

African Green City Index

Assessing the environmental performance of Africa's major cities

A research project conducted by the Economist Intelligence Unit, sponsored by Siemens



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Expert advisory panel

A panel of global experts in urban environmental sustainability advised the Economist Intelligence Unit (EIU) in developing the methodology for the African Green City Index. The EIU would like to thank the panel for their time and valuable insight.



David Wilk Climate Change Lead Specialist, Sustainable Energy and Climate Change Unit, Inter-American Development Bank

David Wilk joined the Inter-American Development Bank (IDB) in early 2001 as an urban environmental senior specialist, with tensive international experience in the fields of land use and environmental planning, watershed management, sustainable urban transport, and environmental assessment of urban and regional infrastructure projects. At IDB, Mr Wilk led the development of the Environment Strategy and Policy (2003), the Sustainable Energy and Climate Change Initiative (SECCI) and the SECCI Funds (2007-08). More recently, Mr Wilk spearheade the Climate Change Strategy (2011), a number of climate change policy-based loans in Mexico and Peru, and technical assistance programs for institutional strengthening and technical support for climate change adaptation and mitigation throughout Latin America and the Caribbean. He is part of the Sustainable and Emerging Cities Platform that will promote sustainable actions and climate resilience in mid-size cities in the region.



Pablo Vaggione
Founder, Design Convergence Urbanism

Pablo Vaggione is an urban specialist with over 15 years of experience. His cross-sector and multidisciplir approach provides cities and actors in urban development with strategically integrated plans to respond to challenges of sustainable urbanisation. He has worked in East and South-East Asia, Western Europe, and North America in the preparation of city develop ment strategies, plans for the regeneration of historic ur and blueprints for new districts. He is the lead author of the upcoming UN Habitat Guide for City Leaders Planning. Mr Vaggione was part of the team of the city of Madrid that received the World Leadership Awa Between 2007 and 2010 he served as the secretary general of the International Society of City and Regio Planners (ISOCARP), a professional organisation of planners from 70 countries.



Mary Jane C. Ortega Secretary General CITYNET

Mary Jane C. Ortega is the former mayor of the city of San Fernando, Philippines, and served the city from 1998 to 2007. She is now the secretary general of CITYNET, a network of 119 member cities and NGOs that works to improve living conditions in human settlements in Asia-Pacific. She was the charter president of the Solid Waste Management Association of the Philippines and was recently re-elected as president. Ms Ortega was a member of the executive committee of the United Nations Advisory Council on Local Authorities (UNACLA) from 2000 to 200 and received the UN Habitat Scroll of Honour Award in 2000. She was recently elected member of the board of directors of Clean Air Initiatives-Asia (CAI-ASIA).



Sebastian Veit
Senior Climate Economist African Development Bank

Sebastian Veit is senior climate economist at the African Development Bank. He is currently serving as the specialist on engyr, environment and climate change in the bank's west Africa region, based in Dakar. While organisation he has focused on green growth strategies in Africa and renewable energy issues. In 2007 Maconsultant to the United Nations Framework Convention on Climate Change and from 2004 to 2007 he consultant with the World Bank in Washington DC. At the World Bank he specialised in energy and water.



Hiroaki Suzuki Lead Urban Specialist and E€d eam Leader, Corporate Finance Economics and Urban Department, World Bank

Hiroaki Suzuki has more than 20 years of operational experience in the infrastructure sector and public sector at the World Bank. Having worked in the East Asia and Pacific region as East Asia urban sector leader and China urba sector coordinator for the last five years, he joined the bank's Corporate Finance Economics and Urban Departme in 2009 as lead urban specialist and Eco2 team leader. Mr Suzuki is the main author of "Eco2 cities: Ecological Ci as Economic Cities" (www.worldbank.org/eco2).



Nicholas You Chairman, Steering Committee of the World Urban Campaign, UN Habitat

Nicholas You is chairman of, amongst others, the Cities and Climate Change Commission of the World Fut cil, and the Asrance Group of the Urban Infrastructure Initiative of the World Business Council for Sustaina Development. After devoting a large part of his professional career to helping urban poor communities, he UN Habitat's Best Practices and Local Leadership Programme as a means to help cities and urban communities are urbanisation. He was subsequently appointed senior policy and strategic planning adviser of UN Habitat, spearheaded a major institutional reform plan. To help implement that plan, he was asked in January 200 UN Habitat's World Urban Campaign. Upon his retirement from the UN in July 2010, some 50 partners republic, private and civil society institutions world wide elected him as chairman of the Campaign's Steering tee. Mr You was recently appointed as a member of the board of the African Medical Research Foundation



African Green City Index

Africa's urban transition – approaching a tipping point

respectively, easily surpassing Africa's cutioentCities must become priority areas for public largest city, Cairo. In percentage terms, protedies."

Africa is urbanising faster than any continentrinsized cities will grow even faster. In the neXtith African governments focussing on so the world, a distinction it has held for steeretal 15 years the populations of Dar es Sathaamy urgent challenges - from health and decades. It started with a low absolute numbed Nairobi could double, and Addis Ababeauistyto unemployment inequalityof city dwellers, however, so even after dapperted to grow by over 60%. More generably me may question whether they have the time percentage increases in urban migration, it atidording to UN Habitat*, cities in sub-Sahaoamesources to devote to the daunting project remained mostly rural. That balance is startAfgica with a current population of 1 million of improving urban environments. However, to shift and the continent is approaching a tipore will grow at an average rate of 32% ovtbose involved intimately with the continent's ping point. The number of urban residents rthogenext ten years. The only exceptions are diagelopment over the years say that action on than doubled in the last two decades to convert African cities and Congo-Brazzaville (empironmental sustainability must go hand-in-412 million and they currently account for 400% of the Republic of Congo). hand with solutions to the continent's social of Africa's population, according to the United Such expansion would be difficult to managed economic problems. "Sustainable develop-Nations Population Division. Within the nexten with the best urban governance, yet topent policies at the city level in Africa are far decade there will be more urban residentifician African cities suffer from unplanned from being a 'nice-to-haveoption'," says Africa than in any other continent except Asia rawl. The region has the highest proportion of the Steering Com-And by 2035 the total number of those livingity dwellers in informal settlements in the mittee of UN Habitat's World Urban Campaign, the continent's growing cities is expected/voted. Infrastructure is stretched to its limits, interview for this report. "These policies double again to 870 million, at which point with an urgent need for more reliable supplied locality determine. Africa's capacity to of all Africans will live in urban areas. electricity and water, and services such as weastere sustainable development for society as a

Growth will be particularly strong soutmanfagement and sanitation. According towhole."

the Sahara. Lagos and Kinshasa, currenthyabiteat's recent report on the state of African Green City Index, a research pro18th and 29th most populous cities in the worldities, "Not a single African government jean conducted by the Economist Intelligence
will by 2025 have vaulted to another to ignore the ongoing rapid urban tradusit, sponsored by Siemens, seeks to give gov-

ernments and other stakeholders in the region insight and understanding into these pressing environmental challenges. To do so, it measures and assesses the environmental performance of 15 major African cities across a range of criteria, and highlights green policies and projects that other cities can learn from.

This report presents the most important findings and highlights from the Index. It is divided into five partsirst, it examines the overall key findings. Second, it looks into the key findings from the eight individual categories in the Index: energy and GO land use, transport, waste, water, sanitation, air quality and environmental governance. Third, the report presents the highlights of a varieof green initiatives under way across the continent. Fourth, it gives a detailed description of the methodology used to create the Index. Finally, an in-depth profile for each city outlines its particular strengths, challenges and ongoing environmental initiatives. These profiles rightly constitute the bulk of the report because the aim of the study is to share valuable experience.

What the Index measures: Evaluating cities with limited data

The 15 cities selected for the African Green City Index are capital cities as well as leading busine centres chosen for their size and importance. The cities were picked independently rather than ron requests from city governments to be included, in order to enhance the Index's credibility and comparability. Another decisive factor in the selection was the availability of data. Some large position centres, such as Kinshasa in the Democratic Republic of the Congo, with a population of rough million people, and Khartoum in Sudan, with about 5 million, or Algiers, Algeria, at about 3 million to be excluded due to a significant lack of available information.

The methodology, described in detail in a separate section in this report, has been developed by the Economist Intelligence Unit (EIU) in cooperation with Siemens. It relies on the expertise of be organisations, a panel of outside experts, and the experience from producing Green City Indexes Europe, Latin America, Asia, and the US and Canada. There are 25 individual indicators for each and these indicators are often based on multiple data points. Each city is assessed in eight cate and placed within a performance band to indicate its relative results. The process is transparent consistent, replicable, and reveals sources of best practice.

Obtaining consistent, reliable and accurate data on environmental performance across Africa is substantial challenge. For example, key figures such as population numbers are disputed and ac urban GDP figures do not exist for many leading cities. The EIU considered carefully whether to each of the 12 quantitative indicators that appear in the African Green City Index. These data po came from transparent, reliable sources. The EIU chose indicators according to whether they con compared across all 15 cities in the Index. For example, concentrations of air pollutants such as gen oxide, sulphur dioxide or particulate matter may be available for some cities, but because the were not available for all 15 cities, they were excluded. The same was true for indicators include previous regional Green City Indexes, such as the share of waste properly disposed of or the share wastewater treated in the city. In the energy category, only electricity consumption figures from electricity grid were available and could be incorporated. This only reflects part of the overall en consumption. For example, diesel generators are common in many Index cities to generate elec during blackouts or in the absence of access to the grid, but no comprehensive figures about thi form of energy consumption exist. Thus, the Index does not include the amount of electricity or CO2 emissions produced by diesel generators. Regarding informal settlements, it could not alway determined whether and to what extent informal settlements were covered in published data so In the end, the EIU made the judgment that it was necessary to include the best available data i environmental index of African cities, even if coverage of informal settlements could not be exactly or uniformly defined. Full details are available in the methodology section.

Thirteen of the 25 indicators in the African Green City Index are qualitative assessments of each policies, regulations and ambitions – for example, its commitment to reducing the environmental impact of energy consumption, developing green spaces and conservation areas, reducing cong or recycling waste. Data limitations in Africa mean that the African Green City Index relies more qualitative assessments of policies than previous regional Indexes. Policies indicate commitmen reduce environmental impacts and for that reason, the rankings in the African Green City Index weighted more toward an assessment of a city's potential future environmental performance the previous Indexes.

Finally, data limitations for African cities raise an important point for the future of sustainability efforts on the continent as a whole. Effective policy making depends on accurate information and improved information gathering must be a priority along with other sustainability efforts. Africation specialists agree: "There is a need to set up programmes to develop, access and use environme data on African cities," says Alfred Omenya, professor of architecture at the University of Nairobian expert in urban planning and climate change. "Currently, this data is captured in a fragmente by all sorts of agencies. More importantly, there is no system to ensure it can be used to deal with urban sustainability challenges."

* UN Habitat, The state of African cities 2010: Governance, inequality and urban land markets, November 2010.

Results

African Green City Index

Overall results

well below average	below average	average	above average	well above average
Dar es Salaar Maputo	n Luanda Nairobi	Addis Ababa Alexandria Cairo Lagos Pretoria	Accra Cape Town Casablanca Durban Johannesburg Tunis	



Category results

Energy and GO

		average	above average	well above average	
	Cape Town	Alexandria	Accra	Addis Ababa	
	Durban	Cairo	Casablanca	Lagos	
	Maputo	Dar es Salaar	ŋohannesburg	,	
	Nairobi	Luanda			
	Pretoria				
1	Tunis				

Transport

	well below average	below average	average	above average	well above average
	Luanda	Accra	Alexandria	Cairo	
		Addis Ababa	Casablanca	Cape Town	
		Dar es Salaar	n Lagos	Durban	
		Maputo		Johannesburg	1
		Nairobi		Pretoria	
A				Tunis	

Water

	well below average	below average	average	above average	well above average
•	Luanda	Alexandria Maputo	Accra Cairo Dar es Salaar Johannesburg Lagos Nairobi Pretoria Tunis		

Air quality

	well below average	below average	average	above average	well above average
		Addis Ababa	Alexandria	Accra	
		Dar es Salaar	n Cairo	Cape Town	
		Luanda	Lagos	Casablanca	
		Maputo		Durban	
		Nairobi		Johannesburg	ı
				Pretoria	
				Tunis	

Land use

well below average	below average	average	above average	well above average
Luanda	Alexandria Dar es Salaar Lagos Maputo	Accra m Cairo Nairobi Pretoria Tunis	Addis Ababa Casablanca Durban Johannesburg	Cape Town

Waste

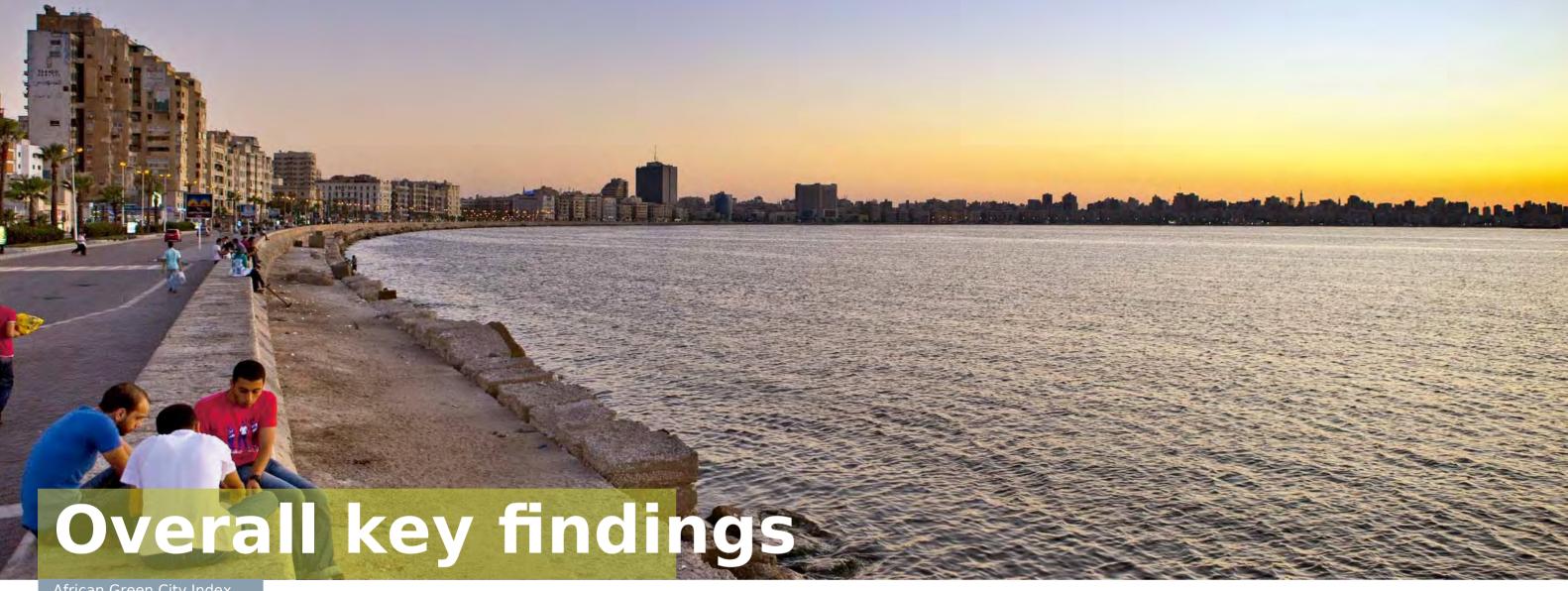
well below average		average	above average	well above average
Dar es Salaar	n Cairo	Accra	Cape Town	Alexandria
Pretoria		Addis Ababa	Durban	
		Casablanca	Lagos	
		Johannesburg	Tunis	
		Luanda		
		Maputo		
		Nairobi		

Sanitation

	well below average	below average	average	above average	well above average	
	Dar es Salaar	n Addis Ababa	Alexandria	Accra		
	Maputo	Pretoria	Cairo	Casablanca		
			Cape Town	Durban		
			Johannesburg	Tunis		
			Lagos			
			Luanda			
1111			Nairobi			

Environmental governance

well below average	below average	average	above average	well above average
Luanda	Addis Ababa Dar es Salaan Maputo Nairobi	n Cairo	Cape Town Durban Johannesburg Pretoria	Accra



African Green City Index

There is no single leader in the Index. Six cities score above average, with South African and the rest.

sumption, none of them perform very well arrothmentalpolicies - the Index'squalitative indeed they have among the highester assessments of the strategies, codes and plans sions from electricity in the Index, mainly to monitor and improve the urban environment. North African cities outperforming because they remain highly dependent on coape Town, for example, has established a comto produce electricity.

prehensive Energy and Climate Change Action

But they more than make up for drawbackan to improve green performance in many of None of the 15 cities in the Index placed in threconsumption with consistently strong enthie eight Index categories. In land use particu-

highest possible band of "well above average", suggesting that even the best-performing cities in the continent have room to improve the overall results environmental footprint. Among the six "above"

average" cities, two groups, those from South Africar Africa and those from North Africa, perform better than sub-Saharan cities (excluding South African cities Africa), for reasons set out below.

South African cities: good with governance

Three of the six above average cities are South African - Capeown, Durban and Johannesburg. On quantifiable metrics such as electricity consumption, waste generation and water con-



larly, it places well above averagefor the to resemble those more familiarin Western eries of cities, far away from basic municipal ser strength of its policies to contain urban sprawuntries. "They have working services and viaes. and protect green space. Durban and Johannelsve the most basic problems - water supply,

burg also generally perform well for enviwante management, human health, that whileth African cities: Connecting residents mental policies. As the city portraits in this of things that go together," she says.toNowver and power report demonstrate, when it comes to gover-are starting with the next round of sustailmough North African cities do nearly as well

nance, the South African cities have strong additity problems." These include the needs foodt African ones in overall performance, structures in place. While in many of the Nombre environmentally conscious resource theory-strengths are different. In policy terms, African and sub-Saharan African cities policy usnption, smarter planning, limiting the reliance to do slightly worse. In the environrun from afar at the national or provincial leveldirty fossil fuels and increasing recyclingmental governance category, for example, all of South African cities have city departments, Professor David Simon, head of the geographe South African cities score above average and often under the direction of a city council ytalepartment at the University of Lonal bof the North African ones are average. Howdirectly oversee and implement policies at thind expert on urban sustainability in Africa and, regarding access to services North African urban level. other developing regions, adds that strongers tend to do better. The two above average

Africa experts say South Africa's attention to iron mental policies have been a key partibles in the Index from North Africa, Casablanca environmental policies can be attributed matimevoost-Apartheid reforms. "South African aitietsTunis, for example, are very strong on to its level of economic development. Canable been able to use the political capitations to electricity, potable water and sanita-Rakodi, Africa specialist and professor emeritorst-Apartheid reconstruction to address tibe, with rates approaching 100%. Cairo and at the University of Birmingham's School of &wironmental problems that were part of thatexandria, although average overall, have ernment and Society, notes that the environment," he says. These problems included delibra access figures as well. Tunis in particular tal challenges of South African cities are staetiately designing black townships on the petripolisen proactive in recent years in connecting



households to the electricity grid. The city harsous environmental challenges to overcontent North African cities are similar. In subalso invested heavily in its light rail and subparticularly waste and sanitation. In the Saharan Africa, she says, "city governments on ban trains. In Casablanca, the authorities had bence of regular waste collection, many rese whole lack autonomy and, even when they ed over management of key services sudlentes simply burn their waste. And althonous eit, city politics are unstable and shaky." electricity provision, water, waste managemente than half of the population has access to

and sanitation services to private contractorspine form of sanitation, only an estimated \(\frac{1}{2}\)%wn versus green

average of 38%.

1997. The move has not been without its cratesouseholds are connected to the sewer sas-the sub-Saharan region, the environmental but the city can point to successes in accessemdand only an estimated 10% of sewagephasis is on the so-called "brown agenda", service quality over that time. The upristnessted before being released. Likewise, in which focuses on human health and poverty around the Arab world have also led to a Maputo a significant percentage of the populæduction, as distinguished rom the "green renewed sense of optimism that more ditiono-lacks access to basic services for water, da", which looks to improve the sustainabilcratic, responsive governments will continue test management or sanitation. These itwof ecosystems. The two agendas should go accelerate improvements. cities also have among the highest percentare in hand, as Mr You of UN Habitat's World of their populations living in informal settleban Campaign (see interview, page 20) and

ments, at an estimated 70% for Maputo and theres have pointed out, but Mr Simon of the

estimated 68% for Dar, compared with the Iddieversity of London notes that the immediate

Africa specialists confirm that these issues exhibit environmental issues are often not priori-

across the sub-Saharan region to varying isself by political elites is that, by definition, sus-

demands of survival in sub-Saharan cities tend

to prevent a focus on sustainability. "One reason

Most sub-Saharan African cities struggle in the Index, reflecting different challenges compared with their neighbours in the north and south.

In a different league grees. Ms Rakodi notes that for many cttaesalbility is a long-term issue, requiring invest-None of the sub-Saharan cities (excluding Sthetregion the problems include "not havingment now for a longer-term benefit in a resource-Africa) except Accra finished better than "averorking water supply, extremely poor sacrotrestrained environment. If you have a gueue age" overall. Two cities. Dar es Salaam taonal and a complete inability to deal with waste de vour office with people struggling to Maputo, were even "well below average". Three management or manage the process of land messet basic needs of food, shelter, and water, face social, economic and environmental probange." She adds that in contrast, South those sorts of immediate priorities trump lems that are in a different league from Northfrican municipalities have a high level of aldroger-termones." In addition, the climate African and South African cities. Dar has enormy and considerable resources of their change agenda is sometimes viewed with suspi-

cion when it comes from outside Africa. Still, effects of climate change on Africa - from im p on crop production to natural disasters - could be devastating in the long term, and the challenge will be to find the right balance bet weer addressing immediate and longer-term proble

Good performance in the Index is strongly correlated with fewer people living in informal settlements. What explains the link?

Among the 15 Index cities, the average percei age of the population living in informal settlements is nearly 40%, but this includes a range, from an estimated 15% in Casablanca t an estimated 70% in Maputo. It turns out that there is a strong correlation in the Index between a city's environmental performance and the pe centage of residents living in informal sett ments. In brief, the fewer residents in a city liv ing informally, the better the city performs.

The impact of wealth on environmental performance is unclear

One possibility is wealth. In other Green Indexes, there is a frequent connection between higher per capita GDPs and better environmer tal performance. Unfortunately, consistent dat on per capita GDP was unavailable across the 15 African Index cities, Still, South African cities have fewer informal settlements on the whole than in the rest of the continent, which seems to indicate a relationship between wealth and the presence of informal settlements. But UN Habitat reports that North African cities have made strides in reducing the numbers of informal urban dwellers through more effective policies. independent of economic growth. So at best, the link between the presence of informal settlements and wealth is unclear at this point.

