**Earth Hour City Challenge: Dossier Antwerpen**

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Introduction

As the largest city of Flanders, the city of Antwerp wants to take its responsibility with its climate and sustainability policy. The city is currently working on more than 275 actions that contribute to a sustainable city by focusing on sustainable energy use, green and water, sustainable materials, air quality and noise, mobility, sustainable land use and soil. 160 of these actions contribute to lower CO2 emissions. The city is setting a good example, for instance by working on the sustainability of its vehicle fleet, events, building projects and (fair) purchasing policy. Sustainability is key in the development and maintenance of the public building patrimony and the homes that the city builds and renovates in execution of its land and property policy.

Sustainability is also integrated in spatial implementation plans, project definitions and master plans. The first new advanced sustainable quarters, Cadix and Nieuw Zuid, are being built as we speak. Acoustic and ecological studies are systematically carried out. The plans to raise and redevelop the quays in order to prepare for climate change will enter the execution phase soon. In striving for a city-wide heat network using waste heat from our port, the city will start its first district heating project in 2014.

In order to ban polluting vehicles from our densely populated city centre, the city will implement a low emission zone by 2016. In the past few years, Antwerp has increased its appeal as a cycling city by developing 100 kilometres of cycling paths and introducing a bike sharing system.

The port of Antwerp is investing in sustainability and renewable energy, for example by building the biggest onshore wind park of Flanders. The city is preparing Blue Gate Antwerp to become a top location for eco effective and energy positive companies.

The city has also elaborated a broad and ambitious strategy to stimulate a climate-conscious urban community. Central to this endeavour is EcoHuis (‘eco house’), a unique centre where residents can obtain advice, information and support regarding environmental and energy matters, visit exhibitions and participate in information sessions, workshops and demonstrations about energy conscious and environmentally friendly building and living.

The city emphasises the aspect of ‘community’ with special attention for the social component and the residents’ own responsibilities. Antwerp recently created a forum, Stadslab 2050 (‘city lab’ 2050), in order to exchange knowledge with companies, knowledge institutions and civil society and to initiate concrete joint projects and collaborations for a more sustainable city.

Profile of the city of Antwerp

Antwerp is an important economical hub. Its three thriving economic engines are its port, the chemical industry and the diamond sector. The port of Antwerp is home to the second largest petrochemical site in the world – after Houston, Texas. The port is the third largest in Europe (after Rotterdam and Hamburg). The city centre is home to the largest diamond trade centre in the world. Antwerp has also become a renowned fashion city. Tourism is important as well: Antwerp is known as a ‘trendy’ city providing modern appeal in a historical setting. The city is visited by almost 1 million (day) tourists each year.

The city covers an area of 204, 25 km². The port covers 7.435 ha. There are 5.460 ha of green areas. This amounts to 108 m² per resident. With its 511.716 residents, Antwerp is the largest city of Flanders (2013).

The city has the following metropolitan characteristics:

* **Residents per km²:** 2.505, including the vast port area (2013)
* **Ages**: 21,6 % 0-to-17-year-olds, 61,4 % 18-to-64-year-olds and 17,1 % 65-plussers (2013)
* **Average net taxable income per person**: 14.212 EUR in Antwerp (2010), 15.598 EUR in Belgium and 16.599 in Flanders
* **Unemployment:** 10,7 %
* **Home owners:** 53 % (2001)
* **Nationalities**: 164 (2007)
* **Residents of foreign origin**: 35 % (2013)
* **Public transport users**: 121.525.000 per year – 333.000 per day (2010), 80 % tram and 20 % bus
* **GDP for the arrondissement of Antwerp**: € 39.553 ($ 56.560) at current rates, per person (2010). GDP for the city of Antwerp is not known
* **Businesses**: 14.227 companies in the secondary industry (2013), 384 in the primary, 51.336 in the tertiary and 10,524 in the quaternary
* **City administration employees**: 6.694 (6.120,92 FTE) (2013)
* **Working budget for the city administration**: EURO 128.570.845,82 ($ 183.856.308) (2010)

Note: A number of indicators were also detailed in the reporting sheet. The USD conversion is based on the principles of this contest or on the exchange rate of August 2013.

# Mitigation: state of affairs

## Policy

In **2003**, the city of Antwerp decided to reach the Kyoto norm for its own administration by 2012. This has been achieved. Antwerp has reduced its CO²-emissions with 7, 5 %. Also in 2003, the city developed a dynamic local Kyoto plan. In addition, the city wanted to stimulate citizens, companies and schools to be more energy conscious and efficient. The city stresses the importance of ‘community’ and hence encourages joint initiatives of neighbours, streets, schools and organisations. [EcoHuis](http://ecohuis.antwerpen.be/) was founded within this context, also in 2003. Its mission was and still is to raise awareness about energy and environmental issues and supporting an ecological urban lifestyle. Thanks to EcoHuis, Antwerp became a member of the [Living Green](http://www.livinggreen.eu/) project in 2008. Living Green is an innovative five-year European project, co-financed by the European funds for regional development. Namur, Lille, London, Delft and Ludwigsburg are the other participating cities. Living Green aims at the broader public to promote sustainable renovation and reuse of buildings.

In **2008**, Antwerp signed the “[Eurocities Declaration on Climate Change”](http://eurocities.wordpress.com/climate-change-declaration/).

