With this small brochure we hope to provide some examples of how seriously we regard the challenge of climate change and the environment in the Øresund Region.

At a time when the eyes of the world are turned on Copenhagen during the International Climate Change Conference, we have a unique opportunity not merely to focus on Denmark and Copenhagen, but also to look at the whole Øresund region. Regional cooperation across the Øresund has become a shop window, where the desire to take the problems of climate change and the environment seriously go hand-in-hand with a large number of innovative environmental initiatives.

We are, therefore, proud to be able to present a small sample of the many ambitious projects which are running in the region. These initiatives cover a wide field, from research into algae production on the island of Lolland via the world’s biggest trial of intelligent electric vehicles on the island of Bornholm, to the use of biogas buses in the town of Kristianstad. We also provide examples of how the region’s combined heat and power plants are transforming ordinary household refuse into green heat and electricity.

Many of these initiatives are at the outset associated with substantial investments. But, as is clear from amongst others the Copenhagen Cleantech Cluster initiative, growth and environmental improvements are far from being incompatible. In fact, quite the contrary.

Common to these initiatives is the fact that they reflect the seriousness with which we in the Øresund region have tackled environmental challenges. We believe that we have prioritised correctly, and we are pleased that our region has become a growth centre for environmental technology – a technology fuelled by our desire to face the future with a green conscience, aware that we have done what we could.

I hope you find this brochure informative.

Jerker Swanstein
President, The Øresund Committee

Vibeke Storm Rasmussen
Vice President, The Øresund Committee

Mikael Stamming
Director, Øresund Committee
Öresund Region
– The Human Capital of Scandinavia

The Öresund Region comprises Sweden’s most southerly province of Skåne and the Danish islands of Sjælland (or Zealand as it is also known in English), Lolland, Falster and Bornholm. The geography embraces considerable diversity from small communities on Lolland and in eastern Skåne to the metropolis of Copenhagen and other major population centres such as Malmö, Helsingborg and Næstved.

With 3.7 million inhabitants the Öresund Region is the largest and most densely populated metropolitan area in the Nordic countries with a quarter of the aggregate populations of Denmark and Sweden.

Here you will find the greatest concentration of highly educated workers in the whole of Northern Europe: 30.8 percent of the workforce has studied at institutions of further education. The Öresund Region has a well-deserved reputation for education and research with 12 universities and university colleges, 155,000 students, 6,500 Ph.D. students, 12,000 researchers, 4,000 foreign students and an active collaboration with 800 other universities worldwide.

The Öresund Region generates 26 percent of the combined GDP of Sweden and Denmark. Many international companies have established a presence in the Greater Copenhagen area, lifting the city from 19th place in 2000 to seventh in 2005 in the world rankings of foreign company establishments.

In Northern Europe the Öresund Region is an important transport hub and is alone in ranking as a major international gateway. Copenhagen International Airport is the largest in Northern Europe with direct flights to more than 120 destinations.

In 2007 a total of 9.7 million railpassengers crossed the narrow sound that separates Sweden and Denmark. Every working day approximately 20,000 people commute between their homes and their work on the other side of the water.

Since 1993 the Öresund Committee is a forum for voluntary political cooperation. The Committee promotes regional cross-border cooperation and ensures that due regard is paid to the interests of the Öresund Region by the nations’ parliaments, the Swedish Riksdag and the Danish Folketing. The Öresund Committee is the “embassy” of the region.

www.oresundskomiteen.dk
Already a global leader in eco-friendly production systems and green technology, Copenhagen is bidding to go one step further as an international hub for clean technology. The Copenhagen Cleantech Cluster is a new initiative aimed at bringing together more than 200 eco-friendly companies and knowledge-based organisations from around the world.

Nicolai Sederberg Rottbøll, of investment promotion organisation Copenhagen Capacity, says the ambition is for Copenhagen and the island of Zealand to become a global growth centre for clean technology.

Together with partners including DI, Copenhagen University, Scion DTU and Risø DTU, Copenhagen Capacity is investing 162 million Danish kroner in the venture – Denmark’s largest-ever cleantech investment.

**GETTING THINGS DONE**

What, then, is cleantech?