In fact, in cities in the developing world, increasing wealth does not necessarily solve environmental issues, and can indeed often lead to more sustainabilitychallenges,especially with regard to resource consumption. "While institutional frameworks and governance need resources," says Mr Omenya of the University of Nairobi, "the reverse, that the presence of resources will automatically lead to better management of environment, is not true ... As cities in Africa have grown and become richer, their environments have degenerated." Anton Cart wright, an economist at the African Centre for Cities in Cape Town, agrees: "The notion that you can grow your way from poverty to greenness is questionable," he says. "Wealth does make the provision of formal water and sanitation services affordable, but this is a small proportion of greenness. For the rest, in Africa,



Index results: Spotlight on Accra

Although six of the seven sub-Saharan cities (excluding South Africa) finish average, below or w below average overall, Accra comes in above average. What sets it apart from other sub-Sahara

Accra's standout category in the Index is environmental governance, where it ranks well above average relative to its Index peers. It has strong scores for environmental management, with str tures in place for local assemblies to work with the national government in implementing policie It also scores relatively well for environmental monitoring and policies on public participation. In addition, the city has policies in place addressing air quality and sanitation, and has a high ra of renewable energy - 74% comes from hydropower.

Africa specialists said that although policies may be in place for the city, which is an indicator of their performance in the future, they are not necessarily a complete reflection of the current situ tion on the ground. A recent UN Habitat profile of the city found that it suffers from an "urban divide" between the rich and poor. Policies, it seems, have not always turned into practical action especially in terms of delivering municipal services to poorer residents.

However, Accra has received considerable outside investment in transport, water and sanitation infrastructure from the World Bank and the European Commission in recent years. Residents in Accra's informal settlements are also more likely to have "tenure" (a form of land ownership), which provides more access to municipal services and encourages residents to upgrade facilities themselves, Although Mr Omenya of the University of Nairobi would caution against calling Accr. "above average" on anything but the relative scale of the Index, he says, "Accra does have uniq attributes that may enable it to outperform most of the sub-Saharan African cities, especially be cause of security of tenure."

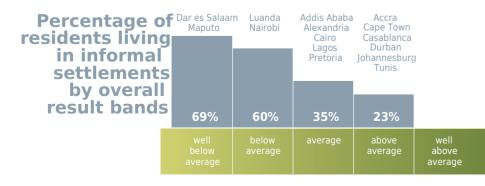


more affluence currently correlates with regimens of the world, but where environmentability'," says Mr Omenya. He adds that there are emissions, more urban sprawl, lower densitallenges cannot wait. regional differences for how African cities cope Dr Joan Clos, Executive Director of UN Halbith informal settlements: South Africa has relamore cars."

tat and former mayor of Barcelona, sugqissets well plannned informal settlements. In that institutional capacity is the first step: "Whest African cities, they are mainly undisputed

The Index suggests another factor may bit iestneed political institutions that can taktribbed lands, which the owners are able to work: good governance. Experts say the instituted in urban planning and design" he supported themselves and which receive basic tional ability to run a city efficiently and intellonce you have that, investment, job crieditiontructure and services. Eastern Africa, on gently matters more than wealth or the levelroof improving quality of basic services for dilivie other hand, tends to have informal settleeconomic development. This idea is powerfuzeous will come." ments set on public land. These are targets for

a continent where many cities may wait decad'sovernance is key, and more importantly ion rather than upgrades, and as Mr for the kind of wealth levels common in otheor the way the city plans and approaches 'iOfnenya adds, "they hardly attract good policy and programmatic interventions."



Governance is key

The cutting edge of policy: Blurring the lines between informal and formal neighbourhoods

Current thoughts on informal settlements take the idea of "upgrades" even further, actually eliminating the distinction in the city between "formal" and "informal". Indeed, it is often difficult to distinguish between the two in some places, as cities begin to deliver municipal services to these neighbourhoods. "Planning and governance in African cities no longer sees this dichotomy as relevant," Cartwright says. And

Action for today: Low-cost priorities to aid urban sustainability over decisions about cities. "In many countries

Although some environmental strategies do cost money, certain policies - such as obtaining enerand very seldom, except for South Africa, ha from existing landfill sites or providing legal protection for waste pickers - cost relatively little butthere been adequate fiscal decentralisation t make an immediate difference. What low-cost improvements would be most beneficial for Africanmatch functionaldevolution, he says. "This goes to the heart of the governance question."

"It is about policies and programmes," says Mr Omenya of the University of Nairobi. "For exampleThe Index raises many questionsabout the power consumption can be limited by having good controls on development. Good planning can efuture challenges of sustainability in Africa, from sure that in areas with adequate daylight solar power can be used to remove domestic consumer providing basic services to poor residents, to from the national grid. Good planning and development controls can ensure that rainwater harvestparading and integrating informal settlements takes place and people are not travelling long distances across the city, polluting the environment freven working to give the "green" agenda the

their wake. Currently planning seems to overtly support unsustainable consumption." He suggests a nee priority as other pressing necessities. But

following policies should be low-cost priorities for African cities:

→ Slum upgrading policies

- → Rainwater harvesting
- → Effective public transport policies that promote non-motorised transport
- → Open space systems, conservation of urban greenery and buffer zones
- → Waste management policies
- → Development control, planning and land use policies
- → Domestic clean energy policies promoting, for example, solar energy

indeed, while informal settlements have many environmentabroblems,he suggests,"they also have high density, low @nissions, low water consumption, high levels of resource efficiency and relatively high levels of collective coherence compared to atomistic suburbs."

To improve urban environmental governance, political power needs to be decentralised, but in many regions of Africa, the reverse is happening.

Experts agree that decentralisation of power from the national to the local level is crucial for effective planning, but the path to get there is difficult. Mr Simon says one of the elements of success can be political will. He notes that Lagos State has been active in improving urban infrastructure and the environment. Lagos State the state is in effect the metropolitan gover ment - in particular has a growing reputation for addressing thingswhich were in a parlous state, in particular relating to sanitation, env ronmental aesthetics, and remediation generally. There has been dramatic change." Indeed, fo sub-Saharan cities, adds Susan Parnell, professor at the African Centre for Cities at the University of Cape Town, "the big error is to assume that they are not powerful. They have contr over some of the most critical levers of change. sometimesunwittingly,things like land use management."

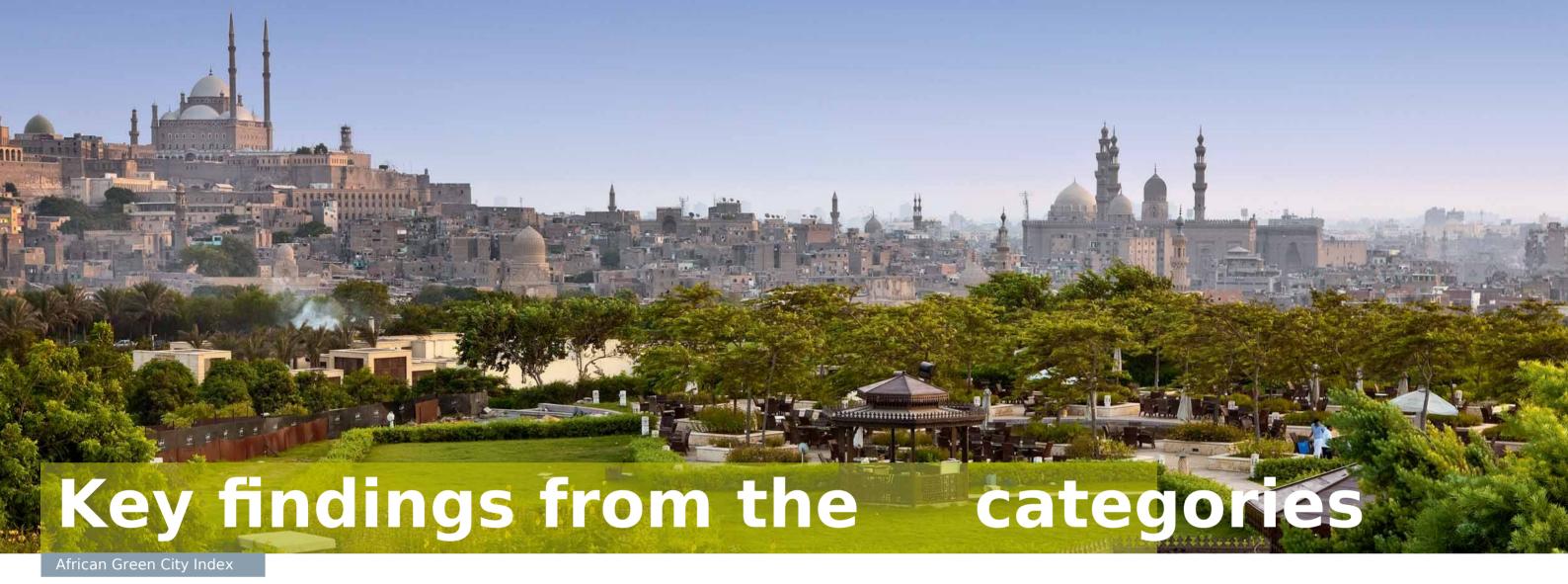
national government saking more authority there has been a recentralisation of functions;

Unfortunately, according to Edgar Pieterse,

director of the African Centre for Cities at the

University of Cape Town, there is a trend toward

experts agree that addressing the green agenda - and convincing public officials that they need to address it along with the other issues the face - will be the crucial task in the years come. "Urban sustainability is not a luxury: it is time bomb," Mr Omenya says. "The issues of poverty, under-development and governance are now becoming increasingly urbanised. This is where the battle for progress in African countries must be located."



Energy and CO

Casablanca, Cairo and Alexandria) and 60 tigitiess emit 49 kg of carbon per person from elec-The results in energy and hoohlight the vary-the figure for the other seven cities in sub-Sarkaity each year.

ing levels of economic development on the com Africa (Accra, Addis Ababa, Dar es Salaam The four North African cities have relatively tinent, particularly between South Africa Larrogobs, Luanda, Maputo and Nairobi). This ignetic electricity consumtion and access levels, the other sub-Saharan African cities in the Indexs the differences in sourcing electricity, with much of their electricity generated through The performance of the four South African cations that Africa is mainly dependent on coal, whateural gas. This combination puts their resul-(Cape Town, Durban, Johannesburg and Pretbe other cities largely rely on natural gas atacht annual Gemissions from electricity conria) is held back because e@Ossions from hydropower. sumption at 570 kg per person on average. Their

electricity consumption are substantially highen policy, however, South African cities appelicies are also relatively weak: none of these than in the other 11 cities and they have anaomong be best performers. Johannesburg, tlate obtains full marks for any energy policy the highest per capita electricity consumption South African city to finish above averagelizator.

figures in the Index. However, they perfolmencategory, combines high policy scores with general, exact data for e60s sions is much better for energy policies. It shoulthebdowest electricity consumption amondacking since they are not directly measured. noted that due to data limitations, this cate from South African cities. CO figures for the Index had to be estimated.

was only able to take into account energy in the of the seven sub-Saharan cities (exclud-

form of electricity, and had to exclude pipogy South Africa) in the Index have very low leand use

sources such as diesel generators, for examelle of electricity consumption. On average, the few an Index cities have had some success in or liquid fuels, which are prevalent in magnisume 2.3 gigaioules per person annual aintaining green space but are generally compared with 9.9 gigaioules for the otherwised down for low-density sprawl and the

→ The average amount of ¿@missions from eight cities in the Index. This, combinedsiwith ficant numbers of residents living in inforelectricity consumption for the South Afribæn widespread use of hydropower in thesael settlements.

cities is 3 tonnes per person, more than cofunctive (on average 69% of electricity general average the 15 African Index cities have times the figure for North African cities (Turtign), leads to low Coemissions. On average74 square metres of green space per person,

which is nearly double the figure for the Asi8r200 people. And only four African cities sive advanced systems such as metro lines. The Index, at 39 square metres, but less than the figive full marks for policies to address urbadex shows that cities could improve in policy ure for the Latin American Index, at 255 squameawl. areas though, for example by establishing more → A more pressing problem is when sprainitiatives to reduce traffic congestion. It should metres per person.

→ In some cases, this may be more a result takes the form of informal settlements. Exempted that the public in African cities relies good fortune than policy. Only eight of the 16hough every city in the Index has some sorextensively on private transport - taxis and pri-African Index cities receive full marks for thelum redevelopment policy, on average 38% attle minibuses, for example, and these forms of green space protection policies. And only thiredex city populations remain in informal setutansport could not be included in this category of the five cities with the most green spacesments. According to UN Habitat, Africa asuato lack of data.

the Index have these policies. In addition, only ole has the most people living in informal average the 15 African Index cities have four get full marks for protecting environmethemhents in the world. The organisation 2150 kilontees of public transport (official bus ly sensitive areas. Without more stringent posiports that North African cities have made (singles) per square kilometre. They also have an cies, population growth is likely to threaten shariful progress in reducing the percentages arrage of 0.07 kilometres of superior transport recent decades. For example, Casablancandtagorks, defined as metros, trams or bus rapid green space.

→ Urban sprawl is an issue in African Indlews lowest figure for the entire Index, at an testinist lines. This is shorter than in the Lati cities. The 15 cities/leaan average populationmated 15%. But dramatic population growtherican Index, at 0.1 km per square kilometre, density of about 4,600 people per square kiloxpected for sub-Saharan Africa threatenantbAsia, at 0.2 km.

metre. Cairo, at 19.100 people per square kelmacerbate the situation in many cities. metre, is the densest city in the African Index.

and without it, the averagedensity falls to Transport

→ A related difficulty is a lack of consistency in mas transport policies. No city has a completely integrated pricing system for its public transport

3,500 people per square kilometre. In contractiven the resources needed to build and maxive tem. Only Cairo gets full marks for investigations of the contraction of the 22 major cities evaluated in the Asian Gtairna public transport network, it is no surprisents to reduce emissions from urban mass City Index have an average population densitivator from Index cities do not have extension. And just three cities - Cape Town



Dar es Salaam and Tunis - receive full marktreated with caution because in Africa it is often as more limited access to piped water and promoting greener forms of transport suclinchesar to what extent figures include what greener forms of transport suclinchesar to what extent figures include what greener forms of transport suclinchesar to what extent figures include what greener forms of transport suclinchesar to what extent figures include what greener forms of transport suclinchesar to what extent figures include what greener forms of transport suclinchesar to what extent figures include what greener forms of transport suclinchesar to what extent figures include what greener forms of transport sucline for the figures include what greener forms of transport sucline for the figures include what greener for the figures include what greener for the figures in the figure for the figures in the fig walking or cycling. produced in informal settlements. the Index. On a policy level, cities' codes cover-

→ Congestion reduction measures such as carRecycling is becoming more common on the water quality and conservation could be pooling lanes, no-car vsa or toll roads are continent. Nine cities vaon-site collection or strengthened. mostly missing. Only park-and-rideschemes central collection points, and one more eit&frican Index cities consumeon average

have been adopted by seven of 15 citie Saared Salaam, has plans for central collectib 87 lites per person per day, less than in the traffic light sequencing is present in 12 Indexoints. Plastics are recycled, or soon will be Latin American Index, at 264 litres or the Asian 14 Index cities, paper in 13 cities and glass indek, at 278 litres. cities.

Waste

agement streety or environmental standaridisthe African cities is 91%, although the defini-African cities vary widely in figures for wastlandfills, are less widespread. Just Alexan of access for Africa does not necessarily generation and many cities could benefit from a, Cairo and Cape Town get full marks form water piped directly to households or a more active policies. However, there are hopeful strategy aimed at reducing, reusin24-modur supply, and can include access to a signs in the area of recycling. recycling waste in place, and only Alexandriao mmunal tap, for example.

→ Waste policies, such as an overall waste maThe average level of access to potable water

→ Waste production figures vary between the one city in this category to finish well abouteakage rates are high, at 30%, although not 160 kg per capita each year in Addis Ababa and rage - regulates waste pickers (residents igh asof the Latin American Index, at 35%. more than 1,000 kg in Pretoria. On average wies i-informally scavenge for recyclables and average for the Asian Index was 22%. It is dents of African Index cities generate 408 kægsable items).

waste per capita. This figure is less than the Latin American Index average of 465 kg, but Whater

than the Asian Index average, at 375 kg. Holwater consumption is relatively low in Africatrong water policies are not widespread. For er, comparisons across continents shouldcibies. But this is likely a reflection of faextamsple, only seven of 15 cities receive full

unclear to what extent leakages or unaccounted-for water in informal settlements are taken into account in the African city data.

marks for improving surface water quality; jubbe type of access also varies widely acrossetheronment at the urban level. In general, five get full marks for monitoring water qualityex cities.

and only two fully enforce water pollution starOn policy African cities tend to lag behincholicies can be lacking. Only four cities are given full marks in the IndexIeven of 15 Index cities are covered by dards for local industries.

→ Robust water efficiency initiatives, suclforabaving a code covering sanitation standards to environmental department, although public parmotion of conservation or grey watend infrastructure. Thirteen cities have whates often a national or state-level body. When recycling, are also not very common. The exceller treatment standards in place and continueste departments exist, they usually have tion is metering or tariffs, which are in placesome monitoring, but only six score full marked remit typically covering most or all of the planned for 14 of the 15 Index cities. for their efforts in these areas.

→ There is also a lack of enforcement of there cities publish environmentaberfor-

existing policies. For example, only Tunismbasse dat regularly, and five cities have also Sanitation access rates vary widely, from arrestilar monitoring of on-site treatment facilities pleted wide-ranging baseline environmenmated 49% in Maputo to an estimated 99% imhomes or communal areas, whereas ten disloguises. Efforts in these areas in the remain-

Casablanca. In addition to the need to improve very limited monitoring or do not monitor cities are partial or non-existent. access, in general most cities face challengebese sites. implementing sanitation codes and policies as Figures on the share of wastewater treated ental organisations and other stakeholders in

well as treating wastewater before dischargimere not available throughout the 15 Afsignme way, however limited, in making environcities, but in several cities only a small percent decisions.

→ On average 84% of residents of African Inakex of the sewerage is treated before being-distizens interested in engaging with the cities have access to sanitation, although canarged into the rivers or sea. with accessto potablewater, definitions of

accessto sanitationdo not always include Air quality

household connections to the sewerage systiemere is no emissions data in many African citaels.

so unlike in previous Green City Indexes, the air quality category in the African Index is evaluated only on the basis of policies. Regarding thes regulations, the more developed cities in South Africa tend to be more active, while in much of sub-Saharan Africa, air quality appears to receiv relatively little attention from governments.

- → All cities in South Africa finish above average in this category, with each gaining full marks for their air quality codes and pollution monitoring, and all but one for setting standards for specific
- → Six of the seven sub-Saharan cities (excluding Soult Africa) are not covered by an air quality code and five of the seven do not condu monitoring.
- → The four North African cities are slightly less active than South Africa, but Casablanca and Tunis are still above average and the other two, Cairo and Alexandria, fall into the average band in this category.
- → Comprehensive comparabledata on air quality was not available to include in the African Green City Index. Yet individual studies and evidence from experts suggest that eve when policies are in place African cities face huge challenges in actually reducing pollution, which often reaches unhealthy levels.

Environmental governance

Environmentabolicy in African Index cities tends to be set at the national, state or provincial level, instead of at city level, which means that in general environmental issues receive less attention than if they were overseen locally The four South African cities are notable for their relative independence o manage the

even if policies are in place, execution of those

environmental areas evaluated in the Index.

→ All but one city involve citizens, non-govern-

authorities face difficulties in getting better data. Only two cities get full marks for ease of access to information and ten cities receive no

18 19

Sanitation

"Far from a nice-to-have option" icies are central to economic and social progress in



An interview with Nicholas You, sustainable urban development expert

that is transforming the lives of millions of

the foresight to allow Kenyans to transfer

money, for a nominal fee, through mobile

to millions of people who were excluded by

people as we speak is mobile banking in Kenya.

The regulatory authorities in Kenya have had

phones. This has made transactions accessible

The path to greener cities, says Nicholas You, requires rethinking how we manage them. Holistic planning too often suffers from a sector-by-sector approach across competing jurisdictions, and policymakers fail to see the city as a single der to sustain economic growth and ensure national governments in Africa entity. Mr You, based in Nairobi, is chairman of the Steering Committee of UN Habitat's World Urban Campaign, a platformula settlements, to support cities in their efforts to achieve governance is required. There should be noyou're leaving out part of the picture. The waterronmentally sustainable growth? for private and public organisations to share sustainable urban policies and tools. He also leads several other global sustainable urban environmentally sustainable growth? tainable development initiatives, and served on the expert panel that advised the Economist Intelligence Unit (EIU) on the methodology for the African Green City Index. He spoke to the EIU about the results of the Index, the difficulty of special and the spoke to the EIU about the results of the Index, the difficulty of special and the spoke to the EIU about the results of the Index, the difficulty of special and the spoke to the EIU about the results of the Index, the difficulty of special and the spoke to the EIU about the results of the Index, the difficulty of special and the special measuring the environmental impact of informal settlements and the necessity to administer cities as "living organisms".

Africa faces many complex and difficult challenges. In this context, urban environmental sustainability could be until other more pressing problems are solved. Given the continent's many challenges, how much attention should officials give to urban environmental sustainability?

at the city level in Africa are far from being are there any practical policy improve-"nice-to-have option". These policies will ments in Africa that can make large ultimately determine Africa's capacity to ensure twithout costing too much money? seen as "nice-to-have" or even irrelevant sustain able development for society as a One of the most compelling policy initiatives

Although wealth is important for environ mental performance, what kinds of ini tiatives or activities can lower income Africa is the most rapidly urbanising region inties undertake to improve their environ

the world. It is undergoing a radical transformantal performance? tion in the way it uses land, water and energy economic terms, cities in lower income conventional banking practices. This initiative

as well as food production, consumption and ountries hee the most to gain from adopting as procured immeasurable social and distribution. This transformation requires a environmentally sound and sustainable policies nomic benefits for all, and at minimal cost. concerted set of social, economic and envirand practices. Such initiatives can substantially can only hope that lessons learned from mental policies that places the city and urbanduce waste, improve efficiency, and creatthis policy initiative, in terms of deregulation is a tion at the centre of the agenda. Droughiobs and income-generating opportunities, and empowerment, will be applied to other flooding may or may not be directly caused Aptypical example is waste recycling and reusectors such as energy and water. human activity, but the resulting famine, In many cities in developing countries, this is

human displacement and impoverishment are ried out by scavengers working and living in the regions covered by the Green City a direct consequence of poor planning and risplorable conditions. The right mix of policiedex series (eg, Europe, Asia, the management: inadequate infrastructure and articipation and empowerment could result inericas) more wealth is linked to better services; inefficient markets and regulatory win-win situations whereby waste is recyclednyironmental performance. In the Afri mechanisms; just to mention a few. These into usable products; methane is captured to an Green City Index, however, where urban functions are critical to sustainable produce green energy; and the scavengers income levels are well below other parts of development in both the cities and rural envionger have to work in life-threatening condine world, there seems to be a strong link ronments. Sustainable development policiesions. rather between good governance and

environmental performance. To what extent do you think better governance is related to improving the environment in Africa's cities?

Often statistical agencies and city autho Wealth creation and governance go hand-inrities report high levels of access to basic hand and, asewhave seen in other regions, aservices, such as potable water, waste societies become wealthier, people demandcollection and sanitation, when the situa better quality of environment. While many tion on the ground may be very different countries in Africa are experiencing appreciable use of the presence of informal rates of economic growth, this is largely thesettlements. What are the challenges in result of those countries having adopted marging to get an accurate picture through liberal and pro-business policies within the lasta?

decade. This "dividend" will not last foreverlflyou are looking at indicators, such as water

mental sustainability, lifting people out of has a remit, and their remits do not typicallyments in Africa should is the formulation of

not planning our cities well.

decisions affecting their livelihoods.

