industry and Plant	2008/104	**Systematic recording of energy profile for use of communication and information technology at Hamburg public authority offices**	In progress		
Industry and Plant	2008/106	**Further development of Master Plan for Industry (includes for example competence clusters for Renewable Energies and Fuel Cell Technology)**	In progress		
Industry and Plant	2009/032	**Consolidation measures in HPA computing centre ("Green IT")**	In progress		
Industry and Plant	2009/067	**Further development of "climate action bonus" for public companies for carbon reduction measures in public buildings**	Completed		
Industry and Plant	2009/085	**Fuel cell heating system for Hamburg Waste (HSR) in National Innovation Programme hydrogen and fuel cell technology (NIP)**	Completed		
Industry and Plant	2009/087	**Climate-neutral parcel dispatch by Hamburg administration within Germany**	In progress		
Industry and Plant	2010/019	**Climate action strategies in public companies**	In progress		
Industry and Plant	2010/058	**Replacement of lighting systems in South Hall and North Hall (Deichtorhallen)**	In preparation	VE: 600.000	KM: 300.000 VE: 300.000
Industry and Plant	2011/012	**Compressed-air aeration at Köhlbrandhöft Süd sewage treatment plant**	In preparation		
Industry and Plant	2011/014	**Subsidy programme "Companies for resource conservation" - Heating Network**	In progress	VE: 800.000	KM: 800.000 VE: 800.000
Industry and Plant	2011/020	**Heat supply from CHP waste heat by means of mobile latent heat storage system**	In preparation		KM: 180.000
TOTAL INDUSTRY AND PLANT EQUIPMENT				**KM: 3.472.365** **VE: 3.122.365**	**KM: 4.502.365** **VE: 3.860.000**

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
NATIONAL AND INTERNATIONAL COOPERATION SECTOR					
Nat. and Internat. Cooperation	2007/049	**Development of climate action concept for/with metropolitan region**	In progress		
Nat. and Internat. Cooperation	2007/053	**Energy efficient building in big cities - signing of a Memorandum of Understanding with Chicago**	In progress		
Nat. and Internat. Cooperation	2007/107	**Cooperation with Vienna and Zurich**	In progress		
Nat. and Internat. Cooperation	2007/138	**Membership of European cities network "Polis"**	Completed		
Nat. and Internat. Cooperation	2007/194	**Hamburg participation in EXPO 2010 in Shanghai**	Completed		
Nat. and Internat. Cooperation	2007/198	**Inclusion of companies from climate action and energy sectors in official international travel of Mayor**	Completed		
Nat. and Internat. Cooperation	2007/203	**Lead management of EUCO2 80/50 Interreg IVC project**	In progress	KM: 40.000	
Nat. and Internat. Cooperation	2008/013	**European Green Capital**	In progress		
Nat. and Internat. Cooperation	2008/075	**Introduction of purchasing of public transport organisations together with other European cities**	In preparation		
Nat. and Internat. Cooperation	2008/087	**Membership of ICLEI - Local Governments for Sustainability**	In progress		
Nat. and Internat. Cooperation	2008/088	**Membership of Climate Alliance**	In progress		
Nat. and Internat. Cooperation	2008/089	**Membership of HyRAMP (European Regions and Municipalities Partnership for hydrogen and fuel cells)**	In progress	KM: 5.000	

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Nat. and Internat. Cooperation	2008/090	**Membership of Connected Urban Development Programme (CUD)**	In progress		
Nat. and Internat. Cooperation	2008/113	**Lead parternship in INTERREG Baltic Sea project "Climate Change & Heritage" - CO_2OL Bricks**	In progress		
Nat. and Internat. Cooperation	2010/014	**Specialist events, symposia and working meetings in the framework of the European Green Capital 2011**	In progress		
Nat. and Internat. Cooperation	2010/026	**Translation of Climate Action Plan**	In progress	KM: 20.000	KM: 20.000
Nat. and Internat. Cooperation	2010/068	**Conference "Future of Cities"**	In preparation	VE: 156.703	KM: 156.703
TOTAL NATIONAL AND INTERNATIONAL COOPERATION				**KM: 65.000** **VE: 156.703**	**KM: 176.703** **VE: 0**

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
CLIMATE IMPACT MANAGEMENT SECTOR					
Climate Impact Management	2007/043	**Tree planting concept for CO_2 reduction**	Discontinued		
Climate Impact Management	2007/104	**Area-related species register for development of conservation of nature and biodiversity**	Completed		
Climate Impact Management	2007/112	**Flood protection**	In progress		
Climate Impact Management	2007/113	**Implement requirements of Federation for inland flood protection**	In progress		
Climate Impact Management	2007/114	**Surface drainage and rainwater management (RISA)**	In progress		
Climate Impact Management	2007/115	**Adaptions in ecology of waters**	In progress		
Climate Impact Management	2007/151	**Protection and development of soils in their climate function for the urban area**	In progress	KM: 75.000 VE: 75.000	KM: 75.000
Climate Impact Management	2008/046	**Extreme storm floods on open coasts and estuary areas: risk determination and mastery in climate change**	In progress		
Climate Impact Management	2008/080	**Hamburg strategy for adaptation to climate change (overall strategy)**	In progress	KM: 20.000	KM: 30.000 VE: 30.000
Climate Impact Management	2008/091	**Maintenance of permanent green spaces**	Completed		
Climate Impact Management	2008/099	**Feasibility study modelling of urban climate**	In progress	VE: 50.000	KM: 50.000 VE: 50.000

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Climate Impact Management	2008/107	**Further development of ecological tidal Elbe management**	In progress		
Climate Impact Management	2009/007	**Urban climate inventory and assessment for Hamburg landscape programme**	In progress		
Climate Impact Management	2009/065	**Conversion of a retention basin incl. new construction of small basin in district of Eimsbüttel**	Completed		
Climate Impact Management	2010/020	**Low water events**	In progress		
Climate Impact Management	2010/021	**IBA - dike park for Wilhelmsburg - climate impact management in the framework of climate action plan Renewable Wilhelmsburg**	In progress	KM: 70.000	KM: 80.000
Climate Impact Management	2010/032	**Development of climate parameters - basics and target levels for assessment of different green space structures**	In preparation		
Climate Impact Management	2010/040	**Development of overall urban strategies and measures for sustainable securing and development of natural ecology functions as a basis for combating climate change**	In preparation		
Climate Impact Management	2010/048	**Street tree monitoring in climate impact management**	In preparation		
Climate Impact Management	2011/013	**"My Tree - My City" - planning of additional street trees as measure in the framework of "Hamburg - European Green Capital 2011"**	In progress	KM: 2.300.000	
Climate Impact Management	2011/027	**Rainwater management in urban development - best practices and visions for urban development with water**	In progress	KM: 30.000	
TOTAL CLIMATE IMPACT MANAGEMENT				**KM: 2.495.000** **VE: 125.000**	**KM: 235.000** **VE: 80.000**