“We define it in broad terms,” Rottbøll explains. “Cleantech is a general term for all companies that take active and measurable steps to minimise their resource use and environmental and climate footprints during the production process. There’s no single definition – we evaluate companies on a case-by-case basis.”

The cluster seeks to encourage cleantech firms to look to Copenhagen by offering them a single entry point where they can gain an overview – and access to – a wide range of networks, partners, research projects and business opportunities.

**MODELLLED ON MEDICON VALLEY**

The Copenhagen Cleantech Cluster models itself partly on Medicon Valley, the highly successful network of Danish and Swedish biotech companies. Expectations are similarly high for the new cleantech cluster.

The aim is to stimulate creation of 1,000 new jobs by 2014 and to establish the cluster as one of the three most successful cleantech hubs worldwide. Achieving these targets would numerous climate and environmental gains.

**GREEN TECHNOLOGY EXPORTS**

Though relatively small in global terms, Denmark is no minnow in green technology. Yet Rottbøll stresses that Danish cleantech know-how will have little global impact if it stays within the country’s borders. Denmark, he says, needs to export more of its cleantech knowledge and technology.

“We’re really good at cleantech and that’s why Danish environmental technology is so popular abroad. When Danish companies develop cleaner production techniques they export them immediately to international markets, and it’s there that we can evaluate their potential impact on the global environment.”

Initially, Copenhagen Cleantech Cluster is focusing on attracting businesses in areas where Denmark is already a strong global player, such as intelligent electricity distribution, energy-smart construction, biofuels and fuel cells.

**EXPANSION IN ÖRESUND**

The cluster was initially conceived as a purely Danish initiative, but the organisers are now considering expanding it across the Öresund Strait.

“We’re in ongoing discussions with public and private companies in Skåne that are interested in being part of this,” Rottbøll says. “Expansion is absolutely not out of the question; we see a lot of potential there.”

So far, 70 public and private enterprises – including DONG Energy, Novozymes, Haldor Topse, Vestas, Siemens and Better Place – have shown interest in joining the project.
FACTS

- Copenhagen Cleantech Cluster was formally launched at the Nordic Climate Solutions conference in Copenhagen’s Bella Centre on 9 September 2009.
- DONG Energy chief executive officer Anders Eldrup is chairman of Copenhagen Cleantech Cluster.
- The project partners are investing a total of 40 million Danish kroner, with the Capital Region of Denmark and Vækstforum Sjælland regional bodies investing an additional 40 million kroner and the European Union Structural Funds expected to contribute a further 80 million kroner.
FACTS
• The Scandinavian Shuttle forms part of the EU’s Marco Polo Programme. The programme distributes between €20 and €30 million per annum to projects promoting green transport and eliminating heavy traffic from roads. The background is a marked rise in freight transports within the EU.
• Øresund Logistics and Øresund Environment Academy are behind the Scandinavian Shuttle project. Also included in the project are the Swedish Logistics business UBQ, the Dutch operator Van Dieren and the research centre Next Generation Innovative Logistics, NGIL, at the University of Lund.
The Öresund Region is the area of Scandinavia through which most trucks pass on their way to and from other countries. Congestion and traffic accidents are a part of everyday life – but the environment also suffers from the need of the transport sector for oil and from the resulting CO2 emissions.

With the EU supported project The Scandinavian Shuttle comes proof, however, that a green and stable alternative does exist. By 2010 the scheme will have eliminated more than 100,000 truck transports from our roads.

The four-year trial involves transferring freight from trucks to trains, which are a far greener alternative. The challenge has, therefore, been to establish a number of stable rail transports functioning as a daily Scandinavian freight shuttle line through Sweden, Denmark and Germany.

**MONITORED ELECTRONICALLY**

Freight transport by rail has previously been associated with delivery problems in relation to pre-agreed times. For this reason many businesses have chosen trucks as their preferred means of transport. This has in its turn had the negative consequence that truck transports produce as much as 84% of the total CO2 emissions made by the transport sector. But with the Scandinavian Shuttle a green alternative has now been provided which guarantees that freight arrives on time.