In **2009**, Antwerp signed the [Covenant of Mayors](http://www.eumayors.eu/index_en.html) by means of which European cities engage themselves to reduce CO2 emissions with 20 % by 2020. The city developed an integrated approach in order to achieve an impressive greenhouse gas reduction.
Apart from a vision on climate change, articulated in the [climate plan](http://ecohuis.antwerpen.be/docs/Stad/Bedrijven/Stadsontwikkeling/SW_Ecohuis/Klimaatplan_CB_def_EU.pdf) (2011), concrete measures and actions were formulated for the city’s own administration (aiming at a 50 % reduction), for supporting residents (via EcoHuis, among other channels), sustainable urban development (for instance the study of a city-wide heat network) and renewable energy (such as the wind park in the port area). The action plan is added in addendum.
The city aims for complete climate neutrality by 2050.

In **2012**, the city took one step further by integrating the theme of climate into a city-wide matrix of ambitions and measures for sustainability. The policy note “[Antwerp, sustainable city for everyone](http://www.antwerpen.be/docs/Stad/Bedrijven/Sociale_zaken/SZ_Milieu/beleid/20110524_Beleidsnota_DuurzameStad_CB.pdf)” describes a sustainable future for Antwerp in eight themes: energy, mobility, air and noise, green, water, materials, use of space and soil. This also means that Antwerp is actively working on these eight themes and uses synergies among the themes in order to achieve a broader impact. “Sustainable city” was elaborated further into a horizontal objective throughout the different city companies and departments. The department for Energy and Environment coordinates and anchors a city-wide collaboration between these departments and companies, which report on progress at fixed times in the strategic cycle of the city administration. Concrete examples are investments in sustainable materials, vehicles, schools, day care centres, cultural centres, sport centres, planning and developing new residential quarters … For specific themes, such as the procurement policy, events, energy and vehicles, quarterly platforms were organised where employees share knowledge and experience and where external experts provide inspiration.

In **2013**, the city founded the forum Stadslab 2050. Together with businesses, knowledge institutions and civil society the city will elaborate activities that contribute to a sustainable city (with themes such as living and building in the city, green, climate, materials, air quality …).

The city plans to evaluate currently its climate measures in order to select those measures that are needed to effectively reach the goal for 2020. However, this exercise does not solely concern specific objectives expressed in numbers, but also reducing energy-dependence in general and efficiently recognising and realising opportunities in terms of mitigation and adaptation. This update will be carried out in collaboration with [Futureproofed](http://www.futureproofed.be), an external organisation that is working on a policy instrument designed to:

* increase the resolution of CO2-figures, allowing causes to be linked to concrete target groups;
* define and prioritise measures per target group based on hard and soft criteria. Hard criteria are the revenue, cost and financing of a given measure. Examples of soft criteria are visibility, setting good examples, social correctness, practicability … The administration wants to use these criteria to select the right measures, taking into account the specific profiles and characteristics of the target groups;
* closely monitor the expected emissions and – through risk-reporting – allow the city to speed up successful/promising projects or discontinue others.

## Emission inventory

In 2013 the city published her emission inventory for the third time. The city has complete sets of figures for 2005, 2007 and 2010. The results for 2012 are expected in 2014. The city reports on the emission of greenhouse gasses (CO2, CH4 and N2O) for the entire city territory and for all sources.

| kTonCO2-eq | Residential | Trade & services | Transport | Industry (ETS) | Industry (non-ETS) | Correction for 2 companies \* | Energy productionnon-ETS | Energy productionETS | Nature & agriculture | **Total** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Industry |  |  |  |  |
| 2005 | 1.048 | 753 | 1.204 | 9.431 | 253 | 3.709 | 257 | 648 | 7 | **,0** |
|  |  |  |  | ,0 |  |  |  |  |
| 2007 | 958 | 895 | 1.221 | 8.094 | 179 | 3.231 | 277 | 1.281 | 6 | **,0** |
|  |  |  |  | ,0 |  |  |  |  |
| 2010 | 910 | 718 | 1.166 | 11.683 | 294 | 0 | 223 | 1.314 | 16 | **,0** |
|  |  |  |  | ,0 |  |  |  |  |
| Compared to 2005 | ,2% | ,6% | ,2% |  | ,2% | ,8% | ,6% |  |
| Compared to 2007  | ,0% | ,8% | ,5% |  | ,5% | ,6% | ,7% |  |

\*A correction had to be made for two large companies in the chemical sector. In 2005 and 2007 only a small proportion of their emissions were ETS. After changes in the applicability criteria of ETS in 2008, their emissions were categorised as ETS.

These figures show that the ETS industry and ETS energy production together produce 12.997 kTon. This is 79 % of the total emissions. ETS emissions are not targeted in the Covenant of Mayors. The total emissions on the city territory which are included in the Covenant of Mayors amount to 3.188 kTon (2010), and have decreased with 6,2 % since 2005.

| kTon CO2-eq | Residential | Trade &services | City services | Transport | City fleet | Industry(non-ETS) | Energy production (non-ETS) | **Total** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2005 | 1.093 | ,0 | 115 | ,0 | 8 | 290 | 258 | **,0** |
| 2007 | 1.064 | ,0 | 118 | ,0 | 8 | 243 | 277 | **,0** |
| 2010 | 960 | ,0 | 95 | ,0 | 9 | 300 | 223 | **,0** |
| Compared to 2005  | ,2% |  | ,4% |  | ,5% | ,4% | ,6% |  |
| Compared to 2007  | ,8% |  | ,5% |  | ,5% | ,5% | ,5% |  |

The city aims for a 20 % reduction by 2020 compared to 2005. In 2010, the city achieved a reduction of 6,2 % and thus is almost on course to reach the 2020 objective. The city aims to halve its own administration’s emissions. A linear translation of this objective over a 15-year-period (2005-2020) would have necessitated a 16,67 % reduction in 2010. The city achieved a 17 % reduction. Also, the effects of the many actions the city has taken since elaborating its local climate plan, will reflect in the 2012 emission inventory. The 2010 inventory mainly shows the results of the Kyoto-measures.