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
AWARENESS RAISING SECTOR					
Awareness Raising	2007/009	**Climate action in curricula of general and vocational schools**	In progress		
Awareness Raising	2007/010	**Participation in programmes for quality management**	In progress	KM: 10.000	KM: 10.000
Awareness Raising	2007/011	**Central climate action day for schools**	In progress	KM: 8.500 VE: 8.500	KM: 8.500
Awareness Raising	2007/012	**Climate ambassadors: "Schools observe climate"**	In progress	KM: 88.500	
Awareness Raising	2007/013	**Programmes of vocational education and further training**	In progress		
Awareness Raising	2007/014	**Courses on climate action for school classes**	In progress	KM: 15.000 VE: 15.000	KM: 15.000
Awareness Raising	2007/015	**Contractors and energy efficiency – more intensive education and training for Hamburg's skilled trades**	In progress		
Awareness Raising	2007/016	**Training module "Climate action advice for estate agents"**	In progress		
Awareness Raising	2007/017	**Centre for "Forward looking building"**	In progress		
Awareness Raising	2007/025	**Success project fifty/fifty at schools**	In progress		
Awareness Raising	2007/029	**Climate action in the "Hamburg educational recommendations for education and schooling of children at day centres"**	In progress		
Awareness Raising	2007/030	**Specialist school project Climate action for kids**	Completed		

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Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Awareness Raising	2007/045	**Communication concept**	Discontinued		
Awareness Raising	2007/047	**Internet portal on climate change**	In progress		
Awareness Raising	2007/056	**Germanwatch - climate expedition in Hamburg schools**	In progress		
Awareness Raising	2007/057	**UN Decade Education for Sustainable Development 2005 to 2014**	In progress		
Awareness Raising	2007/058	**Climate action as a task for out-of-school environmental education**	In progress	KM: 45.000	
Awareness Raising	2007/059	**Environment themepark Karlshöhe (UPK) – Educational centre for climate action in everyday life**	Completed		
Awareness Raising	2007/060	**Expansion of posts in the framework of the Voluntary Ecological Year**	In progress	KM: 61.000 VE: 3.000	KM: 3.000
Awareness Raising	2007/080	**Energy and climate hotline in cooperation with Hamburg Consumer Centre (telephone first-line advice)**	In progress	KM: 213.300 VE: 213.300	KM: 213.300 VE: 426.600
Awareness Raising	2007/081	**Consulting and training measures - Use of renewable energies in existing buildings and new buildings**	In progress		
Awareness Raising	2007/082	**Training for architects and skilled trades - IMPULS programme**	In progress		
Awareness Raising	2007/083	**ELBCAMPUS – Future circles for skilled trades**	In progress	KM: 201.000	KM: 201.000 VE: 201.000
Awareness Raising	2007/099	**Extension of Hamburg Energy Performance Certificate**	In progress	KM: 100.000 VE: 100.000	KM: 100.000
Awareness Raising	2007/155	**Pilot project "From the region – for the region"**	In progress	KM: 60.000	

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011 (KM = fund allocation, VE = commitment)	Funds 2012
Awareness Raising	2007/156	**Afforestation as CO_2 sink**	In progress		
Awareness Raising	2007/184	**Extend contract award legislation: "Environment friendly purchasing"**	In progress		
Awareness Raising	2007/185	**Efficient use of paper**	In progress		
Awareness Raising	2007/186	**Electricity efficiency in information and communication sector**	In progress		
Awareness Raising	2007/191	**Hamburg Planetarium – Climate change information and education centre**	In progress	KM: 95.000 VE: 45.000	KM: 45.000
Awareness Raising	2007/201	**Driver training for energy-efficient, environment-friendly driving**	In progress		
Awareness Raising	2007/218	**Programmes for climate action at pre-schools**	In progress		
Awareness Raising	2007/219	**Teaching materials and supporting programmes for climate action**	In progress		
Awareness Raising	2008/020	**Adjustments in education and training in renewable energies**	In preparation		
Awareness Raising	2008/045	**Revision of concept of Karlshöhe Environment Centre**	Transferred to another project (2007/059)		
Awareness Raising	2008/063	**Climate action advice for households of Turkish origin in Hamburg Altona**	In preparation	KM: 42.000	
Awareness Raising	2008/071	**Cooperation in climate action between the Senate and the North-Elbe Churches**	In progress		
Awareness Raising	2008/081	**School building site for climate**	In progress	KM: 77.650 VE: 75.708	KM: 75.708

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Awareness Raising	2008/082	**Climate action at Hamburg schools (supporting schools in preparation of a climate action plan)**	In progress	KM: 240.000 VE: 50.000	KM: 200.000
Awareness Raising	2009/019	**Economic stimulus programme of Federation: schools as climate action entrepreneurs**	Completed		
Awareness Raising	2009/021	**Environment and watersports centre Neuländer See - innovative combination of nature conservation, environmental education and watersports**	In progress		
Awareness Raising	2009/022	**Green ICT - energy consumption in administration**	In progress		
Awareness Raising	2009/028	**Exhibition "Urban Climate - facts we need to know"**	In progress	KM: 160.000	
Awareness Raising	2009/031	**Sustainability guide Logistics**	Completed		
Awareness Raising	2009/045	**Support for educational measures for children and young people in Hamburg North District**	In preparation		
Awareness Raising	2009/050	**Conduct of Eco-profit for Eimsbüttel district office**	In preparation		
Awareness Raising	2009/055	**Preparation of a concept for educational work on "Climate Action" in the Eimsbüttel district council office**	Discontinued		
Awareness Raising	2009/062	**Training and further education meaures for climate action in district council office Hamburg-Nord**	In progress		
Awareness Raising	2009/063	**fifty/fifty-junior**	In preparation	VE: 88.440	KM: 88.440
Awareness Raising	2009/064	**Improvement of Climate Portal www.klima.hamburg.de**	Discontinued		
Awareness Raising	2009/070	**Hamburg environmental counselling communicates sustainability**	Discontinued		

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Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Awareness Raising	2009/080	**Promotion of climate-friendly food, especially at restaurants**	In preparation		
Awareness Raising	2009/081	**Climate neutral conduct of large-scale events**	In progress		
Awareness Raising	2010/029	**Hamburg Climate Week**	In progress	KM: 145.000	
Awareness Raising	2010/043	**New energy for Altona - Wind turbine at grammar school Gymnasium Allee**	In progress	KM: 35.000	
Awareness Raising	2010/044	**Funding of conferences on Climate Change**	In progress	KM: 100.000 VE: 40.000	KM: 40.000
Awareness Raising	2010/046	**Harburg Climate Action Portal and Project Harburg 21**	In progress	KM: 50.000	KM: 50.000
Awareness Raising	2010/049	**"RUK" - Ressources, Environment, Climate action Establishment of a climate action network at vocational training schools**	In preparation	KM: 55.000	KM: 55.000
Awareness Raising	2010/050	**H_2Expo - International Conference and Exhibition on Hydrogen, Fuel Cells and Electric Drives**	Completed	KM: 50.000	
Awareness Raising	2010/071	**Flight emissions offset with regional component**	In progress		
Awareness Raising	2010/072	**Sustainable, climate-friendly food**	In progress	KM: 70.000	
Awareness Raising	2011/016	**"Hamburg learns action - justice in climate change" - educational work and networking on climate action and global justice**	In preparation		
Awareness Raising	2011/017	**School project "Explain room weather" - Further development, conduct and evaluation of the successful teaching concept tested in 2009-2010**	In preparation		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Awareness Raising	2011/022	**Nutrition is key - Active climate action at pre-schools**	In preparation		
TOTAL AWARENESS RAISING				**KM: 1.921.950 VE: 638.948**	**KM: 1.104.948 VE: 627.600**