The transport line has a fixed timetable, and goods wagons are monitored over the entire line in real-time with the help of cutting edge positioning technology. If problems occur en route – a locomotive break-down or the like – the electronic equipment reports this back to the control centre. It is then possible to transfer the freight quickly to another means of transport which carries it on the remainder of its journey.

**BETTER THAN EXPECTED**

The project, which was launched in the summer of 2006 and runs until 2010, has been a success despite the financial crisis and the decline in the need for transport, reports Patrik Rydén, Director of Öresund Logistics – one of the parties behind Scandinavian Shuttle.

“We have met with considerable interest on the part of businesses with a strong desire to raise their profiles in green transport. This has meant that our goal of eliminating 100,000 truck transports from our roads over four years appears to be succeeding beyond all expectations. For this reason, we naturally also hope that by this project we have enhanced the image of the railway and created a client base, so that the scheme can continue after the EU withdraws its support in 2010.”

**MAJOR SAVINGS**

And there is a great deal to suggest that the Scandinavian Shuttle is here to stay. On the one hand, the number of businesses focusing on the environment has increased, and on the other, the EU has provided actual figures to document the success of the project from a social perspective. When the savings from a reduction in CO2 emissions, fewer traffic accidents and fewer problems of road congestion are added together, the result is DKK 175 million.

“But at the same time one imagines that the decisions of the Climate Conference in December are going to result in higher costs for road transport, and in this way will make it even more attractive to use the railway,” says Patrik Rydén, who hopes that the Scandinavian Shuttle will become a prototype for future freight transport solutions in other areas of Europe.
The world’s biggest trial of intelligent electric cars takes its name from Thomas Edison, inventor of the electric light bulb. A century ago Edison also started production of electric cars, only to see them outcompeted by Henry Ford’s petrol-powered T-Ford.

Now the electric car is making a comeback through the EDISON project, an initiative by eight energy industry players to promote electric car distribution and remove obstacles to the large-scale adoption of electric vehicles.

Danish power company Dansk Energi has a target of 400,000 electric cars on Denmark’s roads by 2020. But meeting this goal right now would collapse the country’s power grid due to overload when everyone recharged their cars.

It would also reduce the environment benefit of having an electric car because electric cars are only eco-friendly if charged while wind farms are contributing power to the grid. At other times – for instance during calm weather when turbines stand idle – most of the grid’s electricity comes from coal-fired power stations.

**INTELLIGENT CHARGING STATIONS**

Intelligent charging stations are a potential solution to this problem and are the project’s main focus, says Dansk Energi’s Anders Holm Foosnæs, the man in charge of the EDISON effort. The stations communicate intelligently with the grid to ensure that charging only takes place when there is a surplus of green energy and the grid is not overloaded.

Another solution could be for car owners to avoid using the electricity immediately. Instead, electric car batteries could serve as cells that store electricity when wind farms are operating and then feed it back to the grid during non-windy conditions. This would enable electric car owners to earn money from charging their batteries when electricity prices are low and selling the electricity when prices are high. Foosnæs says the idea is gaining ground as wind power generation gains an ever-increasing share of electricity production. “A high amount of wind energy requires major shifts in energy production. The ability of electric cars to store electricity and later on feed it back to the grid can have a major effect on creating a stable and green energy supply.”

**TESTS ON BORNHOLM**

The three-year EDISON project was launched in March 2009. The focus in the first two years will be on technological development, with testing of charging stations, electric cars and intelligent management on Bornholm in year three.

The project chose the Baltic Sea island of Bornholm as its test site for two reasons: no less than 30 percent of the island’s power is from wind and it also has a single energy source in the form of a cable from Sweden. Disconnecting the cable would put the island into self-sufficiency mode and create optimal conditions for testing EDISON technologies.

