

LOW CARBON LEADER: CITIES OCT. 2005



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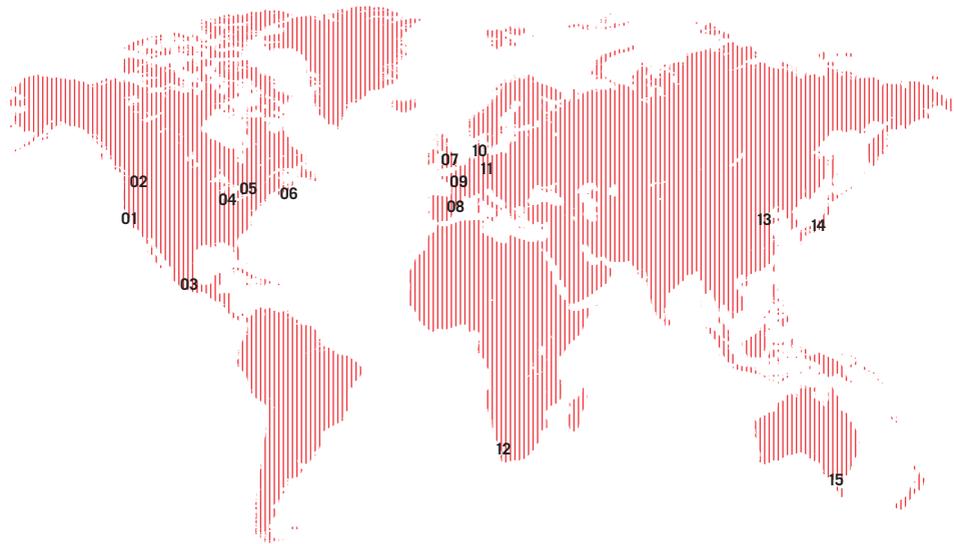
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MAYOR OF LONDON

The Mayor of London is taking decisive action on climate change. Through convening C20: The World Cities Leadership Summit in October 2005, London provides a crucial platform for global cities to exchange best practice. The aim of the conference is to stimulate new commitments from city governments to reduce their own CO₂ emissions, to develop procurement alliances to commercialise climate friendly technologies, and to foster an informal coalition among the largest world cities in partnership with national governments.



LOW CARBON LEADER: CITIES

- 01: SAN FRANCISCO
- 02: SEATTLE
- 03: MEXICO CITY
- 04: CHICAGO
- 05: TORONTO
- 06: NEW YORK CITY
- 07: LONDON
- 08: BARCELONA
- 09: PARIS
- 10: COPENHAGEN
- 11: BERLIN
- 12: CAPE TOWN
- 13: BEIJING
- 14: TOKYO
- 15: MELBOURNE

FOREWORD

Climate change is now the issue that no responsible political leader can ignore.

London, despite its wealth and prominence, will not be able to avoid the impacts of climatic change – some of which are already unavoidable. For example, while previous city administrations took important forward-looking decisions that have given London very high levels of protection against flooding, the potential for sea level rise as a result of climate change means that additional defences may be required to give future generations the same protection that we currently enjoy.

Moreover, as a major contributor to global pollution, London has a duty to the rest of the world to reduce its emissions. There is no reason why this should have a detrimental effect on the quality of life of our citizens. Indeed, many of the technologies that will reduce CO₂ emissions, also provide other benefits such as cutting emissions of the pollutants which damage air quality and cause widespread ill-health.

My approach is that London should lead the world in becoming a low-carbon city.

Large cities, especially major metropolitan hubs such as London are traditionally perceived as dirty, environmentally unfriendly and inefficient. However, given their density of infrastructure, and concentration of activity, large cities also have the potential to be extremely efficient. Though London consumes as much energy as Greece, 70% of its total energy use comes from buildings and appliances, and so action in this area can bring significant benefits. For this reason, the Greater London Authority has initiated large scale investments in energy efficiency and renewable energy procurement and generation which aim to make the city's building stock more efficient.

Moreover through the launch of the London Climate Change Agency, we have demonstrated our commitment to long term action on climate change. We aim to develop a large scale combined heat and power network in new build as well as in our own buildings, scaling up investments in the future to create a comprehensive model which other cities can follow. With the view that cities operate at a scale where it is possible to affect significant change through procurement practices, London is also working to capitalise new energy markets. The Climate Change Agency hopes to encourage the uptake of renewables, reducing emissions while creating markets and jobs which further contribute to the growth and prosperity of the city.

London's most significant large scale success in emissions reduction to date has been its congestion charge. Implemented after witnessing the success of road pricing schemes in both Trondheim and Singapore, our scheme is now the largest charging mechanism of its kind in the world. Since its introduction in 2003, there has been a 19% reduction in CO₂ emissions within the zone and traffic and congestion have been dramatically reduced. The congestion charge illustrates that it is possible for large cities such as London to learn from smaller areas and to encourage a modal shift to public transport.

The cities of the world need to address climate change: the impetus to do so is strong and the potential to affect large scale positive change is high. London is gaining a reputation for implementing decisive and often pioneering measures, and by 2000 had reduced its municipal emissions by 7% on 1990 levels. This leadership is essential, and London intends to show the world what can be achieved by taking on this role. The Cities Climate Summit on October 4-6th, 2005 will bring global cities together to share best practice on how to address the issue. It may not affect us all in the same way, but climate change will leave no city unaffected, and we must collaborate to meet the challenge.