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
RESEARCH SECTOR					
Research	2007/098	**Building of demonstration system for production of micro-algae and coupling with CO_2 elimination from flue gas for CO_2 reduction**	In progress		
Research	2007/168	**Model project for environment friendly air conditioning system (Hamburg University of Technology)**	In progress	KM: 200.000	
Research	2007/169	**Further development of German Climate Computing Centre (DKRZ)**	Completed		
Research	2007/170	**Excellence application for interdisciplinary climate research project "Integrated Climate System Analysis and Prediction" (CliSAP)**	In progress		
Research	2007/171	**Centre for Climate Impact Engineering and Climate Impact Management (KLIFF)**	In progress	KM: 80.000	
Research	2007/173	**Establishment of a new key research area "Energy Independence Technology" at the Hamburg University of Applied Sciences**	In progress		
Research	2007/174	**Masters programme "Environmental Engineering" at HafenCity University Hamburg - University for architecture and city development**	In progress		
Research	2007/175	**Establishment of key research area "Resource efficiency in architecture and planning" at HafenCity University Hamburg - University for architecture and city development**	In progress		
Research	2007/176	**Research project "Microbial methane oxidation in landfill cover strata – MiMethox" (Hamburg University and Hamburg University of Technology)**	In progress		
Research	2007/177	**"KLIMZUG-NORD": strategic adaptation approaches to climate change in North Germany**	In progress		
Research	2007/179	**Research project on impact of climate change on cancer diseases (University Hospital Hamburg-Eppendorf - UKE)**	Discontinued		
Research	2007/182	**Using knowledge gained in research network "Earth and Environment"**	In progress		

Note: No longer includes projects already completed in last document, or discontinued.

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
Research	2008/014	**Application for large-scale research facility (e.g. a Fraunhofer Institute) for energy or resource efficiency**	Completed		
Research	2008/015	**Examination: benefits of spatial concentration of research focus point "Renewable Energies"**	Completed		
Research	2008/016	**Support for establishment of an internationally oriented inter-university post-graduate college in the "Energy" sector, in the framework of the Excellence Initiative**	Completed		
Research	2008/017	**Support for application of HafenCity University Hamburg for a Leibniz Institute dedicated to ecological building**	Completed		
Research	2008/044	**Establishment of a Competence Centre for Renewable Energies and Energy Efficiency – CC4E of the Hamburg University of Applied Sciences**	Completed	KM: 100.000	
Research	2008/100	**Climate Service Center (CSC) in Hamburg**	Completed		
Research	2009/012	**Examination: establishment of a funding area "Climate Action" at Science Foundation**	Completed		
Research	2009/083	**Fuel Cell Lab - establishment of a centre for applied aviation research with integrated laboratory for applied fuel cell research**	In preparation		
Research	2010/002	**Examination: more intensive efforts to gain third-party funding in applied sciences**	Completed		
Research	2010/051	**E-Harbours smart power load management for Port of Hamburg (participation in INTERREG project)**	In progress		
Research	2010/055	**German Climate Computing Centre (DKRZ) - Increase in energy efficiency in high-power computing centre**	In progress	KM: 120.000 VE: 80.000	KM: 80.000
Research	2010/066	**Energy research group**	In progress	KM: 150.000	
Research	2011/005	**Report on promotion of research in Hamburg with respect to Renewable Energies Cluster and Climate Campus, and their synergies**	Transferred to another project (2010/066)		

Annex 1 Project list

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
					KM = fund allocation VE = commitment
Research	2011/030	**KlimaPolis - Climate action in major cities: Comparative study to optimise the dialogue in Hamburg's Climate Action Plan (HafenCity University)**	Discontinued		
Research	2011/031	**Further development potentials in urban building for response to climate change - legal examination (HafenCity University)**	Discontinued		
Research	2011/032	**Battery testing laboratory (University of Applied Sciences)**	In preparation		KM: 47.000 VE: 10.000
TOTAL RESEARCH				**KM: 650.000** **VE: 80.000**	**KM: 127.000** **VE: 10.000**

Note: No longer includes projects already completed in last document, or discontinued.

Sector	Project no.	Title of measure	Status	Funds 2011	Funds 2012
				KM = fund allocation VE = commitment	
EVALUATION AND MONITORING SECTOR					
Evaluation and Monitoring	2008/018	**New appointment of Climate Advisory Board with the goal of reinforcing presence of representatives from scientific bodies**	Discontinued		
Evaluation and Monitoring	2009/001	**Expert report Climate Action Masterplan**	Completed		
Evaluation and Monitoring	2010/001	**CO_2 monitoring and evaluation of Hamburg Climate Action Plan and rough concept for evaluation**	In progress	VE: 75.000	KM: 75.000
Evaluation and Monitoring	2010/022	**Human resources cost fund incl. computer workplace allowance**	In progress	KM: 1.100.000 (Echtkosten liegen erst 2012 vor)	KM: 1.100.000
Evaluation and Monitoring	2010/023	**Further development of climate action software: update of eBIS Climate**	In progress	KM: 60.000	
Evaluation and Monitoring	2010/025	**Cost of Coordination Centre for Climate Issues**	In progress	KM: 60.000	KM: 40.000
Evaluation and Monitoring	2011/004	**Submission of "Master Plan for Climate Action" in 2011 to achieve the long-term climate action goals**	In progress		
Evaluation and Monitoring	2011/007	**Preparation and implementation of a detailed concept for evaluation (evaluating programme and measures) of the Hamburg Climate Action Plan**	In progress	KM: 165.000	KM: 20.000
Evaluation and Monitoring	2011/008	**Determination and documentation of CO_2 reduction and cost-effectiveness in projects of Climate Action Plan which are considered capable of evaluation, by ministries, Senate offices and district councils**	In progress		
		TOTAL EVALUATION AND MONITORING		**KM: 1.385.000** **VE: 75.000**	**KM: 1.235.000** **VE: 0**
		TOTAL OF ALL SECTORS		**KM: 32.410.749** **VE: 10.820.239**	**KM: 18.791.614** **VE: 11.163.226**

Note: No longer includes projects already completed in last document, or discontinued.