Dansk Energi’s goal of 400,000 electric cars in Denmark by 2020 may sound ambitious. But if the Bornholm tests go according to plan they would represent a giant step in that direction – and pave the way for a future based on green transport and eco-friendly energy.
**FACTS**

- EDISON is an acronym for Electric vehicles in a Distributed and Integrated market using Sustainable energy and Open Networks.
- The EDISON project partners are DTU CET, IBM, Risø DTU, Siemens, Dong Energy, Østkraft, Eurisco and Dansk Energi.
- Dansk Energi is a commercial and professional organisation for energy companies in Denmark.
- A total of 49 million Danish kroner is being invested in the EDISON project.
- Having 400,000 electric cars on the streets would cut annual carbon dioxide emissions by 1 tonne.
- Wind power accounts for 20 percent of Danish power generation, a world record.
Read more about these two projects here: 
www.malmo.se  
www.nordhavnen.dk
The Öresund Region is at the forefront as regards sustainable development and urban planning. The Western Harbour in Malmö is a good example, which with its visionary, green profile, draws visiting delegations from all over the world. And on the Danish side of the Öresund things are also happening. Here plans are being drawn up at the moment for a completely new and green neighbourhood in the city of Copenhagen, Nordhavnen (North Harbour).

Detached houses, terraced housing and 2,600 apartments together with offices and shops make up the West Harbour in Malmö. Within a few years the old harbour and shipyard area will be transformed into an internationally acclaimed example of sustainable urban development. The project took off in 2001 when the West Harbour provided land for the European Housing Expo Bo-mässan, B001. Here the goal was to build in an energy-neutral and sustainable way on the 22 hectare site covered by the expo. This succeeded beyond all expectations, and the 175 hectares of the Western Harbour has subsequently been developed, drawing inspiration from the original expo project.

EVERYTHING IS “GREEN”
With the twisted skyscraper Turning Torso as a landmark, a green neighbourhood has been created, packaged in exciting architecture. The entire spectrum of energy-saving measures can be found here: traffic systems designed to reduce vehicle traffic, green courtyards and green roofs, energy-efficient buildings and 100% locally produced, sustainable energy. When a light is turned on in one of the apartments in the area, the electricity has therefore been produced by the neighbourhood’s own wind turbine, explains Tor Fossum, project manager at Malmö City Environmental Administration.

What is more, heat pumps make sure that the heat used in the area is extracted from the sea and from a natural subterranean water magazine. In addition, there are solar collectors and solar cells which are mostly installed on roofs. Finally, the refuse management system is unique, making it possible to collect refuse directly from households and use it to produce biogas.

GREATEST ATTRACTION
“The transformation of the harbour is almost total. Today, 3,000 people live in the area, and by the year 2020 we will have 15,000. What is more, the Western Harbour has become one of Malmö’s greatest attractions. On a good summer’s day we receive up to 15,000 visitors,” explains Tor Fossum, before he has to put down the phone. In half an hour’s time he is to show a delegation from Odense Municipality around the Western Harbour. Tomorrow it is a group of Japanese journalists, and on Monday an Indian delegation of urban planners and politicians have announced their arrival. It is no exaggeration for Tor Fossum to say that the Western Harbour has attracted major international attention. What is more, the project has been awarded a large number of prizes for, among other things, sustainability and urban planning.

THE NORDHAVN PROJECT
In Copenhagen they also have green visions on a grand scale. Here the urban planners are currently outlining what is at present northern Europe’s largest urban development project. The plan is to remodel the old North Harbour area, Nordhavn, into a neighbourhood which will set new standards for environmentally sustainable development, and at the same time put Copenhagen on the map as an international role model for development in the 21st century.

These are great ambitions indeed, and in order to achieve them the environment has to be taken into account in minute detail. And this is what is happening: there is a focus on sustainable energy and new forms of energy, optimal utilisation of resources and recycling, environmentally friendly forms of transport and a living city with green spaces. Before the first sod can be cut in 2011, Nordhavnen will, however, be expanded so that it has an area equal to 470 football pitches. The plan is then to develop the area in stages, so that it will be fully developed over the course of the next 40 to 50 years. By that time no fewer than 40,000 green dwellings will have been created and a corresponding number of new jobs, says Claus Billehøj, project manager for Copenhagen Municipality.

THE FIVE-MINUTE TOWN
The background to the project is, he explains, that in 20 years time there will be 45,000 more Copenhageners.

“The easy answer would have been to build a new district outside Copenhagen, but then we would as a result have produced even more commuter traffic from the suburbs impacting on the environment. We can avoid that now by choosing Nordhavnen, with its central location”.

