

ROTTERDAM CLIMATE CITY

MITIGATION ACTION PROGRAMME 2010



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ROTTERDAM: A DECISIVE AND INNOVATIVE CLIMATE CITY

Europe is responsible for 20% of global CO₂ emissions. The EU intends to reduce greenhouse gas emissions by 20%. By consequence, it is mandatory for every EU Member State to reduce its emissions. Obviously, this applies to the Netherlands as well. The Netherlands has adopted the ambition to reduce CO₂ emissions by 30%, as compared with the level of 1990, and to realize this in the period until 2020.

As a port city of international significance with a strong industrial sector, Rotterdam currently accounts for approximately 16% of Dutch CO₂ emissions. The initiators of the Rotterdam Climate Initiative (RCI) have agreed on the objective to reduce CO₂ emissions by 50% by 2025, as compared with the levels of 1990. However, the RCI objectives extend much further than reduction of CO₂ emissions alone. By 2025, the city intends to be fully climate change resilient as well. Furthermore, the city invests heavily in promoting the Rotterdam economy at the same time. RCI is an alliance between the City of Rotterdam, the Port of Rotterdam, DCMR Environmental Protection Agency Rijnmond and Deltalinqs.

The comprehensive RCI climate approach includes a dedicated community action programme, aimed at long-term climate objectives and the ambitions adopted by the City of Rotterdam. This action programme focuses on opportunities and will help to enhance the level of sustainability and attractiveness of the city and promote its economy. Collaboration is vital if we want to be successful in realizing these ambitions. Together, we can all contribute to a better climate, each in our own way.

In control of the action programme is the Climate Office of the City of Rotterdam, partner of the RCI. The action programme focuses both on the causes and consequences of climate change. Exactly what we do to reduce CO₂ emissions is described in the Mitigation Action Programme.



THE ROTTERDAM APPROACH: 50% REDUCTION OF CO₂ EMISSIONS

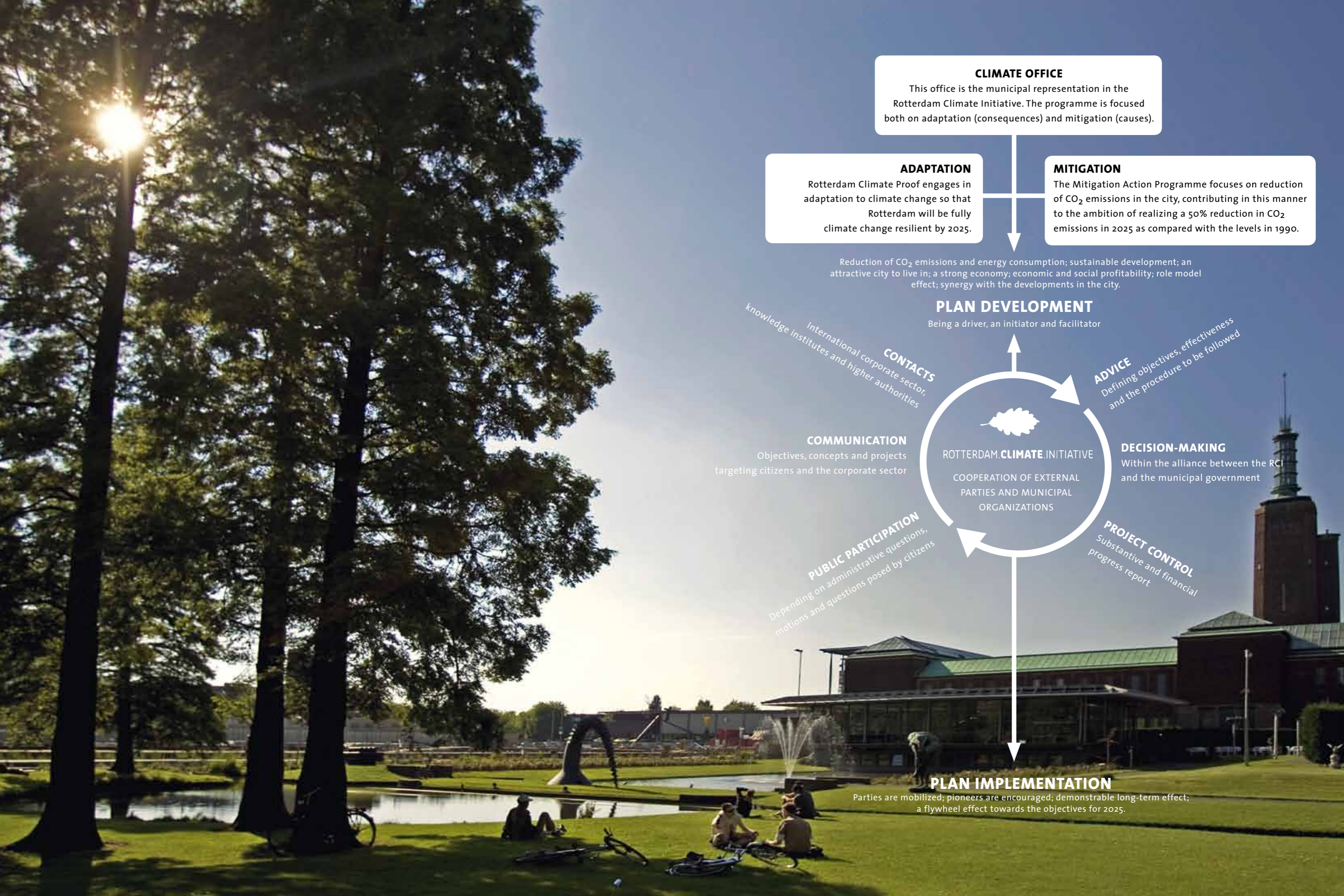
How will we tackle this? The Mitigation Action Programme addresses the causes of climate change and invests in reduction of CO₂ emissions in the city. The approach is based on the Rotterdam Energy Approach (REAP). This is Rotterdam's response to the Trias Energetica, adding the special extra element of the exchange of residual energy flows. The Rotterdam approach is a phased plan that is designed to help the corporate sector, households and public authorities to enhance their level of climate-friendliness step by step:

1. **ENERGY CONSERVATION:** Reduced power consumption, particularly in buildings, transport, industry, small and medium-sized enterprises (SME) and the public space.
2. **ENERGY EXCHANGE:** The exchange of residual energy flows.
3. **GREENIFICATION OF ENERGY:** Rotterdam invests in the use of wind, solar and biomass energy.