How can African cities make their con sumption more sustainable as they grow richer?

It is about consuming more intelligently, with we compare across regions, for example, toring, reporting and implementation remains create the infrastructure they need for todawithin 50 metres of households. People

ture and smart services, for example - couldeople are queuing up for water for hours. tally sustainable?

the African Green City Index have more than half of their populations living infor mally. Yet by their nature, informal settle ments are not well covered by statistics. How exactly do informal settlements affect the environmental performance

water, they are not going to school, which legacker must look at the city or the metro region Informal settlements clearly affect a city's to a snowball effect. Another example: slumssia whole. Competing jurisdictions are one of environmental footprint and some cities in Nairobi may have one toilet for 200 people the biggest obstacles to sustainable urbanisaa statistician will say they have access to tion. Most metropolitan areas cut across many sanitation.

> in the way cities are addressing the challenge of informal settlements?

ment is because ibvides them with access to jobs, or services they would otherwise have to pay considerably more for, Also, in terms of location, they are ideal. Most slums started their life located on the margins of the city. Over time, with rapid growth, the slum actually finds itself located in the middle of the city. Removal or relocation of informal settlements is also asking people to move from a neighbourhood where they have lived a good part of their life, if not their whole life.

say "100% coverage", while the city as a wlocker government ministry the responsibilimay drop down to 70% access. Since the ty for executing the policy. For the moment only

Green City Index is comparative within a region andful of African countries have adopted that is, comparing African cities with each urban development policies and, even in some other, the distortion won't be that serious. of those countries, the responsibility for moni-

less waste and less energy intensity. Rapid between Africa and Asia, we have to be a split between different government entities. growth has many potential advantages, little more careful. Let me give you an examiple.result is poor coordination and poorly in especially in African cities which have yet to slum in Nairobi has piped water supply toformed decision making.

formal settlements are living proof that we avecople don't move from the informal settle -

and tomorrow. Proper planning and well- theoretically have access to piped water supplying are the most important steps that informed technology choices - integrating thet when the water is only switched on at cities in Africa and the rest of theored full benefits of smart growth, smart infrastrucertain times of the day, you begin to see that to take to become more environmen-

allow these cities to leapfrog more mature There is a gender issue as well. Most of the We have to take planning seriously. I don't meal societies. But smart technologies also requipe ople in the queue are older women and 'secoral' planning, where each sector - water, smart systems, including better governanceyoung girls. If young girls are waiting to fetomergy, waste, sanitation - plans independent-

> jurisdictions, with different elected bodies and local government structures. You could be busy Can we identify any common approaches trying to green your city, but half of the popula tion that depends on your city may fall under different planning and regulatory regimes, and

of a city? I believe that we are beginning to see an ensergice providers that are engaged in establish Informal settlements are, by definition, unsuing pattern which favours upgrading buildinging the next shopping mall, the next golf tainable. They represent a high degree of somial services in informal settlements, as op-course, the next exburb. The city is a living and economic exclusion. Milton Santos, onepofs ed to removal and demolition. Slums are ganism that needs to be managed as a single the most advanced thinkers of his time, saidtom munities with their own social, cultural antity, and just like any living organism, it needs that poverty is the worst form of pollution. Inco nomic networks. A lot of the reason whito develop holistically.



Energy and CO: Reducing the

Environmental Policy, which set a vision umique. The provincial government of Western strategy to improve in several areas suchape (Cape Town is the capital of the province)

carbon footprint in Cape Town Cape Town's below average score in the energyte management, open spaces and energynsidering applications to build 40 more and Cocategory comes in part from the secondcy. In 2006 it adopted a Climate Chavingd farms in the province.

highest rate of electricity consumption in Sttategy (updated in 2010), which includes

Index, but even more from the type of energyoite than 100 projects around the city Haighlights from other cities:

uses to meet this demand: 93% of the city's emeswables targets. The city's efforts start which a chanás national government, which tricity comes from coal. The result is that Cappergy conservation. Its goal is to reduce eleversees environmental policy throughout the Town's annual per capita emissions from elecity consumption by 10% by 2012. Efforts: tountry, remains committed to hydropower as tricity consumption, at an estimated 4,099 kgeet this target include an electricity satsing ain renewable power source. However, the are more than four times the Index averagecampaign aimed at individuals, the creations of the owner company, the Volta River 984 kg. To a large degree the causes of nCEpergy Efficiency Forum for business Aathobrity, has also initiated a project to generate Town's problems are beyond its control. Eskarbstantial retrofitting of the city's own build Damegawatts of wind and solar power by the the companythat dominatesSouth Africa's and traffic lights. end of 2011 through the installation of solar

power generation, still relies mainly on coaCape Town has also made commitments botants in three northern regions of Ghana and a although with the support of the national governewable energy, with a target to derive 10% astal wind farm.

ernment it has recently begun to look for clearnerower from renewables by 2020. At tagos: Although efforts are in the early stages, sources of fuel. domestic level, it has launched a programmefficials have been looking at ways to capitalise

What makes the city unique is its impressing all 300.000 solar water heaters over the one witobal carbon-credit trading schemes such as efforts to address its carbon footprint. Cfaper years. The city has also built the countities Kyoto Protocol's Clean Development Mecha-Town, with the best clean energy policies infulse commercial wind farm, which started feedm, under which developed countries can Index, began early. In 2003 it was the first clean energy into the national grid in 2008 est in developing nations in exchange for car-African city to create an Integrated Metropoliham Darling wind farm will soon not be Ison emissions credits. As part of this the Lagos

State EnvironmentaProtectionAgency has Development Agency (JDA). The city set up thendly to pedestrians, revived an existing trans established a Carbon Credit Centre to deal with established a Carbon Credit Centre to deal with encounter to regenportein terchange and drove business to the local carbon credit consultations, transactions, appleicayed inner city areas, and promote economistet.

cations and trading, and also to promote pottervelopment and quality of life. The agencilyes haps the best known IDA project was the

work has integrated urban environmental ransformation of Newtown, an inner-city area tial clean energy deals. Pretoria: During the past two years the city passvements with social and economic developet had the feel of a derelict wasteland. As first installed more than 12,000 solar water heatensnt. Environmentally, the agency's effortssheps, the agency boosted the sense of security in a number of communities in the metropolited ping to curb urban sprawl by drawing in the metropolited ping area through an investment by the nationemits back to the rehabilitated city centrelevision cameras and refurbishing public build Department of Energy. As well as reducing **thes**e central neighbourhoods, the city has **built**. It continued by improving access through gy consumption and associated emissions, thew mixed-incomehouses, has increased projects such as the now iconic Nelson Mandela water heaters have no cost apart from theirancess to municipal services and extended Briedge. In addition, more than 2,000 housing tial installation and are popular among lpwledic transport network, including bus rapits have been built or are planned. The core of income households. the redevelopment is an investment in culture,

Land use: Combining social, economic and environmental revitalisation in Johannesburg

The JDA has brought together a wide rangefreshingthe historic Market Theatre and of stakeholders and city departments on its attoacting visitors to Museum Africa, the counjects. In particular, it has focussed on using the national history museum. The JDA's efforts existing assets of neighbourhoods in orderetoreating urban neighbourhoods that are

Ten years ago the heart of Johannesburgrebate a vibrant city. The regeneration intthactive to business as well as to individuals. In many dangerous, dilapidated neighbourh@dstitution Hill neighbourhood, for exan20169 it estimated that the Constitution Hill and and business generally stayed away. Since thread the new home of the country's ConstitNewtown projects had each received around a dramatic turnaround has taken place itiomal Court as an anchor. The Jeppestown 916-5300 million in private investmentafter small part due to the work of the Johannesbtion Preinct Project created a more secure areaeneration efforts began.



Highlights from other cities:

Dar es Salaam: The Aga Khan Foundation, attrying to address its transport problems through Addis Ababa: The city mast plan calls forinternational non-governmental organisatiom vistments and new policies.

reforestation of surroundingmountains, the trying to introduce traditional Swahili building To begin with, the metro is in the middle of a recovery of existing city parks and the establiebhods, which include using shade and US\$3.7 billion extension that will create two ment of new ones. The most significant breezes to cool buildings, and using local medst-west lines to complement the existing ones green space will be a pedestrian linear packthatch instead of imported steel and glabat run broadly north-south. Construction of winding some 5 km through the city centre. Although these will be difficult to realise on phase one of a third line began in 2006 and a Casablanca: In the past two years officials have e scale, some of the principles of Swebdind phase started in 2009. The first phase is been running pilots throughout the metropodirchitecture can help show the way for superior to open in January 2012. The ministry of tan area to test the viability of "urban agriculeener new developments. transport expects that when the second phase is ture", which incorporatesgreen space into complete within the next two years, the capacity urban centres and provides another food sourcensport: Investing billions in the of the whole metro system will rise from 2.5 mil-

for the city. The project receives funding fromublic transit network in Cairo lion passengers daily to 4.5 million. Moreover, the German government's Ministry of Education in Cairo has a bad reputation. Rather dovernment is upgrading and extending the 80% of intersections in central Cairo angleaith century-old tram system and this may and Research.

Nairobi: The Kenya Wildlife service in partner saturated, the city has a high accident rateolve connections with the metro. ship with private companies is managingesthecially among pedestrians, and public transbuses will also see improvement. Egypt has Green Line Project, an initiative to plant foregoth is under-developed by international retirement funding for the Urban Transport Infraalong 30 km of the perimeter of Nairobi Natubards. However, Cairo is above average amostructure Development Project from the World al Park in the south of the city. The hope is the 15 cities in the African Green City Index Bank. Initially, this will involve replacing the create a visible boundary between the parkthedlength and relativesophistication its existing energy inefficient buses with 1,100 surrounding new developments, and to dissetro system. The city has the only substantiam pressed natural gas ones. The first 200 of courage lobbying by developers to cut slices metro system. And the national governments took to the road in June 2010, with the which oversees environmental policy in Egyptstisscheduled to appear by 2012. the park.

Finally, the Carbon Finance Vehicle Sdight rail network in the south of the city and Bid 503 inton came to the city in April 2011, ping and Recycling programme aims to get knewsestern extension was completed in Deposerised the great strides that the state governly 50,000 taxi drivers with vehicles more than 2009. Two further extensions are also undent had made in this area. 20 years old to replace them with new onesway. An additional suburban network is plannethe challengeof waste managementefar the scheme has been very successful, with 2016. The city also has plans to introduings, but the government has been activel

20,000 vehicles replaced in 2009 alone. This 4snew bus rapid transit corridors, totalling @nobkemmenting a new strategy through its rethe first transport programme in the world tbaloges: In March 2008 bus rapid transit what and department, the Lagos Waste Manageregistered with the UN Framework Conventiontroduced by the Lagos State governmentening Authority (LAWMA). Under LAWMA's on Climate Change's Clean Development Meconiunction with the private sector. This waste-to-wealth programme, waste is treated anism. There is no one solution to making promoted as an affordable, reliable and sefeonly as a problem but as a potential asset. A Cairo's transportation sustainable, but progressans of travelling while significantly reducingsult, currently around 10% of the city's wast

Highlights from other cities:

ning in dedicated lanes, can reduce journeewcling facilities that turn 30 tonnes a day of times by 30%. In 2010 there were 220 buseplastic and nylon waste into shopping bags, Johannesburg and Pretoria: The high-speed operation. In its two years of operation 120 amiliong other items. A paper waste processing train line, Ite Gautrain, which links downtow Ito passengers have used the system, reduction recycles 10 tonnes of waste daily. The effort has only just begun. The state gov-

ernment hopes to nearly triple the rate of waste

conversion to 35% by 2015. It recently exthnounce

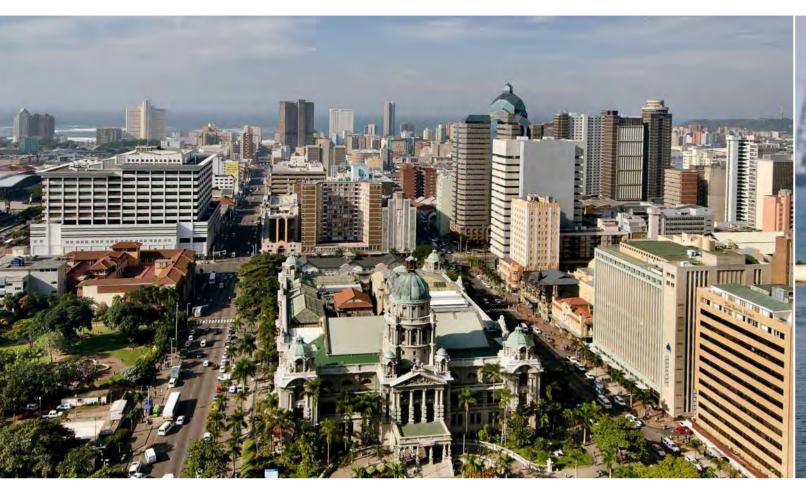
that it would be setting up 1.000 recycling bank

on a wide number of fronts should slowly helpngestion on the city's roads. The buses, rign-converted to other uses. Programs include

Johannesburg to Pretoria, is already operational on emissions by an estimated 13%. and work is underway on one final station. For

Pretoria, the new service offers a long-awaitedaste: Lagos turns waste into alternative to driving between the cities and wall th

greatly reduce the amount of traffic. Before 2005 the amount of waste piling up amound the city. To deal with what residents Tunis: The city is investing US\$2 billion in public streets of Lagos regularly led commentateance in these containers, a new recycling facilit transport network improvements. In Novemback of a crisis. The situation has improve witbbe built in cooperation with the Clinton Cli-2008 the city completed a 6.8 km extensions to the extent that when former US Presidentate Initiative. When complete, it will be able to





recycle or compost 300,000 tonnes of solid-andria: In August 2011 the national governeeiving assistance from outside agencies to waste annually. By tackling waste aggressiventyment in partnership with Korean inveituest in plans and policies for long-term Lagos has become not only a better place too tigened a new chemical waste managementances. Here are highlights of some of these but a more sustainable one. plant in Alexandria. The plant is the first of ibsogrammes: kind in the region to deal primarily with merkocrya: In 2006 the EuropeanCommission

Highlights from other cities:

waste, which is found in fluorescent lamps. Thearheaded a strategic planning process for Cape Town: The city has a number of ongoing vernment first proposed the plant in 2007 than water management and involved multiple initiaties and plans to reduce waste generation bat the problem of mismanaged mestakeholders. This process culminated in an inte-For example, it is running a pilot scheme in disposesal, which is harmful to plant life and fishated vision and planning document released suburbs to have residents separate waste fractording to the national government Egyptpril 2011, which called for a target of 100% recyclables before collection. There is also roblines 40 million fluorescent bulbs annuallycess to uninterrupted water supply in the city internet-based Integrated Waste Exchange and 8 million are discarded as general wastery 2030. The European Commission also helped site, which allows businesses and the public to borban: In a bid to increase recycling and cote free a 2030 vision for improved sanitation in exchangepotentially useful waste materials. local income, informal waste-picker are al- Accra, calling for increased access to acceptable And the city has published a detailed Smartlowed to rummage through the Bisasar Beattation and emphasising the importance of ing Handbook encouraging residents to reduced fill site for items they perceive to be of iralure ved coordination among the municipal reuse and recycle waste in their homes. They can then sell their items at various sbern blies in greater Accra. Maputo: In 2007 the city piloted a waste matrock centres, which are run by both printed a major research project known as

agement project in informal settlements reported companies and the city. lack paved roads. The city contracted with

micro-enterprises to collect household waster and sanitation; Internation- Alexandria's water requirements and examined foot, going door-to-door with plastic bags | Bygencies invest in African cities options for meeting expected demand up to December 2010 the program was extended Delivering clean water and sanitation servic 2010. The project aims to reduce extractions include the majority of the informal neighbourban households one of the continent's from the Nile by 20%. The research looked at a hoods, according to city officials.

SWITCH Urban Water, funded by the European Commission, has provided an assessment of biggest challenges. Many cities in the Indexrange of options to better meet Alexandria's water requirements, including improved waternitation facilities in the Darb al-Ahmar qualificereport was expected to be released in late efficiencyand the upgradingof wastewater of Cairo's Old City. The sewerage system, w2011. The results of the study will be used to previously did not reach all the houses, has diseverlop a national climate change mitigation Dar es Salaam: UN Habitat has run several ieixtended, and lead pipes have been replacepublicy.

tiatives in the city in the past decade, includingablanca: Lydec, the city's private contractor and a: In July 2010 the national Ministry of programme to identify and protect the ditycharge of water and sanitation services, Harwironment began working on a national enviwater sources. A key element is a campaigrup graded the city's water network and improvedent database as part of a project being water education for Dar es Salaam residents Itheasupply of drinking water to a number of size anced by the African Developmen Bank; provides a clearer understanding of the valuters of It has also implemented a programme twork on this is still ongoing. improve the wastewater network and eliminMaputo: In 2011 the Maputo municipal coun-

Maputo: The improvement of sanitation stere discharge of waste into the sea. cil's environmentadepartmentlaunchedan vices is a priority of the World Bank-fundedoan: In 2000 the city's water service awareness campaign to educate students about PROMAPUTO plan over the next five years. Takenched a sewage education programme in the importance of protecting the environment. city is in the process of developing a Citywidbed to reduce damage to the city's sewerage force to the department's director, representations of the department's director of the department of the Sanitation Strategy through consultation with. The campaign, which includes toolkitistatives have visited most of Maputo's school donors and non-governmental organisation and street theatre performance the importance of planting trees Though strategies and plans have proliferated paters to have had a positive impact, and beaches clean. The department als the national level, a city sanitation strategy bisoackages in the system down significantly. Distincted a tree-planting programme in schools. necessary first step to creating synergy ambag's water department was invited to create invited to cre public officials, communities and non-governowikit to be used in urban Kenya and then programmental conditions, mental organisations. bly elsewhere on the continent.

Highlights from other cities:

Environmental governance: Imag- ing on water and energy, and to keep track of the Cairo: The Aa Khan Trust for Culture has undering a more sustainable Durban state of the hydropower dams that provide the taken a programme to rehabilitate waterDarkan, already among the Index leadersitinmost of its energy.

environmental governance thanks to its large environmentalmanagementdepartment, is also blazing trails by engaging civil society build a long-term vision for the city. To that end the city council introduced the Imagine Durban initiative on integrated long-termplanning. Imagine Durban is a comprehensive programme aimed at improving all aspects of life in the city from safety, accessibility and culture to environmental sustainability.

A wide range of goals have already been set in collaboration with citizens, non-governmental organisations and other civil society players. These include a 20-year target to become a zero waste city and a goal to become carbon-neutral by 2050. Imagine Durban has created toolkit that advise businesses and individuals on how to reduce their carbon footprints. It also runs a Facebook page intended to engage a broade spectrum of local residents. The initiative is being implemented in conjunction with Sustainable Cities, a Canadian non-governmental or ganisation, and the PLUS Network, a network of 35 cities in the US, Canada, South America and around the world sharing experiences in sus tainability planning.

Highlights from other cities:

Accra: As pat of Ghana's participation in the UN Convention on Climate Change, the national environmental protection agency is prepar ing a national greenhouse gas inventory report that will identify greenhousegas emissions from the different sources between 1990 to 2006. Work on the inventory began in 2008 and

A government online data portal announced in July 2011 will allow Kenyans to identify spend-



African Green City Index

The African Green City Index measureswohle of previous Green City Indexes (Euaopleaccess to sanitation. The remaining 13 indienvironmentaberformanceof 15 major Germany, Latin America, Asia, and US and Cambars are qualitative assessments of each city's African cities and their commitment to reduding and aims to closely follow their struptulices, regulations and ambitions - for examtheir environmental impact. Cities were cholsenwever, to be applicable to Africa, the EIU blas its commitment to reducing the environwith a view to representing major African coadrapted the methodology to accommodate washtal impact of energy consumption, developtries, and include capital cities or leading bustions in data quality and availability, and ement of green spaces and conservation areas, ness capitals selected on the basis of size, grownental challenges specific to the region reducing congestion, and recycling waste. graphical spread and data availability. In case The Index scores cities across eight cate-

where there was a significant lack of data regeties - energy and, Cland use, transport ata collection

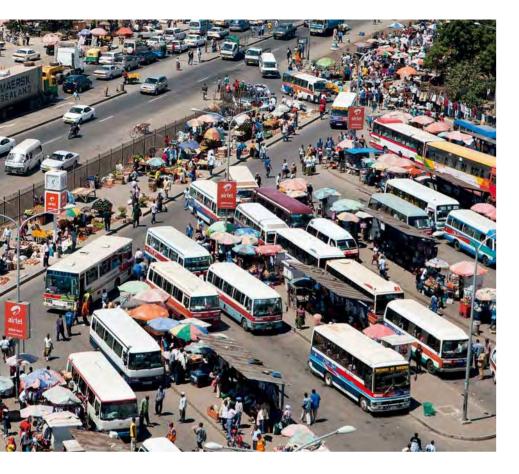
ing to a city, the city was omitted from the reakte, water, sanitation, air quality and envaroneam of contributors from the EIU collected ing, as was the case with Algiers, for exampheental governance - and is composed offates between April 2010 and May 2011. Wher-

The Economist Intelligence Unit (EIU) deviablished indicators. Twelve of the indicators possible, the data were taken from publicly oped the methodologyin cooperation with are based on quantitative data and aim to ragailable official sources, such as national or Siemens. An independent panel of international how a city currently performs - for examgional statistical offices, local city authorities, experts in the field of urban sustainability pade, its level of 2@nissions from electricity cal utilities companies, municipal and regional vided important insights and feedback on inconsumption, proportion of population livinceinvironmental bureaux, and environmental cator selection. The methodology builds on himfermal settlements, level of waste production instries. The data are generally for the year 2009-2010, and where not available, from pageailable for all 15 cities, and therefore could asotnecessary in an environmental index of vious years. be included in the Index category "air quality frican cities, even if the definition of access and Figures for access to electricity, potable waterswithin informal settlements or each

Data quality

and sanitation were taken primarily fromsdunce was not exactly or uniformly defined. The EIU made every effort to integrate the rhabitat's State of African Cities report 2010D Ministrions of access in Africa do not imply conrecent and most comparable figures. The dataurce did not include data for all cities in the include data for all cities i providers were contacted in cases where unlockex, and in this case other reliable, verifiablex essarily imply piped supplies to every home tainties arose regarding individual data pointsurces were used (these are included in hthe EIU has reflected this in the city portraits. Despite all these steps, the EIU cannot rule data tables within each city portrait). According the EIU found that cities use varying definihaving missed an alternative reliable public to UN Habitat, some attemptwas made to tions for some of the data points. This applies in source or more recent figures. include "access'figures for informal settle- particular to definitions on green spaces, popu-

However, in comparison with other Greents, but these remain estimates base battern living in informal settlements and water City Indexes, the availability and comparabisismpling. It is unclear and could not be deterakage. In all instances the team of researchers of data across cities was far more limitedined whether the other published sources sought to standardise the definition used for the Africa. For example, in the air quality categoryade an attempt to include informal settldicator to its maximum extent. However, the sufficient data on levels of air pollutants sughess. In the end, the EIU made the judgment cannot rule out that some differences may sulphur dioxide and nitrogen dioxide were rubtat including the best available data on acseissexist amongst the data used.



aggregated according to an assigned weighting. The indicators receive the same weighting within the respective categories. The category scores were then rebased onto a scale of zero to 100. To build the overall Index scores, the EIU assignedeven weightingsto each category score; that is, no category was given greater importance than any other. The Index is essentially the sum of all category scores, rebased to 100. This equal weighting reflects feedback from the expert panel.