Nordhavnen itself will also be a place where there is not a great need for transport. Everything will be within five minutes’ walking distance. Green areas for recreation, public transport, harbour walks and shopping facilities – they will all be just around the corner. What is more, paths, cycle bridges and the Metro will make sustainable forms of transport the natural choice. In this way the vision of creating a precisely balanced traffic system of at least one third cycle traffic, at least one third public transport and at most one third car traffic will become a reality.

There are still many obstacles to overcome, before the first sod is cut on this enormous project. The urban development plan is, however, in large part already in place, and as is the case with the Western Harbour, it is also attracting international attention. To be precise, the Nordhavn development plan has at the time of writing been nominated for the category Best Masterplan at the World Architecture Festival in Barcelona.
The algae-filled ponds at Onsevig on the island of Lolland may look uninspiring, but they are the heart of an internationally recognised system that can purify drinking water and produce algae for biofuel – and much else besides.

The ponds were built after severe floods hit northern Lolland in 2006. Realising that sea defences were needed, Lolland Municipality and local people devised a novel approach. Why not kill two birds with one stone by solving the flooding and tackling the problem of effluent discharges into the sea at the same time?

To some, it sounded almost too good to be true. But a network of pools and channels was built and stands there today, behind the sea wall. The channels carry nitrogen-rich drainage water from agriculture to the pools, where algae purify the water by absorbing nitrogen. Treated water can be discharged straight into the sea or put to other uses without any pollution.

VORACIOUS ALGAE
Gorging on their nitrous diet, the algae grow so fast that they quickly have to be harvested and put to other uses. One of these is biogas for cars, electricity generation and heating. Other fuels are in the pipeline, and the algae can also be used in food or as fish feed.

The Onsevig Climate Park is now on the radar of multinational oil and energy producers as they scour the globe to find replacements for traditional fossil fuels.

EU TOP 20 PROJECT
Project director Poul Madsen sees Onsevig as an investment in a sustainable future. “Right now, algae aren’t a realistic alternative to oil and petrol. But in the long term they can be.”

Madsen isn’t alone in spying new opportunities. Onsevig – newly included in the European Union’s top 20 list of innovative eco-projects – is not alone even on Lolland.

At Sølvested, a plant is being built to purify sewage effluent with algae and CO2. Algae thrive both on nitrogen and CO2, and the Sølvested project involves pumping gas from the local district heating plant through the algae pool to make the algae grow even faster.

OFFSHORE ALGAE CULTIVATION
Algae may be the black gold of the future. Certainly, this was one scenario discussed by 90 leading international researchers at a workshop held in Lolland earlier this year to explore opportunities for offshore algae cultivation.

The algae grow in huge micromesh bags, explains Jan Johansson from Baltic Sea Solutions (Bass), a Danish sustainable development fund active in Lolland.

“The idea is that in future we’ll be able to farm algae on a much larger scale and exclusively for biofuel production,” he says.

The project is only at the concept stage, Johansson stresses. “But the potential is huge and Onsevig is the natural location because here we have the world’s first offshore wind farm and we can attach the bags to the turbine bases. You could also use surplus electricity generated by the turbines to power lights and the algae farm pumps.”

Future viability depends on finding enough investors. The first step, currently underway, is to establish a secretariat to coordinate the project and provide information on algae cultivation.

Meanwhile, the algae at Onsevig continue to thrive on their nutritious diet, purifying the local water and ensuring that residents no longer have sleepless nights about flooding.
Onsevig Climate Park's backers include Lolland Municipality, the pro-enterprise Green Centre, the Esbjerg branch of Aalborg University, Roskilde University Centre, Flensburg University and Baltic Sea Solutions (Bass).

Various major energy and oil companies are investing heavily in research to develop biofuels from algae. Exxon Mobil, for instance, has earmarked US$600 million to algae studies.

Algae can be used in many different products, including biogas, liquid fuel, chemicals, food, animal feed and health and beauty products.

The algae stock at Onsevig Climate Park can grow sixfold in four weeks. The residues from algae used in biogas production can be used as agricultural fertiliser.