KEN LIVINGSTONE, MAYOR OF LONDON

CITY	TARGETS	REDUCTIONS/ACHIEVEMENTS	BENEFITS
01 SAN FRANCISCO, USA	<ul style="list-style-type: none"> – Reduce GHG emissions 20% below 1990 levels by 2012 – Convert to zero-emission bus fleet by 2020 – Obtain 50MW of city-wide electricity from renewable sources by 2012, and 250MW of city-wide power from gas and gas-electric co-generation by 2008 	<ul style="list-style-type: none"> – Reduced electricity demand by 22 million kWh per year through completed energy efficiency improvements – Installed largest city-owned solar power system in the US – Voter-approved US\$100 million solar bond initiative in 2001 	<ul style="list-style-type: none"> – Annual energy cost saving of US\$2.2 million through city-facility energy efficiency projects
02 SEATTLE, USA	<ul style="list-style-type: none"> – 7% reduction in GHG emissions on 1990 levels by 2010 – Generation of 10MW of energy efficiency measures by 2010 – Seattle City Light first major utility in the US to produce zero net emissions by 2005 	<ul style="list-style-type: none"> – By 2000, the city had reduced emissions from its operations 48% on 1990 levels 	<ul style="list-style-type: none"> – Energy efficiency programmes have saved city rate-payers tens of millions of dollars
03 MEXICO CITY, MEXICO	<ul style="list-style-type: none"> – Lower growth of GHG emissions – Replace 80,000 of the city's taxis with lower emission vehicles by 2006 – Improve water and energy efficiency of 75,000 social housing units – Through the Chicago Climate Exchange, committed to 4% reduction in emissions by 2006, on an average 1998-2001 baseline 	<ul style="list-style-type: none"> – Identified 85 emission reduction actions to be implemented 2002-2010 	<ul style="list-style-type: none"> – Not documented
04 CHICAGO, USA	<ul style="list-style-type: none"> – Reduce emissions 4% from a baseline of average 1998-2001 emissions by 2006 – By 2010 provide 1.7 billion kWh of electricity through demand side management; 1.3 billion kWh from distributed generation; 1.5 billion kwh from cogeneration; and at least 1.5 billion from renewable energy 	<ul style="list-style-type: none"> – Purchased 10% of energy used in its facilities from renewable sources since 2001 	<ul style="list-style-type: none"> – Potential savings of US\$6 million per year through energy savings in City facilities and smart power purchasing – The Chicago Green Bungalow program has modelled green retrofitting techniques that result in energy savings from US\$575-US\$1,050 per year
05 TORONTO, CANADA	<ul style="list-style-type: none"> – 20% GHG reduction by 2005 on 1990 levels – 15% reduction in energy use in city facilities – Purchasing 25% green power by 2005 – Divert 60% of waste from landfill by 2006 – Retrofit 40% of the Institutional, Commercial and Industrial (ICI) floor space across the city by 2010 to reduce 3 million tonnes CO₂ annually 	<ul style="list-style-type: none"> – 42% reduction in GHG emissions in corporate facilities from 1990-98 – Commissioned North America's first urban wind turbine – Developed a deep lake water cooling project to air-condition downtown buildings 	<ul style="list-style-type: none"> – US\$16-25 million in cumulative revenue estimated from landfill methane capture – US\$15 million saved through work of Toronto Atmospheric Fund – The Better Buildings Partnership facilitated retrofits in 467 privately owned buildings, saving a total of US\$102 million in energy costs
06 NEW YORK CITY, USA	<ul style="list-style-type: none"> – Reduce CO₂ levels 20% below a 1995 baseline by 2010 – Expand CNG bus operations, hybrid bus programs and the use of clean diesel technologies 	<ul style="list-style-type: none"> – By the end of 2005 there will be 481 CNG buses and 325 hybrid electric buses in operation in New York City 	<ul style="list-style-type: none"> – Between 1997-2003, 164 energy efficiency projects were completed with annual energy savings totalling US\$14 million
07 LONDON, ENGLAND	<ul style="list-style-type: none"> – Reduce CO₂ emissions 20% by 2010 on 1990 levels – Reduce municipal CO₂ emissions 60% by 2050 on 2000 levels – Establish one zero-carbon development in every London borough by 2010 	<ul style="list-style-type: none"> – 7% reduction in CO₂ emissions between 1990-2000 – 19% reduction in traffic CO₂ emissions within the congestion zone by 2004 on 2003 levels 	<ul style="list-style-type: none"> – Not documented
08 BARCELONA, SPAIN	<ul style="list-style-type: none"> – 60% of new buildings and retrofits to use solar-powered hot water supplies – Reduce energy consumption 17% between 2002-2012 – Reduce GHG emissions 20% between 2002-2012 	<ul style="list-style-type: none"> – Applications for over 24,531m² of solar collectors processed between 2000-04 	<ul style="list-style-type: none"> – Between August 2000 and December 2004, the Solar Ordinance saved €1.08 million
09 PARIS, FRANCE	<ul style="list-style-type: none"> – Reduce car traffic within central Paris by 5% by 2001 on 1996 levels – Reduce number of private car journeys contained within the outer ring of suburbs 85% on by 2001 on 1996 levels 	<ul style="list-style-type: none"> – 31% increase in cyclists in Paris in 2004 compared to 2003 – By 2004, energy consumption in city facilities decreased 45% on 1985 levels 	<ul style="list-style-type: none"> – Not documented
10 COPENHAGEN, DENMARK	<ul style="list-style-type: none"> – Reduce CO₂ emissions by 30% by 2005 on 1990 levels – Reduce CO₂ emissions from transport 5% by 2010 on 1995 levels – Increase proportion of people cycling to work by 6% between 2000-2012 	<ul style="list-style-type: none"> – 23% reduction in CO₂ emissions between 1990-2000 – Reduced methane emissions from waste 8% between 1990-95 	<ul style="list-style-type: none"> – Not documented
11 BERLIN, GERMANY	<ul style="list-style-type: none"> – Reduce GHG emissions 25% by 2010 on 1990 levels – Reduce energy use in public buildings by 30% by 2010 – 75% of all new buildings constructed each year are to include solar thermal technologies in their design 	<ul style="list-style-type: none"> – 13.8% reduction in GHG emissions between 1990-2002 – Annual production of more than 5MW of solar power in Berlin 	<ul style="list-style-type: none"> – Energy efficiency programs have resulted in relief for the municipal budget of almost €2 million per year
12 CAPE TOWN, SOUTH AFRICA	<ul style="list-style-type: none"> – Reduce local authority electricity use 5% by 2010 – Reduce CO₂ emissions 10% by 2010 – Reduce private vehicle trips to city centre 10% by 2010 – 80% of energy from renewables and natural gas by 2050 – Install Compact Fluorescent Lighting in 90% of households by 2010 	<ul style="list-style-type: none"> – Cleaner, safer, more reliable energy for low-income households 	<ul style="list-style-type: none"> – Not documented
13 BEIJING, CHINA	<ul style="list-style-type: none"> – 80% of total energy mix in 2008 should be 'clean and efficient' – Reduce total coal consumption in the city to less than 15.2 million tonnes by 2007, from over 26.4 million tonnes in 2001 – Increase use of solar, geothermal and wind energy 	<ul style="list-style-type: none"> – Beijing rail transportation coverage increased by 59.5km between 2000-04 	<ul style="list-style-type: none"> – Not documented
14 TOKYO, JAPAN	<ul style="list-style-type: none"> – Reduce GHG emissions 6% below 1992 levels by 2010 	<ul style="list-style-type: none"> – District heating and cooling installations operational in 74 of Tokyo's districts by 2001 	<ul style="list-style-type: none"> – Not documented
15 MELBOURNE, AUSTRALIA	<ul style="list-style-type: none"> – 30% reduction in corporate and 20% reduction in community GHG emissions by 2010 on 1996 levels – Increase renewable energy use in the community by 22% and in the city corporation by 50% on 1996 levels by 2010 – Zero net emissions by 2020 	<ul style="list-style-type: none"> – 15% reduction in corporate GHG emissions between 1996-2003 – 16% reduction in community GHG emissions between 1996-2002 – Sourcing 30% of corporate energy from renewables 	<ul style="list-style-type: none"> – Not documented



01: SAN FRANCISCO
 SAN FRANCISCO'S PREMIER CONFERENCE FACILITY, THE MOSCONE CENTER IS ALSO HOME TO A 765KW SOLAR PV SYSTEM, THE LARGEST CITY-OWNED SOLAR INSTALLATION IN THE US.

01: SAN FRANCISCO

POPULATION: 794,000 (2004)

CARBON FOOTPRINT: 9.7 MILLION TONNES CO₂e (2004)

The City and County of San Francisco is the fourth-largest city in the state of California, and its only consolidated city-county. San Francisco's comprehensive Climate Action Plan aims to reduce city-wide GHG emissions 20% below 1990 levels by 2012. The plan focuses on improvements in transportation, energy efficiency, renewable energy and solid waste.

In 2001, San Francisco voters approved a US\$100 million bond initiative to fund solar and other renewable power sources for public buildings. In 2004, San Francisco's Public Utilities Commission (SFPUC) completed the largest city-owned solar power system in the US, which rests atop Moscone Center, San Francisco's premier conference facility. The 765kW solar PV system along with energy efficiency measures at the Center saves 4 million kWh of electricity and US\$305,000 in energy costs annually. By the end of 2006 more than ten new solar systems will be installed at city-owned buildings. Local businesses and homes also receive solar system installations through a partnership between the SFPUC and San Francisco's Department of the Environment.

San Francisco's energy efficiency programs include a Peak Energy Program to reduce electricity demand by 16MW by 2004, and 55MW by 2008. A Green Building Ordinance requires LEED 'silver' certification in City construction projects over 5,000 square feet. The installation of efficient LED traffic signals is expected to cut 7.7 million kWh and save the city an additional US\$1.2 million per year in electricity costs.