Local energy production has doubled since 2005: the largest share springs from the WKK-ETS category. Wind energy increased from 8.723 MWhe to 53.047 MWhe and energy production by PV-panels increased from 4 MWhe in 2007 to 9.165 MWhe in 2010.

# Adaptation: state of affairs

In 2013, the city of Antwerp enrolled in [Naclim](http://naclim.zmaw.de/) and [Ramses](http://www.ramses-cities.eu/), two significant international adaptation projects. By engaging in these projects, the city wants to increase its own knowledge in order to take well-informed and well-founded policy decisions. In view of its current knowledge, important key issues for the city are the heat island effect, water scarcity and floods.

## Floods

Antwerp is situated in the Scheldt estuary. It forms a low-lying part of the Delta region in North West Europe. This region is formed by the rivers Rhine, Meuse and Scheldt. Rotterdam and Antwerp are the two most important cities in this region. The challenges for both cities are the tidal rivers and the rise of the sea level. Antwerp was built on a plain which lies just above sea level for the most part (the central city square ‘Grote Markt’ lies 7,5 m above sea level). The city of Antwerp is also threatened by secondary rivers. The Schijn River intersects highly urbanised zones.

Based on the water levels measured in the sea, the Scheldt and its tributaries, it is clear that the yearly average high-waters are increasing. In the first half of the past century the average high-water level increased by approximately 20 cm. In the second half, another 40 cm where added to this increase (50 cm for the average high-water level at springtide). The Flemish Environmental Outlook 2030 assesses the risks as follows: “High water levels along the coast translate into higher flood risks along the tidal-sensitive part of the Scheldt. In the current climate, floods occur once every 70 years between Vlissingen and Ghent. A medium scenario of a 60 cm rise of the sea level by 2100 would – without further measures – cause a new rise in flood risk back to the current occurrence of once every 70 years by 2050 and of once every 25 years even by 2100.”

Recent measurements and new scientific material made available after the 2007 IPCC-report, show that the sea level rise might turn out to be higher than initially estimated. A worst case scenario predicts an increase with 36 cm by 2050 and with 192 cm by 2100 compared to 2000. At the same time, the storm flood levels increase with 45 cm and 240 cm respectively. The occurrence of a storm flood level of + 6,5 m TAW would increase from once in 109 years in 2000 to once a year from 2080 onwards. Even a +8 m TAW level, which occurred every 17.000 years in 2000, would occur once every two years by the end of the 21st century. Increases to up to two metres by the end of the century cannot be ruled out. In other words, it is clear that in a worst case scenario and without appropriate measures climate change can indeed lead to unacceptable risks for the city of Antwerp.

Torrential rains are a second source of floods. 40 % of the Antwerp territory is paved, and the pattern is not evenly distributed. For example, only 14 % of our historic city centre comprises of green areas. In addition, certain city areas have an inadequate sewerage and buffering system. Heavy rainfall cannot be digested which increases the risk of local floods. A further consequence is that water is forced directly into the rivers instead of guided to purifying stations. As most cities in Europe, Antwerp is slowly but surely moving towards separate sewer systems for rain water and waste water. In new city quarters such as Cadix and Nieuw Zuid, separate systems are the rule. But the implementation is more complicated in the historic city centre.

## Drought

The high level of paved surfaces – especially in the inner city – directly affects the city’s lower groundwater level. It should be noted that Antwerp’s drinking water comes from the Albert Canal, which also has an economic function, which in turn necessitates a certain water level.

## Heat island

The recent European Environment Agency report “How vulnerable could your city be to climate impacts” (2012) states that Antwerp is very vulnerable for urban heat stress, more so than Paris or London. The causes according to the EEA are the lack of porous surfaces and of green-blue zones.

# Mitigation: actions

## The city as a good example

Reference: Government Mitigation Actions 1-9, 12-15

Antwerp makes many efforts to limit its own use of energy and to turn to green sources. By setting a good example, the city wants to inspire and motivate companies and citizens to do the same.

Since 2009 Antwerp has a 100 % green power supplier. Since 2011 this green power is also CO2-emission-free (based on sun, water and wind). This means that the electricity used by the city administration and for public lighting is CO2-free. Trams, too, use green power in Antwerp.

Between 2011 and 2012 small energy saving measures were implemented in all 226 city schools: thermostatic taps, door pumps, attic-floor-insulation, energy saving lamps … In its integrated approach to sustainability, the city worked together with [Werkhaven](http://www.werkhaven.be), a social economy project.

Since 2009, city employees participate in [WerKlimaat](http://www.provant.be/bestuur/departementen/leefmilieu/dienst_duurzaam_mili/ondersteuning_geme_2/aanbod_per_thema/energie-klimaat/campagnes/werklimaat/), a project that encourages colleagues to motivate each other to reduce energy use together. In 2013, 50 city buildings participated in WerKlimaat. Together they saved 584.936 kWh.

Since 2013 the city and the NGO Ecolife developed a bottom-up trajectory for city employees regarding sustainable use of energy, water, materials, food and transport modes. The workshops started at the beginning of 2013. The aim is to realise behaviour change and concrete actions in the most relevant city buildings.