Algae can also be enriched with CO2 gas from local district heating plants.

The nitrogen-rich run-off water from farms etc. is lead into the basins.

The algae absorbs both nitrogen and carbon dioxide.

The algae can be harvested and used for bio-fuels and fish food.

After the algae has absorbed the impurities, clean water can be channelled into the sea.

FACTS

- Onsevig Climate Park's backers include Lolland Municipality, the pro-enterprise Green Centre, the Esbjerg branch of Aalborg University, Roskilde University Centre, Flensburg University and Baltic Sea Solutions (Bass).
- Various major energy and oil companies are investing heavily in research to develop biofuels from algae. Exxon Mobil, for instance, has earmarked US$600 million to algae studies.
- Algae can be used in many different products, including biogas, liquid fuel, chemicals, food, animal feed and health and beauty products.
- The algae stock at Onsevig Climate Park can grow sixfold in four weeks. The residues from algae used in biogas production can be used as agricultural fertiliser.
FACTS
• In a number of towns in Skåne it is also possible for private motorists to fill their tank with biogas or fordonsgas (a mixture of biogas and natural gas). It is also possible to apply for a grant towards the purchase of green vehicles, just as in several towns it is free to park green vehicles.
• 10 kilos of organic refuse contains large quantities of energy. Converted into biogas it is sufficient for a journey of approximately 12 km in an ordinary passenger car.
In Skåne the buses run on food refuse and sludge

At first sight you cannot see any difference. The town buses in the two Skåne towns of Kristianstad and Eslöv look like all other buses: big, rectangular and with advertising hoardings along their sides. But appearances can be deceptive. Because, when the buses in these two Swedish towns, carry passengers across town, they are fuelled by biogas. Biogas, which is extracted from wastewater sludge and organic household and industrial refuse. In this way food refuse, deposited in rubbish bins by Skåne households, helps take the place of environmentally damaging fossil fuels.

And there is a great deal of common sense in this, explains Kristina Christensson. Kristina is the environmental director of the regional transport authority, Skånetrafiken, which is responsible for bus and train services. Biogas extracted from meatballs, mashed potato and other organic refuse has the great advantage that it is CO2-neutral, and in this way does not contribute to global warming.

The actual transformation of refuse into biogas is something for which the local public cleansing departments are responsible. They collect the refuse in the region and extract the biogas by means of a long sequence of biological processes. After that the gas is distributed to the town’s bus depot and can be pumped directly into the buses.

FOSSIL-FREE BY 2020

Over a number of years now Skånetrafiken has worked single-mindedly to reduce the company’s environmental impact. In fact one third of its energy use today is provided from sustainable energy. But the company has even greater ambitions.

“Our goal is that by 2020 Skånetrafiken will go over entirely to sustainable energy,” says Kristina Christensson.

In this process the remaining town buses stand next in turn. 92% of them are already running on a mixture of natural gas and biogas, in this way emitting 10% to 15% less CO2 than traditional diesel-driven buses. But in order to reach its target by 2020 all 325 town buses in Skåne will have to have been converted to biogas as early as 2015. Three years later the regional buses will fall in line with them.

The advantages are quite obvious, explains Kristina Christensson. Firstly, biogas is a green fuel. And secondly, the supply of refuse, from which the biogas is extracted, will never run out.

“Biogas is quite clearly the fuel we are going for. It has really good development opportunities in Skåne”.

SUSTAINABLE TRAINS

Only one publicly owned means of transport can today match the biogas buses in Kristianstad and Eslöv, and that is the train. A train journey in Skåne is the closest you can come to a completely climate-neutral means of transport, unless you choose to walk or go by bike. All of the local trains and the trains across Öresund run on 100% renewable energy, from water and wind power as well as biofuel.

But these impressive results do not mean that Skånetrafiken is resting on its laurels. There is still room for improvement.