“OUR ACTIONS CAN BE AN EXAMPLE TO OTHERS — IT IS UP TO MUNICIPAL GOVERNMENTS TO TAKE OWNERSHIP OF THIS CRITICAL ISSUE”

MAYOR GAVIN NEWSOM, SAN FRANCISCO

With a history of extensive waste reduction, recycling and reuse programs, in 2003 San Francisco's Board of Supervisors adopted a goal to divert 75% of waste from city landfills by 2010, and achieving zero waste by 2020. By 2004 the City had already achieved a waste diversion rate of 63%.

San Francisco is an established leader in low emission vehicles with more than 700 clean air vehicles currently in its fleet (compressed natural gas, hybrid, electric, biofuel and propane). More than half of the Municipal Railway (Muni) fleet is comprised of zero-emission vehicles, and Zero Emissions 2020 calls for Muni to establish an all-electric drive fleet by 2020.

02: SEATTLE

POPULATION: 572,600 (2004)

CARBON FOOTPRINT: 554,000 TONNES CO₂e (2004)

Located in Washington State on Puget Sound, Seattle is the commercial, cultural and advanced technology hub of the US Pacific Northwest and has demonstrated its commitment to climate change through a variety of measures.

In 2001, Seattle adopted Resolution 30359, a measure formalizing the commitment of Seattle's public utility, City Light, to become the first major US utility to achieve zero net GHG emissions. Part of this commitment involves an investment in 100MW of non-hydro renewable energy such as wind power over the next decade, which will diversify Seattle's resource portfolio and protect the City against the volatility of the wholesale electricity market.

Seattle inventoried its GHG emissions in 2002 and one of its major findings was that without the City's recycling and energy conservation programs, its emissions in 2000 would have been more than twice as large as they were. In 2002 the City adopted a further resolution adopting a city-wide goal to achieve a minimum 7% reduction in GHG emissions by 2010.

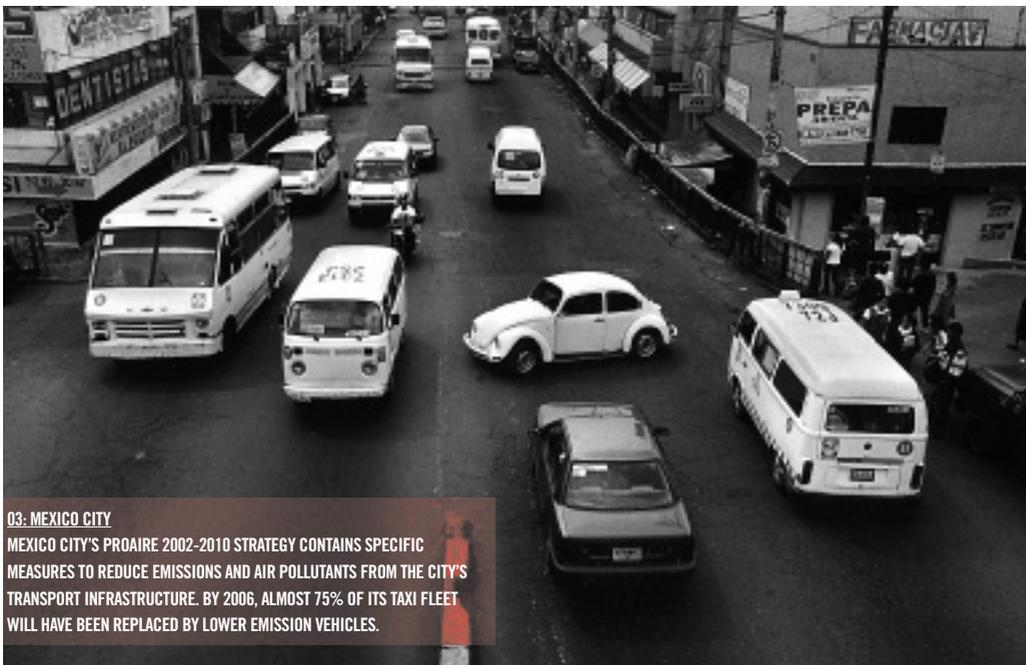
To help achieve its city-wide goal, Seattle has partnered with local businesses and institutions to improve energy and resource efficiency and reduce emissions through Climate Wise Partners. Over 30 local businesses participate, including Starbucks, and have committed to tracking and reducing emissions. Businesses such as Shaklee, Interface and others are now selling services or products that are Carbon Neutral and are taking advantage of the GHG free electricity that Seattle provides.

Seattle's public utility, with researchers from the University of Washington, is analyzing measures to incorporate climate change information into Seattle's long-range water supply planning. This study will use state-of-the-art modelling to determine potential impacts of climate change on the snowpack and streamflows, specifically in Seattle's Tolt and Cedar River watersheds.

“THE REALITY OF GLOBAL CLIMATE CHANGE IS URGENT; THE STAKES ARE HIGH — LOCALLY AND GLOBALLY — AND WE NEED TO ACT”

MAYOR GREG NICKELS, SEATTLE

Additional measures implemented by Seattle to reduce GHG emissions include; improving energy efficiency; substituting waste material for raw material in industrial processes to reduce energy use; preserving forests or planting trees which absorb CO₂; implementing transportation programs that reduce vehicle trips; and building facilities that can use waste heat for power generation.



03: MEXICO CITY
MEXICO CITY'S PROAIRE 2002-2010 STRATEGY CONTAINS SPECIFIC MEASURES TO REDUCE EMISSIONS AND AIR POLLUTANTS FROM THE CITY'S TRANSPORT INFRASTRUCTURE. BY 2006, ALMOST 75% OF ITS TAXI FLEET WILL HAVE BEEN REPLACED BY LOWER EMISSION VEHICLES.

03: MEXICO CITY

POPULATION: 8.2 MILLION (2004)
CARBON FOOTPRINT: 33.5 MILLION TONNES CO₂e (2004)

Mexico City is one of the largest metropolitan regions in the world. Famous for its air pollution problems, the area encompassed by the city and the metropolitan region also contributes significantly to GHG emissions, accounting for 20% of the country's total emissions and 2.1% of Latin America as a whole. CO₂ emissions alone are expected to reach 66 million tonnes by 2012. Due to rapid growth it is difficult for Mexico City to establish an emissions reduction target, therefore the city's objective is to limit emissions growth, rather than reduce emissions absolutely.

FACT: BETWEEN 2001 AND 2006 MEXICO CITY'S MUNICIPAL GOVERNMENT PLANS TO REPLACE 80,000 OF THE CITY'S OLDEST TAXIS WITH NEW LOWER EMISSION VEHICLES

Proaire 2002-2010 is a strategy which integrates air quality and climate protection in Mexico City. The 85 actions outlined for its first phase are designed to cut emissions of air pollutants such as nitrous and sulphur oxides, as well as GHGs over the eight year period. They include energy efficiency improvements, protection of forests and green spaces, and public transportation enhancements.

In 2000, transport emissions contributed 37% of emissions within the federal district of Mexico City, making this sector the primary source. As the largest source of air pollutants as well, many of the Proaire measures focus on transportation.

The municipal government plans to replace 80,000 of Mexico City's oldest 109,400 functioning taxis between 2001 and 2006. By paying US\$1,300 towards each old vehicle with the owner paying the price difference for a new lower emissions vehicle, it is estimated that daily emissions from taxis will be reduced by 31%. Working with EMBARQ, the World Resources Institute Centre for Transport and Environment, Mexico City is developing dedicated traffic lanes to run fuel-efficient, high-capacity buses to cut emissions and congestion. The first Bus Rapid Transit Corridor on Avenida Insurgentes, the city's major north-south thoroughfare, opened in June 2005. It will carry an estimated 250,000 passengers per day.