The Mitigation Action Programme is based on the steps described above. The following eight themes will be used as points of departure for its implementation: areas and spatial processes; sustainable buildings for residential and business purposes; optimal energy infrastructure; sustainable external space; sustainable mobility; sustainable energy in the city; sustainable economy and innovation; and sustainable management.

WHO WILL PARTICIPATE? The Climate Office has been instructed to mobilize all elements of the community and to support them in greenifying their plans and procedures. This means that the primary function of the Climate Office is not so much the execution of projects, but rather to serve as a flywheel or the driving force behind these projects. To realize our climate ambitions, we collaborate closely with municipal services, for instance, as well as market parties, knowledge institutes and other organizations. All parties concerned need to show their full support and commitment. And so they do! Developers, companies, investors, transport companies, educational and knowledge institutes, housing associations and the citizens of Rotterdam all contribute their share.

THE PEOPLE OF ROTTERDAM TACKLE THE CLIMATE CHANGE ISSUE The implementation of the action programme is supported by communication. In the past few years, much has been done to raise people's awareness about the causes and consequences of climate change. In the next few years, the emphasis will be on providing people with a tangible notion of how they can contribute themselves; of what the people of Rotterdam and the businesses and institutes established in Rotterdam can do to enhance our climate. Climate change is an issue that concerns all of us. This is why the communications are designed to inspire citizens, companies, organizations and policy-makers in Rotterdam to commit to a better climate. For instance, we are currently working on a digital counter on the Internet. Citizens of the City on the River Maas can turn to this counter if they have any questions or if they need help finding the right addresses for advice and products. The results of the efforts to tackle climate change are becoming increasingly visible this year. We will use this in our communication in order to inspire and motivate people and to show them that our efforts generate results. We show people that everyone can contribute to a better climate.



CLIMATE OFFICE
This office is the municipal representation in the Rotterdam Climate Initiative. The programme is focused both on adaptation (consequences) and mitigation (causes).

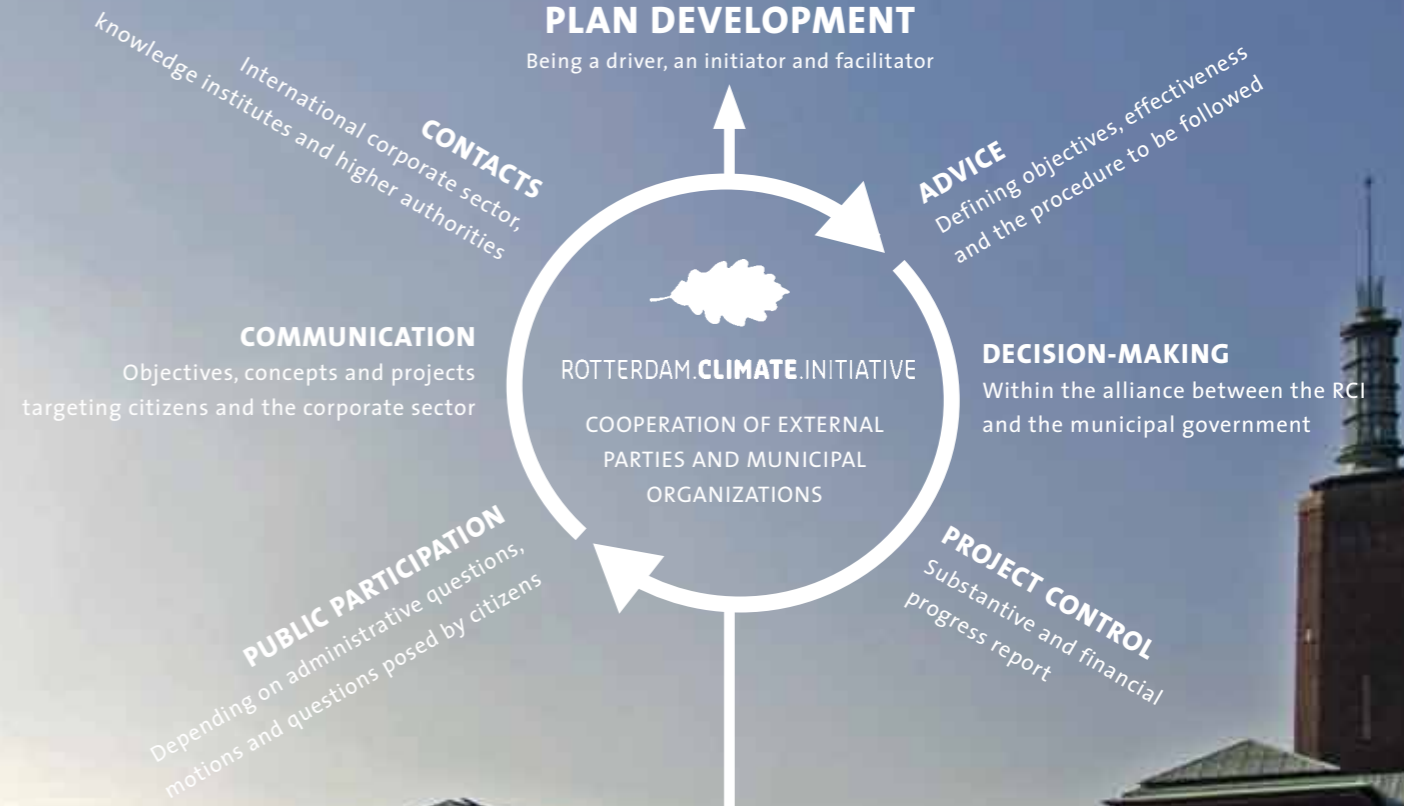
ADAPTATION
Rotterdam Climate Proof engages in adaptation to climate change so that Rotterdam will be fully climate change resilient by 2025.

MITIGATION
The Mitigation Action Programme focuses on reduction of CO₂ emissions in the city, contributing in this manner to the ambition of realizing a 50% reduction in CO₂ emissions in 2025 as compared with the levels in 1990.

Reduction of CO₂ emissions and energy consumption; sustainable development; an attractive city to live in; a strong economy; economic and social profitability; role model effect; synergy with the developments in the city.

PLAN DEVELOPMENT

Being a driver, an initiator and facilitator



PLAN IMPLEMENTATION

Parties are mobilized; pioneers are encouraged; demonstrable long-term effect; a flywheel effect towards the objectives for 2025.