Between 2010 and 2020 the city steadily invests in energy saving measures in its own old building patrimony. Measures are relighting and LED in public buildings, renovating boiler rooms, renewing boilers, applying roof insulation, placing high efficiency glass, applying wall insulation and placing cogeneration systems in public swimming pools. 54,5 million euros worth of energy saving measures and self-rewarding investments were carried out in the city’s building patrimony and city schools between 2010 and 2013. The city has calculated that the energy saving measures realised and ordered in 2012 for its own administration yields a total annual reduction of 3.844.059 kWh / year, the equivalent to 767.7 tonnes of CO2 per year and an energy bill reduction of € 226.455 / year.

New city buildings such as child day care centres and schools are mostly built according to the passive house standard. In 2009 the city opted for one energy accounting system based on telemetry. The implementation for the first 100 buildings was finished by the summer of 2013.

In March 2013 the city won the [Green Truck Award](http://www.truck-business.com/events/awards_green_truck_award_-nl-445-0.html?parent=436http://www.truck-business.com/events/awards_green_truck_award_-nl-445-0.html?parent=436) at the Transport & Logistics Award ceremony. A welcome reward for the city’s investments in a green fleet. All our sustainable vehicles were decorated to help spread our awareness campaign: ['Together](http://www.antwerpen.be/eCache/ABE/82/28/895.Y29udGV4dD04MTc3NjY4.html) we achieve more with less'.

By its engagement in several projects (the Olympus ‘Living Lab Electric Vehicles’, cooperation with the Flemish government) and by its own purchases the city increases its share of electric vehicles. At the end of 2010 the city had 10 e-cars and 5 e-delivery vans. Antwerp also has a crane truck, three moving trucks and a library-bus running on CNG. In 2012 electric bikes were acquired for the couriers and – in cooperation with Olympus – 10 employee bikes with charging stations. There are also eight silent pick-ups working at our cemeteries and parks and 20 electric street vacuum cleaners. Car sharing has made its way into the city administration. The city owns more than 300 cars. The objective is to share more and more of our cars and to further reduce the size of our fleet. In the future, the city hopes to share 10 to 20 % of its current fleet and to reduce the size of the fleet itself with 10 to 20 %. In order to reduce the emissions of our heavy vehicle fleet, we need to switch to CNG. The city already has some experience with CNG, of which the availability will reach sufficient levels in 2014.

The city wants to limit the impact on the environment of its public procurement policy as much as possible and takes into account the working conditions of the labourers that manufacture the products. Via the intranet, city employees can consult a guide for sustainable purchases. To its contractual specifications and conditions, the city has added a standard paragraph which informs suppliers about the importance of sustainability. Several sustainable framework contracts have been closed, for instance for fair trade products, FSC wood, ecological cleaning products, energy efficient computers, craft materials, office equipment, cold and hot beverages, paint, safety and work clothing, work shoes and work gloves.

## Renewable energy and heat networks

Reference: Government actions mitigation action 9 ,11,16; Community Actions Mitigation Action 15,17

Antwerp is pioneering with the construction of a heat network with a central heat plant at future residential quarter Nieuw Zuid (ca 360.000 m2 of property development). The city carried out the feasibility study and market positioning and will also monitor the exploitation. The investment value is € 5 to 10 million, the exploitation value amounts to € 50 to 120 million. The procurement phase is running, the first heat will be delivered in 2015. The following areas are probable candidates for their own heating networks: Cadix, Luchtbal, Spoor Noord. Every project is a step towards a city-wide heat network based on waste heat from our port, which can only be achieved when there is a sufficiently large ‘market’ for this heat. This is why the city starts with heat networks and heat plants at the level of residential quarters.

In collaboration with network distributer for gas and electricity EANDIS, the city is mapping out the demand for room heating, sanitary water, cooling and electricity on a 50 m by 50 m grid, per street segment and on a yearly basis. This map reveals those locations with the most potential for heating and cooling networks. It sheds light on the technical and economic feasibility as well as the technical dimensions of the heat network. But the use of this map is not limited to heat networks, it also provides insight into the necessary investments in the energy networks of tomorrow and provides precious input for customised campaigns about energy saving.

The city also invests in the production of its own renewable energy. Antwerp manages 10 buildings with PV-installations and the roofs of 9 buildings are operated in concession by a third party. The total yield was 1.009 MWh in 2012. The city department for education is planning to build 22 new schools with PV installations.

The presence of the airports of Deurne and Hoevenen has an important impact on the potential of wind energy in Antwerp. The interference with the radars is the cause of a consistent negative advice by the authorities on wind turbines on the right bank. This is why EcoHuis is currently testing a compact micro wind turbine with possible network connection in a strongly urbanised environment. The expected return is 1.000 kWh per year. On the left bank [Vleemo](http://www.vleemo.be/nieuw/) has already built 7 wind turbines and is planning to add more.

A feasibility study has shown that hydro-energy from the Scheldt is very difficult to realise because of the necessary dredging works and because of additional sedimentation. The Kallo lock is an exception. A specific study into this lock’s potential is being carried out.

The goal is to construct a biomass centre on the right bank by 2018. The Antwerp Port Company participates in Antwerp Biopower as a minority shareholder. The majority shareholder is Solvay. There is already an agreement with E.On about the services.