Proaire also targets improving the efficiency of low income housing. Water and energy efficiency systems will be installed into 30,000 new social housing units and retrofitted into 45,000 existing units over a three year period. Systems include compact fluorescent bulbs, low-flow showerheads, and tap aerators. The estimated annual emissions reduction from these changes is 31,000 tonnes CO₂. Over a five year period, solar-powered heating systems will be installed in 50,000 new social housing units.

Internationally, Mexico City also participated in the design phase of the Chicago Climate Exchange (CCX), a reduction and trading pilot programme for emission sources and offset projects in the United States, Canada, and Mexico.

04: CHICAGO

POPULATION: 2.9 MILLION (2004)
CARBON FOOTPRINT: 28.4 MILLION TONNES CO₂e (2004)

Chicago, the Windy City, is the third largest city in the US. In 2001, the city was the first municipality to join the Chicago Climate Exchange (CCX), and like all Exchange members pledged to reduce its emissions 4% below the average emissions from the years 1998-2001.

“THE DAY IS LONG PAST WHEN GOVERNMENT STOOD ON ONE SIDE OF ENVIRONMENTAL ISSUES AND PRIVATE ENTERPRISE ON THE OTHER – NOW WE UNDERSTAND THAT WE SHARE COMMON INTERESTS” MAYOR RICHARD M. DALEY, CHICAGO

Adopted in 2001, Chicago's energy plan aims to make the city a green technology leader and to provide 1.7 billion kWh of electricity through demand side management by 2010. By retrofitting 15 million square feet of government facilities the City estimates it could achieve energy use cuts of 30% and savings of US\$6 million annually in operating costs.

A Community Energy Cooperative supported by city funds offers members in three pilot neighbourhoods free and discounted energy efficient products. The project also replaces old heaters with energy efficient ones, the new heaters can reduce heating bills by as much as 40%.

To guide the design, construction, renovation, operation and maintenance of municipal facilities, The City has adopted The Chicago Standard, which is based on aspects of the LEED Green Building Rating System that are appropriate for Chicago. Implementation of the standard will save 15-20% of energy costs annually.

Summers in Chicago are known for heat waves. Studies show that dark roofs and pavement surfaces absorb heat from the sun making the city and the inside of buildings hotter, and hot days lead to higher energy use for cooling. To offset this 'urban heat island effect' Chicago has established an Energy Conservation Code which sets standards to limit the amount of solar energy absorbed by building roofs. The new roofs keep buildings cooler thus reducing the energy demand from fans and air conditioners.

There are approximately 2,800 intersections in Chicago and 350 have already been retrofitted with LED traffic signals which use 85% less energy, reduce operating and maintenance expenses, and enhance safety through better visibility. The City will save approximately US\$2.5 million annually by retrofitting all intersections. Currently this program decreases CO₂ emissions by 7,250 tonnes annually, equivalent to taking 1,600 cars off the road.

05: TORONTO

POPULATION: 2.5 MILLION (2004)
CARBON FOOTPRINT: 40.2 MILLION TONNES CO₂e (2004)

Located on the northwest shore of Lake Ontario, Toronto is Canada's largest city. Toronto was one of the first municipal governments in the world to set a GHG emissions target, pledging in 1990 to reduce its city-wide emissions 20% by 2005. In 2003, Toronto had far exceeded this goal in its own corporate facilities and operations, reducing emissions 42% below 1990 levels.

The majority of this reduction came through waste management improvements. In 1990, 72% of Toronto's emissions came from waste methane escaping from landfills and the garbage collection system. To address this, Toronto installed piping into three of its largest landfills, collecting methane and routing it to power plants, where it was burned to create electricity. These plants produce about 44MW of electricity, enough to meet the power needs of 34,000 typical residences. Landfill gas electricity projects have provided the city with annual royalties in excess of US\$2 million.

To address other GHG emissions, Toronto City Council established the Toronto Atmospheric Fund endowing the organization with US\$19 million. This endowment has financed a variety of emission reducing projects including: safer and more energy-efficient street lighting; energy efficiency upgrades for city buildings, schools and homes; public transportation for underserved areas; and clean technology demonstrations such as solar cells, wind turbines and hybrid electric vehicles.

Toronto's Better Buildings Program has significantly reduced CO₂ emissions throughout the city's buildings, through retrofitting and undertaking energy efficiency projects.

In 2004, alongside Toronto's announcement of a US\$29 million plan to reduce emissions 60% below 1990 levels by 2010, a US\$5.3 million appliance renewal plan for Toronto Community Housing Corporation was established to replace appliances with new cost-saving, energy efficient ones. Up to 50% of electricity use by refrigerators will be cut in social housing units.

In 2005, Toronto launched a number of transport initiatives, including the Employee Trip Reduction program, promoting alternative modes of transport for commuters and the Toronto Transit Commission's (TTC) VIP Metropass Program which allows city employees to purchase discounted transferable monthly passes. The TTC will receive 150 diesel electric hybrid low floor buses from 2006.

WHY CITIES MATTER

CLIMATE CHANGE:

The majority of the world's people live in cities. With modern urban lifestyles, city dwellers use vast quantities of energy, that is mostly derived from fossil fuels. This same energy, that provides heat and electricity and powers vehicles, is also responsible for the emissions that cause global warming. Cities also contribute to GHG emissions from waste management practices and clearing forests and vegetation for urban expansion. All this adds up to climate change being inextricably linked to the increasing demand for energy and transport that flows from growing urban populations.

Although cities are in the background of the international debate, city governments in fact have significant influence. The facilities cities operate and the land use and other decisions they make have substantial impact on present and future levels of energy consumed, fuel used and waste generated in the communities they serve. Cities can lead by example making their policies a model for energy sustainability. As political leaders, city governments can be advocates for effective action on national and international levels.

City governments have a critical role to play because they:

- own buildings and facilities such as sports stadiums, streetlighting, and waste treatment plants, which directly consume large quantities of energy
- manage landfills and waste treatment – major sources of methane
- have significant purchasing power, thus can influence markets for vehicles, equipment and technologies
- set local land use policies, determining where development is located and the mix of uses allowed
- operate public transit and transportation infrastructure
- can enact building codes, determining the energy efficiency of local building stock
- regulate automobile parking, traffic flow and roadways
- may own or control the local energy utility

Retrofitting municipal buildings and other public facilities such as hospitals, schools and community centers to improve energy efficiency can potentially save a city millions of dollars. These savings can be used for other important services and programs. GHG emissions reduction has additional benefits: preserving open space, reducing traffic congestion and cleaning up the environment improves the quality of life for all residents.