Annex 2 – Projects funded

Climate Action in Hamburg

Update 2011/2012

Overview of main expenditure areas by fund allocation 2011 and planned fund allocation 2012 for Hamburg Climate Action Plan 2007-2012

Fund allocation 2011

Energy	3.239.180
Renewable energy systems (esp. photovoltaic) on schools - "Climate action at school"	**100.000**
IBA - renewable energies in the framework of IBA - "Wilhelmsburg Energy Bunker"	**1.350.000**
Promotion of use of biofuels	**200.000**
Climate programme "Solar thermal energy and heating"	**500.000**
IBA: Energy Association New Centre Wilhelmsburg	**200.000**
IBA: Climate action concept Renewable Wilhelmsburg	**285.000**
BA: Model project Deep Geothermal Energy	**200.000**
Energy-efficient lighting concept for subways and tunnels of 60s and 70s in central locations in Harburg	**20.000**
Smart Power- intelligent load management project (Demand Side Management) and power-controlled micro CHPs in connection with heat storage in city infrastructure	**264.180**
Solar Potential Analysis II Expansion to the whole of Hamburg	**120.000**

Forecast fund allocation 2012

Energy	2.590.000
Energy savings in buildings with high peak load	**1.000.000**
IBA: Energy Association New Centre Wilhelmsburg	**335.000**
IBA: Climate action concept Renewable Wilhelmsburg	**255.000**
Load management in public buildings using smart meters	**300.000**
Grant programme "Renewable heating"	**700.000**

Buildings	16.485.282
Education centre "Gateway to the World" (IBA)	**4.238.932**
Energy moderniation of public buildings – building envelope modernisation (police and fire stations)	**1.209.600**
Grant programme: Thermal insulation in existing buildings	**1.000.000**
Grant programme: New housing programme of Hamburgische Wohnungsbaukreditanstalt (WK)	**2.000.000**
Grant programme: Energy-efficiency modernisation of rented housing (WK)	**6.000.000**
Climate action and climate adaptation in urban development - Climate model districts	**200.000**
IBA - experimental housing in Island Park Wilhelmsburg	**189.000**
IBA - Harburger Schlossinsel - housing on Schlossinsel (building phase 2)	**320.000**
Complete examination of buildings	**8.300**
Measurements for examination of building project Schlettstadter Strasse	**19.450**
Pilot projects for funding energy-efficient non-residential building	**500.000**
Grant programme for urban design and climate action (Brick building fund) and implementation of demonstration projects	**400.000**
Community Center Hohenhorst	**200.000**
Niels-Stensen-Gymnasium (grammar school) nearly zero-energy standard	**200.000**

Buildings	5.434.000
Urban building projects (housing, industrial, district centres) in the districts - Bürgerhaus Bornheide	**900.000**
Grant programme: Thermal insulation in existing buildings	**1.500.000**
Grant programme: New housing programme of Hamburgische Wohnungsbaukreditanstalt (WK)	**Funds posted in 2011**
Grant programme: Energy-efficiency modernisation of rented housing (WK)	**Funds posted in 2011**
Climate action and climate adaptation in urban development - Climate model districts	**200.000**
IBA - experimental housing in Island Park Wilhelmsburg	**690.000**
Pilot projects for funding energy-efficient non-residential building	**1.500.000**
Grant programme for urban design and climate action (Brick building fund) and implementation of demonstration projects	**400.000**
HPA office and workshop building Spreehafen in Plus energy standard	**150.000**
Rieckhof Cultural Centre in Harburg Energy saving by roof insulation and replacement of windows and doors	**94.000**

Fund allocation 2011

Mobility	2.696.973
Extension of Bike&Ride facilities	**246.875**
Implementation of cycling strategy of Cycle Forum	**2.000.000**
Continued operation of the fuel cell powered Alster boat "Alsterwasser" of ATG	**65.000**
Implementation of existing feasibility study for improvement of cycle routing in selected streets	**310.000**
Electric vehicles - pilot project introduction of E-Smart ED	**75.098**

Industry and plant equipment	3.472.365
Increase range of climate action programmes by active inclusion of companies previously not involved, via business organisations (HK Energy Guides / ZEWU-mobilplus)	**222.365**
Extension of programme "Companies for resource conservation"	**2.000.000**
Funding programme: CHP Initiative - Implementation of a programme to increase CHP (combined heat and power) with Hamburg companies in production, services and housing sectors	**500.000**
Subsidy programme for climate action in product development for technological innovations in energy generating and conversion	**750.000**

National and international cooperation	65.000
Lead management of EUCO2 80/50 Interreg IVC project	**40.000**
Memership of HyRAMP (European Regions and Municipalities Partnership for hydrogen and fuel cells)	**5.000**
Translation of Climate Action Plan	**20.000**

Forecast fund allocation 2012

Mobility	3.386.598
Extension of Bike&Ride facilities	**52.000**
Implementation of cycling strategy of Cycle Forum	**2.000.000**
Continued operation of the fuel cell powered Alster boat "Alsterwasser" of ATG	**50.000**
Implementation of existing feasibility study for improvement of cycle routing in selected streets	**500.000**
Cycle stn. Harburg Rail Station (zero-energy building)	**400.000**
Electric vehicles - pilot project introduction of E-Smart ED	**75.098**
Expansion of trials of battery-powered elecric vehicles	**160.000**
Increasing appeal for pedestrians, creation of attractive pedestrian link in Langenfort park	**149.500**

Industry and plant equipment	4.502.365
Increase range of climate action programmes by active inclusion of companies previously not involved, via business organisations (HK Energy Guides / ZEWU-mobilplus)	**222.365**
Extension of programme "Companies for resource conservation"	**1.500.000**
Funding programme: CHP Initiative - Implementation of a programme to increase CHP (combined heat and power) with Hamburg companies in production, services and housing sectors	**500.000**
Subsidy programme for climate action in product development for technological innovations in energy generating and conversion	**1.000.000**
Replacement of lighting systems in South Hall and North Hall (Deichtorhallen)	**300.000**
Subsidy programme "Companies for resource conservation" - Heating Network	**800.000**
Heat supply from CHP waste heat by means of mobile latent heat storage system	**180.000**

National and international cooperation	176.703
Translation of Climate Action Plan	**20.000**
Conference "Future of Cities"	**156.703**

Fund allocation 2011

Climate impact management	2.495.000
Protection and development of soils in their climate function for the urban area	75.000
Hamburg strategy for adaptation to climate change (overall strategy)	20.000
IBA - dike park for Wilhelmsburg - climate impact management in the framework of climate action plan Renewable Wilhelmsburg	70.000
"My Tree - My City" - planning of additional street trees as measure in the framework of "Hamburg - European Green Capital 2011"	2.300.000
Rainwater management in urban development - best practices and visions for urban development with water	30.000

Forecast fund allocation 2012

Climate impact management	235.000
Protection and development of soils in their climate function for the urban area	75.000
Hamburg strategy for adaptation to climate change (overall strategy)	30.000
Feasibility study modelling of urban climate	50.000
IBA - dike park for Wilhelmsburg - climate impact management in the framework of climate action plan Renewable Wilhelmsburg	80.000