Owing to concerns that the availability and quality of data are not sufficient enough to allow a detailed ranking of Index results, the African Green City Index results are presented in five performance bands. The cities were assigned to the five groups based on their underlying scores. These bands are built around the mean score and the standard deviation. The standard deviation is a statistical term which describes to what extent approximately 68% of the values differ from the mean. The bands are defined as follows:

Well above average: Cities score >1.5 times the standard deviation above the mean Above average: Cities score between 0.5 and 1.5 timeshte standard deviation above the mean

Average: Cities score between 0.5 times the standard deviation below and 0.5 times the standard deviation above the mean Below average: Cities score between 0.5 and 1.5 timeshte standard deviation below the

"mid area", with an administrative area between

500 and 2,000 square kilometres; and "large

area", with an administrative area larger than

In some cases where there were data gaps therk of 10,000 inhabitants per square kilonmetern

EIU applied theoretically robust techniqueor the indicator "population density" to preWent below average: Cities score >1.5 times calculate estimates. Regarding the indicatorCairo - a significant outlier - from skewing the standard deviation below the mean CO emissions, for example, the EIU used intelistribution of scores.

national COcoefficients provided by the UNQualitative indicators were scored by Elwsters

Intergovernmental Panel on Climate Change trailysts with expertise in the city in questidn, order to conduct a deeper analysis of city estimate the 6@missions produced by these on objective scoring criteria that constituted, the 15 cities in the Index were clustered city's electricity consumption. The national elties' targets, strategies and concrete actions and on population, area and density. These tricity generation mix - as recorded by the Infiber-qualitative indicators were again scoreduded: national Energy Association - was generally a scale of zero to ten, with ten points → Population: "small population", with a

used as a proxy for the city-level electricity assigned to cities that meet the criteria on the pulation below 3 million; "mid population", checklist. In the case of the "clean air profiltryd" population between 3 million and eration mix.

indicator, for example, cities were assessed 5 million; and "high population", with a according to whether they have a code or ppboylation exceeding 5 million inhabitants.

Scoring of indicators

In order to compare data points across cities consustain or improve local ambient air quality Area: "small area", with an administrative to calculate aggregate scores for each city, and the degree to which such codes are area smaller than 500 square kilometres; data gathered from various sources had etrofobeed. made comparable. For this purpose the quanti-

tative indicators were "normalised" on a scaledex construction

zero to ten, with the best city scoring ten political scores 2,000 square kilometres. and the worst scoring zero. In some cases, refathe underlying indicators. It is first aggregated by: "low density", with a population of sonable benchmarks were inserted to prevent tegory - creating a score for each area fewer than 2,000 people per square kilometre; outliers from skewing the distribution of scoressastructure and policy (for example, efferinglydensity", with a population between In these cases, cities were scored against either CQ emissions) - and finally, overall, base 0000 and 5,000 people per square kilometre; an upper or a lower benchmark or bothorFolme total of the category scores. To creatæntthéhigh density", with a population of more example, the EIU introduced an upper beatergory scores, each underlying indicator whas 5,000 people per square kilometre.

List of categories, indicators and their weightings in the African Green City II

Category	Indicator	Туре	Weighting	Description	Normalisation (
nergy	Access to electricity	Quantitative	25%	Percentage of households with access to electricity.	. Min-max.
nd ČÓ₂	Electricity consumption per capita	Quantitative	25%	Total electricity consumption, in GJ per inhabitant (1 GJ = 277.8 kWh).	Zero-max.
	CO ₂ emissions from electricity consumption per capita	Quantitative	25%emissi	sio ω in kg per capita. Zero-r	max.
	Clean energy policy	Qualitative	25%	Measure of a city's efforts to reduce carbon emission associated with energy consumption.	ns Scored by EIU analysts on a s
and use	Population density	Quantitative	25%	² inserted	upper benchmark of 10,000 person I to prevent outli pes : km
	Population living in informal settlements	Quantitative	25%	Percentage of the population living in informal settlements.	Zero-max.
	Green spaces per capita	Quantitative	25%	Sum of all public parks, recreation areas, greenways waterways, and other protected areas accessible the public, in metres squared per inhabitant.	
	Land use policy	Qualitative	25%	Measure of a city's efforts to minimise the environ- mental and ecological impact of urban developm	
ransport	Public transport network	Quantitative		Consists of two equally weighted sub-indicators: 1) Length of superior transport network, includin bus rapid transit, trams, light rail and subway, in city areper km 2) For 2) Length of mass transport network, including dedicated public and private bus routes, in km city areper km	
	Urban mass transport policy	Qualitative	33%	Measure of a city's efforts to create a viable mass transport system as an alternative to private veh	Scored by EIU analysts on a shicles.
	Congestion reduction policy	Qualitative	33%	Measure of a city's efforts to reduce congestion.	Scored by EIU analysts on a so
/aste	Waste generated per capita	Quantitative	33%	Total annual volume of waste generated by the city, including waste not officially collected and disposin kg per capita per year.	
	Waste collection and disposal policy	Qualitative	33%	Measure of a city's efforts to improve or sustain its waste collection and disposal system to minimise environmental impact of waste.	Scored by EIU analysts on a sco se the
	Waste recycling and re-use policy	Qualitative	33%	Measure of a city's efforts to reduce, recycle and re-use waste.	Scored by EIU analysts on a s
ater	Access to potable water	Quantitative	20%	Proportion of population with access to potable water	er. Min-max.
	Water consumption per capita	Quantitative	20%	Total water consumption, in litres per person per day.	Min-max; cities that consume capita/day score f less than 20 l/capi their consumption for basic subsister
	Water system leakages	Quantitative	20%	Share of water lost in transmission between supplier and end-user, excluding illegally sourced water on-site leakages, expressed in terms of total wat supplied.	or
	Water quality policy	Qualitative	20%	Measure of a city's policy towards improving the quality of surface water.	Scored by EIU analysts on a
	Water sustainability policy	Qualitative	20%	Measure of a city's efforts to manage water sources efficiently.	Scored by EIU analysts on a s
Sanitation	Population with access to improved sanitation	Quantitative	50%	Share of the total population either with direct connections to sewerage, or access to on-site sources.	Min-max.
	Sanitation policy	Qualitative	50%	Measure of a city's efforts to reduce pollution associated with inadequate sanitation.	Scored by EIU analysts on a
Air quality	Clean air policy	Qualitative	100%	Measure of a city's efforts to reduce air pollution.	Scored by EIU analysts on a
Environ- mental	Environmental management	Qualitative	33%	Measure of the extensiveness of environmental management undertaken by the city.	Scored by EIU analysts on a s
gover- nance	Environmental monitoring	Qualitative	33%	Measure of the city's efforts to monitor its environmental performance.	Scored by EIU analysts on a
		Qualitative	33%	Measure of the city's efforts to involve the public	Scored by EIU analysts on a

^{*} Cities score full points if they reach or exceed upper benchmarks, and zero points if they reach or exceed lower benchmarks



have access to electricity, equal to the <code>britdlexs</code> fringes, which are used for urban agriculaverage, though residents in the city's numburous and supply 80% of fresh vegetables in the informal settlements typically pay three <code>tilty</code>es

more for electricity than do residents in wealthi-

er neighbourhoods. Several projects are underansport: Below average

way to increase Ghana's power-generation Public transport is extremely limited in Accra capacity. The national government has contaract the city's inhabitants rely heavily on private ed with a Chinese company to build a welvicles, primarily tro-tros (minivans). Some source of hydroelectric power – the Bui dambouses operate informally but few people use the Black Volta River in the northwest religion, opting instead for smaller and more nim-The dam is scheduled for completion in bloody application of dedicated routes also limits hours per year. Following the discovery of netter appeal of buses, although plans are in place all gas fields, the national government is too buse allow).

ty of power generation increases in the coming

years will come from gas-fired power plantsGreen initiatives: In 2007 the national govern-

ment adopted an urban transport policy,

Green initiatives: Although the national govfinanced by the World Bank. One of its objective ernments main renewablepriority is hydrois to promote more environmentally sustainable power, the state-owned power company, transport in Accra through the creation of a bus Volta River Authority (VRA), has also initiateral paid transit (BRT) route in the city. The cit project to generate 100 megawatts of wind begin construction in February 2011 and the solar power by the end of 2011 throughproject is expected to be operational in 201 installation of solar plants in three northerwing about 12,000 passengers during pea regions and a coastal wind farm.

Land use: Average Waste: Average

Accra has the second highest population deAsitya generates an estimated 440 kg of waste in the Index, at 11,700 people per square kipper year on a per capita basis, just above to metre, versus the Index average of 4,600. Ondex average of 408 kg. The city scores well for the past two decades officials have strugglettheorange of materials it adequately disposes of keep up with the sprawling metropolitan areand recycles, which includes household hazand the city's policies to contain sprawl andaptopus waste, paper and plastic. Accra also coltect green spaces could be improved. Afterestiand adequately disposes of medical, chem mated 42% of the city's population lives in interdrand construction waste. Yet unlike the city's mal settlements, slightly above the Index middle- and high-income communities, which average of 38%. There was no availablety that ally pay for house-to-house waste collector the amount of green spaces per persion, irresidents in informal settlements have to Accra, but there are pleasant green areas on the rubbish to container sites. The sites

A ccra is Ghana's capital city. Stretching addngnd as a result the city was unprepared to the Atlantic coast, the city covers just 200eet the surging demand for housing and sersquare kilometres, which is the smallest admirces.

istrative area among the 15 cities in the AfricaDespite the visible challenges, Accra ranks Green City Index. Accra's estimated populatation ve average overall in the Index. The city's of 2.3 million (extending to some 4 millistandout category is environmental governance, when neighbouring urban agglomerationswarere it ranks well above average relative to its taken into account) makes the city the secolometex peers, with strong scores for environmendensest in the Index, behind Cairo. Althoughmanagement, monitoring and public partici-Ghana is viewed as one of sub-Saharan Africation. Other strong areas are air quality and development success stories, many challengenitation, where it ranks above average, bol-remain for its capital. The city suffers from whered by air quality promotion and monitoring, UN Habitat calls an "urban divide" between the a robust policy aimed at promoting sanitarich and poor, especiallywhen it comes to tion. Energy and Gos another above average accessing affordable housing and municipalcategory for Accra, driven by a high rate of vices. Urbanisation was more sudden and rapidewable electricity and low electricity conthan Ghana's post-colonial government prediction, but limited supplies and steep prices

partly explain the city's relatively low consump	Performano	e • Accra	• Oth	ner cities			
tion. Accra'sweakestcategoryis transport, where it ranks below average, largely because underdeveloped infrastructure and policies.			below average	average	above average	well above average	
5	Energy and Q	O	•	••••	• • •	• •	
Energy and CQ: Above average An estimated 49 kg of © mitted per person	Land us	e •	• • • •	• • • • •	••••	•	
in Accra through electricity consumption, w	ell Transpor	t •	••••	• • •	•••••		
below the Index average of 984 kg. The relatively low CQ emissions are due in part to a heavy	e- Waste	e • •	•	••••	••••	•	
relianceon renewableenergy.Nearlythree-	Wate	r	• •	••••	••••		
quarters of Accra's electricity comes from	Sanitation	n ••	• •		••••		
hydropower. Electricity consumption per capital at 2.6 gigajoules, is less than half the Index av		У	••••	• • •	••••		
age of 6.4 gigajoules. However, supply limi		nce •	••••	••••	••••	•	
tions and high prices partly explain the relative low usage. An estimated 84% of household		• •	• •	••••	••••		

The order of the dots within the performance bands has no bearing on the cities' results

Background indicators

Total population (million)	2.3
Administrative area (⊀)m	200
Population density (persons/km	11.700

are few in number and often difficult to read water provided by these various merchants sanitation facilities earn Accra an above aver-Over the past few years, local groups have not regulated, and water bought this way carge weighting in this category. Accra is covered stepped up their demands for improved wasterst five to ten times more than piped bwatercode outlining strategies and policies to collection and disposal. In response, in 2010Atluea's consumption rate, at 121 litres per meanage sanitation in the city, and the national national government reaffirmed its commit- son per day, is below the Index average of 1937/wernment works with local agencies to implement to increasing the private sector's **riddes** but the lack of supply is a clear **faetu**rthe policies. The code is backed by public handling waste and sanitation, and the privategarding policies, the city has not embarkadvareness campaigns around the efficient and sector is making investments to improve the public promotional campaigns to encoul and investments to improve the public promotional campaigns to encoul and investments are improved the public promotional campaigns to encoul and investments are improved the public promotional campaigns to encoul and investments are investments. city's waste management system (see "greemeater water efficiency. Accra has a relativeB% of the city's population has access to tiatives" below). high level of water scarcity relative to other softies form of sanitation, more than the Index in the Index, leading it to source water from lessage of 84%. However, there is still much

Green initiatives: The private waste collection stainable sources such as imported both to be done in improving the city's sanitacompany operating in Accra has nearly completer. Accra is marked up in the Index, howeverfacilities, Accra's sewer system only covers ed construction of a multi-million dollar waster having some measures in place to conserve part of the city, around the government processing plant in the city that will harwdheer, such as regulations limiting the amounninistries and central market. Moreover, the 1,200 tonnes of solid waste per day for sortiofowater that can be taken from local lakes and majority of the wastewatertreatment recycling and composting. The plant is experiteds. plants associated with the sewer system either to be operational by March 2012. are not functional or are operating below Green initiatives: The national government isapacity. Indeed, although Accra performs gen-

Water: Average

investigating strategies to increase the distributly well in some of the policy areas covered in An estimated 80% of Accra's residents have of piped water in Accra. In 2006 the Euthe Index, it is marked down for its monitoring some form of access to potable water, comparand Commissionspearheaded five-year, of wastewater treatment plants. In addition, a

strategy to increase sanitation coverage oventhesessment carbon dioxide emissions tation, land use, informal settlements and next five to ten years. from the transportsector. On the basis of waste management. In addition, each of those this study, the agency drafted a plan for main category areas has been subject to a base

Air quality: Above average

an annual vehicle certification regime that line review within the last five years. Accra pro-Unlike the majority of Index cities, Accra information include G@missions. The EPA is explorides public information on environmental procitizens about the dangers of air pollution. Airg collaborations with private companieseits and performance. The city also has a monitoring is also relatively rigorous. Checkgraler to implement the plan. In addition, process to involve non-governmental organisamade at various locations throughout theheithovernment's bus rapid transit project ations and other stakeholders in public meetings for levels of nitrogen dioxide, suspended pathicreduce air pollution from the transport sean projects that have a major environmental late matter, suspended fine particulate matter and carbon monoxide. The transport sector, pri-

marily consisting of the tro-tros, is the dominantironmental governance: source of air pollution in Accra. Authorities takell above average

air pollution seriously particularly from the Accra is the only city in the Index to place with in the UN Convention on Climate Change. transport sector, and are taking steps to tacktheve averagein the environmentabover- As part of this process, the EPA is preparing the problem (see "green initiatives" below). name category. The city's local government on a greenhouse gas inventory report, city benefits from the location of major indusvorks in partnership with the national EPA twhich will identify greenhouse gas emissions by tries in the neighbouring city of Tema, abouin addement environmental policies. The city is referred to 2006. Work on the inventokilometres east of Accra.

assembly has the power to implement envinonbegan in 2008 and the report was expected to ment-related regulations, and has a relative deleased in late 2011. The results of the stud

impact.

Green initiatives: One of Ghana's most note-

worthy environmental initiatives is its participa-

Green initiatives: In 2006 the national Envi-wide remit, encompassing all the main catequil be used to develope national climate ronmental Protection Agency (EPA) conducted areas monitored by the Index, including satisfage mitigation policy.











with the Index average of 91%, and only aboutlti-stakeholder strategic planning procestation procestation procestation. 40% have a supply piped into their homes. **Lustian** water management. This process septilic tanks is dumped untreated into nearby under a third of the water supply is lost duertagted in an integrated vision and planning datageams and the sea. Those living in informal leakages in the system, which is equal toethtereleased in April 2011, which called forethereness have to use public facilities, which Index average. Rapid urbanisation combined target of 100% access to uninterrupted availabilities in number for the populations they with underinvestment infrastructurehas supply in the city by 2030. Also, in 201slerare. meant that many people must purchase waberreement was signed with the Export-Import

separately for washing and drinking from Bardk of China for a US\$270 million loan to dowen initiatives: The European Commissionvate and community service producers. The she capacity of the Kpong water treatment ded strategic planning processfor urban private vendors distribute water through sement (on the Volta River, downstream of thewakker management defined a 2030 vision for mechanisms: sachets (treated water in half-signe bo Dam) - an improvement that will incireagre ved sanitation in Accra, calling for plastic sachets), which are sold in shops and then supply of piped water in Accra by 50%, if there ased access to acceptable sanitation by the streets: tanker services, which directbrosed is scheduled for completion in 2014,2030 and emphasising the importance of water to households from tanker trucks; and improved coordination among the municipal domestic vendors, who purchase water floamitation; Above average assemblies in greater Accra. The national gov-

tankers and resell it to households in smalleFhlespresence of sanitation policies evaluated imment, led by the Ministry of Water Resources, litre to 20-litre containers. The price and quality/index and the relatively high level of actives and Housing, is nearing completion of a

Ouantitative indicators

Category	Indicator	F	Altrem ag	e Year*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	8	4 84 .3	2003	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)		2.6	4 2009	Ghana Energy Commission
	2 er@sions from electricity consumption per person (kg/person)	983.9	49º2	2009	Ghana Energy Commission
LAND USE	Population density (pers d)ns/km	4,57 E1]	710.0	2000	EIU calculation
	Population living in informal settlements (%)		4290	.0 2010	UN Habitat
	Green spaces per β /pscsro(r/ n	73.6	0.0	n/a	No data available
TRANSPORT	Length of mass transport network ² (km/km	2.7	6.0	2010	Metromass Transit Ltd
	Superior public transport netwerk (km/km	0.07	0.00	2010	Metromass Transit Ltd
WASTE	Waste generated per person (kg/person/year)		4398.8	2010	Accra metropolitan assembly presentation
WATER	Population with access to potable water (%)		80102	2007	International water management institute report
	Water consumption per person (litres per person per day)		1213.0 .2	2010	Aqua-Viten Rand Ltd
	Water system leakages (%)		30.0	302007	International water management institute repor
SANITATION	Population with access to sanitation (%)		88.0	2007	International water management institute repor

Il data applies to Accra unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed, e = FIU Estimate, 1) National electricity generation mix used to estimate city



ity for Addis to become a "green industrial giby arate poor and rich like a "sunny-side up However, critics say that Ethiopia's rush to egg", according to experts, but Addis is more lik hydropower may falter because of the difficustorambled egg". The city is razing slums as in keeping prices affordable for customers. Blaidking apartment blocks in their place. Some outs and brownouts are less common that 0,000 housing units are being offered under a other African cities, but some 85% of Addis **gesi**ernment-sponsored lottery in which winners dents still cook meals using wood fire. pay subsidised prices for new flats.

Green initiatives: Although most of the city's reen initiatives: The city master plan calls for renewable efforts are focused on large hedgoestation of surrounding mountains, the projects, a small-scale pilot is under way to property of existing city parks and the creation vide solar street lights in Addis Ababa. Af bew parks. The most significant new green based private company has won a contract from will be a pedestrian linear park winding the city to operate the pilot, which was set toome 5 km through the city centre. In addition, begin in January 2011 with the replacementtbe master plan calls for the planting of indigeten street lights in the city. nous trees along other rivers and streams in the city, and the establishment of urban agriculture.

Land use: Above average

with households and neighbourhoods compost-Addis Ababa has a relatively high populartionorganic waste. Regarding buildings, one of

Performance

	well below average	below average	average	above average	well above average
Energy and Q	D	•••••	• • • •	• • •	• •
Land use	e	••••	••••	• • • •	•
Transpor	t •	• • • • •	• • •	•••••	
Waste	• •	•	••••	••••	•
Wate	r •	• •		• • • •	
Sanitation	1 • •	• •	••••	••••	
Air qualit	У	••••	• • •	••••	
Environmental governar	nce •	• • • •	••••	••••	•
Overall result	• •	• •	••••	•••••	

The order of the dots within the performance bands has no bearing on the cities' results.

ddis Ababa is the capital city of EthiopiaMbuntains encircling the city are protected and Ahas one of the smallest administrative appearside a watershed, there is a lack of public in the African Green City Index, covering green space.

500 square kilometres. Combined with Addisddis Ababa ranks average overall in the Ababa's estimated population of 2.7 million Jnitlex. The city's best category performance is in one of the densest cities in the African @neery and CO where it performs well above City Index, alongside Cairo and Accra. Universege. Water and land use are also strong most other African cities, Addis Ababa hasearsoin which Addis Ababa achieves above avercolonial heritage; rather it was founded by take ranks. On a per capita basis, it has one of the Ethiopian Emperor Menelik II in 1886 on a minwest water consumption rates and generates eral spring. Today it is the headquarters for the eleast waste in the Indexe60ssions from African Union, an organisation promoting electricity consumption also fall below the Index greater political and social-economic integraerage. The city ranks below average in transtion across the continent, and whose new slopert, sanitation, air quality and environmental scraper headquarters will open in 2012. A bgödernance. Challenges here are an underdeveling boom is under way, but air quality, sanitatien public transport network, one of the lowand public transport remain challenges for thet sanitation access rates in the Index and limitcity. Although eucalyptus forests on the Entetopolicies to improve air quality.