“We have just purchased new trains for our local lines. Unlike the old trains, they can accumulate the energy generated when braking. This energy can then subsequently be used to propel the train forward again, and in this way further reduces energy use,” explains Kristina Christensson. She also mentions the fact that Skånetrafiken is working intensively to encourage more people to use public transport. Because the more people who take the train or the bus, the greater is the gain for the environment. A target has, therefore, been set for a rise in the number of passengers by 3% per annum.
Green Cities
– eco-friendly cooperation between local authorities

Organic food in city council institutions, eco-friendly decision-making in all municipal bodies and publicity campaigns about green living are just three of the steps Copenhagen has taken as a member of the Green Cities initiative.

Green Cities aims to inspire and promote progress to a sustainable society. Participating municipalities pledge to work proactively to improve their performance in ten areas: soil, groundwater, air, climate, nature, noise, chemicals, waste, planning and green awareness among citizens.

EXTERNAL CONTROL
Each municipality draws up action plans for the ten areas. The plans are designed to facilitate performance measuring and assessment, and an external auditor carries out an annual review to ensure effective compliance.

Municipalities that fail to follow their plans or set their sights too low can be asked to leave the initiative, says Hans Christian Christiansen, consultant to the City of Copenhagen and member of the Green Cities management group.

Green Cities was founded in 2000 after a group of far-sighted policymakers in the municipalities of Albertslund, Ballerup and Copenhagen decided to draw up standards that went beyond the statutory minimum. After sitting down together they agreed a set of basic requirements for environmental management systems.

ECOLOGY AND PUBLICITY
In addition to general targets such as ISO-based environmental management and a 25 percent cut in CO2 emissions between 2006 and 2015, Green Cities membership offers local people a range of benefits. For Copenhageners, it means that 90 percent of meals served at or by municipal institutions will be organic by 2015.

Copenhagen is also striving to spread awareness about the benefits of green living – an area where the city has made huge strides, Christiansen says.

“We’ve realised that the public really want to be involved,” he says. “Many people are very clear about the benefits of a good local environment and they’re willing to make a contribution, whether by buying more organic food or simply saving water.”

GROWING INTEREST
Despite the constant pressure on Green Cities members to perform, interest in the initiative continues to grow. The programme has expanded beyond the three founder members into a system linking eight municipalities. These include the City of Malmö, which joined in 2006 and like Copenhagen has environmental protection and sustainability high on its political agenda.

CLIMBING THE GREEN LADDER
Hans Christian Christiansen says the Green Cities initiative is already a success and is confident it will continue to gain ground.

“New members will join us and we’ll see Green Cities change and develop,” he says. “We’re not going to sit around waiting when we’ve met most of our targets for 2015 – we’re going to try and climb even further up the environmental ladder by being even more ambitious and devising new, tougher standards.”
Emissions of hazardous air pollutants to be reduced. Upper limits for NO₂ and particulates to be reached by 2015

Reduce households’ daily water consumption to a maximum of 100 litres per person by 2012

No use of pesticides on municipal land. Concerted efforts will be made to persuade citizens, businesses and farmers not to use pesticides either

Halt the decline in biodiversity by 2010. Increase the number of priority species by 2015

Reduce the number of homes suffering from excessive noise by 2015

Ensure that a minimum of 75 percent of municipal food consumption is organic by 2012.

Draw up shared environmentally sustainable guidelines for the building and construction sector

Environmental certification of municipal institutions and offices to be environmentally certified by 2015

Green Cities municipalities have agreed to achieve the following shared targets:
**FACTS**

- Sysav and Amagerforbrænding are municipally owned combined heat and power plants.
- Amagerforbrænding incinerates refuse produced by 500,000 citizens and 40,000 businesses.
- Sysav incinerates household refuse produced by 655,000 citizens. In addition, there is business refuse from a large number of businesses.
- Amagerforbrænding supplies electricity and heating to 240,000 households, equivalent to 10% of the use in Copenhagen.
- Sysav is responsible for approximately 60% of the provision of district heating in Malmö and Burlöv, equal to the use by 60,000 households.
- In 2008 Amagerforbrænding incinerated 435,000 tons of refuse. At Sysav, the figure was 440,600 tons.
- Amagerforbrænding’s energy production: Heat – 872,007 MWh, Electricity – 181,452 MWh.
- Sysav’s energy production: Heat – 1,200,000 MWh, Electricity – 180,000 MWh.
- Refuse statistics show that the amount of refuse in Sweden and Denmark is rising by a minimum of 1% to 1/2% per annum.
Refuse is converted into green energy

It does not matter how attractive and glittering goods appear on the shelves in the store. Sooner or later they lose their usefulness and become refuse, which has to be disposed of as soon as possible.