Awareness raising	1.921.950
Participation in programmes for quality management	10.000
Central climate action day for schools	8.500
Institute of Weather and Climate Communication - "Schools observe climate"	88.500
Courses on climate action for school classes	15.000
Climate action as a task for out-of-school environmental education	45.000
Expansion of posts in the framework of the Voluntary Ecological Year	61.000
Energy and climate hotline in cooperation with Hamburg Consumer Centre (telephone first-line advice)	213.300
ELBCAMPUS – Future circles for skilled trades	201.000
Extension of Hamburg Energy Performance Certificate	100.000
Pilot project "From the region – for the region"	60.000
Hamburg Planetarium – Climate change information and education centre	95.000
Climate action advice for households of Turkish origin in Hamburg Altona	42.000
School building site for climate	77.650
Climate action at Hamburg schools (supporting schools in preparation of a climate action plan)	240.000
Exhibition "Urban Climate - facts we need to know"	160.000
Hamburg Climate Week	145.000
New energy for Altona - Wind turbine at grammar school Gymnasium Allee	35.000
Funding of conferences on Climate Change	100.000
Harburg Climate Action Portal and Project Harburg 21	50.000
"RUK" - Ressources, Environment, Climate action Establishment of a climate action network at vocational training schools	55.000
H2Expo - International Conference and Exhibition on Hydrogen, Fuel Cells and Electric Drives	50.000
Sustainable, climate-friendly food	70.000

Awareness raising	1.104.948
Participation in programmes for quality management	10.000
Central climate action day for schools	8.500
Courses on climate action for school classes	15.000
Expansion of posts in the framework of the Voluntary Ecological Year	3.000
Energy and climate hotline in cooperation with Hamburg Consumer Centre (telephone first-line advice)	213.300
ELBCAMPUS – Future circles for skilled trades	201.000
Extension of Hamburg Energy Performance Certificate	100.000
Hamburg Planetarium – Climate change information and education centre	45.000
School building site for climate	75.708
Climate action at Hamburg schools (supporting schools in preparation of a climate action plan)	200.000
fifty/fifty-junior	88.440
Funding of conferences on Climate Change	40.000
Harburg Climate Action Portal and Project Harburg 21	50.000
"RUK" - Ressources, Environment, Climate action Establishment of a climate action network at vocational training schools	55.000

Fund allocation 2011

Research	650.000
Model project for environment friendly air conditioning system (Hamburg University of Technology)	**200.000**
Centre for Climate Impact Engineering and Climate Impact Management (KLIFF)	**80.000**
Establishment of a Competence Centre for Renewable Energies and Energy Efficiency – CC4E of the Hamburg University of Applied Sciences	**100.000**
German Climate Computing Centre (DKRZ) - Increase in energy efficiency in high-power computing centre	**120.000**
Energy research group	**150.000**

Evaluation and monitoring	1.385.000
Human resources cost fund incl. computer workplace allowance (effective costs not available till 2012)	**1.100.000**
Further development of climate action software: update of eBIS Climate	**60.000**
Cost of Coordination Centre for Climate Issues	**60.000**
Preparation and implementation of a detailed concept for evaluation (evaluating programme and measures) of the Hamburg Climate Action Plan	**165.000**

Forecast fund allocation 2012

Research	127.000
German Climate Computing Centre (DKRZ) - Increase in energy efficiency in high-power computing centre	**80.000**
Battery testing laboratory (University of Applied Sciences)	**47.000**

Evaluation and monitoring	1.235.000
CO_2 monitoring for Hamburg Climate Action Plan 2007-2012 and rough concept for evaluation	**75.000**
Human resources cost fund incl. computer workplace allowance	**1.100.000**
Cost of Coordination Centre for Climate Issues	**40.000**
Preparation and implementation of a detailed concept for evaluation (evaluating programme and measures) of the Hamburg Climate Action Plan	**20.000**

Annex 3 – Commitments for funding 2012

Climate Action in Hamburg

Update 2011/2012

Overview of funds already approved by commitments for 2012 for Hamburg Climate Action Plan 2007-2012

B01-BSU-Annex 3 - Commitments for funding for 2012

	Project no.	Title of measure	Status	Funds committed by for 2012
ENERGY SECTOR				
Energy	2007/092	**Promotion of use of biofuels**	Transferred to another project (2011/025)	100.000
Energy	2008/053	**IBA: Energy Association New Centre Wilhelmsburg**	In progress	335.000
Energy	2008/054	**IBA: Climate action concept Renewable Wilhelmsburg**	In progress	255.000
	TOTAL ENERGY			**690.000**
BUILDING SECTOR				
Building	2007/001	**Urban building projects (housing, industrial, district centres) in the districts - Bürgerhaus Bornheide**	In preparation	900.000
Building	2007/095	**Grant programme: Thermal insulation in existing buildings**	In progress	1.000.000
Building	2008/059	**IBA - experimental housing in Island Park Wilhelmsburg**	In progress	690.000
Building	2010/061	**Grant programme: urban design and climate action (Brick building fund) and implementation of demonstration projects**	In preparation	400.000
	TOTAL BUILDINGS			**2.990.000**

	Project no.	Title of measure	Status	Funds committed by for 2012
MOBILITY SECTOR				
Mobility	2007/127	**Increase in Bike&Ride facilities**	In progress	52.000
Mobility	2008/083	**Implementation of cycling strategy of Cycle Forum**	In progress	2.000.000
Mobility	2010/027	**Continued operation of the fuel cell powered Alster boat "Alsterwasser" of ATG**	In progress	50.000
Mobility	2010/034	**Implementation of existing feasibility study for improvement of cycle routing in selected streets**	In progress	500.000
Mobility	2010/065	**Electric vehicles - pilot project introduction of E-Smart ED**	In progress	75.098
Mobility	2011/029	**Increasing appeal for pedestrians, creation of attractive pedestrian link in Langenfort park**	In progress	149.500
TOTAL MOBILITY				**2.826.598**

	Project no.	Title of measure	Status	Funds committed by for 2012
INDUSTRY AND PLANT TECHNOLOGY SECTOR				
Industry and Plant	2007/068	**Increase range of climate action programmes by active inclusion of companies previously not involved, via business organisations: (HK Energy Guides / ZEWU-mobilplus)**	In progress	222.365
Industry and Plant	2007/070	**Extension of programme "Companies for resource conservation"**	In progress	500.000
Industry and Plant	2008/073	**Subsidy programme for climate action in product development for technological innovations in energy generating and conversion**	In progress	1.000.000
Industry and Plant	2010/058	**Replacement of lighting systems in South Hall and North Hall (Deichtorhallen)**	In preparation	300.000
Industry and Plant	2011/014	**Subsidy programme "Companies for resource conservation" - Heating Network**	In progress	800.000
TOTAL INDUSTRY AND PLANT EQUIPMENT				**2.822.365**
NATIONAL AND INTERNATIONAL COOPERATION SECTOR				
Nat. and Internat. Cooperation	2010/068	**Conference "Future of Cities"**	In preparation	156.703
TOTAL NATIONAL AND INTERNATIONAL COOPERATION				**156.703**
CLIMATE IMPACT MANAGEMENT SECTOR				
Climate Impact Management	2007/151	**Protection and development of soils in their climate function for the urban area**	In progress	75.000
Climate Impact Management	2008/099	**Feasibility study modelling of urban climate**	In progress	50.000
TOTAL CLIMATE IMPACT MANAGEMENT				**125.000**