Energy and CQ Well above average density of about 5,200 residents per squarethitocity's most important initiatives is an Addis Ababa's performance in this categorietrie - the third highest in the Index. According to the Ethiopian Institute of Archite driven by very low rates of electricity consutopofficial figures, an estimated 18% of the diting. Building Construction and City Develoption and Coemissions from electricity. Electrizopulation lives in informal settlements, wellt (EiABC) to develop green building codes. ty consumption per capita is among the lowlestown the Index averageof 38%. However, Supported by the Swiss Federal Institute for the Index, at 1.8 gigajoules, compared with dbpendingon definitions of informal settle- Technology, the EiABC has contracted local prioverall average of 6.4 gigajoules. Estimatedn@nts, other sourcesput the figure higher. vate developersto design cheap and green emissions per capita from electricity con sureum spaces are limited, at 37 square metitasilding materials. In particular, the organisa tion are 16 kg per capita, versus the Index appearson in the city, versus the Index avertage focuses on substituting Chinese-imported age of 984 kg. Nearly 90% of Addis Ababa74 square metres. While the city genstheadly and glass with local stone, wood and adobe electricity is produced from renewable executes well for land use policy, particula (taymon of sand, clay and straw) to cut building sources, the bulk of which is hydropoweurbam sprawl containment, Addis Ababa couldsts by up to a third, and raise environmental increase in dam construction is ensuring chearther improve green space protection. The pit vaesthetic standards. electricity to Addis and an estimated 97% of allows it plans to establish new parks (see "green householdshave accessto electricity Prime initiatives") but the opportunistic building msnsport: Below average Minister Meles Zenawi is particularly probdtelfs and apartment blocks remains a problemberdeveloped public transport infrastructure

the proposal for the Renaissance Dam of uthingue characteristic of Addis within Africanisal policy shortcomings account for Addis

Nile, which he claims will supply enough elettreichtegration of the poor. Most African citiAbaba's performance in this category. The city'

Background indicators

Total population (million)	2.7
Administrative area (4)m	500
Population density (persons/km	5,200

e = EIU Estimate



public transport system relies heavily on than in other African cities. For example, so these to cope with chemical and pharmaceutical Anbessa, the state-owned bus company, what of commuters use the Anbessa buses. By bish. As with the majority of cities in the has a fleet of more than 500 buses, coape, with population growth, Anbessa estimates, however, Addis Ababa has no collection mented by 12,000 private minibuses. The length be serving 6 million customers in and amount in a mount of the city's mass transport network is And the land of t

behind the Index average - an estimated 2. **Elikerly** sophisticated traffic management system,

per square kilometre, versus the Index average has yet to introduce any car-pooling laneseen initiatives: The city says it is committed of 2.7 km. But the system itself is outdated and any corresponding new landfill sites in the Doro, Dertu-unable to meet demand. Addis Ababa is also were. The city also drops points for not takingojo, Bole and Yeka Abado districts distributed of five Index cities yet to build any form of sampesteps to reduce emissions from mass undomoss the city. The governmenthas also rior public transport, such as subways, tramsport, as well as failing to encourage citizenes unced its intention to limit the use of plaslight-rail or bus rapid transit lines. Addis berteftake greener forms of transport.

tic in local packaging and increase composting, from a relatively cohesive culture, with income

disparity lower than in many other African continues: Addis has seen major Chirtiesed for landfills. However, details are scarce. This means that the city's office workersuaded in estment in its city roads – an amounted cycling remains limited but is likely to increase more likely to travel to work on public transport material at over US\$1 billion by 2015. With filter establishment central recycling

congestion has eased with the completion of the total and plastic, the authorities say, Chinese-backed Gotera Interchange on the within the next year.

planned ring road. Additionally, plans are under-

way to build a light rail line, expected to traks poter: Above average

20,000 passengers a day, though no coracterise Ababa has one of the lowest rates of per dates for this project have been announced capita water consumption in the Index, measur-

Waste: Average

ing 57 litres per day, compared with the Index average of 187 litres. An estimated 99% of the

Addis Ababa generates the least waste in the population has access to some form of Index, at 160 kg per person, on average otalerie water, according to UN Habitat, above year. Although much lower than the Index alther-Index average of 91%. However, the water age of 408 kg, the city still struggles to copelelivery infrastructure in Addis is badly built There is only one main landfill site, at konsheften does not adequately serve the poor. Repi in southwest Addis, which dates backetactual water supply is plentiful, with an the 1960s. City-wide waste collection is absobt and water table and reservoirs. In Index instead, city neighbourhoods ("kebeles") cities where drinking water is so widely availresponsible for collecting rubbish. This is doalele, water consumption is typically much highin partnershipwith private companies, but er than in Addis Ababa. Water delivery could collection costs remain high. In policy arients rove with better management and if pay-Addis Ababa is one of only three cities inebbef bills using mobile phones were more Index that does not encourage proper waidespread in Ethiopia. The city also has a management by citizens, failing to impose water system that is less profligate than that basic measures such as bans on litterinoofamost cities covered in the Index - it loses making waste dumping illegal. Collection 20% to leaks, versus the Index average of 30%. points for recyclable material are also albsetetms of policies and initiatives surrounding Addis Ababa fares slightly better in the collegater efficiency, the city has room for improvetion and disposal of special waste, having facient.



There are major sanitation challenges in Addisd high emissions from older vehicles. Stufbieseither environmental monitoring or public Ababa. Access to sanitation is limited to 72% yofthe Ethiopian Forum for the Environmentalicipation. No baseline environmental review the population, according to estimates byhow that more than 65% of the vehicles or his been conducted in the last five years, and Habitat, but access for many people meaned in Addis are over 15 years old – many anceinformation has recently been published on shared toilets and communal washing facilities sain Lada cars that form the majority environmental performance and progress. Often there are not enough of these, and washed is a sain the only city in the Ind borne diseases are common as a result of deficen fires is another contributor. The city hat access not involve citizens, non-governmentation on open ground, and directly into relatively weak air quality policies to improve air quality environmental functions or other stakeholders in decistreams and rivers. Even in richer neigh shoust ion – there is no code to improve air quality rommental impact. Despite its environmon sight. The city lacks adequate wastew attents.

Mental department, the city of Addis has only limited control of its environmental future. It

air entrapped by the mountains, heavy failsito meet any of the criteria set by the Index

20% treated, and there is no regular monitoringen initiatives: The Ethiopian governmentserves as a loyal arm of the national govern of sanitation facilities. However, the city is makenowledges the problem and has plansment. However, given the government ambing some attempts to impose regulations gradually replace automobiles in the citytionitto limit imports and improve efficiencies, requiring new apartment buildings to managedectric-poweredtars, using tax incentives, and the communal nature of the city, there are their own sewage according to stricter galithe ugh details are limited.

good prospects for improvedenvironmental governance. The bigger challenge for the city

Environmental governance: Below average

Air quality: Below average Below average enforcement, especially laws regulating state-Air quality in Addis Ababa is widely regarded Marile Addis Ababa has a department dedicated enterprises and ministries that are not used among the poorest in Africa, largely because of green issues and policy implementation, other sight.







will be translating laws into meaningful

Quantitative indicators

Category	Indicator	Addis Ab⁄abærageYear*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84.2 96.9 2005	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)	1 5.8 2009	The Ethiopian Electric Power Corporation
	₂ er Gi3 sions from electricity consumption per person (kg/person)	983.9 15.7 2009	2006 IPCC Guidelines for National Greenhouse Gas Inventories
LAND USE	Population density (persa)ns/km	4,578.2 5,196.3 2007	EIU calculation
	Population living in informal settlements (%)	18:3 0 2007	Addis Ababa City Administration, Land Administration Office
	Green spaces per 🎢 psaro(n)	73.6 36.5 2007	Addis Ababa Environmental Protection Authority
TRANSPORT	Length of mass transport network ² /km/km	2.7 2.2 2009	Anbesa City Bus Service Enterprise
	Superior public transport netwerk (km/km	0.07 0300 2009	Federal Transport Authority, Addis Ababa Branch Office
WASTE	Waste generated per person (kg/person/year)	160.0 2004	Ethiopian Development Research Institute
WATER	Population with access to potable water (%)	99.0 2005	UN Habitat
	Water consumption per person (litres per person per day)	1 56.7 2009	Addis Ababa Water and Sewerage Authority
	Water system leakages (%)	20.0 3(2009	Addis Ababa Water and Sewerage Authority
SANITATION	Population with access to sanitation (%)	8 71.8 2005	UN Habitat

All data applies to Addis Ababa unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed. e = EIU Estimate. 1) National electricity generation mix used to estim CO₂ data, 2) Number of bus routes (88) multiplied by average length of bus route (13.5 km), 3) There are no subway, tram, light-rail or BRT lines





nology Fund (CTF), a multi-donor trust funditides Alliance, a multi-donor trust fund run by providing financing for low carbon technology World Bank and UN Habitat. Local and intergies with potential for reducing greenhouserpaisonal consultants compiled five reports emissions. Egypt has its own US\$350 midieoailing a development strategy for Alexandria CTF Investment Plan, which involves a combine ugh to 2017. One of the major results of the tion of renewable energy production and cleanry was the Alexandria Governate Pole Project transport projects, although it is unclear whowh focused on sustainable economic growth. much of the budget will be allocated to project's objectives include environmenta in or around Alexandria. Under the renewablegeneration, supporting private development energy scheme, Egypt hopes to meet 20% afritsimproving access to basic services for peoenergy needs from renewable energy by 2020e living in informal settlements. This includes and to build 7,200 megawatts of wind generapgrades to six informal neighbourhoods in the tion capacity alone. Of this, constructioncity by improving infrastructure and basic se facilities to generate 400 megawatts has vices, setting up community facilities, and in already been financed and plans have betterasing access to credit and business support. developedfor facilities to generate another A number of new projects have been developed 600 megawatts. as a result of the strategy, including a policy to ensure the protection of coastal areas and a

Land use: Below average

pedestrian walkways.

Alexandria is marked down in the Index for having a relatively low population density ramsport: Average

1,900 people per square kilometre comp@fædl cities in the Index, Alexandria has the mos with the Index average of 4,600 and alscorfoprehensive traffic management measures having fewer green spaces than other citiesiinplace, including traffic light sequencing and the Index. Alexandria offers less than 1 squareffic information systems, among others. It is metre per person versus an Index averagleoofelatively strong on congestion reduction 74 square metres. Much of the green spacertheatsures, including pedestrian zones. But it is does exist in Alexandria is along the beachfroatked down in the Index for a relatively underand is privately owned. 31% of Alexandria'sdamelopedpublic transportnetwork. At just ulation lives in informal settlements, companedler 1 km per square kilometre, the city's mas with the Index average of 38%. Regarding ptotinsport network falls short of the Index avercies, there is some protection for green appeace 2.7 km per square kilometre. Alexandria's and environmentally sensitive areas, and a straterior transport network – defined in the

egy is in place to connect informal settlemehrtsex as comprising subways, trams, light-rail or to municipal services such as street lightingbarsdrapid transit lines – consists of two transit lines – consists of two transits.

pollution abatement project.

ways measuring 0.02 km per square kilometre,

compared with the Index average of 0.07. The Green initiatives: Between 2004 and 2006 the vernment 20 years ago announced the inten-World Bank helped Alexandria create its firstioity to build a 44 km metro system along the development strategy, using a grant from these plans have not moved forward.

A lexandria is the second most populous carbove average in the waste category, with some in Egypt after Cairo. Located between that the best waste management policies among Mediterranean Sea and Lake Mariout, Alexanti-5 cities evaluated in the Index. It has also dria has a population of 4.4 million across abrect assisted in this area in recent years by forropolitan area covering 2,300 square kiloenger aid. Alexandria is average in the categories tres. This makes it one of the least denset and correspond and correspond, sanitation, ali-qua populated cities in the African Green City Indexand environmental governance, with relative-Alexandria has grown significantly in thelyplaigh rates of access to electricity and potable 40 years, spurred on by rural-urban migrationater. The city falls to below average in the wall is home to 40% of Egypt's industry, the inclategory because of a high rate of consumpincludes iron and steel, petroleum, cement aiod and less developed policies in this area. petrochemicals. Around 60% of Egypt's foreign

trade is handled through Alexandria's port and ergy and CQ: Average

the nearby El Dekheila port. The city is also hims estimated that almost 100% of households important historical, cultural and religious himbAlexandria have access to electricity. Still, CO in Egypt, second only to Cairo. Alexandria iseraidseens and electricity consumption are relaaverage overall in the Index. The city istiwedly low. Based on national figures, it is esti-

mated that Alexandria generates nearly 70% operformance its electricity using natural gas, with 12% coming from renewable sources. The city emits an estimated 353 kg of 60° capita from electricity consumption against an Index average of generated standard standard

Green initiatives: Green initiatives in energy happen athe national level in Egypt. The country as a whole is a beneficiary of the Clean Te

om- an c-			below average	average	above average	well above average
	of Energy and QO		•••••	• • • •	• • •	• •
nate / the	I and use		• • • •	••••	••••	•
ate			••••	• • •	•	
ent, (se	Waste	• •	•		••••	•
٠	/ is Water	•	• •		••••	
ner-	- Sanitation		• •		••••	
	Air quality	/	••••	• • •	••••	
y	Environmental governan	ce •	••••	••••	••••	•
un-[Ted	Overall result	• •	• •	••••	•••••	

The order of the dots within the performance bands has no bearing on the cities' results

Background indicators

Total population (million)	4.4
Administrative area (4)m	2,300
Population density (personally)	1 000

 $\mathbf{a}_{\mathbf{0}}$

The city has several main thoroughfaresflathing, which limits the amount of greenhousebal EnvironmentaFacility grant for the coastal road, which runs parallel to the sea gades released into the atmosphere. The project. the main traffic artery in the city, experiseness mated to have prevented approximate various to improve institutional mansevere traffic congestion during rush hours.171,000 tonnes of @missions from escapinggement of the Alexandria coastal zone and into the atmosphere between February 2020 ce pollution in the Mediterranean Sea and

Green initiatives: The national government and April 2011. considering offing out its taxi scrapping and

recycling scheme in Alexandria, which has hadater: Below Average

Sanitation: Average

Lake Mariout.

considerable success in Cairo. Under the CaAocording to UN Habitat, an estimated 99% Afrelativelylarge percentage of Alexandria's scheme, taxis more than 20 years old are believandria's population has access to population has access to sanitation, at an estirecycledwith the aim of replacing around water. The city relies heavily on the River Nite after 94%, compared with the Index average of 45,000 to 50,000 over the course of the projectwater supply and has a relatively high level?6f However, despite investment by outside In April 2009 the Ministry of Finance launched nsumption, at 351 litres per person per damencies (see "green initiatives" below), which the taxi scrapping scheme with the initial forces us the Index average of 187 litres. The bits improved the situation, the city's wasteon private taxis. The scheme will be expanded to loses 36% of its water through leak matter, treatments tandard scould be better. mass transport vehicles over time. Alexandria isparedwith the Index average of 30%, Alexandria is also marked down for a lack of one of the cities on the list for potential expalthough some effort is made by city authorities it or not on-site sanitation facilities in sion but no further plans have been annountoed no urage greater water efficiency. Howevernes and communal areas.

Alexandria's regulations on water pollution stan-

Waste: Well above average

dards for local industry are not always strictly initiatives: Since 1987 the US Agency Alexandria has particularly strong policie enforced.

waste recycling and reuse when compared with the other 14 cities in the Index. It has on-sit@armod initiatives: A major research projectastewatercollection, pumping, treatment central collection points for recyclables, funded to the European Commission, known and disposal. The agency invested an initial accepts a wide range of materials for recycl5/W/ITCH Urban Water, has provided an ads66425 million in the construction of 211 km

The city also enforces environmental standards for waste disposal sites and is the only city in the Index to regulate waste pickers - residents who informally scavenge for recyclables and reusal items. The amount of waste generated by the city's inhabitants, at an estimated average 209 kg per year, is around half the Index average of 408 kg. Since 2000 Alexandria has employe international contractors, with financial assi tance from the US Agencyfor International Development (USAID), to collect and dispose of the city's waste. In addition, the government h focused on enhancing private sector participa-

tion in the cleaning process and on integrated solid waste management. This privatised systems limits the government's role to monitoring while at the same time involving citizens by adding collection fees to residents' electricity bills.

for International Development (USAID) has run a programmeto support improvementsin



ment of Alexandria's water requirements of sedwer pipes, six pumping stations, two treat-Green initiatives: In August 2011 the national amined options for meeting expected demand plants and a sludge disposal facility. An government in partnership with Korean investots 2037. The project aims to reduce extradditional US\$113 million was invested to opened a new chemical waste managemteonts from the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste managemteon to the Nile by 20%. The research lowesteend not read a new chemical waste management of the Nile by 20%. The research lowesteend not read a new chemical waste management of the Nile by 20%. The research lowesteend not read a new chemical waste management of the Nile by 20%. The research lowesteend not read a new chemical waste management of the Nile by 20%. The research lowesteend not read a new chemical waste management of the Nile by 20%. The research lowesteend not read a new chemical waste management of the Nile by 20%. The research lowesteend not read a new chemical waste management of the Nile by 20%. The read a new chemical waste management of the Nile by 20%. The read a new chemical waste management of the Nile by 20%. The read a new chemical waste management of the Nile by 20% and the Nil plant in Alexandria. The plant is the first of ibs a range of options to better meet Alexandria the city treat two thirds of its wastewater, kind in the region to deal primarily with merwater requirements, including improved watend has largely eliminated sewage collecting in waste, which is found in fluorescent lamps. Effeciency and the upgrading of wastewater the streets and discharges into the Meditergovernment first proposed the plant in 2007 brants. Among those that were examined aimean Sea. In addition, one of the most imporcombat the problem of mismanaged mercoome detail were minimising losses fromtatheimprovements in the management of water disposal, which is harmful to plant life and fishe network, maximising household water and wastewater in Alexandria is the clean-up of According to the national government Economic increasing the cost of water to customerake Marjout. Before the initiative, municipal produces 40 million fluorescent bulbs annually study encouraged the government to introduce water was allowed to drain untreated into and 8 million are discarded as general waste, standards for appliances such as tobiletiake. The clean-up, which was part of the city Furthermore, landfills used by the city havestwowers, taps, washing machinesand dish-strategy drawn up with assistance from internamethanegas capture projects, which were washers at a national level. These remain retigonal organisations, involved the construction established in 2006 by a private contractor action at this point. Additionally, in 2000 several small wastewater treatment plants Methane is captured and disposed of thtbleeqWorld Bank approved US\$7.2 million and the upgrading of two existing wastewater

treatment plants. The aim was to fully prevenental legislation. Under the project, publicresponsible for drafting and implementing envithe discharge of raw waste into the lakeri Tate businesses receive help to bring right policy. Alexandria scores well for regprogramme also worked to prevent the dumemissions in compliance with the country's glarity publishing reports on its environmenta ing of industrial waste in the lake by installingnifihent protection law. Specific projects cappieformance and progress - it is one of only a ters and treatment plants. out under the scheme have included minimissing cities in the Index to do so. Moreover. waste, preventing pollution and adopting clear recently conducted a baseline envi-

Air quality: Average

technology. The programme also has marginal review in the water and air qualit Alexandria scores well for regularly monitor imamber of recommendations to the authorities gories However, like most cities in the air quality in different city locations and for imelaiding the strengthening f partnerships Index, Alexandria does not offer its citizens suring a wide range of pollutants. The distribution on envi marked down for a lack of public awarethesspromotion of community participationroimmental performance and projects. The city's campaigns around air pollution, althoughetheronmental issues and the encouragement mance has benefitted from outside intersame can be said about the majority ofoffderinesses to adopt cleaner policies and premation by aid agencies mentioned above. cities. The air quality in Alexandria is poor. Itices. In addition, a vehicle exhausts inspection until ning strategies for development. ly because of traffic congestion and industry ramme has been implemented in 12 goweste and water system upgrades. but its proximity to the Mediterranean Sea Intelligence, including Alexandria, in cooperation disperse some air pollution.

with the Ministry of Interior. The Ministry Grefen initiatives: In May 2011 the national Environmental Affairs has also implemented earnment announced plans to discuss creat-

Green initiatives: The Egypt Pollution Abate programme to change the fuel used by publing an environmental information sharing sysment Project is a scheme to help the countries port vehicles to natural gas. reduce industrial pollution. The programme,

which is sponsored by the World Bank, encounvironmental governance:

ages voluntary environmental management Average

and sustainable financing, as well as introductional government sets environment and processes for data sharing between mechanisms for the enforcement of envipolitics for the city. It has an executivearm these countries.

tem between Europe and Arab countries in the southern and eastern Mediterranean regions The goal would be to develop common environmental indicators, environmental reporting

Ouantitative indicators

Category	Indicator	Alexan/odriearageYear*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84.2 99.9 2005	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)	5.7 2006	Egyptian Electricity Holding Company
	2 erûðsions from electricity consumption per person (kg/person)	983.9 352.7 2006	Egyptian Electricity Holding Company
LAND USE	Population density (perse)ns/km	4,578. 1,895.8 2010	EIU calculation
	Population living in informal settlements (%)	312 0 2007	SWITCH stakeholder analysis report for Alexandria
	Green spaces per paracro(n)n	73.6 3.4 2006	CAPMAS
TRANSPORT	Length of mass transport network ² /km/km	2.7 1.0 2008	CAPMAS
	Superior public transport netwerk (km/km	0.07 0.02 2008	Alexandria Passenger Transport Authority
WASTE	Waste generated per person (kg/person/year)	209.2 2007	Egyptian Environmental Affairs Agency
WATER	Population with access to potable water (%)	98.8 2005	UN Habitat
	Water consumption per person (litres per person per day)	350.7 2009	SWITCH urban system water modelling report for Ale
	Water system leakages (%)	36.3 3@007	SWITCH urban system water modelling report for Ale
SANITATION	Population with access to sanitation (%)	8 94.1 2005	UN Habitat

All data applies to Alexandria unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed, e. = FILL Estimate. 1) National data used as proxy for city level data



multi-donor trust fund to provide financing flor 2009 it attracted more than two million visilow-carbon technologies with the potential floors and has contributed to improving the city's reducing greenhousegas emissions. Egypt air quality. The Al-Azhar park development was announced a US\$350 million CTF investmented out by the Aga Khan Trust for Culture, an plan in April 2011 that involves a combination of the Geneva-based Aga Khan Developrenewable energy production, clean transpert Network, in partnership with the Goverand solid waste management projects. Underoitate of Cairo.

renewable energy scheme, Egypt hopes to meet

20% of its energy needs from renewable energy needs from the energy needs fr

by 2020 and to build 7,200 megawatts of with obenefits from a relatively long mass transgeneration capacity alone. Of this, construction network as well as a new metro system. The of facilities to generate 400 megawatts Saeater Cairo area has the second longest supealready been financed and plans have been public transport network in the Index developed for facilities to generate another (defined as metro, trams, light rail or bus rapid 600 megawatts. In addition, the governmentsit), at 0.2 km per square kilometre, cor has announcedit will constructthree pilot pared with the Index average of 0.07 km, and it waste-to-energy plants in partnership with asphreing expanded. The first stations on the city' vate company. third metro line will be operational in 2012. By

Performance	Cairo	• Oth	er cities		
	well below average	below average	average	above average	well above average
Energy and QO		•••••	• • • •	• • •	• •
Land use	•	• • • •	• • • • •	••••	•
Transport	•	••••	• • •	••••	
Waste	• •	•	••••	••••	•
Water	•	• •	••••	••••	
Sanitation	• •	• •	••••	••••	
Air quality		••••	• • •	••••	
Environmental governance	•	••••	••••	••••	•
Overall result	• •	• •	••••	•••••	

The order of the dots within the performance bands has no bearing on the cities' results.

airo is the capital city of Egypt. Locatedestion is still a serious problem. Cairo also lackling and a relativer Nile, Greater Caippenforms well for having a relatively high share home to just under 20 million people and of the population with access to electricity and encompasses the governorates of Cairo, witzable water. The city ranks average in most and Qalyubia. For reasons of data availabtility categories. The social upheaval in early and comparability, data included in the Afri 2011 that led to the resignation of President Green City Index are based on a mix of statishic warak ushered in multiple changes of govfor Greater Cairo and the inner Cairo Government and a continually shifting political norate. An estimated 7.1 million inhabitalated scape. However, already this year the occupy the 370 square kilometre area wildtional government has announced several Cairo Governorate; it is consequently the meaturionmentalinitiatives that are detailed densely populated city in the Index, with earny.

estimated 19.100 people per square kilometre.