**PERCENTAGE OF THE WORLD'S
POPULATION LIVING IN CITIES
IN 2005:**

50

**PERCENTAGE OF THE WORLD'S
ENERGY USE ACCOUNTED FOR
BY CITIES IN 2005:**

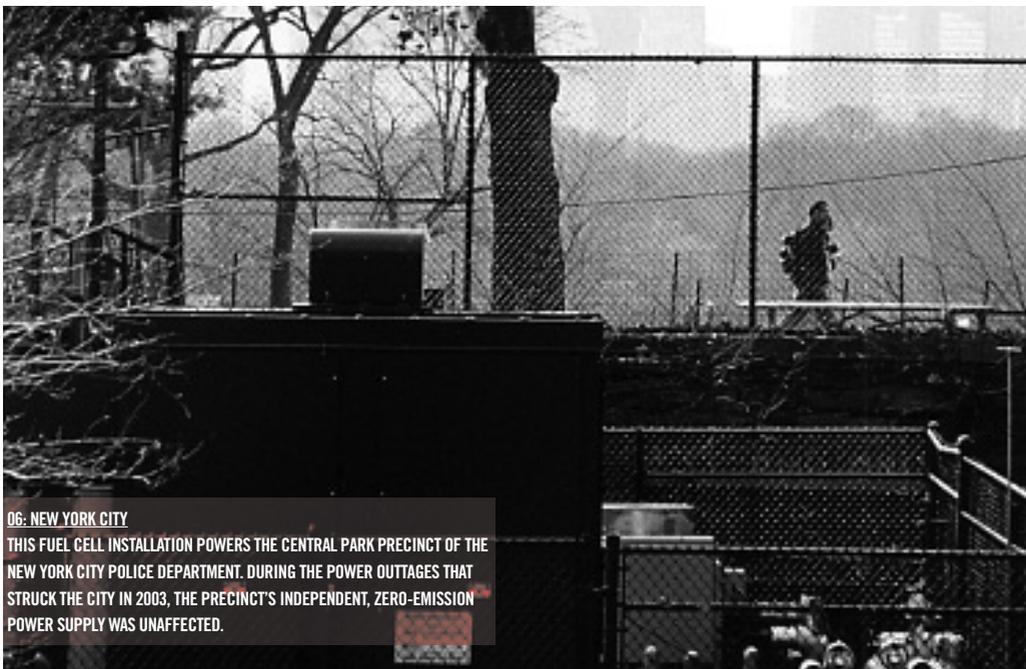
75

**PERCENTAGE OF THE WORLD'S
POPULATION THAT WILL LIVE
IN CITIES IN 2030:**

60

A number of efforts exist to help cities take action: Climate Alliance is a European based organization that motivates local governments to become proactive by twinning developed country cities with counterparts in rainforest areas to halt deforestation. ICLEI's Cities for Climate Protection (CCP) campaign assists cities reduce emissions of CO₂, other GHGs and air pollutants. Its mission is to support a worldwide movement of local authorities whose actions achieve measurable reductions in emissions. CCP offers a framework for local governments to develop a broad agenda on climate change, and provides the analytical methods to help set reduction targets and develop a climate action plan. Over 550 municipalities worldwide participate in the CCP. Kyoto USA is a grassroots effort to get US cities to adopt the Kyoto Protocol. In a parallel effort Seattle Mayor Greg Nickels organized the US Conference of Mayors to unanimously pass the Mayors Climate Protection Agreement that calls on cities to meet or beat Kyoto Protocol targets within their own communities.

Implementing effective and environmentally sustainable energy management is beneficial to the health and economic vibrancy of cities. From the operation of water and sewage infrastructure, to the construction and maintenance of road and transit systems, to the planning processes that determine development and settlement patterns, city governments already play a large, yet unappreciated, role in determining energy use and global GHG emissions. Cities that prioritize clean energy, efficient infrastructure, and effective transportation are putting into place the long term practices needed to resolve the threat to our global climate.



06: NEW YORK CITY
THIS FUEL CELL INSTALLATION POWERS THE CENTRAL PARK PRECINCT OF THE NEW YORK CITY POLICE DEPARTMENT. DURING THE POWER OUTAGES THAT STRUCK THE CITY IN 2003, THE PRECINCT'S INDEPENDENT, ZERO-EMISSION POWER SUPPLY WAS UNAFFECTED.

06: NEW YORK CITY

POPULATION: 8.1 MILLION (2004)

CARBON FOOTPRINT: 72 MILLION TONNES CO₂e (2004)

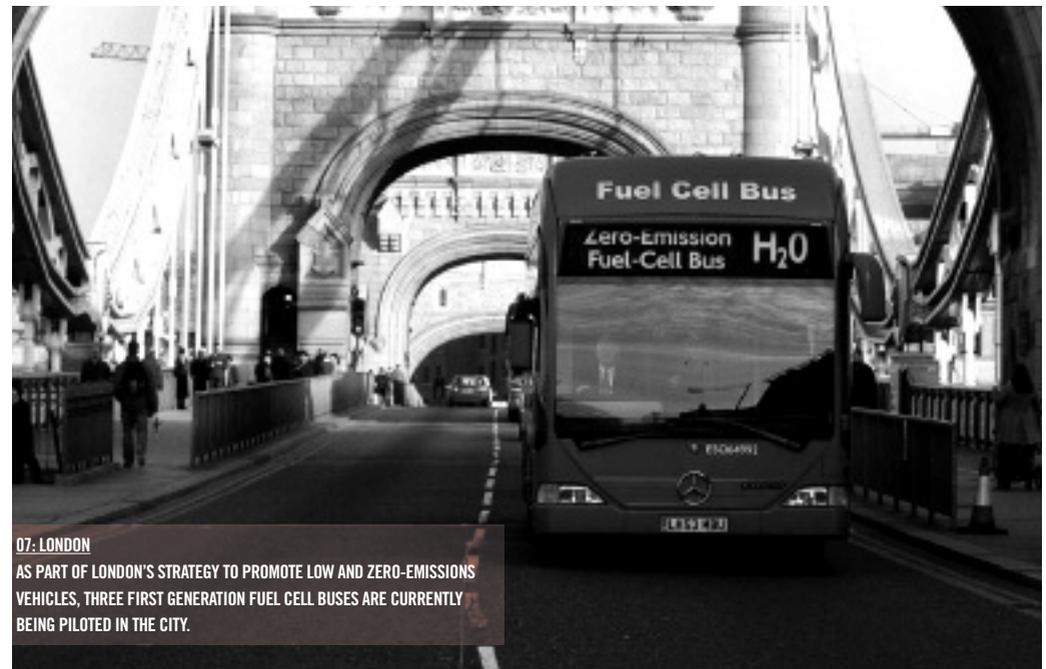
New York City (NYC) is the most populous city in the United States, and is an internationally significant centre of finance, politics, communications and culture. As a bustling metropolis, the city is not perceived as the most 'green space', however the NYC Government is extremely proactive on climate change mitigation, particularly in the areas of energy efficiency, sustainable architecture and transportation.

Since 1997, NYC agencies have undertaken energy efficiency capital projects through the Energy Cost Reduction program, an initiative by NYC and the New York Power Authority. Projects included new high efficiency lighting in 150 City public schools that cut energy costs US\$7 million annually. Energy efficient chillers were installed at the Brooklyn Municipal Building, resulting in savings of US\$153,000 per year.

As of 2000, the New York State Green Building Tax Credit grants a 5-8% tax credit on sustainable buildings of over 1,900m². It is intended to encourage building owners and developers to design, construct and operate energy efficient buildings utilizing recycled materials and incorporating renewable and energy efficient power generation. Prominent buildings within the city, including 4 Times Square and the Solaire building in Battery Park have capitalized on this incentive, becoming milestones in sustainable architecture. Additional incentives include; a 30% tax credit on fuel cell installations; a 100% tax credit on the marginal costs of integrating photovoltaics in the building design and; a 15 year real property tax exemption for installation of solar and wind energy systems.

FACT: BETWEEN 1997 AND 2003, 164 ENERGY EFFICIENCY PROJECTS WERE COMPLETED IN NEW YORK CITY WITH ANNUAL ENERGY SAVINGS TOTTALLING US\$14 MILLION

In 2001, New York State Governor George E. Pataki issued Executive Order 111, Green and Clean State Buildings and Vehicles. Since then, the City's Clean Fuel Bus Program has received more than US\$300 million from state funds, with the following results: NYC transit repowered 642 buses with 94% cleaner, new diesel engines and now operates more than 400 CNG buses (with 481 expected to be in service by the end of 2005), and 180 hybrid-electric buses (with 325 planned by the end of 2005). NYC Transit fleets also operate with regenerative braking, utilizing the energy that would normally be lost through heat.



07: LONDON
AS PART OF LONDON'S STRATEGY TO PROMOTE LOW AND ZERO-EMISSIONS VEHICLES, THREE FIRST GENERATION FUEL CELL BUSES ARE CURRENTLY BEING PILOTTED IN THE CITY.