Antwerp has made a lot of progress already, with Hooge Maey landfill-gas valorisation, cogeneration systems at two sewage treatment plans and energy recuperation at the incinerator managed by the inter-municipal cooperation for waste disposal. This incinerator turns waste into energy via heat recuperation. Together with VITO ([Vlaams Instituut voor Technologisch Onderzoek](http://www.vito.be/VITO/EN/HomepageAdmin/Home/Organisatie/organisatie), Flemish Technological Research Institute), Antwerp is looking into the possibilities of geothermic energy, which includes a concrete user case involving a public swimming pool and some other public buildings.

## Mobility

Reference: Community Actions – Mitigation Action 1-5

Over the past years, the city has invested heavily in its cycling policy and the expansion of the tram network. Antwerp was Flemish Cycling City of the Year in 2012 and landed on the 5th place on the [Copenhagenize](http://copenhagenize.eu/index/index.html) index, a worldwide ranking of bike friendly cities. Antwerp expanded its bike track network with 100 km between 2007 and 2013. In June 2011 the public bike lending system [Velo](https://www.velo-antwerpen.be/modulos/modulos.php?TU5fSU5GT1JNQUNJT05fREVGSU5JQ0lPTg%3D%3D&Mw%3D%3D&Ng%3D%3D) was launched with more than 80 bike stations and 1.000 bikes. The immense success called for an expansion of the system to 150 stations and 1.800 bikes by June 2013. And there are new stations underway.

Tram line extensions into the peripheral areas are being realised. These extensions are part of Masterplan 2020 (for mobility in and around Antwerp) and go hand in hand with new Park & Rides and with the reduction of bus traffic in the inner city. The current tram network is 72,6 km long. 30 km is added as well as at least two new Park & Ride zones. The trams use green power.

The city supports [Cambio](http://www.cambio.be/), [Bolides](http://www.bolides.be/) and [Autopia](http://www.autodelen.net/), three organisations that promote car sharing. The city stimulates and supports car poolers via parking permits and new parking spaces for individual car poolers where possible. In total there are approximately 1.800 car sharers.

In January 2016 the city will implement a low emission zone in the inner city. Trucks as well as cars will have to meet stringent criteria in order to be allowed in the inner city zone between the Scheldt and the Ring Road. This means for instance a reduction in black carbon, which has a net climate warming effect. This is again a pioneering move by Antwerp.

# Adaptation: actions

Reference: City Actions - Adaptation – Action 1,4,5,

## Sigma plan

The Flemish Sigma plan contains flood defence projects for the areas along the Scheldt (260 km of river). In anticipation of the expected rise of the sea level (the Flemish authorities takes a rise with 60 cm over 100 years into account) – banks along the Scheldt and the side rivers are being raised and fortified. A chain of new controlled flooding areas is to provide more space to the river. Phase one of the updated Sigma plan is now in execution. The execution of the Sigma plan as a whole will be finished in 2030.

Specifically for Antwerp, the Sigma plan includes the following measures: raising the flood defence system to a height of 11.00 m TAW from the border with the Netherlands to Noordkasteel (North Castle in the north of the city) and from there onwards to a height of 9.25 TAW. For the Antwerp banks and quays, this means an additional 90 cm for the existing embankments and flood defence walls.

Completed and nearly finished projects are the flooding area near Lillo Fort and the controlled flooding and tidal areas near Kruibeke and Bazel. Apart from measures that pay for themselves in the short term, the Sigma plan has also specified reserve measures. These can be realised later if the further increase of risks is confirmed or if the risks turn out to be more severe than predicted (e.g. due to the rising sea level ).

Antwerp sees the necessary adaptations as an opportunity to redevelop the entire quay area. The Scheldt Quay programme combines the flood defence adaptations with the renewal of Antwerp’s largest and most important public space. The flood defence solution (e.g. an embankment, hill, mobile wall, pontoon …) determines the possibilities for public space (a landscape park, a promenade, public meeting spaces such as markets …) and vice versa. Flood defence and public space are also designed to play into the characteristics and needs of the adjacent residential quarters.

## Heat island studies

Antwerp is involved in two heat island studies. With the first study Antwerp and VITO are producing a first heat map for the years 2013 to 2030. This map is to outline problematic zones and suggest possible actions with a mitigating effect. Naclim is the name of the second study, which uses long term scenario’s (IPCC, up to 2100). In addition, possible measures or actions (e.g. a new park) are studied. Urban trends such as growth and increasing density are taken into account and mapped out. The outcomes of these scenarios will be optimally used to elaborate new spatial plans.

## Ramses

Together with Bilbao, Bogotá, Hyderabad, London, New York, Rio De Janeiro and Skopje, An twerp is a ‘focal city’ in the project [Ramses](http://www.ramses-cities.eu/about/project-setup) project. Ramses stands for ‘Reconciling, Adaptation, Mitigation and Sustainable Development for CitiES’.It is an internationally renowned project in which, among other institutions, London School of Economics, Potsdam Insitute for Climate Research, Tyndall Centre and VITO participate. The first goal of this research project is to clarify climate change effects at the level of the city. The second objective is to provide insight into the costs and benefits of a wide range of adaptation measures. The third goal is to seek lower adaptation costs and a better understanding and acceptance of adaptation measures in cities.

# Urban development: actions

Reference: Community Actions, Mitigation Action 11,; Government Actions, Mitigation Action 7, City Actions-Adaptation Action 2 ,6,7,8

With several large urban development projects the city is working on the sustainable city of tomorrow. Sustainability criteria in terms of climate mitigation and adaptation are consistently and ambitiously integrated into these projects. In all future urban development projects, reservation strips will be provided in anticipation of a heat network. Project developers have to integrate one central heat- and/or climate control system per block of apartments, offices, retail spaces …

Examples of these types of projects are Nieuw-Zuid, Cadix and Blue Gate Antwerp.