That fact is turned to good account at several of the Öresund Region’s combined heat and power plants, where the refuse is incinerated and converted into green electricity and heat. At Sysav in Malmö and Amagerforbrænding in Copenhagen they have actually become so clever at extracting energy from refuse that a sack of household refuse can provide the electricity and heat used in an apartment over a 3 to 4 hour period.

This means that some of the electricity and heat supplied to households in the Öresund Region may very well have been extracted from refuse from these selfsame households. In this way a direct link is made between the waste bin under the sink and the heat and electricity piped into dwellings.

Good deal

There are both environmental and financial advantages in incinerating refuse and making use of the energy produced. Traditional dumping of refuse at landfill sites releases large quantities of methane – a greenhouse gas approximately 20 times as harmful as CO2. If, on the other hand, the decision is made to use the refuse as a fuel in combined heat and power plants, the process suddenly becomes 80% CO2-neutral. Ultimately the refuse takes the place of other fossil fuels such as coal and oil, whereupon yet again there is a reduction in the emission of greenhouse gases and savings are made on the fuel budget. And it is no trifling saving. Roughly four tons of refuse contains approximately the same energy as a ton of oil. Incinerating refuse is, therefore, not just of benefit to the environment, but also a profitable business.

Refuse is a resource

At Sysav they incinerated 440,600 tons of refuse last year. This resulted in district heating production equal to the consumption by 60,000 households. At the same time they produced electricity on a scale able to power no fewer than 400,000 40 watt bulbs. Refuse has in this way been transformed into a resource – and, it should be noted, a resource which is not in short supply! Quite the reverse in fact; the amount of refuse is growing constantly in modern consumer society.

But even if the concept might sound simple, it makes great demands on the efficient collection of refuse. Since the early 1970s, when a start was made on extracting energy from refuse, the logistics have constantly been improved, and at the same time citizens have been required to sort their refuse. What is more, a well-developed district heating network has been established, which makes it possible to distribute the heat from the combined heat and power plant to consumers.

The refuse pyramid

Both Amagerforbrænding and Sysav also operate a number of recycling plants, where citizens can take their refuse. A large proportion of materials are recycled, which results in a considerable reduction in the use of natural resources. Only a few percent of the refuse left for recycling ends up being dumped on landfill sites. For this reason in the southern part of Skåne, where Sysav collect refuse, less than 10% of all refuse and only a couple of percent of household refuse ends up in landfill.

Despite the favourable results on both sides of the Öresund, energetic attempts are being made in political circles to do even better. In this regard people talk of the refuse pyramid, which consists of three levels. It is a question of: Reducing, Recycling and Utilising the refuse. The amount of refuse should be reduced by challenging the “use and throw away” mentality. It is, in other words, when we are buying our products in the store that we have the opportunity of influencing the amount of refuse. And then it is a question of recycling that part of the refuse which is of value. And the final stage in these endeavours is to turn the residual refuse to account – for example in combustion and the utilization of the energy produced.

Success with organic refuse

At both Sysav and Amagerforbrænding they also hope soon to be able to expand their activities, so that the energy in the organic refuse can be used in different areas. On Sysav’s part, they have definite plans for a plant to extract biogas and biofertiliser from food refuse in preference to incinerating it. At Amagerforbrænding, on the other hand, they have had success with a project which converts organic refuse into bioethanol. The results here look promising, in that the ethanol can be used as a fuel for cars and in this way takes the place of the fossil fuels with their consequent CO2 emissions.
The Öresund Committee is running a climate working group together with the climate controllers of the member organisations. Øresund Environment Academy is coordinating the project.

Editors: Elsebet Fristed and Eva Holmestig, The Öresund Committee, Jacob Juul, Øresund Environment Academy
Text: Frank Ulstrup
Translations in English: Phil Holmes and Greg McIvor
Graphic Design: Mikael Forth

November 2009.
Printed on eco-friendly paper