07: LONDON

POPULATION: 7.4 MILLION (2004)

CARBON FOOTPRINT: 41.9 MILLION TONNES CO₂e (2004)

Sustainable development is a principle purpose of the Greater London Authority (GLA) Act and the Mayor, Ken Livingstone intends to make London an exemplary, sustainable world city.

Introduced in 2003, London's congestion charge encourages travellers to use public/non-motorised transport or cleaner vehicles. Money raised by charging drivers to enter the zone (currently £8 a day up from £5 in the programme's first year) is invested in public transport. Together with a 40% increase in bus usage since 2000, the congestion charge has underpinned an unprecedented modal shift from car to public transport. The congestion charge is estimated to have reduced traffic-related CO₂ emissions within the zone by 19%.

London is also testing first generation zero-emission fuel cell buses. Three buses are running between Covent Garden and Tower Gateway until December 2005. As conventional diesel buses already operate on this route, vehicle performance can be accurately compared. The Mayor plans to make Greater London a Low Emissions zone through introducing fines for polluting trucks, coaches, buses and taxis from 2008.

The Mayor's Energy Strategy, published in 2004, sets a range of targets including introducing renewable energy schemes by 2010. A London Energy Partnership was established to bring together key stakeholders, and a London Hydrogen Partnership has also been set up to promote the development of the hydrogen economy in London.

Confirming its long-term commitment to addressing climate change, the GLA launched the London Climate Change Agency in June 2005. The Agency will enter into joint public – private ventures to develop, finance and operate sustainable energy services. These will encourage energy efficiency and greater use of combined heat, power, cooling and renewable energy. Its main aim is to reduce emissions from both new and existing buildings, especially GLA properties, as 70% of CO₂ emissions in London come from powering buildings.

08: BARCELONA

POPULATION: 1.4 MILLION (2004)

CARBON FOOTPRINT: 4.8 MILLION TONNES CO₂e (2004)

Barcelona is Spain's second largest city and as it is blessed with over 2,400 hours of sunshine every year, one of its first commitments was to reduce GHG emissions through energy efficiency and the use of solar energy.

In August 2000, Barcelona's Solar Ordinance came into force. It obliges the use of solar energy for hot tap-water consumption in 60% of all new and refurbished residential buildings. Failure to comply with the ordinance can result in fines as high as €60,000. Since the ordinance was passed, applications for 327 new building projects have been processed, covering 24,531m² of solar collector surface area, saving the equivalent of 3,451 tonnes of CO₂ emissions.

The city also has a plan to reduce city energy consumption 17% between 2002 and 2012 and reduce GHG emissions by 20%. The plan's 55 projects include – improving window frames, insulation and boilers; and energy efficient lighting in municipal buildings; replacing mercury vapour street lighting with high-pressure sodium lamps, and incandescent bulb traffic lights with LEDs. Combined heat and power (CHP) facilities are to be installed in sports centres and commercial buildings of over 3,500m², large hotels and clinics, and office blocks of over 4,000m².

09: PARIS

POPULATION: 2.2 MILLION (2004)

CARBON FOOTPRINT: 13 MILLION TONNES CO₂e (2004)

Although France has relatively minimal per capita emissions due to its heavy reliance on nuclear power, Paris as the nation's capital has still adopted a number of measures designed to minimize its climate impact.

In 2003, Paris initiated the Bilan Carbone, an emissions inventory designed to evaluate potential measures to cut emissions. Initially carried out in seven municipal buildings, the study highlighted the large share of emissions generated by heating. Air-conditioning and single-occupancy vehicles were also shown as significant sources of emissions. By the end of 2005, the assessment will be extended, and by 2006 an estimate of the whole of the capital's emissions should be available.

Paris has engaged in a program to cut energy consumption in the city, which includes over 2,000 schools, nurseries, swimming pools, museums and municipal buildings. While the number of city owned facilities has risen by 15% since 1985, energy consumption has decreased 45% by modernising installations. The city is currently designing a lighting system that will decrease night lighting from 5,040kWh to 4,440kWh. The new system will lead to savings of up to 95,000kWh annually, equivalent to the lighting requirements of 10,000 inhabitants.

FACT:
BETWEEN 1985 AND 2004, ENERGY CONSUMPTION IN PARIS' CITY OWNED FACILITIES DECREASED 45%, THOUGH THE NUMBER OF FACILITIES INCREASED 15%

Paris has been most proactive in the area of transportation. In December 1996 a law was passed by Ile-de-France (regional government) that obliged areas with more than 100,000 inhabitants to develop an Urban Transport Plan. Plan de Déplacements Urbains de la Région Ile-de-France issued general guidelines including: reducing motor traffic; developing public transport systems; improving road networks; promoting public transport and car share schemes. Within Paris new bus routes were introduced between 2001 and 2003 and extensions of the metro and tramways to the north of the city are to be completed in 2006. The Deputy Mayor of Paris, Dennis Baupin is also planning to introduce a ban on Sports Utility Vehicles in the city centre which is due to be implemented in 2005.

10: COPENHAGEN

POPULATION: 502,000 (2004)

CARBON FOOTPRINT: 2.5 MILLION TONNES CO₂ (2000)

Copenhagen is Denmark's capital and largest city. Denmark is the world's leader in wind energy, and Copenhagen is often called "The Environmental Capital of Europe" due to its early action on reducing GHG emissions in the building, transport and waste management sectors.

"IN COPENHAGEN WE GO ON IMPLEMENTING MEASURES AND INITIATIVES TO ENSURE A CONTINUAL REDUCTION OF CO₂ EMISSIONS"

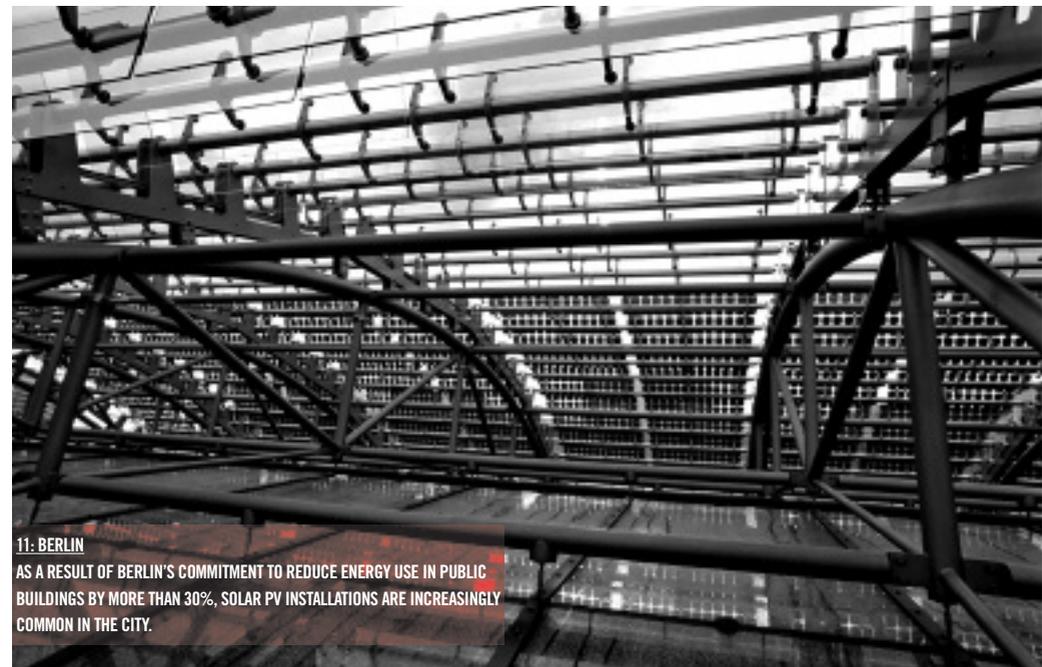
BO ASMUS KJELDGAARD, MAYOR OF ENERGY, WATER AND ENVIRONMENT (1998-2001), COPENHAGEN

Middelgrunden Wind Turbine Co-Operative located two kilometres outside Copenhagen Harbour; a joint project between Copenhagen Energy and a Co-Operative of owners, was the first wind power initiative to sell shares to consumers. The farm is now co-owned by 8,552 individuals, and consists of 20 turbines which supply 4% of Copenhagen's electricity. Copenhagen Energy will build three new offshore windfarms between 2000 and 2008 (Rodsand, Omo and Gedserrev), and the Valby district of Copenhagen plans to cover 10-15% of its energy use with solar cells by 2025.