## Nieuw Zuid

Nieuw Zuid (a former railway terrain) is to become a new green residential quarter with ambitious goals in terms of energy, water, materials, use of space, green and mobility. The former industrial site will be recycled into a new living and working environment for approximately 4.500 citizens. 25 % of the new homes will consist of social housing. The quarter is a stone’s throw from the city centre. Its urban park of 15 ha connects other city parks with the Scheldt and will help mitigate climate change together with the new houses’ green roofs. Nature development is stimulated by opting mainly for indigenous plants. Rain water from roofs and in the streets is collected in wadi’s and infiltration zones in the park. This makes the site ‘rainwater neutral’, and Nieuw Zuid another pioneer’s project for Belgium regarding sustainable living. Rain water is drained separately from waste water. After infiltration and local buffering with a view to reuse and slow drainage, the rain water is finally transferred from the wadi’s to the Scheldt via basins. The location and orientation of new buildings buffer negative noise- and air effects. This is also to become the first Belgian residential quarter with a heat network. The construction of the heat plant starts in 2014. Every building is obliged to connect to this system. In the near future, the city will study the possibility of connecting existing residential buildings and the nearby palace of justice and college to the network as well.

## Cadix

The Cadix area in the old port area (Eilandje or ‘Islet) is being (re)developed by private actors but under the coordination of the city. The most important feature of this project is the remediation of polluted soil, which is then prepared to offer space for housing – including social housing – employment and public services.

Public space is being completely renewed. An important aspect is the introduction of a well-thought-out green structure by connecting a central square/park with two large urban parks at the edges of the quarter by means of green ‘stepping stones’. This green structure does not only have an ecological function. The large (5\*2 m) tree boxes and park strips along the dock edges also allow for infiltration of rain water and help counter urban heating. The central neighbourhood square – which will in fact become half-park – will be home to a number of grown trees which were saved from being chopped and are currently stocked at a ‘tree depot’. There, they are maintained until their permanent space is free at the square/park. The city has chosen for a variety of indigenous trees.

At Cadix, drinking water, rain water and waste water will be used and managed carefully. First of all, new developments have to have green roofs installed on every horizontal roof surface. This is an obligation in our Building Code. There can only be made an exception for roof space that is needed to install a solar energy system. The green roofs are not only useful in terms of infiltration but also have a cooling effect on the environment. The candidate-project-developers are asked (in the contest phase) to elaborate a system for the reuse of rainwater as well as grey water as part of the development. The sewerage system will drain rainwater separately from wastewater. Rainwater that is caught in the sewerage system is led straight into the surrounding docks (after infiltration and local buffering with a view to reuse and slow drainage). Waste water is pumped into the treatment plant.

New developments have to be built according to the passive house standard. A school is being renovated according to these ambitions, meaning that the city aims for a low-energy standard for the historical buildings (protected monuments) and for the passive house norm for the new wing. Pipelines are reserved in anticipation of a future heat net that can be connected to the port (residual heat) in the future.

The bike sharing system will be extended to this new city area in the first phase of the development. In order to welcome river cruises, shore side electricity systems are planned. This way, cruises can moor and stay at the dock edges without having to use their diesel generators. Finally, Flanders and the Flemish tram and bus company De Lijn will invest in two tram lines in the following 5 years, allowing tourists and residents to sustainably travel to the inner city or Central Station in comfort.

## Blue Gate

[Blue Gate Antwerp](http://www.bluegateantwerp.eu/en) is to write a new history for Petroleum Zuid (‘Petrol South’), a brownfield . This terrain will become an advanced and sustainable business area as well as a water-bound distribution centre at the level of the city region. The entire terrain is being constructed in a sustainable manner. The BREEAM guide lines are respected. Each building will be built according to the BREEAM guidelines. Polluted industrial waste material will also be demolished in sustainable ways. Reuse on-site is key. Whenever this is not possible, new suitable uses are sought elsewhere.

Blue Gate is energy positive. This means that it is self-sufficient in terms of energy. The energy sources that are used are renewable. In time, surpluses will be transferred to the Nieuw Zuid quarter.

With Blue Gate, the city wishes to give new meaningful functions to water. There are several wadi’s on the terrain. Green roofs are constructed wherever possible. BREEAM guidelines will be followed in order to catch water and stimulate reuse. Because of the BREEAM guidelines, the site will have to surpass the legal norms in terms of air quality. A green corridor will run through the terrain and offer space for animal and plant life.

In terms of activities, sustainable chemistry is expected to take centre stage. Blue Gate also has a logistic zone. In cooperation with the market, the city is looking into the realisation of a city distribution centre. The goal is that goods arriving at Blue Gate – preferably via the river – are reorganised as efficiently as possible and distributed in the city. Companies seeking to move to Blue Gate, have to use the Global Reporting Initiative.

## Land and property policy

Via her property company [AG VESPA](http://www.agvespa.be/) the city buys dilapidated buildings or small, difficult to develop sites in order to renovate or develop them. This policy concentrates on so-called ‘focus areas’, the parts of the city which appeal less to private investors and where small projects can function as levers. AG VESPA uses architecture as an instrument for urban development. Innovative designs are pursued to create added value for neighbourhoods. Where desired and possible, adjacent run-down buildings are bought in order to tackle a considerable part of the street in one swift move. AG VESPA has integrated a range of sustainability criteria in its design guidelines. This way, the new homes (or retail spaces) contribute to a sustainable, low energy housing stock including passive houses.