compared with the Index average of 4,600. Energy and CQ: Average Cairo is average overall in the Index. The With Habitat estimates that almost all households ranks above average in the transport category, Cairo have access to electricity, but the city thanks largely to the length of its metro systems less well in curbing electricity consumpoperational since 1987, although chronic traffin. On average, Cairo consumes 8.0 gigajoules

of electricityper capita, compared with the Land use: Average 2022 the city is planning to add another three Index average of 6.4 gigajoules. Despite Claimy by's high population density bolsters its pre-etro lines; it is hoping to attract new funding electricityconsumption CO₂ emissions from formance in the land use category. On the oath eart of a public-private investment partnerelectricity are an estimated 477 kg per capita, with less than an estimated 1 square shated well-run metro system apart, the city's less than half of the Index average of 984 kgf green space per person the city falls pwblic transport services are otherwise over-Nearly 70% of the city's electricity produbetion the Index average of 74 square rotetweeted and often unreliable. Traffic on the is based on natural gas. During the sum/amound a third of Cairo's population is estimatædds can be chaotic and congested. With outmonths, the use of energy rises and the govterfive in informal settlements, primarily localized funding assistance, however, plans are now ment in March 2011 announced measures three city's outskirts and historic centre. in place to tackle traffic pollution and congesmeet the soaring demand with generators powtion (see "green initiatives" below). The govern-

ered by natural gas. Plans are under wayreten initiatives: For centuries, the Al-Darrassent has also announced plans to invest in increase the country's use of renewable energy located outside the boundary of historics electronic improvements to the city's transport (see "green initiatives"), which today ac@airdswas used as a place for dumping debring rastructure, including new roads, river-based for around 12% of national electricity praddorubble from the city. With the 2005 inautonsport and encouraging cycling. tion.

ration of the Al-Azhar Park, a 30-hectare devel-

opment in Al-Darrasa, this has changed. Green initiatives: A major programme is under Green initiatives: Egypt is a beneficiary of theark, which provides a 360-degree panomagnido improve traffic congestion and reduce Clean Technology Fund (CTF), an internationalew of historic Cairo, has been a huge successituting emissions from public transport vehi-

Background indicators

Total population (million)	7.1
Administrative area (4)m	370
Population density (personऔk€m	19,100

e = EIU Estimate

cles. The work is being carried out through two schemes - the Egypt Urban Transport Infrastru ture DevelopmentProject and the Carbon Finance Vehicle Scrapping and Recycling Pi gramme. Both initiatives are being develop with financial assistance from the World Ba and the multi-donor Clean Technology Fund The urban transport project includes the provision of 1,100 new fuel-efficient buses to replace the old fleet, the construction of six bus rapid transit corridors and improvements to the traff management system. In addition, the gove ment wants to promote the use of the river for commercial transport as an alternative to using the countries' roads, and thereby reducing traf-



water quality database. Five plants have been

private partnership investment which was

announced recently.







fic congestion. Plans include funding a manageste: Below average

bottled water. Those who cannot afford such ment system to help coordinate river transpostro generates an estimated 457 kg of wastreasures are susceptible to a variety of waterand a committee has been established atteit increasing per year, more than the Index a when the diseases. Cairo's residents should benefit, national level to improve safety for river trangle of 408 kg. Waste collection is a challen however, from a national initiative to improve The governmenthas also launched pilot and piles of waste are commonplace, partict/harwater quality of the River Nile (see "green inischeme in an area of Greater Cairo to encouvaigethe poorer parts of the city's historic cetratrieves" below), Cairo's main source of drinking residents to ride bicycles, including a pulltie prevalence informal settlements has water.

information campaign to encourage cycling ntade waste collection difficult. While several

installation of bicycle racks and the sale of **brow**ete waste collection companies operate initiatives. The national government cles at discounted prices. the city, zabbaleen, waste-collectors from the doped 12 programmes for the protection

poorer neighbourhoods who try to make a liofithe River Nile. Measures include: preventing from informal payments, also contribute sigthis-flow of industrial effluents into the Nile; precantly to waste collection and are consideretting sanitary drainage; managing waste more efficient than private companies. Despitem Nile river vessels; treatment of agricultural the challenges, Cairo has introduced a poliste; solid waste management; periodic moniaimed at encouraging recycling and reusteriotig of water cleanliness; and developing a

waste.

established to receive waste from river cruisers, Green initiatives: The government has suncluding one at Cairo. The plants are equipped ceeded in transafing 15 million cubic metres toof safely dispose of the waste in the sanitary accumulated municipal waste from the residerainage networks.

tial areas of greater Cairo to controlled dumping

sites, according to the Egyptian Environmentalnitation: Average

Affairs Agency. In another initiative, a German estimated 98% of Cairo's population has government agency, GIZ, is carrying out a parocess to sanitation. Even so, the standard of ject to help improve waste management in <code>b&o</code>itationservicescan vary enormouslyIn poor urban areas in Greater Cairo: Khanka assume parts of the city, such as Ma'adi and Khossos. The project includes an analysis of Zhamenalek, sanitation is provided to a high stancurrent system for waste collection, segregationd. In other parts, particularly in the historic and recycling, and the development of acemetive, sanitation is provided to a lower stansolid waste management strategy that emplard, with one facility serving many people or sises the role of the informal sector. The Billfacidties not connected to the sewage system. Melinda Gates Foundation has provided a grant government is hoping to fund new wasteof US\$5.3 million towards the project. water projects as part of an overarching public-

Water: Average

Cairo consumes 237 litres of water per capita per

day, more than the Index average of 187 lit@seeThisitiatives: The Aga Khan Trust for Culis coupled with an above average high leak age has undertaken a programme to rehabilirate of 35%, Although UN Habitat estimatest the twater and sanitation facilities in the Darb almost 100% of residents have access to patastillenar quarter of Cairo's Old City. The sewerwater, compared with the Index average of 94% system, which previously did not reach all the quality of water in Cairo is sometimes poloe. houses, has been extended, and lead pipes Wealthier residents have their own water filtrave been replaced. The programme was cartion systems, while visitors to the city drived out in conjunction with measuresto

improve awareness of health and environmetecade in the city following investments in anvironmental governance: Average tal issues, to provide education and trainingotoality improvements (see "green initiati\atilonational agencies oversee environmental policy local residents, and to restore historic buildibelow). and monitoring in Cairo. The national environin the guarter. ment ministry is responsible for the formulation Green initiatives: The national governmental application of environmental policies. The

Air quality: Average

spent US\$1.2 billion improve air quality iministry has an executive arm that is responsible During the past decade the national govereater Cairo and the rest of the country for elaborating environmental policy, oversee ment set up 13 air pollutant monitoring battaween 2006 and 2010. There were seineramplementation of policy, and carrying out tions in Greater Cairo, and parts of the Nile **debte**cts involved in the programme, includi**pi**dot projects designed to preserve natural and upper Egypt region. Of these, six are inritioning polluting industries out of popularies out prevent pollution. The city's pergovernorates of Cairo and Giza. Althougharairs, increasing waste collections in informfarmance in this category is helped by its regula quality is monitored in different parts ofathers (and thereby reducing waste burning innonitoring of environmental performance, and city, a combination of severe traffic pollutformal settlements), tree planting and some inclusion of citizens and non-governmenand dust from the desert south of the dithoroving Greater Cairo's network of air motrail organisations in the decision-making process makes air quality in Cairo extremely poor. Intothing stations. The national government is bryenvironmental projects. autumn smoke from farmers burning rice stimut limit vehicle emissions by converting gov-

following the harvest also contributes to air profiment cars from petrol to compressed natured initiatives: In May 2011 the national lution. However, the fact that the bulk of ash(ENG), introducing unleaded petrol, createvernment announced plans to discuss creatcity is paved, particularly in central distribute, a national programme for vehicle testing en environmental information sharing sysmeans that dust generated from the city itselfds rehabilitating old taxis. The government between Europe and Arab countries in the not as severe as in many African cities. The last situated fines for the burning of rice southern and eastern Mediterranean regions performance in this category is also bolsteredusks, which contributes to air pollution in titlee goal would be to develop common environby the presence of a strategy to improve local turn after the harvest, and has also providental indicators, environmental reporting air quality. The government recently repoeteeral hundred special compressors to farmers and processes for data sharing between that it had achieved the best air qualityasmaalternative to disposing of the husks, these countries.

Ouantitative indicators

Category	Indicator	Æ æiro ge	Year*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84. 299.7	2005	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)	860/	2006	Egypt Information Portal
	₂ er@sions from electricity consumption per person (kg/person)	983.9 4770	2007	Egypt Information Portal
LAND USE	Population density (pers d)ns/km	4,578 19,083.5	2010	EIU calculation
	Population living in informal settlements (%)	3¶3	2005	IDSC Egypt Information and Decision Support Centre
	Green spaces per per growth	73.6 0.8	2007	CAPMAS
TRANSPORT	Length of mass transport network ² (km/km	2.7 7.3	2008	CAPMAS
	Superior public transport netwerk (km/km	0.07 0?24	2008	CAPMAS
WASTE	Waste generated per person (kg/person/year)	456.9	2007	Egyptian Environmental Affairs Agency
WATER	Population with access to potable water (%)	99.6	2005	UN Habitat
	Water consumption per person (litres per person per day)	23%.0	2009	OECD
	Water system leakages (%)	35.0	2607	Egyptian Holding Company for Water and Wastewater
SANITATION	Population with access to sanitation (%)	89812	2006	Egypt Information Portal

All data applies to Cairo unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed, e = EIU Estimate. 1) National electricity generation mix used to estimate city





Index average of 84%. Although Cape Townsisace in the Index. The city boasts an estimated marked down for its @missions and electrici289 square metres of green space per person, Energy and Climate Change Action Plan agement department oversees Cape Town's "greeninitiatives'below). It is also making green spaces and environmentall sensitive including wind power.

ty consumption, the city has the most raboust four times the Index average of 74 square clean energy policies in the Index, including ritstres. A local environmental resource manefforts to source more renewable energy, areas. The city also has a robust set of policies t protect these areas. Furthermore it has the second lowest share of its population living in infor-

Green initiatives: City officials have drafted mal settlements, at an estimated 17% compared comprehensive Energy and Climate Change with the Index average of 38%. Action Plan, which identifies 11 key objectives.

While the plan covers a broad range of sectors initiatives: As part of the Climate including transportand education, the first Change Action Plametcity has updated its objective calls for a 10% reduction in electridity elopment quidelines, which address urbar use city-wide by 2012; in the second objectisgerawl, among many other issues. The new the city aims to source 10% of its energy froman, currently with the Western Cape provincial renewable sources by 2020; and the third month for approval, also promotes susdates a 10% reduction in energy consumptibainable building design, construction and renofrom council operations by 2012. Already 13@ation. The city is looking to adopt urban planprojects are under way across the city as a resultprinciples that encourage non-motorised of the plan. Programmes to achieve its transport and create more open spaces that can include installing 300,000 solar water heateused for recreation.

across the city by 2015 and retrofitting public

buildings with energy efficient lights.

Transport: Above average

Cape Town has invested US\$5.8 billion over the last six years in developing a new bus rapid tran

• • • • •

Land use: Well above average With just 1,500 people per square kilomaitreBRT) network (see "green initiatives"). As a versus an overall average of 4,600, Cape Townsult, it is among the top cities in the Index for has the second lowest population density intheelength of superior forms of transport, such Index. It has grown rapidly over the past deasdaetro, tram or BRT lines. The city's superior and faces the challenge familiar to other Africabilic transport system measures 0.11 km per cities of finding the right balance between esquiare kilometre, compared with the Index aver ronmental sustainability and economic necessie of 0.07 km. Transport, however, is still domty. The city has approached this dilemma pinated by private vehicles, taxis and minibuses, tively, implementing measures to contain udout congestion remains a challenge. While sprawl that are currently being updated there is an extensive network of suburban rail "green initiatives"). Home to multiple nationes, these are not adequately maintained and reserves containing some of the world's rareapidly growing areas in the west of the city are plant species, Cape Town has the most poredly served. New investment in this network

Total population (million)	3.7
Administrative area (4)m	2,500
Population density (persons/km	1.500

Background indicators

ape Town is the second most populous diby Index. The city has some of the most robust in South Africa behind Johannesburg, etterironmental policies among Index cities in 3.7 million inhabitants occupy a metropoliitæst categories, which bolsters its strong perarea of just below 2,500 square kilometifesmance. In some categories - such as energy which is the second largest area in the Africand CQ, and waste - Cape Town does not per-Green City Index behind Lagos. Aside from Foem well on quantifiable metrics, yet scores toria, Cape Town is the least densely populated well on policy. Its best category perforcity in the Index. Located at the northern emdarce is in land use, where it is the only city that the Cape Peninsula and with a mild climate, pitaises well above average. In this category one of the most popular tourist destinationssimong policies go hand in hand with abundant Africa. The city is also a base for IT and marqufæen spaces and a relatively low percentage of turing companies, and has undergone a receptople living in informal settlements. Underpinconstruction boom largely due to the 2010 ning much of Cape Town's policy efforts is the World Cup. The legislativecapital of South city's Energy and Climate Change Action Plan, Africa, Cape Town is also home to the countwitisch has set multiple targets and recommendparliament. ed various initiatives to improve green perfor-

Cape Town ranks above average overathlaringe.

Cape Town is marked down for having the high- est CQ emissions per capita from electricity consumption in the Index, producing an esti-		well below average	below average	average	above average	well above average	
mated 4,099 kg, around four times the Index	Energy and GO		••••	••••	• • •	• •	
average of 984 kg. The city relies heavily on electricity produced from coal, which accounts for	Land use	•	••••	••••	••••	•	
93% of total supply. Only 2% of electricity pro-	Transport	•	••••	• • •	•••••		
duction is generated by renewables ources. Electricity consumption is also relatively high, at	Waste	• •	•	••••	••••	•	
an estimated 13.9 gigajoules per capita, com-	Water	•	• •		• • • •		
pared with the average of 6.4 gigajoules. This is	Sanitation	• •	• •	• • • • •	••••		
in part due to high consumption in wealther householdsand cheap residentialelectricity	Air quality		••••	• • •	••••		
prices in recent years that have not encouraged Enviro	nmental governance		••••	••••	• • • •	•	

Overall result

Performance • Cape Town

The order of the dots within the performance bands has no bearing on the cities' results

Energy and CQ: Below average

conservation. An estimated 90% of households

have access to electricity, compared with the

has been announced, although it will be driweater quality, and industrialwater pollution access figures are lower, especially in informal by the national government. The city's preafrodards are enforced. The 2011 Waters Stefements. When it comes to wastewater treatmance in this category is bolstered by policieises Development Plan sets a target to provide, rapidly developing commercial and resiaimed at encouraging commuters to take greater to all residents by financial year dential areas have placed a strain on many dated er forms of transport and by the exister 2021. However, with an estimated 91% eaftment facilities. The city has acknowledged dedicated mass transport lanes. residents having access to potable water (wthichissue and steps are being taken to upgrade is on par with the Index average), Capefatowies (see "green initiatives" below). Already,

Green initiatives: In 2009, ahead of the Worldill need to make considerable progress in the Index that Cup, he city launched the first phase of its name in the coming years. While the cityhasoa-policy aimed at setting standards for treat-BRT network, known as MyCiti. The first phasemes 225 litres of water per capita each dament and monitoring of wastewater. included an inner city loop, a commuter service pared with the Index average of 187 litres, it route serving the West Coast, and links to the reduce water consumption to 180 litresen initiatives: The city has a rolling tenport. By 2012 a network of nine permanent BerTcapita per day by 2014. To this effect, thear programmeto upgradeits wastewater bus routes is expected to be launched in theitenis targeting water leakages. Althoughreitment facilities by 2014. Its goal is to bring tral city. By 2013 it is hoped that an expressal ready has the lowest leakage rate in the laddle wastewater treatment facilities close to vice between the townships of Mitchells letaining 10% of volume, compared with the Introductional wastewater management standards.

and Khayelitsha on the Cape Flats will link taybeage of 30%, Cape Town is nonetheless from progress has already been made and in

Waste: Above average

central business district.

Waste generation in Cape Town on a per ca basis is the second highest in the Index 573 kg, compared with the Index average 408 kg. Despite this, the city's good pe mance in this category is due to strong poli relative to the other 14 cities in the Index. Town monitors and enforces standards for industriesto properlydispose of hazardous waste, for example. In addition, a numb schemes are in place to reduce waste gene (see "green initiatives"). Recycling facilities widely available, with on-site and central co tion points, including several community dr off facilities for large items, construction rule and recyclables. Nevertheless, population growth is putting pressure on waste ma ment and the city is rapidly running out of I fill space at its three main sites.







will help it achieve this vision.

informal areas, steppingup enforcement of





cle emissions. A diesel vehicle testing programme is under way whereby traffic officials have the power to conduct spot checks. The council has also produced a booklet explaining what residents can do to reduce air pollution.

Environmental governance: Above average

The city has conducted an environmental baseline review for areas such as water and sanitation, waste, energy, and climate change within the last five years. Regular reports are also published on green performance and progress. Envi ronmental policy is overseen by the city government. Its Environmental Resource Management (ERM) department is directly responsible and works in close collaboration with other core departments such as Electricity, Water and Sani tation, Transport, Solid Waste Management, and City Health. There are committees to addres energy issues and climate change, and they often collaborateacross departmentsunder named remits such as "energy security" and "ca bon mitigation".

Green initiatives: Cape Town runs environmental awareness trainings, including sessions for 23,000 city staff members on how to implement sustainability advice contained in the Smart Living Handbook. Officials have proposed building a Smart Living Centre that would include exhibits and educational activities for the public relating to sustainability. The proposa is still at the planning permission stage, but organisers have proposed several facilities within the centre, including an organic farmers' market and a recycling centre.

Green initiatives: The city has a number of

ongoing initiates and plans to reduce waiste to improve the efficiency of its water system, eight of Cape Town's 23 wastewater faciligeneration. It is running a pilot scheme in some "green initiatives" below). ties were given the Department of Water and suburbs to have residents separate waste from Forestry's "Green Drop" award for high standards recyclables before collection. There is alsoream initiatives: The city has an ongoing pro-wastewater management.

IntegratedWaste Exchangewebsite, which gramme to help residents of poorer households

allows businesses and the public to excland ee high water bills by fixing water laiksquality: Above average

potentially useful waste materials. Furthernthmenselves. The city provides information b@ake Town has the most robust clean air policies under Cape Town's Extended Producer Respects with practical information on how to fix illeaks, Index, with ongoing air monitoring at 13 bility policy, city procurement guidelines favouwell as promotional flyers printed in Englishes around the city and public information companies that operate take-back program Afreikaans and Xhosa, three of the country in plainings. Air quality checks are made at varifor items they sell, such as used printeroffaial languages. In addition, more than 450000ocations throughout the city and most of tridges and glass bottles. In addition, the citwates meters have been installed in housestsie ceir pollutantshighlightedin the Index, published a detailed Smart Living Handbthockend of 2010 to alert owners when wateringologiang sulphur dioxide, nitrogen dioxide, susencouragingresidentsto reduce, reuse and sumption has reached unaffordable levels. pended particulate matter and carbon monoxrecycle waste. ide, are measured. Despite this, air pollution lev-Sanitation: Average els in Cape Town are high, especially in informal

Water: Above average An estimated 94% of Cape Town's popularteas. Air pollution is caused by a number of fac-Cape Town performs very well for its politimises to sanitation, according to govern-including vehicle emissions, smoke from related to water quality and sustainabilitmeAt figures, which is above the Index averaged or coal-burning fires, industrial processes code is in place to monitor and sustain surfacte84%. However, some studies have suggested wind-blown dust. Another contributing fac-

Ouantitative indicators

tor is a meteorological condition known as low-

Category	Indicator	Cape Towrn ageYear*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84.2 89.7 2009	General Household Survey 2009
	Electricity consumption per capita (GJ/inhabitant)	13 94 2009	City of Cape Town, Electricity Department
	₂ er 619 sions from electricity consumption per person (kg/person)	983. 4,098.6 2006	State of Environment Report 2008
LAND USE	Population density (persa)ns/km	4,578. 1,509.5 2009	EIU calculation
	Population living in informal settlements (%)	17:0 0 2009	City of Cape Town, Environmental Resource Management Department
	Green spaces per paperoto(n)	73.6 289.5 2010	City of Cape Town GIS data
TRANSPORT	Length of mass transport network²(km/km	2.7 1.9 2010	Golden Arrow Bus Company
	Superior public transport netwerk (km/km	0.07 0?11 2010	Cape MetroRail & MyCiti BRT
WASTE	Waste generated per person (kg/person/year)	572.9 2010	City of Cape Town Solid Waste Minimisation and Disposal Statistics Database
WATER	Population with access to potable water (%)	91.4 2009	General Household Survey 2009
	Water consumption per person (litres per person per day)	225.2 2009	City of Cape Town, Environmental Resource Management Department
	Water system leakages (%)	10.0 3/2009	City of Cape Town, Environmental Resource Management Department
SANITATION	Population with access to sanitation (%)	8 94.1 2009	General Household Survey 2009

route (26.1 km), 2) There are no subway or tram lines, 3) Unaccounted for water = 24.5%



been complaints about high prices. Electricate per person across the metropolitan area, consumption remains relatively low, measuring with the Index average of 74 square 5.0 gigajoules per capita versus an Index averetoes. Although in general the city lacks suffiof 6.4 gigajoules. ©missions from electricity ient green space, the main exception is the consumption are also lower than the average rank in central Casablanca. Planted an estimated 405 kg per capita versus the linde 18. the park features palm trees and café average of 984 kg. Leaving aside the four Stertlaces for refreshments. There has been dis-African cities in the Index, which push up theus with of another new large park but this is yet age considerably, Casablanca has one of theolioghrealised. er volumes of Comissions per capita from elec-

tricity consumption in the Index. That's becausen initiatives: The governmenthas a more than half of the city's electricity productivenopment strategy that aims by 2030 to is generated from coal, while only 8% comesemphilitate the city centre, bring more balance renewable sources. in living standards between the eastern and western regions of greater Casablanca and

Green initiatives: Lydec, operating in Casablamprove conditions in informal settlements, ca since 1997, has upgraded the city's powleding building new parks. In the past tw network and expanded access to areas that were, officials have been running pilot proviously lacked electricity. According to the commanmes around the metropolitan area to test pany, improved monitoring of the powerthmetriability of "urban agriculture", which incorwork has reduced the number of outages asponed space into urban centres and proas the average time to restore power after a inless another food source for the city. The profrom 33 minutes to ten minutes. ject receives funding from the German govern-

Land use: Above average

Historically Casablanca has been well planted evelopment of the 80,000-seat stadium, a and its growth over the past 50 years has lamingely profile project for the city, includes plans followed a deliberate pattern. But the unfloarithe creation of green space, a new element sprawl that makes up greater Casablanca, wolfinghban planning in Casablanca.

ment's ministry of education and research. A

new football stadium is also under construction.

used to consist of 27 different municipalities, is

less organised and there is a great disparity linansport: Average

standards of living in different parts of the city's public transport network measures Casablanca has the smallest proportion of 4ths per square kilometre, less than the Index population living in informal settlements in therage of 2.7 km. Transport connections ar Index, at an estimated 15%, considerably belowcentrated on the city centre with few links to the Index average of 38%. Land use policiesperepheral areas, meaning that commutes on also strong, particularly regarding green spaceblic transport from the suburbs are often protection, with city authorities focused on letresthy and complicated. On a policy level, the grating more green space into urban areas. Thehas made little effort on initiatives to tackle city has an estimated 55 square metres of graffic congestion and there are no exclusive but

Other cities

asablanca is Morocco's chief port and lathæntthe city itself, is responsible for many of the city, with 3.4 million people across the meten initiatives detailed in this city portrait. ropolitan area. Situated on the Atlantic Oceane downside to this policy is that without the city is a conglomeration of several withbeart control, city authorities do not always centres and has a large industrial presence. Have a quick remedy when things go wrong. the fourth largest port in Africa, handling moreCasablanca ranks above average overall in than 500,000 containers a year. In all, the ctheilindex, and places above average for five indiresponsible for 60% of Morocco's trade winduals categories: energy and Cand use, home to 40% of the country'sworkforce. water, sanitation and air quality. It does not fall Casablanca relies heavily on a private conecon average in any category. Particular sionaire to deliver a range of essential servistes ngths when compared with the other 14 such as electricity, water and sanitation. Privittes in the Index include relatively high levels of sation has led to a range of investments in publiss to electricity, potable water and sanitainfrastructure in recent years. On the wholetthis and a relatively low number of residents livarrangement has worked well, which is refleicted informal settlements. Policies in these in the city's performance in the African & market also comparatively strong. Challenges 3,300 City Index. Indeed, the concessionaire, rantiblerde making waste collection and disposal

more consistent across the city, and the need **Rerformance** improvement in overall environmental monitoring. There is some hope that the uprisings around the Middle East and North Africa, which also centre on providing better services and liv-Energy and GO • • ing conditions for the population, may help to Land use accelerate improvements. • • • • • Transport . . . Energy and CO: Above average • • • • • • • Waste An estimated 99% of households in Casablanca Water . . • • • • have access to electricity, one of the highest percentages in the Index and above the Index aver-Sanitation • • • • age of 84%. Electricity, water and sanitation ser-• • • • • • • • • • • • • Air quality vices are provided by Lydec, a private-sector consortium. Although Lydec has improved thenvironmental governance • • • • • • • • • city's power network since it began operations • • • • • Overall result 0 0 .

there in 1997 (see "green initiatives"), there have The order of the dots within the performance bands has no bearing on the cities' results.