Sustainable buildings are also a priority for Copenhagen. All buildings over 1,500m² are legally required to conduct energy audits, and the installation of electric heating systems in new buildings is banned in favour of district heating. Copenhagen's futuristic Avedore2 combined heat and power (CHP) plant holds world records for efficiency and by 2007, Bygas2, a combination of natural gas and air will power 170,000 of Copenhagen's buildings.

In Copenhagen bicycle planning is integral to mainstream traffic planning. With the city's cycle network over 300 kilometres long, one third of Copenhageners cycle to work. Copenhagen Cycle Policy 2002-12 states that one third of the city's US\$10 million road construction budget is to spent on improving cycling conditions. Specific measures include increasing cycle tracks, improving cycling conditions in the City centre, combining cycling and public transport and bicycle parking. In 2004 US\$1.6 million was spent on cycle track maintenance.

In the early 1990s Copenhagen also dramatically changed its waste management system, when it began to prioritize recycling. As a result in 1992 the quantity of waste taken to the landfill decreased by 37%. By 1995, Copenhagen reached its goals of recycling 58% of local household, commercial and industrial waste and reduced methane emissions 8% on 1990 levels. Copenhagen Waste Plan 2008 sets out the guidelines for dealing with waste and recycling in Copenhagen in the coming years.



11: BERLIN

AS A RESULT OF BERLIN'S COMMITMENT TO REDUCE ENERGY USE IN PUBLIC BUILDINGS BY MORE THAN 30%, SOLAR PV INSTALLATIONS ARE INCREASINGLY COMMON IN THE CITY.

11: BERLIN

POPULATION: 3.4 MILLION (2004)

CARBON FOOTPRINT: 25.3 MILLION TONNES CO₂e (2002)

Berlin is Germany's capital and largest city. Having established a reduction goal of 25% by 2010 on 1990 levels, by 2002 Berlin had already reduced its community GHG emissions by 13.8%.

Berlin's success in emission reductions come from three main sources. The first comes as a result of decline in industrial activity after the fall of the Berlin wall, the second comes from fuel switching and the third from building stock retrofits and modernization. The city has also increased production of renewable energy.

Fuel switching began in the early 1990s when the city established large subsidies for apartment buildings switching from coal to natural gas, or to district heating. At the same time, the city implemented a wide-scale modernization program for public and privately owned apartments. The measures undertaken included improved insulation, district heating, efficient design and construction, and the installation of solar thermal plants.

The Energy Savings Partnership was developed and implemented by the Berlin Energy Agency to enable to city to reach its target of reducing energy use in public buildings by more than 30%. Under this programme partnerships are developed with energy service companies (ESCOs) which take responsibility for financing energy efficiency improvements in a number of buildings over a period of 10-15 years. The ESCOs guarantee cost savings for the City of Berlin and the rest of the savings are used to refinance the ESCOs' investments. This has proven to be a highly successful model and since the programme started with 50 buildings in 1990, it now covers 25% of Berlin's 6,000 public buildings.

"SINCE REUNIFICATION, OUR CITY HAS IMPLEMENTED EXTENSIVE MEASURES FOR CLIMATE PROTECTION – OUR EFFORTS HAVE BEEN SUPPORTED BY THE GERMAN FEDERAL GOVERNMENT'S PROMOTION OF ENERGY EFFICIENCY AND RENEWABLES AND BY THE EUROPEAN UNION'S INTRODUCTION OF EMISSIONS TRADING"

DR KLAUS MÜSCHEN, HEAD OF CLIMATE PROTECTION UNIT, BERLIN

In addition to its emission reduction and energy efficiency goals, Berlin set a target of doubling the use of renewables, primarily solar energy, between 2000 and 2003. In 1997 Berlin developed an agreement with local energy companies to support the installation of solar photovoltaic (PV) and solar thermal plants. Since the introduction of the Federal Renewable Energy Act (EEG) in 2000, more than 5MW of solar power has been installed in Berlin. The rapid uptake stems from the fact that EEG guarantees a rate of about 50 cents per kWh for PV electricity that is fed into the grid, allowing investors to feel safe when purchasing solar plants. The Solar Power Roof Initiative offers roofs of public buildings to private investors for the installation of PV plants.

12: CAPE TOWN

POPULATION: 3.2 MILLION (2005)

CARBON FOOTPRINT: 21 MILLION TONNES CO₂ (2003)

Cape Town is the southernmost metropolitan area on the African continent, situated on both the Atlantic and Indian oceans. Cape Town's government is committed to developing a world-class African city which is an established leader in sustainable energy initiatives. The Cape Town Energy and Climate Change Strategy 2005 calls for improved energy efficiency; reduced fossil fuel dependence and; significant reductions in CO₂ emissions by 2050.

The city's municipal buildings account for 16% of total emissions. To reduce these emissions, the Tygerberg Administration headquarters underwent a pilot energy efficiency retrofit and employee awareness campaign in 2002 with annual savings of 130,000kWh of electricity, worth US\$5,440, and 140 tonnes of GHG emissions. Two additional buildings have since been retrofitted and the largest civic building has been audited, awaiting retrofit funding.

Residential buildings have also been targeted. At the Kuyasa Clean Development Mechanism (CDM) project, 10 demonstration houses have been outfitted with solar water heaters, compact fluorescent light (CFL) bulbs and insulated ceilings. Additional project activity will eventually retrofit 2,310 households in Khayelitsha, eliminating 6,200 tonnes of emissions annually. The Kuyasa project was approved by the UNFCCC CDM Executive Board in August 2005, making it the first African CDM project and first international Gold Standard CDM project. The city's solid waste landfills, which account for 33% of the City's GHG emissions, are also being considered as waste-to-energy CDM projects.

The city's fleet of 7,700 cars and trucks account for 13% of its GHG emissions. In 2003, two vehicles were converted to LPG and a training course was conducted for five drivers. A further 10 LPG vehicles have since been added to the fleet. The city plans to test other clean transport technologies like biodiesel. Cape Town is also transforming its public transport system to a Bus Rapid Transit (BRT) system, based on successful models from Bogota, Colombia and Curitiba, Brazil. A bicycle feasibility study has been conducted and existing cycle tracks are being extended.

As part of Cape Town's commitment to obtaining 10% of its energy supply from renewables by 2020, an agreement is being finalised to purchase green electricity from the country's first independent commercial wind farm – Darling Independent Power Producer (DarIIPP). DarIIPP should have 5.2MW installed capacity by 2006.

13: BEIJING

POPULATION: 7.4 MILLION (2004)

CARBON FOOTPRINT: 62.4 MILLION TONNES CO₂e (2004)

Beijing is the capital of China, and is the country's second largest city after Shanghai. According to the World Bank, six of the world's most polluted cities are in China. However, Beijing has increased investment in environmental protection in recent years and will continue to increase with its efforts to make the 2008 summer games the world's first Green Olympics.