## Building Code

The ‘green’ building code has been in effect since April 1, 2011 and contains sustainability aspects such as obligated green and white roofs, indoor parking space for bicycles, limited hardened outside areas … The building code is binding for anyone who wishes to build or renovate in the city of Antwerp. The ‘blueprint for building with the city’ provides guidelines for private partners in constructing or renovating public buildings and contains a considerable number of demands regarding energy and choice of materials.

# Actions for a climate-aware urban community

Reference: City Actions- Adaptation Action 3;9 Community Actions – Mitigation Actions 6,7,8,9,10,14,12

## EcoHuis

[EcoHuis](http://ecohuis.antwerpen.be/Ecohuis/Startpagina-Ecohuis.html) (‘eco house’) literally and figuratively embodies a cutting-edge approach to public activities and communication about ecology and the environment. Thanks to EcoHuis, communicating and informing citizens about ecology and the environment is a daily affair, all year round, as well as supporting citizens in their efforts to contribute to a better environment. This way, the subject loses its ‘occasional’ character and becomes a normal part of the citizen’s discourse with the city administration.

EcoHuis is a former brewery warehouse that was sustainably renovated in 2003, with support from the European Union, the Flemish region and several public and private mentors, partners and sponsors. The city used as many sustainable and natural materials as possible, such as FSC wood, clay, clay paint, linoleum and parallam beams. The energy management system consists of an efficient interaction between insulation (wood fibre boards and paper flakes), heat-reflecting double glazing, ventilation (including an old Arabic ‘shindaga’ or wind tower on the roof), electricity (photovoltaic solar cells, energy efficient lighting and appliances) and heating (sun, groundwater-heat and gas).

Rain water is used to flush the toilets and to maintain the garden. The natural ‘eco garden’ and the garden roof illustrate how citizens can create a bio diverse green area in an urban context. The visitor sees examples of small-scale urban green: plant boxes, pottery gardens, upside-down gardening, square-metre-gardens, pallet gardens …

The Eco cafe provides organic meals and snacks. With a visit to EcoHuis the visitor earns one point on his ‘[A-kaart’](http://www.dna.be/a-kaart) (‘A-card’). The points can be traded at EcoShop, for instance for environmentally friendly potting soil, a wormery, an ecological gadget or discount on a book.

An iconic project is the thermo-graphic map, or ‘zoom in on your roof’. Antwerp pioneered with this project and inspired other cities. During four cold nights in March 2009, a small airplane with an infrared scanner photographed every roof in Antwerp and in twenty other municipalities. The results were presented on a thermo-graphic map and made accessible via the website [www.antwerpen.be/zoominopuwdak](http://www.antwerpen.be/zoominopuwdak). This map gives residents a good idea about just how much heat escapes through their roofs. Every resident can print out the thermo-graphic photo of his roof.

Another flagship project is the EcoHousedoctor. This architect provides free, independent technical advice to home owners with renovation ideas and plans. He offers an integrated vision on the required measures and evaluates the materials used. The EcoHousedoctor uses life-size cross sections of insulated roofs and walls as well as a catalogue containing the actual materials. The service was extended to local ‘housing offices’ throughout the city, providing a real public service character to sustainable building advice, whereas public services are usually limited to strict administrative matters. There are six local housing offices where residents can consult an EcoHousedoctor.

A third eye-catching initiative is [Biodroom](http://www.dna.be/biodroom/homepage): an urban agriculture project. Cultural centre De Link, the social services department and EcoHuis created a socio-cultural hotspot where people can meet up, enjoy food, art and culture as well as work in a shared garden. EcoHuis guides more than 100 local volunteers with permanent tasks in the garden. This project (among others) won the city the 2013 [Energie-en Milieuprijs](http://ecohuis.antwerpen.be/Ecohuis/Ecohuis-Hoofdnavigatie/Bewoners/Nieuws-voor-bewoners/Energie--en-milieuprijs.html) (Belgian ‘Energy and Environment award’). In total, Antwerp has more than 17 [*samentuinen*](http://ecohuis.antwerpen.be/Ecohuis/Ecohuis-Hoofdnavigatie/Bewoners/Bewoners-Natuur-en-dieren/Samentuinen/Waar-zijn-er-samentuinen.html) (‘shared gardens’) and 1.626 garden allotments.

The city provides subsidies for energy-saving measures in private homes:

|  |
| --- |
| Costs per measure (or participant) |
|  | **2010** | **2011** | **2012** |
| Roof insulation | 745.958 EUR | 981.143 EUR  | 637.970 EUR |
| Condensing boiler | 83.625 EUR  | 97.600 EUR  | 61.612 EUR |
| Solar boiler | 12.707 EUR | 8.437 EUR | 8.643 EUR |
| Low-energy new-builds | 496 EUR  | 1001 EUR  | 3.325 EUR  |

With regard to adaptation, EcoHuis provides information about relevant legislation and available subsidies for climate-resistant building: catching rainwater, green roofs and green façades … In 2012, twenty groups of neighbours received guidance in their joint initiative to create green façades in their streets. In total, 876 citizens created a green façade (more than the total for the 10 preceding years) with the help of the green maintenance department and more than 250 residents received personal advice. The city financially supported the construction of more than 60 rainwater wells or green roofs. More than 40 architects participated in a workshop about vertical gardens.

EcoHuis is planning to create maps that visualise the suitability of citizens' roofs for potential measures in terms of adaptation, insulation and renewable energy.