	Project no.	Title of measure	Status	Funds committed by for 2012
AWARENESS RAISING SECTOR				
Awareness Raising	2007/011	**Central climate action day for schools**	In progress	8.500
Awareness Raising	2007/014	**Courses on climate action for school classes**	In progress	15.000
Awareness Raising	2007/060	**Expansion of posts in the framework of the Voluntary Ecological Year**	In progress	3.000
Awareness Raising	2007/080	**Energy and climate hotline in cooperation with Hamburg Consumer Centre (telephone first-line advice)**	In progress	213.300
Awareness Raising	2007/099	**Extension of Hamburg Energy Performance Certificate**	In progress	100.000
Awareness Raising	2007/191	**Hamburg Planetarium – Climate change information and education centre**	In progress	45.000
Awareness Raising	2008/081	**School building site for climate**	In progress	75.708
Awareness Raising	2008/082	**Climate action at Hamburg schools (supporting schools in preparation of a climate action plan)**	In progress	50.000
Awareness Raising	2009/063	**fifty/fifty-junior**	In preparation	88.440
Awareness Raising	2010/044	**Funding of conferences on Climate Change**	In progress	40.000
TOTAL AWARENESS RAISING				**638.948**

	Project no.	Title of measure	Status	Funds committed by for 2012
RESEARCH SECTOR				
Research	2010/055	**German Climate Computing Centre (DKRZ) - Increase in energy efficiency in high-power computing centre**	In progress	80.000
	TOTAL RESEARCH			**80.000**
EVALUATION AND MONITORING SECTOR				
Evaluation and Monitoring	2010/001	**CO2 monitoring and evaluation of Hamburg Climate Action Plan and rough concept for evaluation**	In progress	75.000
	TOTAL EVALUATION AND MONITORING			**75.000**
	TOTAL OF ALL SECTORS			**10.404.614**

Climate Action in Hamburg

Update 2011/2012

Interim status CO_2 monitoring
for Hamburg Climate Action Plan 2007-2012

CO_2 monitoring for Hamburg Climate Action Plan 2007-2012 (interim status 2011)

List of projects with emission reductions achieved (status 08/12/2011)

Notes:
The data on self-commitments of industry are kept separately.
The data shown here indicate an interim status of CO_2 monitoring of the Hamburg Climate Action Plan (status 08/12/2011).
Data may change for individual measures, where improved data are obtained, subsequent calculations are possible on the basis improved data, or data for measures are recorded where this was not possible in 2011.

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2007/025	fifty/fifty success project at schools	BSB	Awareness Raising	0	7.400	8.380	8.860	11.260	12.460	
2007/201	Driver training for energy-efficient, environment friendly driving	PA	Awareness Raising	0	0	25	25	25	25	
2009/022	Green ICT - energy consumption in administration	FB	Awareness Raising							Data requested
2010/043	New energy for Altona - a windturbine at Gymnasium Allee	BSU	Awareness Raising	0	0	0	0	46	46	
2011/xxx	Powersaving Check	BSU	Awareness Raising				1.692	3.243	3.243	
Total Awareness Raising				**0**	**7.400**	**8.405**	**10.577**	**14.574**	**15.774**	
2007/019	Renewable energy systems (esp. photovoltaic) on schools - "Climate action at school"	BSB	Energy	0	3	15	40	80	80	
2007/039	District heating from Köhlbrandhöft sewage treatment plant to Tollerort Container Terminal	BSU	Energy	0	0	0	0	0	0	Included in "Companies for resource conservation"