To manage emissions from transport, Beijing has introduced both a Gasoline Standard and a Diesel Oil Standard for Beijing Motor Vehicles, which are equivalent to the Euro 3 Emission standards and higher than those required by the Chinese Government. Automobiles failing to meet the limits will not be allowed to enter Beijing's market or be granted licence.

Beijing currently has 2,100 CNG buses on the road and by 2007, 90% of public buses and 70% of taxis will run on clean fuels. In addition, parking fees are higher in the downtown area to encourage the use of public transportation and policies encouraging clean energy use via fees, tariffs and fuel switching are under consideration.

Cooperating with the Green Illumination Project of the Beijing Municipal Development and Reform Commission, The Beijing Organizing Committee for the Olympic Games encouraged its contracted hotels to use energy saving light bulbs instead of incandescent lamps, resulting in the purchase of more than 20,000 highly efficient lighting products as well as 10 additional electricity saving devices by the contracted hotels.

The Green Olympics will target the application of renewable energy such as solar, geothermal and biomass. Solar cells with a capacity of 3MW will be constructed in the Olympic Park to provide 90% of hot water, and 20% of the Olympic Park's electricity will be generated by wind power. With the installation of a second natural gas pipeline, 5,000 of Beijing's coal-fired boilers will be retrofitted to use natural gas by 2005, with the remaining 3,000 retrofitted by 2007.

Geothermal resources will be exploited for heating and cooling of around five million square metres of floor area by 2008. To date, three million square metres of buildings in Beijing use the technology, and it is expected to replace 112,500 tonnes of coal in winter alone sparing 280,000 tonnes of CO₂ emissions.



14: TOKYO

SEVENTY-FOUR OF TOKYO'S DISTRICTS HAVE BEEN DESIGNATED FOR DISTRICT HEATING AND COOLING SYSTEMS.

14: TOKYO

POPULATION: 12.5 MILLION (2005)

CARBON FOOTPRINT: 69.5 MILLION TONNES CO₂e (FY 2002)

Tokyo is Japan's capital and as its largest city is strongly affected by the 'urban heat island effect'. Tokyo Metropolitan Government (TMG) has stated that the number of nights over 25°C has increased from 14 in the 1960s to a five year average of 32.4°C by 2001. This and other impacts have spurred the city to address climate change and in 2002 TMG introduced the CO₂ Emission Reduction Program targeting business sites, which consume large volumes of energy.

In Tokyo, office buildings and homes account for roughly half of energy consumption. As many buildings are scheduled for renovation and rebuilding, TMG introduced the Green Building Program in June 2002. This requires administrators of building construction projects to submit project plans itemizing their action on energy conservation and other environment-conscious measures. In April 2005, TMG added the Abatement of Heat Island Phenomenon measures and strengthened the criteria for evaluation of energy conservation and greening.

In July 2005 TMG introduced a labelling system designed to promote energy conservation at the household level. The scheme requires electronics stores to label products such as air-conditioners, refrigerators, and televisions showing their level of energy efficiency.

Using the city's compact infrastructure to its advantage, district heating and cooling (DHC) is an area in which Tokyo expects to lead. DHC is an area-wide system which supplies steam, and hot/cold water from a heating plant to a number of buildings in the district. As of January 2005, 74 districts covering about 13.5km² have been designated for DHC and have contributed to reducing environmental impact and conserving energy.

FACT:
SINCE 2004 ALL LARGE FACILITIES OWNED BY THE TOKYO MUNICIPAL GOVERNMENT ARE REQUIRED TO SOURCE AT LEAST 5% OF ENERGY USE FROM RENEWABLES

TMG has been implementing major renewable energy projects since 2002 including wind power generation in the waterfront area and hydrogen pumping stations. In addition, a solar power system has been established along with rooftop greenery on the roof of the Tokyo Metropolitan Assembly Hall. Since November 2004, TMG has promoted renewable energy use at large-scale TMG-owned facilities, by requesting the purchase of electricity with 5% or more of renewable energy use.



15: MELBOURNE
CH2 (COUNCIL HOUSE TWO), DUE FOR COMPLETION IN 2005, WILL HOUSE
MELBOURNE'S ADMINISTRATIVE OFFICES. THIS WORLD CLASS GREEN
BUILDING WILL PRODUCE ONLY 13% OF THE EMISSIONS OF CITY'S EXISTING
COUNCIL HOUSE.

15: MELBOURNE

POPULATION: 3.6 MILLION (2004)
CARBON FOOTPRINT: 59.6 MILLION TONNES CO₂e (2004)

Melbourne is the second largest city in Australia, and is the capital of the State of Victoria. Melbourne was the first Australian city to achieve all five Milestones in the ICLEI Cities for Climate Protection (CCP) programme.

Through CCP, Melbourne set a goal of reducing the city corporation's energy consumption by 30% on 1996 levels by 2010. As a flagship for this programme, the city commissioned a world class green building to house its administrative offices. The building, known as CH2 (Council House Two), will cost approximately US\$38.5 million, and is due to be completed in 2005. CH2 is aiming to be a zero net emission (climate neutral) building.

Melbourne has sought to improve energy efficiency in the community, setting a goal of reducing energy use in buildings 50% on 1996 levels by 2020. The city set up a number of new programmes including the Commercial Buildings Partnership (CBP). In its pilot phase, the CBP provided energy audits and retrofit plans to the 20 largest commercial buildings in Melbourne, resulting in annual reductions of 11,500 tonnes of GHGs. Melbourne has also been an advocate of the State of Victoria's work to enact mandatory energy requirements for residential premises, and to develop similar minimum standards for commercial buildings.

Melbourne has set strong targets for renewable energy use, aiming to meet 50% of the corporation's energy needs from renewables by 2010. The city currently purchases 30% of its power from renewable sources, including wind, landfill/biogas generation, and pulp and paper biomass cogeneration. Much of this power is currently used for street lighting.

“CITIES ARE THE REGION THAT IS REALLY GOING TO MATTER, THEY HAVE THE MAJORITY OF THE POPULATION, THEY HAVE THE MAJORITY OF THE ECONOMIC POWER, AND WHEN CITIES CHANGE THEIR MIND AND MOVE IN PARTICULAR DIRECTIONS, THEY HAVE A VERY BIG INFLUENCE”
DAVID RISSTROM, CITY OF MELBOURNE COUNCILLOR

Melbourne has also increased the profile of renewable energy in the city through the development of leadership projects. The most prominent of these involved the installation of 1,350 solar panels on the roof of Queen Victoria Market (QVM). This project is the largest grid-connected solar installation in any Australian city, and has the capacity to generate 252,000kWh each year. The solar panels at QVM are expected to reduce the market's annual electricity needs by 40% and reduce of CO₂ emissions by more than 250 tonnes each year.

Melbourne is seeking to increase the amount of renewable energy used by the community by 22% on 1996 levels. This is being achieved through exploring fuel cell and solar hot water heater demonstration projects; and the promotion of Community Power, a bulk electricity purchasing programme for households that helps reduce the cost of and increase access to green power.

GLOSSARY

CNG

Compressed natural gas

CO₂e

Carbon dioxide equivalent

GHG

Greenhouse gas – A group of gases absorb and re-emit infra-red radiation. These gases occur through both natural and human influenced processes and include: carbon dioxide, nitrous oxide, methane, sulphur hexafluoride, hydrofluorocarbon, and perfluorocompounds

ICLEI

International Council for Local Environmental Initiatives

LED

Light emitting diode

LEED

Leadership in Energy and Environmental Design – Is a voluntary standard for developing high-performance, sustainable buildings, developed by the members of the United States Green Building Council

LPG

Liquified petroleum gas

UNFCCC

United Nations Framework Convention on Climate Change

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