RESULTS UP UNTIL 2009

The Climate Office is working hard to reduce CO₂ emissions in the city. So far, the following results have been achieved.

AGREEMENTS

Agreements have been reached with several **housing associations**, including Woonbron, Com.wonen and Woonstad Rotterdam, concerning far-reaching energy conservation (3% annually).

On 16 July 2008, the **Sustainable Development covenant** was signed in Rotterdam by a large number of market parties and the municipality. They all agreed on large-scale collaboration in the property industry in order to greenify development projects in Rotterdam.

The City of Rotterdam and RET (the public transport company in Rotterdam) use **100% green power**.

An agreement was signed with RET on **energy conservation in public transport**.

In close cooperation with the Traffic and Transport Department of dS+V (the Urban Planning and Public Housing Department), sustainability will be a permanent focus of Rotterdam's **traffic and transport policy**.

By the end of 2009, Rotterdam launched the **biodiesel B30** project. In a unique alliance, transport companies, filling station operators and car dealers have affirmed their commitment to biodiesel. Five large freight carriers have agreed to use biodiesel-fuelled trucks and refuse lorries for at least two years.

The **sustainable purchasing ambition** for the City has been set at 75% in 2010 and 100% in 2015.

Over 7,500 people **symbolically signed up** for a better climate in the 'I subscribe to the goals' campaign.

KNOWLEDGE

In June 2009, the **Rotterdam Energy Approach (REAP)** was presented. The City of Rotterdam, DSA Urban Planning and Architecture, JA Architects and Delft University of Technology have developed a method to realize CO₂ neutrality in new and existing buildings, districts and areas. The essential element of this method is to utilize waste energy flows.

Rotterdam is an active member of the **Dutch Green Building Council**. The investigation board aims to find a common measuring instrument for the level of sustainability in buildings and areas.

Close collaboration has been established with Erasmus University, Delft University of Technology and Rotterdam University. Several endowed chairs have been established, including the one for Professor Braungart. He will lecture on the Cradle-to-Cradle concept for five years.

A concept **Toolbox for More Greenery and a Better Climate** was developed for open space designers in Rotterdam. The toolbox includes 45 practical instruments to enable the use of greenery at various design levels (city, district and street level) in such a way as to enhance the city's resilience against heat and particulate matter.

Several **conferences on sustainability** were organized.

The dedicated '**www.iktekenervoor.nl**' ('I subscribe to the goals') website includes a variety of tips people can use to deliver a personal contribution to a better climate.

INSPIRING EXAMPLES

In Rotterdam, 30% of all **traffic lights** have been provided with **LED lighting**.

Successful **sustainable lighting** pilot projects were launched, in districts such as *Kralingen*, *Prinsenland* and *Hoogvliet*.

Test pilots with wind turbines and solar panels on the roofs of apartment buildings taught us more on the use of wind and solar energy.

Several **sustainable buildings** have been realized, including the Central Post. In the renovation of this building, sustainability was prioritized in every aspect of the process.

In Rotterdam, a number of historic buildings have been retrofitted to use very little energy, according to the **Passive House** concept.

The *Laan op Zuid* building, an eighteen-floor office tower, was designed to comply with modern **sustainability standards**. This is one of the greenest buildings in the Netherlands.

An architecture competition was held for the **new Municipal Office**, sustainability being one of the key criteria. OMA Firm of Architects was announced the winner.

The **innovation chain** was launched late in 2009 for the purpose of helping first-time entrepreneurs with a commitment to sustainability and a clever new idea to set up successful businesses.

In Rotterdam, filling stations were opened for biodiesel, bio-ethanol and natural gas. The Municipal Executive fleet now also runs on **biofuel**.

Rotterdam University shares an electric car with another owner. An **electric shuttle** drives around the *Wilhelminapier*, and RET has a number of hybrid city buses.

The first **charging points for electric transport** have been realized. At these charging points, electric bikes, scooters and cars can be recharged.

The streets in Rotterdam were brimming with life during the **Climate Street Festival**.

Business owners in the *Nieuwe Binnenweg* shopping street were assisted with **energy scans**. These scans offer shopkeepers practicable and useful advice on how to save energy.

A number of successful **information meetings were held on energy conservation** for healthcare and knowledge institutes.

The **television show Mulder & Sno** on RTV Rijnmond instructed the people of Rotterdam on facts and fibs concerning the climate.

192 women from the *Tarwewijk* district in Rotterdam were presented an **environmental certificate** by Alderman Grashoff. These women provide information to the people in their neighbourhood on energy conservation. Their efforts are part of a low-income energy efficiency project.





CENTRAL DISTRICT The area around the Central Station in Rotterdam is being developed into a multifunctional area. Mobility (high-speed rail line, RandstadRail), the central location and the mix of multinational corporations, local trade and industry and residential purposes will ensure Rotterdam Central District's future as a bustling and charming city entrance. The Rotterdam Central District area development project attaches high priority to sustainability. In close collaboration with the stakeholders in the area, no efforts are spared to realize the highest level of sustainability, including sustainable use of materials, energy consumption, use of residual heat, heat and cold storage, and collective waste collection and transport.

One concrete example concerns the solar panels that will be installed on the roof of the Central Station to supply the station with sustainable energy. In one of the busiest and most centrally located areas, travellers can witness the fact that solar energy is effective while at the same time it can be an elegant embellishment to the architecture.



APPROACH BASED ON EIGHT THEMES

The Mitigation Action Programme is based on eight themes. Each theme tackles the causes of climate change and is dovetailed perfectly with the practical implementation and the responsibility of the municipal services as well as other organizations in the city. The idea is that they will eventually integrate the climate approach into their regular work.

Project managers have been appointed for all of the separate themes. These project managers will guide the various projects, manage the budgets and connect people and organizations. They serve as spiders in the web for a comprehensive climate approach.

THEME 1: AREAS AND SPATIAL PROCESSES

Rotterdam intends to reduce the emission of CO₂ by 50% by 2025 as compared with the levels in 1990. This objective also applies to the built environment. This is not a simple task, and it requires all kinds of processes in the city to be influenced drastically. In a way, the city needs to be reinvented.

Optimal use of the heat distribution network, heat and cold energy exchange, energy conservation in existing buildings and investing in energy-efficient new developments offer ample opportunities to make significant progress in reducing CO₂ emissions. However, we need to do more. In spatial processes, the climate and energy should be on the top of the list of priorities right from the start.