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2007/086	Large-area thin-film solar arrays on industry hall roofs grant programme)	BSU	Energy	0	427	947	1.282	1.282	1.282	
2007/088	IBA: Renewable energies in the framework of IBA - "Wilhelmsburg biogas project"	BSU	Energy	0	0	0	0	0	974	
2007/089	IBA: Renewable energies in the framework of IBA - "Georgswerder energy hill"	BSU	Energy	0	0	0	287	574	6.077	
2007/090	IBA: Renewable energies in the framework of IBA - "Wilhelmsburg energy bunker"	BSU	Energy	0	0	0	0	0	200	
2007/092	Promotion of use of biofuels (grant programme)	BSU	Energy	888	2.942	3.701	4.696	5.200	5.800	
2007/093	Wood-fired heating plant SAGA/GWG	BSU	Energy	0	0	11.669	16.670	16.670	16.670	
2007/097	Renewable energy supply to island of Neuwerk	BSU	Energy	0	0	0	0	33	33	
2007/100	Climate programme "Solar thermal energy and heating" (grant programme)	BSU	Energy	938	6.483	10.347	12.756	17.395	21.395	
2007/117	Optimisation of waste management in Hamburg with a view to climate action (Recycling initiative)	BSU	Energy	0	5.669	8.772	15.155	22.372	83.537	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2007/158	Electricity procurement of municipal organisations: increase to 100% renewable energy sources	BSU	Energy	0	132.398	132.360	132.360	0	0	This project terminates 2010. New project see 2008/028
2007/160	Energy savings in buildings with high peak load	BSU	Energy	0	42	76	607	648	648	
2007/161	Solar water heating	BSU	Energy	0	0	36	72	72	72	
2007/193	Photovoltaic array on Kampnagel Culture Centre	KB	Energy	0	0	46	46	46	46	
2007/205	Energy generating from waste water	BSU	Energy	0	0	0	0			Data requested
2007/215	New building of Rahlau depot - use of renewable energy supplies (solar thermal, photovoltaic)	BA	Energy	0	0	1	2	4	4	
2008/028	Changeover to green electricity on expiry of contracts, instead of separate tendering of RECS certificates	BSU	Energy	0	0	0	0	201.250	201.250	
2008/038	Examination: provision of municipal sites for CHP	BSU	Energy	0	0	0	0	0	500	
2008/041	Enabling repowering of existing wind turbines	BSU	Energy	0	0	0	0	9.000	12.500	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2008/053	IBA: Climate action concept Renewable Wilhelmsburg	BSU	Energy	0	0	0	0	0	200	
2008/054	IBA: Climate action concept Renewable Wilhelmsburg	BSU	Energy	0	0	0	0	210	210	
2008/102	Measures to increase share of renewables in Hamburg energy mix (grant programme)	BSU	Energy	0	0	0	138	138	138	
2009/016	Grants for micro-CHPs	BSU	Energy	0	0	0	0	1.203	1.203	
2009/024	Expansion of a photovoltaic plant on works and storage hall of Rahlau depot	BA	Energy	0	0	0	43	43	43	
2009/074	Wind turbines on Dradenau sewage treatment plant	BSU	Energy	0	0	0	0	7.656	7.656	
2009/075	Sewage gas treatment and feed-in at Köhlbrandhöft sewage treatment plant	BSU	Energy	0	0	0	0	2.937	2.937	
2009/078	Photovoltaic systems of Hamburg Waste (SRH)	BSU	Energy	19	20	20	22	39	39	
2010/037	IBA: New Hamburg Terraces Heating network	BSU	Energy	0	0	0	0	0	1.000	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2010/039	Energy-efficient lighting concept for subways and tunnels of 60s and 70s in central locations in Harburg	BA	Energy	0	0	0	0	0	5	
2010/060	Solar Potential Analysis II Expansion to the whole of Hamburg	BSU	Energy	0	0	0	0	6.357	6.357	
Total Energy Sector				**1.845**	**147.984**	**167.991**	**184.176**	**293.209**	**370.856**	
2007/168	Model project for environment friendly air conditioning system (Hamburg University of Technology)	BWF	Research	0	0	0	0	0,3	0,3	
2008/092	Installation of a photovoltaic array on the roof of HAW in Hamburg-Bergedorf	BSU	Research	0	3	3	3	3	3	
2010/055	German Climate Computing Centre (DKRZ) - Increase in energy efficiency in high-power computing centre	BWF	Research	0	0	0	0	250	250	
Total Research Sector				**0**	**3**	**3**	**3**	**253**	**253**	
2007/001	Urban building projects (housing, industrial, district centres) in the districts - Bürgerhaus Bornheide	BA	Building	0	0	0	0	0	137	
2007/006	Urban building project (housing, industrial, district centres) in the district Hamburg-Nord - Oberaltenallee southern part, formerly P&W spaces	BA	Building	0	0	0	0	79	79	
2007/018	Project "No school over 200"	FB	Building	0	0	684	1.300	2.000	2.700	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2007/021	IBA - Educational Centre "Gateway to the World"	FB	Building	0	0	0	0	0	0	
2007/028	Energy-efficiency modernisation of public buildings - building envelope modernisation (police and fire stations)	BIS	Building	0	0	151	220	266	266	
2007/095	Grant programme: climate action programme "Thermal insulation in existing buildings"	BSU	Building	4.542	11.698	20.251	31.591	33.380	41.380	
2007/140	Grant programme: New housing programme of Hamburgische Wohnungsbaukreditanstalt (WK)	BSU	Building	1.354	2.536	5.150	7.696	8.471	9.867	
2007/142	Grant programme: Energy-efficiency modernisation of rented housing (WK)	BSU	Building	0	11.846	30.941	39.662	49.504	61.504	
2007/159	Energy-efficiency modernisation of public buildings - modernisation of building equipment	BSU	Building	0	0	450	1.306	1.660	1.760	
2007/183	Energy eficiency in new building of HafenCity University Hamburg	BWF	Building							Data requested
2007/192	Roof modernisation Kampnagel Culture Centre	KB	Building	0	0	0	301	301	301	
2007/211	IBA - urban building projects (housing, industrial, district centres) in the districts - Open House - Vogelhüttendeich 75-79	BSU	Building	0	0	0	0	0	110	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2007/212	IBA Dock	BSU	Building	0	0	0	35	35	35	
2008/001	Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Öjendorfer Weg 4	BSU	Building	0	0	0	51	51	51	
2008/002	Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Eddelbüttelstrasse 9	BSU	Building	0	0	0	15	15	15	
2008/003	Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Eckermannstrasse 3	BSU	Building	0	0	0	94	94	94	
2008/004	Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Sanitasstrasse 11	BSU	Building	0	0	64	64	64	64	
2008/005	Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school - Paul-Roosen-Strasse 24	BSU	Building	0	0	92	92	92	92	
2008/006	Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Rotenhäuser Damm 90	BSU	Building	0	0	8	8	8	8	
2008/007	Investment agreement for energy-efficiency modernisation of social infrastructure - pre-school Wohlers Allee 40	BSU	Building	0	0	16	16	16	16	
2008/008	Investment agreement for energy-efficiency modernisation of social infrastructure - school Sterntaler Strasse 42	BSU	Building							Data requested