Background indicators

Total population (million)	3.4
Administrative area (र)ने	1,000
Population density (nerson@l/m	3 300

1) Greater Casablanca

lanes that might encourage greater take-up\\(\rightarrow\) fater: Above average remain. Some of the country's biggest industrial public transport. However, the city's first transport it is estimated that all Casablancafarcibities, located at Mohammedia in greater way is under construction (see "green initiatives," have access to potable water, the Cata blanca, often pump waste and wastewater consumption level, at 89 litres per persodirecetry into the sea, a problem that Lydec is trybelow). day, is about half the Index average of 187 litgets address (see "green initiatives" below). An

Green initiatives: Casablanca's first 30-km the efficiency of the city's water system, whitebility to drain rainwater effectively during way will have just under 50 stops and conneist run by Lydec, is about average by theexibals-of heavy rainfall is also an ongoing prob-Sidi Moumen in the east, to Hay Hassani and athes of the Index. The system loses an estilematfor the city.

Quartier des Facultés in the west via the cite 28% of volume to leaks, compared with the

historic centre. The government says then the average of 30%, but work is under way to initiatives: Lydec has implemented a will carry 250,000 passengers a day; operation over that performance (see "green in the proventies and a second or see "green in the performance of the performance o are slated to begin in December 2012. Anottives"). Policy areas are also relatively stworkg.eliminate the discharge of waste into the 150-km line, along with a suburban rail link. Gasablanca is one of only a few cities iseahet Mohammedia and transfer wastewater eventually planned to connect Mohammedianidex with a code aimed at reducing strain for its Bouskoura Ouled Saleh for treatment. The the north of greater Casablanca with Nouacewater resources and consuming water more grammeinvolves the rehabilitation and in the south. Additionally in 2011 the Morocefficiently. Water quality standards have extension of the sewerage system and wastegovernment began works on a high-speed Tlice en set, which is relatively rare amongwater collection facilities, the rehabilitation of train linking Casablanca to Rabat and Tangiether 14 cities in the Index. wastewater treatment stations, and the con-



reduce the sulphur content in the countrelatively little information has recently been petro leum from about 10,000 parts per milition blished on environmental performance and (ppm) to just 50 ppm. In addition, until dwgress, and Casablanca could also do more to years ago there was no inspection system famorease public participation in environmental vehicles in Casablanca, and therefore no affiairs. As mentioned above, a number of areas to prevent owners from running highly pollute environmental policy - electricity, water and ing automobiles. In the past two years, howeverse management - are managed by public er, there has been a major effort to addressptheate partnerships (PPPs) in which the governproblem. A Swiss private firm has been roomt grants a concession to a private company tracted to ensure that proper inspection soaren the service in a certain region of the city carried out and it has introduced a comfourta set period of time. By and large, the use of erised record system that bans highly-pollumages has proved an effective way of improving vehicles from the roads. public services, but it means that policy is not necessarilyconsistentacross the city, and

Environmental governance: Averagethere has been some popular opposition to the Casablanca performs relatively well for envisormategy, particularly in the waste management mental management and it has a departmentation. dedicated to environmental issues. However,





Casablanca is in need of strong policies as its air





Green initiatives: As part of its management of Casablants water, wastewater and power utilities, Lydec has introduced state-of-the-art computer technology to help improve oversight of the city's key services. The systems are moni tored electronically, and data is transmitted to a control room known as the Multifluid Central Coordination Bureau. In an effort to improve reliability, Lydec has installed more than 300 remote control points on the network to give early warning of the necessity of maintenance and repair work on the system, helping prevent leaks and outages. The systems are monitored 24 hours a day. Lydec has also sought to improve community engagement. It has organised local communication days, set up a new division focussed on skills development, and held campaigns and exhibitions for the public in general and schoolchildren in particular.

The 350-km train line, scheduled to be oper@reen initiatives: Lydec has upgraded the truction of a flood relief channel for the Oued El tional in 2015, will cut travelling time from Citiss water network and improved the Maleh River. blanca to Tangiers from five to just over two upply of drinking water to a number of sectors.

Waste: Average

The Merchich pipe, which supplies water Atio quality: Above average

Mohammed V, the city's main airport, has Casablanca has comparatively strong clean air Casablanca generates an estimated 474 algo dieen renovated. In addition, work is policies. There is a code to improve ambient air waste per capita versus the Index averaquedef way to minimise system leakages dowality, and monitoring in different city loca-408 kg. Recycling policies are relatively understelling flow meters to better monitor waterions regularly takes place. The city also meaveloped compared with the other 14 cities in themes. sures a wide range of air pollutants. However,

Index. In general, waste collection has improved

in the last five years, but the quality of servanitation: Above average

quality suffers from traffic congestion and polluvaries widely across the city, with responsibilities mearby in grea ter split between three private contractors who adisess to sanitation, exceeding the Index a carsablanca, including the Samir oil refinery. pose of waste at one site. Casablanca fares about of 84%. Sanitation policies are generally

ter in the Index for special waste collection andust as well. Casablanca has a sanitation Coden initiatives: After years of delays and disposal. Facilities are available for medical. in place and it has also set minimum standards diations, in 2009 the national government chemical and construction waste. Casablandariswastewater treatment, backed up by regular pleted the conversion of the Samir refinery marked down in the Index, however, for a lardopitoring.Lydechas been responsible or at Mohammedia to low-sulphur diesel, bringing onsite collection points for recyclable material of the improvements in sewage manadate refinery's petroleum products into line with and a limited range of items accepted. ment in recent years. Even so, challenges international standards. The conversion helped

Ouantitative indicators

Category	Indicator	Casabl ånea ageYear*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84.2 99.2 2004	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)	5.0 2009	Centre d'Etudes et de Recherches Démographiques
	₂ er 6i9 sions from electricity consumption per person (kg/person)	983.9 405.3 2006	2006 IPCC Guidelines for National Greenhouse Gas Inventories
LAND USE	Population density (persented)ns/km	4,578. 3,287.5 2009	EIU calculation
	Population living in informal settlements (%)	14.6 0 2008	Development Innovations Group Report - Best pract in slum improvement, the case of Casablanca
	Green spaces per paperso(n)n	73.6 55.5 n/a	Department of Agriculture & Department of Water and Forests
TRANSPORT	Length of mass transport network²(km/km	2.7 1.4 2005	ONCF (National Office for Railways in Morocco)
	Superior public transport netwerk (km/km	0.07 0.03 2010	ONCF (National Office for Railways in Morocco)
WASTE	Waste generated per person (kg/person/year)	474.4 2009	Estimate by GESI (private contractor running the city's landfill)
WATER	Population with access to potable water (%)	100.0 2004	UN Habitat
	Water consumption per person (litres per person per day)	1 89.0 2004	Office National de l' Eau Potable
	Water system leakages (%)	28.0 3(2005	World Bank
SANITATION	Population with access to sanitation (%)	8 98.9 2004	UN Habitat

All data applies to Casablanca unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed. e = EIU Estimate. 1) Greater Casablanca. 2) National electricity genera to estimate city level 60ata. 3) Metropolitan area. 4) Number of bus routes (56) multiplied by average length of bus route for other cities in the Index (26 km). 5) There are no subway, tram or BRT lines



been compromised by inefficient agricultimallar, she wants to strengthen the city's poliactivities upstream in the Kilombero and Usaies to improve the quality of the building stock valleys. Instead it is favouring natural gas, wahidhreduce illegal building. Under her watch currently accounts for 36% of electricity problem cFibaijuka says, developers will have to take tion. For example, the city is looking to add account of sanitation, waste and traffic prostantial supplies by building a natural gas duced by their proposed construction. The minpipelinefrom a newly discoverecourcein istry will also seek to limit and manage illegal south Tanzania. The city is marked down fotalteeovers of vacant land in the city. In another lack of clean energy policies. For example tiative relating to buildings, the international does not have a strategy to reduce the enviAgra-Khan Foundation, a non-governmental mental impact of its energy consumption. organisation, is trying to introduce traditiona Swahili building methods. This includes using

Land use: Below average

shade and breezes to cool buildings, and using An estimated 68% of Dar es Salaam's popullationhmud and thatch instead of imported steel lives in informal settlements, compared with tolde glass. Although these will be difficult to Index average of 38%. Despite a fairly low prepaise on a large scale, some of the principles o lation density of roughly 2,200 people per Swahili architecture can help show the way for square kilometre, the city's amount of graperior and greener new developments. Other spaces is under the Index average, at 64 squaitieatives include the integration of urban farm-

Performance	 Dar es Salaam Other cities
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	well below average	below average	average	above average	well above average
Energy and QO		•••••	• • • •	• • •	• •
Land use		• • • •	••••	••••	•
Transport	•	• • • • •	• • •	•••••	
Waste	• •	•	••••	••••	•
Water	•	• •	••••	••••	
Sanitation	• •	• •	••••	• • • •	
Air quality		••••	• • •	••••	
Environmental governan	ce •	• • • •	••••	••••	•
Overall result	• •	• •	••••	•••••	

The order of the dots within the performance bands has no bearing on the cities' results.

ar es Salaam, more commonly knowicoase, particularlyin waste and sanitation, Dar, is the largest city in Tanzania. It hawhere it ranks well below average. DAWASCO, population of 3 million, a number expected Dear's water and sewerage provider, is struggling double by 2020. Located on a natural harbottor cope with demand. In addition, there are few on the Indian Ocean, Dar is the country's trandinges in place to tackle green issues, and the hub. Like many other Tanzanian cities, itityas transport network is one of the least develexperienceda constructionand population oped in the Index. Investment on the scale needboom in recent years, putting a strain ord theoverhaul Dar es Salaam seems unlikely in city's resources and infrastructures. Dar es statement term. Instead, further green initiatives is among the top-ten fastest growing citive's imost likely have to come from innovative the world, and this too will bring huge abalroaches, community participation and more lenges, especially as more than two-thirds dhitelvement from international agencies, such population already lives in informal settlements be UN, which have been active in the city in

Dar es Salaam ranks well below average commt years. all in the African Green City Index. Its best cate-

gory results are in energy and COell as Energy and CO: Average water, where it ranks average. The city has commence Dar es Salaam's stronger categories is ^{2,200} enormous environmental challenges to overlergy and QOwhere it is marked up for its rel-

atively low electricity consumption and emmessres per person. The Index average is 74inguiate modern Swahili construction but so far sion levels. The city consumes 2.5 gigajoulesnefres. Relatively weak land use policiesthesse remain experimental. electricity per capita, versus the Index averagetoribute to Dar's performance. It does not 6.4 gigajoules. Comissions from electricity ave policies to protect green space or environmensport: Below average consumption are an estimated 61 kg per capitantally sensitive areas, for example, nor does es Salaam's public transportnetwork is a tiny fraction of the Index average of 984 kig have policies in place to manage urban spraderdeveloped and the city lacks any form of The city's emissions performance is helpedeboity gains marks, however, for provisiperior transport such as light rail, trams of sourcing 60% of its electricity from hydropointermal settlements with municipal servingestro. Although 7,000 to 10,000 privately run Also, a lack of electricity supply helps explain thing it has carried out in partnership with buses and minivans are in operation, dedicated low consumption and low comissions. Only Habitat. The city's master plan dates babkstooutes have yet to be created. There are an estimated 60% of households in Dar es Stalla align 70s, although this is currently being relans to roll out a bus rapid transit network (see have access to electricity, compared with the d. "green initiatives"), but it is not expected to be Index average of 84%. This leads to a heavy de up and running until 2013. Meanwhile. Dar es

pendency on gas and diesel generators - leased n initiatives: Tanzania's new minister of alaam's roads continue to get more and more at high expense from foreign companiesLantbs, Housing and HumarttSements, Anna congested - average commuting time has doumeet the city's power requirements. Dar seeribaijuka, has returned from heading UN Halbiedtduring the last decade. Policies, too, are rel set to reduce its reliance on hydropower, betwodelare that one of her first tasks will be tatively underdeveloped. Dar es Salaam is one of the water supply to power the hydro plants imagose "urban order" on Dar es Salaam. In paly a few Index cities that have not taken any

Background indicators

Total population (million)	3.0
Administrative area (4)m	1,400
Population density (persons/km	2.200

steps to reduce emissions from mass urbes to recycle paper, plastics and glass are issuicated rationing water sources in the city. A key transport. Nor has the city undertaken any ibatian-the planning stage, but are not yet presentent is a campaign of water education for tives to reduce traffic congestion, althoublowever, some private operators recycle goodleses Salaam residents that seeks to promote a does have sequenced traffic lights. However, as plastic on a small scale around the bienter understanding of the value of water and Dar is marked up for being one of three cities in its limited supply, and implementimproved the Index that promote greener forms of transater: Average water usage in communities. In another initia-

port. It has, for example, a partnership with an quantifiable water metrics Dar es Salaantive in anzania minister for water recently local non-governmentadrganisation to take line with Index averages: the city consumesaamounced a US\$21 million effort to increase into account the needs of cyclists when estimated 187 litres of water per day per cathitea, supply of water to the city by 90% before structing new roads. which is equal to the Index average. An esti**2021**5. The ministry says this will be achieved by ed 90% of the city's inhabitants have accessatoidly improving sewage treatment, doubling

Green initiatives: In 2005 the World Bankotable water, compared with the average of the pumping plants on rivers that supfunded the development of plans for a bus rapid. Water system leakages, at an estimated with water, and drilling large boreholes transit system in order to modernise the publow of total volume, also mirror the Index another around the city.

transportation network and limit the furthage. Yet challenges remain. Poorer districts in

growth of car traffic. The plan envisions the acity receive water only on a weekly Sassisation: Well below average DART (Dar Rapid Transit) will run along dediggad-Dar's performance is relatively weak in Appliestimated 56% of the city's population has ed lanes, with links to private minibuses. cy areas. The city does not yet have a strategyess to sanitation, with an estimated 7% of Although the project has been delayed, alimented at encouraging efficient water consumper's households linked directly to sewers. In are signs that the start of construction is netion, nor does it enforce water pollution astalition, it is estimated that only 10% of the raises carbon monoxide and nitrogen oxide **Environmental** governance: els. Another air pollution problem is the use below average

wood and charcoal for cooking, as well as then like the majority of Index cities. Dar has no burning of solid waste. There has been air quathority dedicated to green issues. Responsit ty monitoring in the past, with the assistance of environmental programmes is generally the US Environmental Protection Agency divided between various departments and the UN, but these efforts were temporary amdany cases when policies are in place they are only took place in limited locations around time or not enforced. Neither have ther city. Dar does not currently monitor air qualities any recent published reports on environon its own without outside assistance. mental performance and progress. In a city

where more than two thirds of the population Green initiatives: Dar es Salaam hopes toves in informal settlements, the lack of green receive part of a US\$777 million loan from the porting is unlikely to be a top priority in most World Bank to the national government of Taeople's minds. Nevertheless, the absence zania to improve the environment, includiaseline environmental reviews and the lack of provisions to deal with air quality. Specifics any concerted green management efforts a unclear at this point, although one suggestisse for concern. Without a plan or strategy scheme could help develop clean energy storrerove the city's environmental affairs. t and community cooking initiatives in poorregionity of city inhabitants are unlikely to see communities. rise in their environmental living standards.















ing. City authorities say the first seven statidasds on local industry. In a recent assessmentage is treated before being discharged. The will be open by 2013. This initial phase is exto that outlined water and sanitation needs has relatively weak sanitation policies, ed to cost US\$10 million, with most of the fundDar es Salaam. Those included developingham need to be strengthened to improve saniing coming from the World Bank. overall conservation and water-demand rtation services. Like the majority of Index cities, agement strategy that addresses in partial addresse

Waste: Well below average

the needs of the urban poor; educating polition facilities and treat wastewater. But unlike Dar es Salaam generates an estimated 462 kmg kers and senior administrators about the majority of Index cities, Dar does not prowaste per capita, slightly more than the Indexemand management in order to reducentiate public awareness about healthy sanitation average of 408 kg. Policies, however, are reframber of illegal connections and vandatismatices.

tively weak and the city lacks an integrated transfer ingresource management from the

egy aimed at reducing or recycling waste. Itcitis water and sewer agency to communities; quality: Below average

lacks regulations for waste picking, monitorized introducing water conservation educationes Salaam has no code to improve air quality of illegal waste dumping and standards for the children. The UN has made investments and there is no comprehensive and continuous industry to adequately dispose of hazardthescity to address some of these action points nitoring of air pollutants. The city lacks camwaste. As a result the city is struggling to copee "green initiatives" below). paigns to raise public awareness about the danwith municipal waste. In the absence of a regugers of air pollution, although that might lar and reliable waste collection service, Gressian initiatives: UN Habitat has run severathange if it is awarded outside financial assis-

dents typically burn their rubbish. Toxic fumeriatives in the city in the last ten years, inclarde (see "green initiatives"). Meanwhile, Dar's from burning plastic are not uncommon. Facility a programme aimed at identifying, proteobds are becoming more congested, which

Ouantitative indicators

Category	Indicator	Dar es Sale	mange Year*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84.2	59.8 2004	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)		6 2.5 2009	National Bureau of Statistics
	₂ erGissions from electricity consumption per person (kg/person)	983.9	60.8 2009	2006 IPCC Guidelines for National Greenhouse Gas Inventories
LAND USE	Population density (persans/km	4,578.1 2	,182.4 2009	EIU calculation
	Population living in informal settlements (%)		3 68.0 2009	UN Habitat
	Green spaces per 🍂 pecso(n)n	73.6	64.1 2004	Royal Institute of Technology, Division of Urban Studie Stockholm
TRANSPORT	Length of mass transport network ² /km/km	2.7	2 0.0 2011	
	Superior public transport netwerk (km/km	0.07	0.00 2011	
WASTE	Waste generated per person (kg/person/year)	4	462.4 2009	Dar es Salaam City Council
WATER	Population with access to potable water (%)		91 90.0 2009	Energy and Water Utility Regulatory Authority
	Water consumption per person (litres per person per day)	1	8 1/87.0 2009	UN Habitat
	Water system leakages (%)		30 2007	UN Habitat
SANITATION	Population with access to sanitation (%)	8	4. 155.6 2004	UN Habitat

All data applies to Dar es Salaam unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed. e = EIU Estimate. 1) National electricity generation mix used to esti level CQ data, 2) There are no dedicated bus routes in Dar es Salaam, 3) There are no subway, tram, light-rail or BRT lines, 4) Data refer to Tanzania urban population. As the largest urban centre, this is a good estimate for



Green initiatives: One effort aimed at addressdex, with an estimated 1,500 people per ing climate change locally is driven by the 2000are kilometre, versus an overall average of initiated Durban Climate Change Partnershood. An estimated 22% of the population which includes members of the private sectores in informal settlements, well below the academia, government, civil society and Index average of 38%. Durban is rich with green governmentabrganisations. Durban was a space, at 187 square metres per person. This is host city for the 2010 World Cup and in the moore than double the Index average of 74 up to that event launched the Greening Durstamare metres, and the third highest amount in 2010 campaign. It aimed to neutralise the Index, behind Cape Town and Johannes-370.000 tonnes of G@missions forecasted tourg. Nevertheless, many of these areas are be produced during the construction and hosteder threat from urban sprawl and agricultural ing period. Initiatives included making the development. The city's recently introduced Moses Madiba Stadium as energy efficies batisal Development Framework plan aims to possible, a reforestation project at the Buffets mbat this potential sprawl, while an Integratdraai landfill site, and promoting other weaterevelopment Plan has identified the imporand electricity saving schemes, although themece of meeting infrastructure and housing is no information on whether the initiative ds in informal settlements. reached their targets. Similar climate change initiatives are under way ahead of Durban hosten initiatives: There are several initiatives ing the United Nations Climate Change Confer-improve the city's ecosystem under the ence COP 17. There are several targets to readule ellaof the Durban Metropolitan Open overall Coemissions by 2020, focussing sepapace System (D'MOSS) project. D'MOSS is

rately on industry, transport and homes.system of open spaces, some 74,000 hectares addition, the Imagine Durban scheme is partofoliand and water deemed to be of high big a global campaign, led by Sustainable Citiesdiaersity value. A key part of D'MOSS has been Canadian non-governmental organisation, tooidentify and categoriseen dangered and improve urban environments and reduceseasitive areas to protect them from develop bon emissions. It aims to make Durban a canbent, and raise awarenessabout the city's neutral city by 2050. As part of the campaigniodiversity. There is also a campaign to sto the city has created tool-kits for businesses taked invasion of alien plant species, and the soil individuals to advise them how to reduce thaird water erosion that they cause. Furthercarbon footprint. more, as part of the preparations for hosting

Land use: Above average

ed. With this Greening Durban project, the city Durban contains a densely populated urbangely targeted the city's biggest landfill sit core surrounded by more spread out suburbBuffelsdraai. For low-income residents living fairly densely populated townships and infearby the trees have hidden the view of the mal settlements in the outskirts. As a resultroubbish and encouraged new wildlife to flourthis sprawl and the city's large administisaltive and are absorbing some of the smells from area, it is one of the least dense cities the thedfill.

the 2010 World Cup, 62,500 trees were plant-

urban, located on the Indian Ocean, is the also boasts abundant green spaces and ge-Uthird most populous South African city, withally performs well in delivering utilities, pub-

Durban ranks above average overall in 48% Supply shortages, once common, particu-Index. With 1,400 bus routes, the city has therely in colder months when heating and electrilongest public transport network in the Indexal appliance use increases, have been much

The order of the dots within the performance bands has no bearing on the cities' results.