Rather than just reducing CO₂ emissions, energy conservation is also about economic aspects. Examples include job opportunities, affordability and guarantees for the long-term supply of sustainable energy. In addition, in using renewable energy, particularly biomass, the local air quality will always have to be taken into account. Apart from a clean city, Rotterdam also wants to be an economically strong city. For this purpose, we take advantage of all of the opportunities greenification has to offer.

It is important to demonstrate that sustainable development leads to added value for the city, the area concerned, the people in Rotterdam and other parties as well. In the Rotterdam City Vision, several areas have been designated VIP or high-priority areas. The Climate Office helps to coordinate the development process to ensure that sustainability is given high priority.

THIS IS HOW WE DO IT:

- In September 2010, the results of the **Sustainable Development** covenant from 2008 will be reassessed. The result should be that in every phase of a building's life cycle – from the initial plan and design through the phase of construction and use, up until its demolition – the reduction of CO₂ emissions is prioritized. Starting from

2009, we thus save approximately 25% in CO₂ emissions, and as from 2011, this will rise to as much as 50%.

- The key element of the Rotterdam **Energy Approach (REAP)** is to utilize waste energy flows. In many places, including swimming pools, there is a need for heating, while in other places, such as ice-skating rinks or supermarkets, a lot of heat is lost. Supply and demand are coordinated in this approach within a certain area. This method can be applied everywhere, and is already applied in a model for the 'Southern Heart' project. In 2010, it will be implemented in practice in the development of the Stadium Park and the *Stadshavens* district, in an effort to optimize energy efficiency.

VIP AREAS

- The Rotterdam port district is about to undergo a metamorphosis. Both on the left and the right bank of the River Maas, the ports will be transformed in the next few decades into an area characterized by a successful combination of residential and business purposes: the **Stadshavens** district. The ports that are located close to the city will be developed into sustainable, innovative and modern work and residential environments. In the Stadshavens district, some 13,000 climate change resilient homes will be built between now and 2040, approximately 1,200 of which will be built on water. Sustainable materials will be used to construct them, and the goal is to make the entire Stadshavens district energy-neutral.
- For the newly to be developed **Stadium Park**, several themes have been presented to be fleshed out in the sustainable development. Energy, an optimal water system and sustainable mobility have been identified as priorities. This is expressed in terms of energy-efficient measures in buildings and homes, a climate change resilient water system, proper public transport and research into the options of electric transport.



- **Rotterdam Central District**, the area around the Central Station, is characterized by the use of sustainable materials, low energy consumption, the use of residual heat, heat and cold storage and collective waste collection and transport.
- Rotterdam invests in the **Hoboken** district. This district will become an attractive location for young scientists and artists, but most of all, it will become a very sustainable district. It will feature sustainable architecture, lots of green outdoor spaces including parks and some 12,500 m² of green roof vegetation covering Erasmus MC. By 2030, the *Hoboken* district will be a marvellous green oasis in the city centre of Rotterdam.
- To invest in sustainability on a broad scale and actually implement it in the city centre, a special control group for **sustainability in the city centre** was formed. This is an alliance between various municipal organizations. Their commitment is to develop an implementation programme for the city centre, to guarantee that elements such as sustainable mobility and electricity, renewable energy generation and the creation of a green living environment will actually be realized.

THEME 2: SUSTAINABLE BUILDINGS FOR RESIDENTIAL AND BUSINESS PURPOSES

Compared with other large cities, Rotterdam households consume relatively little electricity and gas. Contributing to this effect is the fact that proportionally, Rotterdam has a lot of small apartments. This is no reason for complacency, however, as compared with new buildings, existing buildings use twice or six times as much energy.

What is important in this approach is the fact that half of the existing homes are the property of housing associations, and 20% of them are governed by an association of owner-occupiers. In addition, 5% appear to be single-family houses, a large share of which is typically characterized by very high levels of power consumption.

Taking this fact into account, the focus for existing buildings will be on housing associations, associations of owner-occupiers and civil society organizations.

The energy conservation approach in commercial property was included in the Sustainable Development programme and the SME programme. The latter is conducted by DCMR Environmental Protection Agency Rijnmond, one of the four RCI partners.

THIS IS HOW WE DO IT:

- We will develop an information brochure for **owners' associations**, containing energy-saving measures for the implementation of a long-range maintenance plan.
- We will develop a plan to bring **energy-saving measures** to the attention of owners of older homes (built before 1980). Significant reductions can be realized in the energy bills of occupiers of these homes.
- We will proceed to make **new arrangements with housing associations** such as Woonbron, Com.wonen and Vestia, on far-reaching reduction of CO₂ emissions.
- We will develop a collective **energy platform**. This will offer opportunities to exchange knowledge and experience regarding energy efficiency. The platform is intended for all housing associations, large and small.
- We will provide as much as possible online information about energy efficiency via www.rotterdam.nl/klimaatstad.



THE SLEEPHELLINGSTRAAT On the initiative of Woonstad Rotterdam housing association and BAM Woningbouw Rotterdam, a number of historic buildings were retrofitted to meet the highest energy efficiency standards. We decided in favour of renovation in accordance with the 'box-in-box' principle for maximum insulation and ventilation. This renovation method is evidence to the fact that highly energy-efficient renovation is possible in all kinds of situations.

In Germany, the so-called Passive House concept has been applied successfully for some time now, and even though there is growing attention in the Netherlands for this sustainable building concept, it has been applied on a very limited scale in renovation projects. As far as we know, the *Sleephellingstraat* project was the first project in the Netherlands to actually apply the Passive House renovation concept in practice. Seven historic buildings were renovated and remodelled into fourteen highly energy-efficient and comfortable homes. The nature of the buildings – the façades are part of a designated urban conservation area in view of their special architectural and historic interest – and the beauty of the location required an approach that would guarantee the conservation of the unique character of these buildings.

The sustainable measures that were applied included high-quality insulation, triple glazing, airtight construction, proper sun blinds, ventilation and heat recovery, solar water heaters and energy-efficient appliances. This renovation project won the Passive House Award 2009. The Award was granted for the first time that year.

THEME 3: OPTIMAL ENERGY INFRASTRUCTURE

Intelligent energy consumption initiatives are necessary to improve the urban climate. An optimal energy infrastructure will ensure that the available energy is used and reused in the most efficient manner.

Buildings and businesses use and/or produce energy, cold and heat. A large energy potential remains untapped. This source is referred to as residual flows. The strategy to take optimum advantage of these residual flows by reusing the generated energy/heat will contribute to a higher level of urban sustainability. For Rotterdam, for instance, the district heating network is important in this respect, which utilizes industrial residual heat.