## Stadslab 2050

Building a sustainable city together requires new ideas and initiatives to be created, picked-up and become ‘common’ practices. In order to stimulate these dynamics the city launched Stadslab 2050, a unique cooperation between city, companies, knowledge institutions and civil society.

[Stadslab 2050](http://stadslab2050.be/duurzamestad) aims at:

* Cooperation: Stadslab 2050 brings people and organisations together in order to tackle problems that are too large to be solved by one organisation. The city creates a network of people and organisations with a variety of capacities and experiences. By working together we create more opportunities to achieve a lasting impact.
* Incubation and acceleration: creative and resourceful people and organisations create opportunities for an accelerated process towards sustainability. With the Stadslab 2050 network, the city wants to support those people, organisations and collaborations in elaborating their innovative ideas.
* Actions: Stadslab 2050 puts a clear focus on actions and experiments for a sustainable city. It is only by initiating things, by trying, experimenting and even by sometimes failing that we can learn and build on our sustainable city.
* Communication/visibility: Sharing good practices, engaging stakeholders and consistently motivating and inspiring citizens for a sustainable city is an important aspect of Stadslab 2050.
* Capacity building: throughout our actions we want to continuously gather knowledge that will lead us to a turnaround. We want to offer people and organisations the necessary capacities to achieve lasting changes in their organisations or systems.

Stadslab2050 plays into a broader story about the necessary transition to a sustainable society.

As an extra incentive the most promising projects are rewarded with process guidance and the best projects receive financial support. At the first gathering of Stadslab 2050 on October 10 2013 a jury selected a number of actions and experiments regarding more green in the city. The second gathering on December 3 will focus on sustainable living and building in the city.

## Raising awareness

In 2011 Antwerp launched the main campaign “Together we achieve more with less”. Sub campaigns are elaborated for several sub projects, always referring to the main campaign. This results in recognisability, engagement and continuity. Examples are the “Less CO2, more fresh air” campaign including communication about and promotion for electric vehicles, public charging stations, car sharing, the sustainable city fleet … and the “More green, less grey” campaign which promotes shared gardens and green façades.

The concept of EcoScholen (‘eco schools’) is promoted with the “Learning about sustainable living” campaign which includes information, activities, a contest for a grant and an entire year-programme with workshops and information sessions for pupils and teachers. The eco schools sign a charter to participate at one of two levels: EcoMini or EcoMaxi. This entails actions on several fronts: waste and sustainable materials, energy and climate, nature at school, sustainable food and water. At the moment there are 105 eco schools. In 2012, the city’s education department created a new campaign [www.energiecooleschool.be](http://www.energiecooleschool.be/) (‘energy cool school’) together with EANDIS (energy distributor). In September 2013, 12 pilot schools started with an awareness-raising project about careful use of energy. This entire school year the teachers and pupils will participate in an intensive programme “Energy, also in the curriculum”.

# Actions by the port of Antwerp

Referentie: Community Actions-Mitigation Action 13

The port strives towards a balance between the 3 p’s: people, planet and profit. In 2012 the port published its first and immediately crowned sustainability report (<http://www.sustainableportofantwerp.com/en>). The port won the 2013 bronze [IAPH Environment Award](http://www.portofantwerp.com/nl/news/antwerpse-haven-wint-bronzen-iaph-environment-award) as well as the prestigious [Environmental World Ports Award 2013](http://www.portofantwerp.com/nl/news/haven-van-antwerpen-wint-prestigieuze-environmental-world-ports-award-2013). The port also completed the [MVO-charter](http://www.portofantwerp.com/nl/news/het-havenbedrijf-behaalt-het-mvo-charter) in 2013.

The municipal Port Company and private companies are indeed sparing no efforts to improve the quality of air, water and soil. We already discussed renewable energy in the chapter “Renewable energy and heat networks”.

Other measures for a sustainable city include:

* The municipal Port Company uses 100 % green power.
* The municipal Port Company rewards clean ships. In 2011 the port introduced the [Environmental Ship Index](http://www.environmentalshipindex.org/Public/Home) (ESI) which rewards sea ships with an ESI-score of over 31 with a 10 % discount on tonnage dues since April 1, 2011.
* Barges can use shore side electricity at a number of locations within the port energy. This way, they don’t have to keep their engines running in order to generate electricity. The

[Shore power platform](http://www.walstroomplatform.be/)  lists locations that provide shore side electricity in the port of Antwerp and other Flemish ports.

* The municipal Port Company sets the example and enrolled in [Lean and Green](http://www.vil.be/2012/lean-and-green/) in 2013, which encourages companies to take responsibility and elaborate an action plan to reduce the relative CO2 emissions of their logistic activities by 20 % over a five year period. The Port Company is currently working on this action plan.

The port of Antwerp is also committed to protect extremely valuable nature in and around the Scheldt estuary. Large parts of the port area are protected by the European Birds and Habitats Directives, which ensures the necessary space and rest for animal and plant life. Today Kuifeend (ca 45 ha), Binnenweilanden (ca 18 ha) and Grote Kreek (ca 22 ha) are among the best wetland areas in Flanders. In order to reduce noise from the surrounding industries embankments were landscaped in 2007 and the entire area was reorganised. The Port Company works closely together with the organisation Natuurpunt (‘nature point’). The focus lies on the further development of ecological infrastructure within the port area. Ecological infrastructure is “small nature” which easily combines with other functions. A network of core areas, corridors and stepping stones in the port area is to create more opportunities for protected, port-specific animal and plant life. All this is realised without endangering the development and exploitation of our port.