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2008/012	Economic stimulus programme of Federation: funding of energy optimisation of Hamburg House in Eimsbüttel, Doormannsweg	BA	Building	0	0	9	91	105	105	
2007/023	Exemplary project "School modernisation to zero-emissions standard"	FB	Building					132	132	
2008/024	Amendment of Hamburg Climate Action Act and Hamburg Climate Action Ordinance (legislation)	BSU	Building	0	21.424	41.800	42.816	43.832	44.848	
2008/025	Climate action and climate adaptation in urban development – Climate model districts	BSU	Building	95	156	208	379	402	407	The calculated carbon reduction relates to residential share of HafenCity (approx. 1/3 of gross floor space), actual carbon savings including industry & commerce are greater
2008/025	Climate action and climate adaptation in urban development - Climate model districts	BSU	Building	0	0	0	0	0	104	see above
2008/057	Veringhöfe heritage buildings - spaces for art	BSU	Building	0	0	0	0	0	0	
2008/059	IBA - experimental housing in Island Park Wilhelmsburg	BSU	Building	0	0	0	0	0	0	
2008/066	Increased orientation of number of modernisation projects in existing housing to the goals of climate action, including establishment of monitoring	BSU	Building	0	4.440	0	0	0	0	From 2009: see report 2007/142
2008/068	Introduction of quality controlling for energy-efficiency modernisation in existing housing	BSU	Building	0	5.334	5.334	5.334	5.334	5.334	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2009/002	Investment agreement for energy-efficiency modernisation of social infrastructure - Öjendorf Comprehensive School, Öjendorfer Höhe 12	BSU	Building	0	0	0	0	38	38	
2009/003	Investment agreement for energy-efficiency modernisation of social infrastructure - Horn Comprehensive School, Snitgerreihe 2	BSU	Building	0	0	0	0	1	1	
2009/008	IBA - Neue Hamburger Terrassen, Baufeld 1	BSU	Building	0	0	0	0	0	40	
2009/017	Economic stimulus programme of Federation: Hamburger theatres; here: Deutsches Schauspielhaus	KB	Building	0	0	0	0	49	49	
2009/018	Economic stimulus programme of Federation: Hamburger theatres; here: Thalia Theater	KB	Building	0	0	0	0	26	26	
2009/026	Energy modernisation and refurbishment projects in Mümmelmannsberg	BSU	Building	0	0	0	344	1.663	1.663	
2009/047	Am Weissenberg – establishment of a carbon-optimised housing area on about 12.5 ha between Sengelmannstrasse, Maienweg, Suhrenkamp and JVA Fuhlsbüttel	BA	Building	0	0	0	0	79	79	
2009/057	Investment agreement for energy-efficiency modernisation of social infrastructure - school in Potsdamer Strasse, specialist class tract	BSU	Building	0	0	0	0	0	89	
2009/058	Investment agreement for energy-efficiency modernisation of social infrastructure - school Sander Strasse, sports hall	BSU	Building	0	0	0	0	18	18	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2009/059	Investment agreement for energy-efficiency modernisation of social infrastructure - school Altonaer Strasse, sports hall	BSU	Building							Data requested
2009/068	Pilot project: new building of childcare centre in Rissen in nearly zero-energy standard (North Elbe Church - NEK)	BSU	Building	0	0	0	9	9	9	
2009/069	IBA - Harburger Schlossinsel - housing on Schlossinsel (building phase 2)	BSU	Building	0	0	0	0	0	112	
2010/011	Measurements for examination of building project Schlettstadter Strasse	KB	Building	0	0	0	0	103	103	
2010/031	Pilot projects for funding energy-efficient non-residential building	BSU	Building	0	0	0	0	1.500	1.500	
2010/053	Energy-efficiency in extension at Finkenau Art and Media Campus	BWF	Building	0	0	0	0	0	29	
2010/061	Grant programme: urban design and climate action (Brick building fund) and implementation of demonstration projects	BSU	Building	0	0	0	0	0	2.000	
2011/009	Community Center Hohenhorst	BSU	Building	0	0	0	0	0	13	
2011/010	Niels-Stensen-Gymnasium (grammar school) nearly zero-energy standard	BSU	Building	0	0	0	0	0	77	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2011/018	HPA office and workshop building Spreehafen in Plus energy standard	BSU	Building	0	0	0	0	0		Data to be submitted subsequently
2011/021	Rieckhof Cultural Centre in Harburg Energy saving by roof insulation and replacement of windows and doors	BA	Building	0	0	0	0	0	14	
Total Building Sector				**5.991**	**57.434**	**105.158**	**131.424**	**149.327**	**175.269**	
2011/013	"My Tree - My City" - planning of additional street trees as measure in the framework of "Hamburg - European Green Capital 2011"	BSU	Climate Impact Management	0	0	0	0	75	75	
Total Climate Impact Management				**0**	**0**	**0**	**0**	**75**	**75**	
2007/119	Development of diesel hybrid buses of HVV or comparable systems ready for series production (National Innovation Programme Hydrogen and Fuel Cell Technology - NIP)	BWVI	Mobility	0	144	94	128	150	534	
2007/127	Extension of Park&Ride facilities	BWVI	Mobility	0	0	0	7	118	118	
2007/130	Extension of flow control on motorways in Hamburg	BWVI	Mobility	0	0	0	0	700	700	
2007/131	CarSharing	BWVI	Mobility	0	0	0	540	540	540	
2007/134	Creation of new roundabouts	BWVI	Mobility	100	150	350	700	750	900	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2007/135	Energy optimisation of traffic lights	BWVI	Mobility	578	1.031	700	1.904	1.904	1.904	
2007/136	Optimisation of street lighting and replacement of illuminated road signs	BWVI	Mobility	203	436	943	1.683	1.683	1.683	
2008/052	Development of programmes for innovative propulsion technologies in motor vehicle transport (e.g. electric vehicles)	BWVI	Mobilität	0	0	0	0	260	825	
2008/065	Introduction of cycle hire system	BWVI	Mobility							Recording of effects of cycling lproject together under 2008/083
2008/083	Implementation of cycling strategy of Cycle Forum	BWVI	Mobility	0	5.494	5.494	7.000	7.000	13.735	Previously: Increasing attractiveness of cycling system - Improvement in infrastructure (2007/123).
2010/007	Changeover of propulsion power for railbound public transport to 100% renewable energies	BWVI	Mobility	0	0	0	0	173.650	173.650	
2010/027	Continued operation of the fuel cell powered Alster boat "Alsterwasser" of ATG	BSU	Mobility	0	0	0	0	47	47	
2010/030	Eco-taxis for Hamburg: award of an environment or climate label	BWVI	Mobility	0	0	0	0	1.020	1.020	
2010/034	Implementation of existing feasibility study for improvement of cycle routing in selected streets	BWVI	Mobilität	0	0	0	0	0	0	Impact of cycling measures to be summarised under 2008/083

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2010/042	Cycle station Harburg Railway Station (zero-energy building)	BA	Mobility	0	0	0	0	0	0	
2010/065	Electric vehicles - pilot project introduction of Smart ED	BWVI	Mobility	0	0	0	0	10	13	
2010/073	Guidelines for purchasing of low-emission vehicles for public authorities vehicle fleet	FB	Mobility							Data being processed
2011/024	Expansion of trials of battery-powered elecric vehicles	BWVI	Mobility	0	0	0	0	0	160	
Total Mobility Sector			**Mobility**	**881**	**7.255**	**7.581**	**11.962**	**187.832**	**195.829**	
2007/070	Extension of programme "Companies for resource conservation"	BSU	Industry and Plant	33.129	63.282	95.971	138.865	146.486	175.000	
2007/147	Investment promotion for energy savings in horticulture and agriculture	BWVI	Industry and Plant	1.737	3.437	5.248	6.985	8.648	8.648	
2007/195	Energy optimisation for Köhlbrandhöft/Dradenau sewage treatment plant group	BSU	Industry and Plant	8	0	119	119	119	119	Compressed-air aeration Köhlbrandhöft South transferred to own project, see 2011/0012
2007/196	Conversion of aeration system at Dradenau sewage treatment plant	BSU	Industry and Plant	0	0	7.763	7.763	7.763	7.763	Only share without grant from "Companies for resource conservation"
2008/031	CHP Initiative - Implementation of a programme to increase CHP (combined heat and power) with Hamburg companies in production, services and housing sectors (grant programme)	BSU	Industry and Plant	0	0	7.300	7.320	7.320	12.320	

Project no.	Title	Lead management	Sector	Measured or calculated CO_2 reduction						Comments
				2007 (t)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	
2009/032	Consolidation measures at computing centre of HPA ("Green IT")	BWVI	Industry and Plant	0	0	0	0	127	127	
2009/085	Fuel cell heating system for Hamburg Waste (HSR) (NIP)	BSU	Industry and Plant	0	0	0	0	3	3	
2010/019	Climate Action Plans and carbon inventories in public companies	BSU	Industry and Plant	0	0	0	0	29.099	34.937	Interim status
2010/058	Replacement of lighting systems in South Hall and North Hall (Deichtorhallen)	KB	Industry and Plant	0	0	0	0	0	0	
2011/014	Grant programme "Companies for resource conservation" - Heating Network	BSU	Industry and Plant	0	0	0	0	890	3.600	
Total Industry and Plant			**Industry and Plant**	**34.874**	**66.719**	**116.401**	**161.052**	**200.455**	**242.517**	
	Grand total			**43.591**	**286.795**	**405.539**	**499.194**	**845.725**	**1.000.573**	

	Total excl. measures 2008/028 and 2010/007 green electricity			**43.591**	**286.795**	**405.539**	**499.194**	**470.825**	**625.673**	
	Hamburg Energie 50,000 green electricity customers (forecast end of 2011)							107.500		

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