The programme to realize an optimal energy infrastructure focuses on optimization of Rotterdam's (residual) heat network, taking optimum advantage of the energy sources available in Rotterdam, and conducting research into the options of optimizing the use of the electricity grid in order to realize a significant reduction of CO₂ emissions, by means of the so-called smart grids.

Heat is not the only thing we need, however. The impact of climate change also confronts us with increasingly hotter summers. As a result, there is a steadily growing demand for air conditioning and comfort cooling systems in buildings. And the industrial sector is equally inconvenienced by the rising temperatures. Both for heating and cooling purposes it is, therefore, important to realize an optimal energy infrastructure.

THIS IS HOW WE DO IT:

HEATING AND COOLING

- Expanding the number of connections of homes and other buildings to the existing district heating network that utilizes residual industrial heat. This prevents residual heat loss and allows more homes and other buildings to be heated by means of the residual heat network of the **Heat Distribution Company**.
- On the 'Maasvlakte', a terminal will be realized for the storage of liquefied natural gas. The use of **residual cold** stemming from the re-gassing of liquefied natural gas may offer a solution to provide cooling for the city and certain branches of industry in increasingly hotter summers,

reducing the need for electricity consumption. We are researching the feasibility of the application in production environments, the urban environment and the logistic process.

ENERGY SOURCES IN ROTTERDAM

- In order to prevent energy loss, underground storage is an option. Both heat and cold can be stored in this manner. However, the soil in urbanized areas is not suited for the separate installation of such systems for individual homes or buildings. This requires connection to the same system of several homes or offices. A strategy is currently being developed for large-scale **cold and heat storage**.
- The number of residual heat sources to supply the heating network will decrease in the long run, for instance as a result of greenification of the industrial sector, which leads to a decrease in the production of residual heat. For this reason, the heating network was designed to be flexible. New heat sources can conveniently be connected to the network. Studies have been conducted into the options of other heat sources apart from residual heat. Examples include the use of **geothermal heat** sources. The results of these studies show that the environment of Rotterdam is suitable for the utilization of geothermal energy. The next step is to prepare a detailed map of the subsoil of Rotterdam in order to assess the potential of geothermal heat.

INTELLIGENT INFRASTRUCTURE

- The electricity grid can contribute to the reduction of CO₂ emissions by means of the application of so-called smart grids. These are intelligent networks that allow energy to be fed back into the grid and to absorb the difference between supply and demand. Local and regional power generation is essential in greenifying our energy supply in an affordable and sustainable manner. Without a smart grid, including smart meters, it would be virtually impossible to realize local or regional power generation. Smart meters are designed to inform occupiers online about their energy consumption. Smart grids are required for local or regional solar, wind and micro-CHP energy generation (both supply and demand). It is possible to develop smart grids for electricity as well as for heat, and we are studying the options of the feasibility of smart grid application in Rotterdam.

WARMTEBEDRIJF Rotterdam will engage the Warmtebedrijf (Heat Distribution Company) for the large-scale heating of buildings and homes using waste industrial heat. The industry in the port of Rotterdam releases vast amounts of heat into the atmosphere and into the water. A large share of this heat can be used directly to heat buildings in the city, which requires the connection of these buildings to the residual heat connections instead of gas furnaces. As a result, less natural gas is used and thus, less CO₂ is emitted. Furthermore, the air quality is improved in the process. The Warmtebedrijf also has the capacity to convert residual heat into electricity. The Warmtebedrijf is expected to commence its heat supply operations in 2012. The new 'Maasstad' Hospital in Southern Rotterdam will be among its first clients.



THEME 4: SUSTAINABLE OPEN SPACE

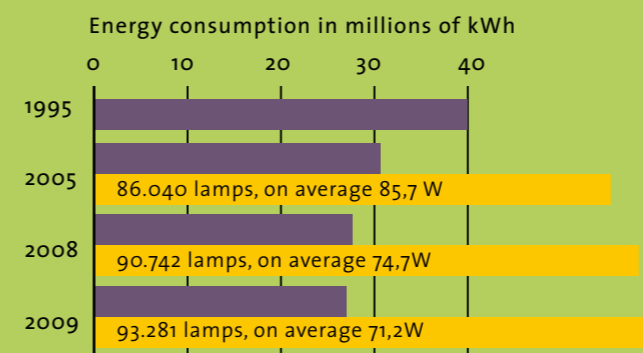
The overall municipal electricity consumption amounts to approximately 115 million kWh, which equals a total annual energy bill of approximately 30 million euros. The public open space in the city accounts for some 40% of this total. This concerns energy used for sewage pumping stations, traffic lights, public lighting, bridges, tunnels, car parks, etc. As the City has to set a good example, CO₂ emissions should be cut down by 50% also in its own operations.

The 'water' and 'green' chains are indispensable elements in the realization of a sustainable city. Sewage treatment requires a lot of energy. Solutions such as separate sewerage systems and the mandatory reuse of rainwater effect the climate beneficially. Additional greenery in the city, such as green roof vegetation, helps to cool down the urban environment, making (additional) air conditioning systems redundant.

THIS IS HOW WE DO IT:

- We aim to reduce our energy consumption in public open spaces by 3%, the ultimate objective being 50% reduction in 2025 as compared with the levels in 1990.
- In 2010, all traffic lights in Rotterdam will be equipped with LED lighting.
- 6,000 lamps along through roads will be exchanged for low-energy lamps. We will sign agreements with submunicipalities to proceed with the greenification of public lighting.
- Agreements will be reached with the Municipal Public Works Department to enhance the level of sustainability of sewage pumping stations.
- The contents of the Toolbox for More Greenery and a Better Climate will be adjusted for more practical effectiveness. In addition, we will study the possibilities of incorporating the toolbox in our regular green policies. The toolbox contains 45 practical tools to enable the use of greenery at various design levels (city, district and street level) in such a way as to enhance the city's resilience against heat and particulate matter.

SUSTAINABLE LIGHTING In 2010, all streetlamps will be equipped with LED lighting, and another 6,000 low-energy light bulbs will be fitted into lampposts along the public roads, resulting in annual decreases of energy consumption for lighting purposes.





THEME 5: SUSTAINABLE MOBILITY

Rotterdam has a wide variety in types of mobility in and around the city. The Sustainable Mobility programme develops a strategy to realize sustainable access to the city. In addition, a large number of pilot projects are launched to promote the use of clean, low-noise, energy-efficient vehicles.

Working towards sustainable accessibility for the city, the first goal to pursue is maximum efficiency in the structure of mobility. This requires intelligent spatial planning, encouraging people to use their cars less, and providing alternative transport solutions. The mobility issue that remains once all this has been solved, will be handled with maximum care for sustainability. Here, again, the strategy of the Trias Energetica will play a significant role. With respect to sustainable mobility, this strategy involves:

1. Clean use: Clean use of traffic, transport and logistics based on spatial planning, mileage reduction and efforts to effect a paradigm shift and a change in mentality. The idea is to 'limit demand'.
2. Clean vehicles: To encourage the use of energy-efficient vehicles. The motto is: 'using resources wisely'.
3. Clean fuels: To encourage the use of biofuels and green power for electric transport. The motto is to 'use renewable sources'.

THIS IS HOW WE DO IT:

- The trends and developments expected by national trendsetters and other key players in the sustainable mobility arena are identified and listed in a document entitled: **'A beckoning perspective. Sustainable mobility'**. The perspective concerns the collected ideas and knowledge of market parties and knowledge institutes, and can serve as a motivation document for the realization of sustainable accessibility for the city.

- The **Power Surge** project was set up for the purpose of accelerating the introduction of electric vehicles in Rotterdam's streetscape. Where electric transport is concerned, Rotterdam is and will always be a trendsetter. The city centre of Rotterdam is pre-eminently suited to accommodate electric transport. In 2010, a significant number of extra charging points will be installed, in close collaboration with the 'Rotterdam Air Quality Approach', to charge electric vehicles.

- During the Grand Départ of the Tour de France event, the promotion of sustainable mobility, like the (electric) bicycle, for instance, will play a prominent role. Under the theme of **'New Energy'**, various avenues will be used to call attention to sustainable transport in all its different shapes.

- In the summer of 2010, a pilot will be launched involving two **electric RET city buses**. These buses are unique for their location of the electric motor, which is mounted inside a wheel. As the motor drives the wheel directly, much more energy is converted into motion, avoiding virtually all energy loss.

- In 2010, we will measure the **effects of the biodiesel B30** project. The number of trucks running on B30 is increasing, and we use their data on the use of biodiesel as input for our research into issues including the effect on CO₂ emissions and air quality.

- **EVA (Electric Vehicles for Advanced cities)** is a unique alliance on a European level consisting of 19 cities, 17 car manufacturers, 12 energy companies and a number of leading organizations in the field of ICT and research, who have submitted a project proposal to the European Commission. This proposal, coordinated by the City of Rotterdam, aims to encourage and promote electric transport in Europe.



POWER SURGE The streetscapes of Rotterdam feature a significant increase in the number of electric bikes, scooters, cars, delivery vans and even buses. The Power Surge project will add to this effect in the next few years. As electric vehicles are clean, quiet and energy-efficient, Rotterdam intends to accelerate the introduction of this type of transport dramatically.

Cruising around Rotterdam even today are electric street sweepers, scooters and even an electric refuse collection vehicle of *Roteb* (Department of Cleansing, Disinfection, Transport and Workshop Rotterdam). Electric minibuses and shuttle buses have been introduced in *Kralingse Zoom* and at the *Wilhelminapier*, *Hogeschool Rotterdam* (Rotterdam University) shares an electric car, and the police squads and urban surveillance teams use Segways. Electric transport is the transport of the future. However, a fast introduction does require some effort and resources. For example, charging points are required to supply electric vehicles with energy – green energy, of course. Furthermore, incentives are necessary to make it financially more attractive for private individuals and organizations to purchase electric vehicles.

How fast this development will take place will depend predominantly on supply and demand. The Power Surge project creates the right conditions to provide optimal support for this market development and to accelerate it. We can contribute to this effect, for example, by ensuring that sufficient charging points are in place and by encouraging and promoting innovation.





BLIIDORP ZOO Blijdorp Zoo Rotterdam attaches high priority to sustainability. The City of Rotterdam collaborates closely with this trendsetter, and various sustainable applications are paving the road towards a CO₂-neutral zoo. The crocodiles are snug and warm in their Crocodile River heated by a wood chip heater, a system that is much better for the environment than a system using fossil fuels. The roof on the Oceanium is covered with approximately 3,400 solar panels to heat the complex. The new Savannah House was built in accordance with sustainability strategies, using sustainable materials such as untreated FSC-certified lumber and grass varieties including reed and pressed bamboo. The accommodation measures 400 m³ and can be heated partially instead of in its entirety depending on the weather conditions. The giraffes have access to specially designed ‘cuddle walls’ if they feel a bit chilly, which are heated by the same wood chip heating system that also serves to heat the Crocodile River. The giraffe house has a rainwater recovery system in place to collect and store the rainwater that falls on its roof, and to use it to water the tropical plants along the adjacent Crocodile River. Further plans include a wind turbine to generate energy.

THEME 6: SUSTAINABLE ENERGY IN THE CITY

The CO₂ reduction objective can be achieved to a significant extent by means of sustainable energy generation, for which purpose the port area provides the best options. A lot of wind energy and biomass is used in this area. The urban areas offer less dramatic options, but progress can be achieved here as well. Particularly the use of solar energy is a suitable option for the city. Wind energy and energy produced from biomass are equally realistic alternative sources of energy.

THIS IS HOW WE DO IT:

WIND ENERGY

- On a regional level, Rotterdam is committed to reaching administrative agreements on the installation of **wind turbines**. All municipalities within the city region will have to abide by these agreements.
- We are developing a strategy to apply wind energy also in the urban areas.
- **Blijdorp Zoo** Rotterdam is a trendsetter when it comes to sustainable applications. We are currently studying the options of a wind turbine to supply energy to the zoo.

- In addition to large-scale investments in wind energy, various parties in Rotterdam are collaborating in **small-scale wind energy** projects. RCI, DonQi, the police force of the Rotterdam-Rijnmond district and Woonbron housing association have collectively applied for subsidy from the European Commission to realize this.

SOLAR ENERGY

- The City of Rotterdam is investigating the options of **solar energy for the benefit of municipal buildings**. Once the suitable buildings have been identified, they will be provided with solar panels. The Central Station development project already applies photovoltaic cells. Please refer also to the section on the Rotterdam Central District on page 10.

BIOMASS

- RCI has joined forces with Blijdorp Zoo, Rotterdam University, the Rotterdam City Region and the province of South Holland to develop intelligent solutions for the use of biomass in the city. Examples include the use of wood chips, bark and grass clippings.

THEME 7: SUSTAINABLE ECONOMY AND INNOVATION

This involves a dual track theme, one track focusing on innovation, while the other track specifically targets existing economic activities.

INNOVATION

Enhancing the sustainability and innovation level of the economy will benefit the climate as well as yield profit. This offers excellent opportunities to maximize benefits! The objective, therefore, is to guide the transition of the existing economy into a new, sustainable economy. Sustainable innovation is the key to achieving this objective, as it will strengthen the economy in Rotterdam while at the same time offering alternatives to the fossil fuel based industry. Furthermore, these efforts will result in job creation for highly qualified workers.

The success of these efforts will depend on Rotterdam's abilities to offer innovative companies attractive conditions to establish their headquarters or branches here. Furthermore, it is a necessity to share as much as possible relevant knowledge and expertise and to incorporate the well-known concept of the triple bottom line of 'People Planet and Profit' into financial products.

ECONOMIC ACTIVITIES

The approach of the corporate sector in Rotterdam focuses on a paradigm shift and a change in mentality aimed at greenification of the operations. Enhanced sustainability in commercial activities will offer economic opportunities as

well. Sustainability will therefore be included permanently on the city's economic policy agenda. DCMR Environmental Protection Agency Rijnmond, one of the four RCI partners, is responsible for the SME action programme.

THIS IS HOW WE DO IT:

INNOVATION

- We create *and* showcase **inspiring projects**. This helps to bring a lot of people together, so that they can motivate and inspire one another and exchange knowledge and experiences. Examples of inspiring projects in Rotterdam include the Sustainable Dance Club in WATT, the wind turbines of DonQi, as well as the Laddermillship energy kites.
- Innovation requires knowledge. **Alliances are in place with knowledge institutes** such as Delft University of Technology, Erasmus University and Rotterdam University to greenify their curriculums. In addition, several initiatives have been launched to create platforms for knowledge exchange between the government, knowledge institutes and the corporate sector. One example is the **AIDA** project, which is designed to bring students and commissioning authorities together for the purpose of developing research projects concerning sustainable topics. The regional network of **KISSZ** was set up and launched, and the knowledge network by the name of **Knowledge Alliance**, which has been operational since an earlier start, now also focuses on an intermediate role to facilitate the exchange

of climate change related knowledge between knowledge institutes and the corporate sector. In the next few months, the corporate sector will be involved even closer in these partnership structures.

- **Rotterdam Pioneers** was launched in 2008. This is a network of sustainable innovative trendsetters who convene at regular intervals in order to address a wider audience. Employers, policy-makers, decision-makers and various tiers of government, as well as scientists and civil society organizations attend their meetings. The meetings always attract a large audience and are highly appreciated. Meetings are planned for 2010 as well.
- The **innovation chain** was launched late in 2009. This chain consists of an 'incubator', Dnamo, for the establishment of a new company, and an 'accelerator', Rotterdam Innovation Centre, to help the company grow. Sustainable entrepreneurs with innovative ideas can turn to these two parties, who will provide them with advice, help them to find a work location,

introduce them to their first client or help them to access funding.

COMPANY

- A special action programme was developed for small and medium-sized (SME) companies in Rotterdam to encourage them to **REDUCE THEIR ENERGY CONSUMPTION**, which will in turn lead to a reduction of CO₂ emissions as well as cost savings. The projects contained within the programme reflect the wide diversity of companies and institutions established in Rotterdam. For example, energy scans are conducted in shops on the *Nieuwe Binnenweg* shopping street to provide shopkeepers with information on possible savings. Hotels and conference centres throughout Rotterdam unanimously agree on the importance of the Green Key ecolabel. Companies and institutions receive support through meetings and workshops whenever they are confronted with energy-related environmental legislation. Furthermore, every company in Rotterdam can apply for a starting licence, free of charge, for the 'Environmental Barometer', a useful tool to gain insight into one's own energy consumption.



THE INNOVATION CHAIN The innovation chain is aimed at guiding sustainable 'Brainiacs' in their transition from concept to business operation. Supporting them in this transition are two parties: Dnamo, the 'incubator', and the Rotterdam Innovation Centre in its role as 'accelerator'. The 'incubator', Dnamo, is *the* place in Rotterdam for sustainable and innovative first-time entrepreneurs to turn to for support and advice in the establishment and development of their business. Dnamo provides strategic advice, advice on sustainability and personal coaching to accelerate the establishment and development of new businesses. The selected pioneers are currently working on projects such as a new type of propeller for the shipping industry, a concept for healthy baby food and child nutrition, and innovative water purification technology. The platform also offers work-places at RDM Campus for product development, access to facilities of Rotterdam University and Delft University of Technology as well as office space in the RDM Campus Dok office. In addition, first-time entrepreneurs have access to highly beneficial loans for the start-up of their business, as well as to an extensive network of experts and peers. In the role of 'accelerator', Rotterdam Innovation Centre takes care of the follow-up process. Through their CleanTech BusinessClub, they offer support to help the business grow, strengthen the network, access growth funding and participation as well as in legal matters and globalization. For these purposes, they collaborate with experienced entrepreneurs, start-ups, corporations, researchers and investors.



THEME 8: SUSTAINABLE BUSINESS MANAGEMENT

Encouraging sustainable business management starts with the greenification of the city administration itself. This offers opportunities for excellent progress in terms of reduction of CO₂ emissions, cost savings and energy conservation.

Apart from greenification of the operations, this commitment also concerns improvement of the sustainability partnerships between the various municipal services. The Climate Office is the driving force behind these partnerships. The goal is to ensure that sustainable management becomes a logical aspect of the municipal operations within the City of Rotterdam.

THIS IS HOW WE DO IT:

- We are committed to the **greenification of municipal buildings**. Several pilot projects have been launched for this purpose. Examples include: 'Green Buildings in Rotterdam', green theatres, the renovation of city farms

according to the Cradle-to-Cradle concept, energy-efficient lighting and the development of a monitoring system for the proper measuring of energy consumption in buildings. In new municipal buildings, sustainability is included as a priority from the very beginning. The Municipal Office serves as an excellent example, as this is designed to become the most sustainable office in the Netherlands!

- The City of Rotterdam applies a **sustainable purchasing policy**.
- Thirdly, we conduct research into the **mobility of public servants**; the types of vehicles they use and the options that are open to enhance the level of sustainability.
- In addition to the projects mentioned above, we are developing a **vision on sustainable management** that is practicable in the long range.



GREEN BUILDINGS IN ROTTERDAM The Green Buildings in Rotterdam programme delivers energy-saving measures for the property portfolio of the City of Rotterdam (swimming pools, schools, theatres, offices) categorized per group of buildings, such as improved insulation, more efficient air-conditioning systems and new heating installations. Specialized market parties are engaged to implement these measures.

The City of Rotterdam signs contracts with these parties stipulating guaranteed energy-saving levels. These companies are responsible for the realization of the agreed level of energy conservation and the required investments. A significant advantage of this approach for the City is the fact that it can be carried out in a budget-neutral manner. The companies take care of the funding for the investments and recover these costs by saving on their energy bills. This means that no additional investment budgets are required.

The first targets to be tackled are the swimming pools, as they are bulk consumers of energy and water. The City applies the procedure of the so-called competition-oriented dialogue, which leads to a result-oriented partnership that offers space for creative ideas proffered by the market. The City of Rotterdam is the first municipality in the Netherlands to apply this type of public-private partnership.

DO YOU WANT TO JOIN IN?

Do you feel inspired by this brochure, and do you feel that it is time for you to rally behind the cause? If you do, you are welcome to contact the Climate Office:

CLIMATE OFFICE

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ORGANIZATIONS INVOLVED: ABN-AMRO, AgentschapNL, Albeda College, Altran Technologies Netherlands B.V., 2012 Architecten, AM Wonen, Argos Groep B.V., Arup B.V., ASN Bank, Ballast Nedam, BAM Vastgoed, Bestuursdienst Rotterdam, Bientôt, Bio-DSL, Blauwhoed B.V., Bokx Vastgoed Ontwikkeling B.V., Bouwfonds MAB, Ontwikkeling CVG B.V., Bouwfonds Property Development B.V., BP Nederland, BPF, Broekman Group, Bureau Binnenstad, CE Delft, Chief Marketing Office, Clingendael, Clinton Foundation, Cogen Nederland, Com-wonen, Croon, DC-Berkeel, DCMR Milieudienst Rijnmond, De Hogeschool Rotterdam, De Stroom, De Wilgen Vastgoed B.V., Deelgemeenten, Deloitte, Delta Projectontwikkeling, Deltalinqs, Den Hartogh, DGMR, DHV Ruimte en Mobiliteit BV, Dienst Sport en Recreatie, Dienst Stedenbouw en Volkshuisvesting, Diergaarde Blijdorp, Doepel Strijkers Architects, Döll - atelier voor bouwkunst, DonQi, DRIFT, dS+V, Duracar, Dura Vermeer Groep N.V., Dutch Green Building Council, DWA, E.ON, ECN Beleidsstudies, Ecofys B.V., Ecomobiel, Economic Development Board Rotterdam, Ecorys, ENECO Energie, Enviu Foundation, Epyon, ERA Bouw, Erasmus Medisch Centrum, Erasmus Universiteit, Essent, Estrade Projecten, e-Traction, Evelop International, Evides, Ford Nederland B.V., Formula Zero, Gasunie Engineering B.V., Gemeente Amsterdam, Gemeente Delft, Gemeente Den Haag, Gemeentewerken, GeodisBM, Greenwheels Nederland, Grontmij, Groothandelsgebouw, Havenbedrijf Rotterdam N.V., HD Projectrealisatie B.V., Heijmans Vastgoed, Hogeschool INHOLLAND Rotterdam, Hotels, Imtech, ING Real Estate, Irado N.V., Johan Matser Projectontwikkeling B.V., JOS, Kamer van Koophandel, Kema, Koninklijke Vopak N.V., Kuiper Compagnons, LedNed, Leene.txt, LSI Project Investment N.V., Milieufederatie, Ministerie van Economische Zaken, Ministerie van Financiën, Ministerie van Landbouw, Natuurbeheer en Voedselkwaliteit, Ministerie van VROM, Ministerie Verkeer & Waterstaat, Mitsubishi Motor Sales Nederland B.V., Multi Vastgoed bv, Nederlandse Gasunie N.V., Nederlandse Waterstofvereniging, NICIS, Nissan International, NS Poort, Nuon, Ontwikkelingsbedrijf Rotterdam, OV-fiets, OVG projectontwikkeling B.V., Peugeot Nederland, Politie Rotterdam-Rijnmond, Pon Holdings B.V., Pons Automobielenhandel, Proper-Stok Groep B.V., Prorail, Provincie Zuid Holland, PWS Vastgoedontwikkeling B.V., PWS Woningcorporatie, Qurrent, Rabobank, Redevco Nederland B.V., RET, ROGAM, Roteb, Rotterdams Milieu Centrum, Royal Haskoning, Saab Nederland, SBR Stichting Bouwresearch, Scania, Servicedienst Rotterdam, Shell, Siemens, SNS Property Finance, SMD-OLIE, Sociale Zaken en Werkgelegenheid, Sparta, Stadion de Kuip, Stadshavens Rotterdam, Stadsregio Rotterdam, Stadstoezicht, Stadswonen, Stedin, Stichting Ouderenhuisvesting Rotterdam, Stichting Woonstad Rotterdam, Stimular, Studentcar, Sunergy, Tamoil, Techniplan adviseurs B.V., Technische Universiteit Eindhoven, Theaters, The Rail Factory, TNO, TNT, Toyota Nederland, Truckland Zuid-Holland, TU Delft, Unibail-Rodamco, Unica Installatiegroep, Unilever, Van der Looy Projektmanagement B.V., Van Gansewinkel, Van Maarssegroep, VCCR, Ventura, Vesteda Project B.V., Vestia Groep, Volker Wessels Vastgoed B.V., Volvo Nederland, Vopak, Warmtebedrijf N.V., Woonbron, WTC, Zadkine, Zuid-Hollandse Milieufederatie, etcetera...

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ROTTERDAM CLIMATE INITIATIVE Improving the climate for the benefit of people, the environment and the economy; that is the challenge confronted by the collective initiators: the Port of Rotterdam, the City of Rotterdam, employers' organization Deltalinqs and DCMR Environmental Protection Agency Rijnmond. The Rotterdam Climate Initiative creates a movement in which government, organizations, companies, knowledge institutes and citizens collaborate to achieve a 50% reduction of CO₂ emissions, adapt to climate change, and promote the economy in the Rotterdam region.

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