an estimated 3.5 million residents. It is homlectoservices and policies. As a result, Durba
East Africa's largest port and has a substantianks above average in the Index in most cate-
amount of industry and manufacturing. Toweries: land use, transport, waste, water, sanita
heart of Durban is densely populated, but theon, air quality and environmental governance
city, which spreads out across 2,300 squareTkito-city ranks below average for energy ar
metres, is one of the least dense in the Inde&O ₂ , owing in part to high ₂ @nissions result-
Like other South African cities, Durban useding from a major dependence on coal to produc
2010 World Cup as a catalyst for a range of electricity.
ronmental initiatives, which it can showcase
when it hosts the COP 17 United Nations Climatergy and CQ: Below average
Change Conference, taking place in November estimated 88% of Durban households have
and December 2011. access to electricity, above the Index average of

less frequent in recent years. As a result of wid	E.El IOI IIIalic	□ • Durba	an Oth	er cities			
spread access, electricity consumption is a			below	average	above	well	
higher than average, at 11.3 gigajoules per ca	oi-		average		average	above	
ta, versus the Index average of 6.4 gigajoules.						average	
Electricity in Durban is generated mainly throu	2 2		••••	• • • •	• • •	• •	
coal, with renewables, mostly hydro, comprising	l and uco	•			• • • •	•	1
just under 2% of the electricity production mix	- Land use			0000			4
The city has also begun generating energy on	Transport	•	••••	• • •			
a limited basis from local waste by-product	S. Waste	• •	•	••••	• • • •	•	
Durban's heavy reliance on coal drives up CO	Water			••••			+
emissions from electricity - the city emits	an ^{Water}	•	• •	0 0 0	• • • •		
estimated 3,503 kg per person from electricity	Sanitation	• •	• •		• • • •		
consumption, well above the Index average of	Air quality		••••	• • •	••••		1
984 kg, and second only to Cape Town in the							-
Index. However, promising policies in this area	Environmental governan	ce •	••••	••••	• • • •	•	
will hopefully catalyse reductions in consump-	Overall result	• •	• •		• • • • •		7
tion and improvements in efficiency.	Sverdir result				•		╛

Population density (persons/km e = FILLEstimate 1) eThekwini area

Total population (million)

Administrative area (4)14

Background indicators

Transport: Above average

city's growth. Though there is no separate water sustainability in the Index, and leads the With an extensive bus system of 1,400 mounteespal collection service for household handex, along with Cape Town, on water quality and some 200 operators. Durban has the ardous waste, a domestic collection programpdiev. longest public transport system in the Indexensures the adequate disposal of cardboard,

total it measures 9.2 km per square kilometpaper, tin and glass, and covers most of the Criter's initiatives: There are seasonal hosemore than three times the Index average off@rmal housing areas. In recent years, the citivoe bans, and some impromentally conscious km. Superior forms of public transport, suchhas introduced public clean-up campaignsestidents carry out private collection of rainwametro, BRT or tram lines, make up an estimatethess the problem of illegal dumping and the sand grey-water recycling. The city promotes 0.16 km per square kilometre, more than tweven conducted raids to stop that. Durbanater conservation in homes by giving out free the Index average of 0.07 km, and consist most be score is further bolstered by a robust weterflow limiters and encourages people to ly of suburban trains. Nevertheless, Durbardisies aimed at enforcing environmental stasse-water meters. Furthermore, the water and public transit network is often hampereddands on landfill sites. sanitationdepartmenthas started supplying unreliability and those who can afford them treatedwastewaterto irrigatefarmlandand

commonly use private vehicles. City officials initiatives: In a bid to increase recyclicommunity gardens.

ability to overcome these obstacles will be ankelyceate local income, informal waste-pickers

factor in the future success of mass transit degretallowed to rummage through the Bisaritation: Above average opment efforts.

Road landfill site for items they perceive to An estimated 90% of the population has access value. They can then sell their items at various anitation, compared with the Index average Green initiatives: The city council used they-back centres run by both private recyclorg84%, and the city's wastewater is treated

hosting offte 2010 World Cup as an opportunion and the city. It is estimated that before being discharged into nearby rivers and ty to invest in public transport, securing US\$236 66.000 kg of material are retrieved: million of national government money for thise Bisasar Road site each month by some 3000eto Durban faces challenges providing sanipurpose. Initiatives included the launching of 00 waste collectors, or around 200 fantilings.conditions to low-income informal settle-







new passenger bus called the People Mother, city is studying ways to expand these sitteents. Those areas often suffer from a poorly which created new routes in areas not servean by yout them in more suitable areas, closer traintained and often vandalised sewerage netexisting transport providers, running along the er-income residents. work susceptible to blockages during periods of beachfront and connecting Durban to neighhigh demand. Nevertheless, Durban's efforts to

bouring communities. The council also created ater: Above average

promote public awareness around proper saninew online travel information system integrate estimated 98% of the population has actes on and its implementation of minimum ing details of buses, taxis and minibusescopotable water, compared with the Indexstewatertreatmentstandardsset it apart touch screens at various sites around the verifage of 91%. The city's consumption from many of the other cities in the Index. including the Moses Mabhida Stadium. Thremeased steadily over the past four years and

are longer-term plans to have a fully integrated by, at 253 litres per person per day, Gitees initiatives: In 2000 the city's water serpublic transport system, so that bus and taxe the Index average of 187 litres. Leak wigges Jaunkeed a sewage education programme at 36%, are also higher than the Index average bid to reduce damage to the city's sewerage routes match up with train stations.

of 30%. The quality of Durban's drinking wabetwork, Educational resources and toolkits Waste: Above average is generally very good, in part due to the citwer designed for use in schools and at informal

Durban generates 519 kg of waste per stripittapolicies on improving and monitoring studiucation settings, such as clinics. There were annually, more than the Index average of 40% ckg, water. Likewise, the city enforces wasted shows and street theatre performances Landfills are increasinglyunable to match pollution standardson local industry. As a aimed at lower income communities where literexpanding waste volumes resulting from resealt, the city has the strongest policies correvels are lower. The campaign appears to







experiences in sustainability planning. The con-

cept behind Imagine Durban is to focus on what

citizens would like the city to be in the future an

have had a positive impact, with blockages harmful to human health". In a bid to achieve dregularly publishes information on prodown significantly, and the scheme has the target, a number of key goals have been easthailed as a best-practicexample. Durban's lined. The first is to reduce commercial pollution

cles to meet low-emissions standards, and sumjunction with partners: Sustainable Cities, a

gestions that workers share vehicles and commandian non-governmental organisation, and

water department was invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited to create a tdw/ketstablishing and implementing by-laws that invited the create a tdw/ketstablishing and invited to create a tdw/ketstablishing and create a tdw/ketstablishing a tdw/ke to be used in urban Kenya and then posseible penalties for pollution and promottime is a city-council-led project on integrated elsewhere on the continent. low-emission industries. There are calls for weahin-term planning. It is being implemented in

Air quality: Above average

Durban'sclean air policies are among the nies promote carpooling or provide more the PLUS Network, a network of 35 cities sharing strongest in the Index, and officials have becommunal transport. monitoring air quality at various sites around the city since 2004. Systems measure sulphur diaxvironmental governance:

ide, nitrogen dioxide, particulate matter and Acrove average

then set medium- and long-term targets to mee bon monoxide. Air pollution is particularly Durban has some of the strongest policities sangoals. In another initiative, in September severe in the south of the city, near the coachy ronmental management and monitoring 011 Durban hosted its second three-day "Suswhere the mix of heavy industry and deheelindex. In 1994 Durban was the first Southinable Living Exhibition" which aimed to settled residential sectors has prompted Afforcan city to adopt the UN's Local Agenda showcase innovative ideas for more environwhich committed the city to implement sustrairentally friendly lifestyles. More than 130 cerns about air quality. ability measures, including creating a small stanids exhibited a range of goods, including

Green initiatives: Through its Imagine Durbaonmental managementdepartment. Since devices to save water and energy, solar-power project (see "green initiatives" in the entitivem, the department has expanded to 20 feelquipment, ozone-friendly appliances, and tools mental governance category) the city has state employees. The city government cofosis gardening and recycling. The event target to ensure that within ten years air is "tently monitors its environmental performances seen as a warm up for the COP 17 summit.

Ouantitative indicators

Indicator	Du	ı r.bae rage	Year*	Source
Proportion of households with access to electricity (%)	8	34 88.0	2010	National Department of Cooperative Governance and Traditional Affairs
Electricity consumption per capita (GJ/inhabitant)		11.3 .4	2010	Durban Electricity Department
₂ er@sions from electricity consumption per person (kg/person)	98 3	503.4	2010	World Bank
Population density (persð)ns/km	4,578 1]	,509.8	2007	EIU calculation
Population living in informal settlements (%)		22.48.0	2007	Community survey 2007
Green spaces per pleoso(n)	73.6	186.6	2007	State of Energy, Key Indicators Report 2007/08
Length of mass transport network ² (km/km	2.7	9.2	2011	eThekwini Transport Authority
Superior public transport netwerk (km/km	0.07	0.16	2010	Metrorail
Waste generated per person (kg/person/year)		519 0.8	2007	State of Energy, Key Indicators Report 2007/09
Population with access to potable water (%)		98902	2007	Community Survey 2007
Water consumption per person (litres per person per day)		252.9 .2	2007	State of Energy, Key Indicators Report 2007/08
Water system leakages (%)		36.4	2007	State of Energy, Key Indicators Report 2007/09
Population with access to sanitation (%)		90.1	1998	UN Habitat
	Proportion of households with access to electricity (%) Electricity consumption per capita (GJ/inhabitant) 2 er6@sions from electricity consumption per person (kg/person) Population density (persens/km Population living in informal settlements (%) Green spaces per person (h) Length of mass transport network km/km Superior public transport netwerk km/km Waste generated per person (kg/person/year) Population with access to potable water (%) Water consumption per person (litres per person per day) Water system leakages (%)	Proportion of households with access to electricity (%) Electricity consumption per capita (GJ/inhabitant) 2 er6@sions from electricity consumption per person (kg/person) Population density (pers@ns/km 4,5781; Population living in informal settlements (%) Green spaces per plapecrotin Length of mass transport network2km/km Superior public transport netwelyk (km/km Waste generated per person (kg/person/year) Population with access to potable water (%) Water consumption per person (litres per person per day) Water system leakages (%)	Proportion of households with access to electricity (%) Electricity consumption per capita (GJ/inhabitant) 2 er6i3sions from electricity consumption per person (kg/person) Population density (pers3ns/km Population living in informal settlements (%) Green spaces per person (m) Creen spaces per person (m) Elength of mass transport network km/km Superior public transport network km/km Waste generated per person (kg/person/year) Population with access to potable water (%) Water consumption per person (litres per person per day) Water system leakages (%) 8488:0 11.3.4 12.4 13.4 15.9 18.6 19.2 18.6 18.6 18.6 19.2 19.2 19.2 19.2 19.2 19.2 19.2 19.2 19.3 19.	Proportion of households with access to electricity (%) Electricity consumption per capita (GJ/inhabitant) 2 er6i3sions from electricity consumption per person (kg/person) Population density (pers3ns/km 4,5781,509.8 2007 Population living in informal settlements (%) 22.4:.0 2007 Green spaces per person (kg/person) Length of mass transport network k/km/km 2.7 Superior public transport network k/km/km 0.07 Waste generated per person (kg/person/year) Population with access to potable water (%) Water consumption per person (litres per person per day) Water system leakages (%) 2010 2007

All data applies to Durban unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed. e = EIU Estimate. 1) eThekwini area. 2) There are no subway, tram o



Green initiatives: The city of Johannesburg ishe averageof 74 squaremetres. Although keen to promote solar power as a way to reglockennesburg aims to protect sensitive areas carbon emissions and cut electricity costs. Thuse h as wetlands, the overwhelming demand authorities, thanks to funding from the Danistr new housing will put pressure on this goal. Development Agency, have spent US\$1.2 mil-

lion installing solar water heaters in 700Glown initiatives: The city is trying to reduce cost homes in Cosmo City, a housing development by rehabilitating under-populated ment. There are plans to extend the schemeity centre neighbourhoods and building new other parts of the city where electricity supprhised-density and mixed-income housing de are poor. In another solar-related initiative, the pments with access to municipal services Johannesburg Road Agency has been installamed public transport links. To this end, the Johan solar power signals at key city intersections measured. Development Agency, which receives 2009. In addition to saving energy, the signalty and private funds, was set up in 2001 with are not susceptible to power failures, whithen specific remit to regenerate decayed inn cause congestion and higher fuel consumption areas. It has been credited with transformin from queuing drivers. Plans are also under weveral city districts, upgrading pavements, to convert landfill gas from several siteslighting, parking and security. The parks depart electricity to power city homes. Work has begent, meanwhile, works to maintain and refuron the first plant of its kind at one of the citoish green spaces and promote environmental landfills, and there are plans to extend the projects, such as tree planting, bird watching, lit scheme to four further landfill areas, with a telewcollection and river cleaning. A number of to generatingenough electricity for 12,500 parks have been developed from wasteland households over a 20-year period. alongside some townships with a view to create a greener environment for residents.

Land use: Above average

average in any individual category, achieving erformance

electricity is also highly dependent on coal, Environmental governance

age of 84%. Although the majority of people are

mal settlements rely on coal and wood fires. Grid-

connected to the electricity grid, those in infor-

which is responsible for more than 90% of the

Johannesburg is a sprawling city comprised of ansport: Above average scattered pockets of residential, industrial through the city has an estimated 6.8 km per office developments. As a result, population are kilometre of bus routes, far more that

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JohannesburgOther cities

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ohannesburg is the economic centre of Southers of transport, land use and air quality, with Africa and headquarters or the country's the specific aim of improving environmental manufacturing and mining industries. A magnetormance. There was also significant profor migration, it is South Africa's most populoness in transport and land use in preparation for city, with around 3.9 million people. Johannesbe 2010 World Cup.

burg is located in the Gauteng province, which ohannesburg ranks above average overall in has a total population of over 10 million. Watter, Index, along with five other cities. It is partic-waste and sanitation standards are generably strong in energy and God use, transbetter than in many of the other cities prortheir quality and environmental governance, African Green City Index, and often consisterathing above average in each category. The with those in more developed parts of the worlds environmental performance is bolstered However, like many developing cities in latinarying the second highest amount of green and globally, and due in part to the leganaceofamong the 15 Index cities and an exten-Apartheid, there are wide income disparitive bus network, as well as generally robust and dramatically different living conditions environmental policies, especially for clean between rich and poor. The city has introduced rgy and congestion reduction. The city's perseveral policies and plans, particularly informance is very consistent – it never falls below

Background indicators

Total population (million)

Administrative area (4)m

average rankings in water, waste and sanitation. Energy and CQ: Above average Providing energy to Johannesburg's 3.9 million Energy and GO • • • residents, half of whom live in cramped and • • • • Land use poorly served townships, is no easy feat. In the • • • • • • • • colder months when demand is high, power Transport outages are regular occurrences. Still, an esti-• • • • • • • • • Waste • • mated 90% of households in the city have access • • • • Water to electricity, which is better than the Index aver-

Sanitation

Air quality

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Population density (persons) km 2,400 Several policies and plans, particularly infollmeance is very consistent – it never falls below city's electricity production. As a result, CO The order of the dats within the performance bands has no bearing on the cities' results.

the Index average of 2.7 km, public transpolities: Average

Iohannesburg'swater from as far away as the city is often unreliable or unsafe. This meansity generates 401 kg per person of wastesotho or Botswana. Johannesburg performs personal vehicles, for those who can affect hvear, very much in line with the Index better than the Index average for water leakthem, and mini-bus taxis for the less wedgeofff 408 kg. Almost 95% of this goes to lambes, at 25% compared with the Index average clog city streets. However, the city has workfeld with recycling and composting accounting 30%. Plans are underway to introduce meters, improve, introducing a bus rapid transit systemess than 5% of waste treatment. The citarhdaismprove billing and water delivery services. and a high-speed train line to the airport (seetroduced recycling through central collection have had a reputation for administrative "green initiatives" below). Both of these points rather than curb-side collection. Overentors in past years. Regarding policy, the munictives have helped extend fast, safe and affoddaling with waste, including the estimated ity monitors surface water, ground water, able transport options. 244,000 tonnes that are illegally dumped eardtable water and wastewater for multiple pol-

year, remains a challenge in Johannesbuluqtaants and quality levels by taking water sam-Green initiatives: There are two recently the city is rapidly running out of landfill spaces from about 150 different points in the city. launched major public transport initiatives and the population is growing. It has also placed sensors in key areas to detect Iohannesburg, both of which were driven in sewer overflows and pump-station failures. Furpart by South Africa's hosting of the 2010 Worden initiatives: In a bid to increase recyclithogremore, the city promotes public awareness Cup. The first is the high-speed train line, the city is drafting new regulations to make support conservation.

to Pretoria. It is already operational thought for residents and businesses. Non-convolven initiatives: Tackling the looming threat works are underway on one final stationanthe could possibly be punishable by fine fsacid mine drainage will be on be of togest train also connects the Johannesburg's Sandtrimminal prosecution. Pikitup, the city's waterdepartment in the Sanitation: Average Air quality: Above average

An estimated 92% of the population has acdebannesburg's above average performancetin Air Quality Management Plan, hwhias to clean toilets, according to a 2007 commutative guality category is driven by its strotagen updated several times and forms part survey, well above the Index average ofp&Mces to improve air quality, including roublinehe 2040 Growth DevelopmentStrategy Unlike other parts of South Africa, Johannes and stringent air quality monitoring efforts unched in 2011. The city is proposing to add does not have open toilets, and most pelsiphe a well-developed network of air monitowe air quality monitoring stations to the existwho live in informal settlement are given in a stations, the city measures sulphur dioxide.six. Officials are also in the process of estabportable toilets. Johannesburg Water owns antrogen dioxide, carbon monoxide and ozofiehing an air pollution control bylaw that will operates six wastewater treatment works, whitibisions from vehicles, industry and domeseticacceptable industry and commercial emistreat all domestic sewage and industrial feffluoring. Despite aggressive action in this policy. However, they have not specified area, air quality issues still persist, and Johawhen the new rules are expected to come into nesburg faces the same challenges as moste.

Green initiatives: In 2008 the water deplate cities in reducing air pollution. Vehicle ment commett US\$139 million in its capitalissions are growing and air pollution is Environmental governance; budget to improving water infrastructurepasing a real health risk to residents, particular over age sewer networks. Work is still ongoing, though people who live in areas where paraffinhe city government has several department

exact details are difficult to obtain. In additiond wood are commonly used for heating a focusing on different aspects of environmental the city promotes proper sanitation at wateking. Dependence on fossil fuels for generanagement, while various regional and neighevents such as the annual Water Festival healting electricity also contributes to air qbelithood entities work in tandem with the April. issues.

municipal authorities to carry out policies and enforce regulations. Although the city government must work under national law, it sets its own environmentabbjectivesand management plans. Johannesburg has one of the best records on environmental monitoring in the Index: the municipal government regularly monitors environmental performance and publishes information on progress. The latest iteration was in 2008, when it published the State of the Environment Report.

Green initiatives: In 2003 the city launched

Green initiatives: Johannesburg'sGrowth Development Strategy, launched early August 2011, aims to set out a clear strategy for t city's management. It started with a nine-week consultation period, during which nine separate themes were tackled through community events, roundtables and roadshows, as well as high-level meetings and expert conferences.







from the city's water sources. As part of its 2011

revised Growth and Development Strategy the





business district to OR Tambo International Anianagement company, has been pilotingnexal-decade, and responsibility for the proport. The second major initiative is the Rea Meayteon of some recyclable materials from moremme has been scaled up to the central govbus rapid transit system. Construction begathim 30,000 households, and is encouragement. In early 2011 the national Department 2006, with the first route connecting the depseple to use separate bins for paper, route Affairs announced plans to install a ly populated township of Soweto with downstic, textiles and electronic equipment, US\$25 million pump to divert acid mine water town Johannesburg. The 25 km route hasltBough this is voluntary. station stops, and a number of other feeder

Gautrain, which links downtown Johannesburgation of waste into recyclables a legal require-

routes join from the east and west. The longWater: Average

city has said it is keen to invest in urban rainwaterm plan is for the Rea Vaya to cover more of the residents consume 349 litres of farvesting systems and capitalise from 300 km and become a transport option for 80% for per person per day, versus the Index increased rainfall due to climate change. The of the city's residents. Officials say it is the single of 187 litres. An estimated 98% of the probability currently canvassing for ideas about how gle biggest initiative to tackle greenhouse glastion has access to potable water, more than an access to potable water, more than a constant and access to potable water, more than a constant and a constant and a constant and a constant a cons in the city. They also claim that if only 15% to Index average of 91%. Most of Johadets: are yet to be announced. In addition, Iohannesburg's car users switched to Rea Vavao's water supply is delivered from they vaalyear, usually in April, the city puts on a buses, which run on low-sulphur diesel, inst Rawer 50 km away. In order to meet growwaiter Festival aimed at promoting water conserof using their private vehicles, the city when and address concerns about industriation, with educational and family activities cut its CQ emissions by 1.6 million tonnes by ontamination from past mining operations. However by the city and private companies that 2020. city has considered long-term plans to sparoe or the event.

Ouantitative indicators

Category	Indicator	Johanne!	sobernagge Ye	ar*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84	.2 90.0 2	010	National Department of Cooperative Governance Traditional Affairs
	Electricity consumption per capita (GJ/inhabitant)		6. 5.6	2007	7 State of Energy Report 2008
	2 erûðsions from electricity consumption per person (kg/person)	983.9	1,483.8 2	007	State of Energy Report 2008
LAND USE	Population density (pers@ns/km	4,578.1	2,363.5	2007	EIU calculation
	Population living in informal settlements (%)		3 28.8 2	007	State of Energy Report 2008
	Green spaces per person (r)n	73.6	230.7	2007	State of Energy Report 2008
TRANSPORT	Length of mass transport network2km/km	2.7	1 6.8 20	003	Johannesburg Integrated Transport Plan 2003-20
	Superior public transport netwerk (km/km	0.07	0.08 2	010	Metrobus & Gautrain
WASTE	Waste generated per person (kg/person/year)		40 401.3	2007	7 State of Energy Report 2008
WATER	Population with access to potable water (%)		91. 98.3 2	007	Community survey 2007
	Water consumption per person (litres per person per day)		18 348.7	2008	Johannesburg Water - Annual Report 2007/0
	Water system leakages (%)		25 (1/2)	800	Johannesburg Water - Annual Report 2007/08
SANITATION	Population with access to sanitation (%)		84.191.92	007	Community survey 2007

a bus route (25 km), 2) There are no subway or tram lines, 3) Data refer to "unaccounted for water



joules. Per capita comissions from electricity esources to champion the city's electricity chain consumption, at an estimated 36 kg, aldenges and ensure the development of the well below the Index average of 984 kgstatets natural mineral resources. over a guarter, 27%, of the city's electricity is

generated from hydropower Nevertheless, Land use: Below average

Lagos faces electricity shortages and blackoute World Bank estimates that two-thirds of are common, forcing households and industriagos's residents live in informal settlements to rely on generators as an alternative powerared with the Index average of 38%. Only supply. an estimated 20% to 40% of development in Lagos is carried out with government approval.

Green initiatives: For the past three years the mand for land in Lagos has skyrocketed in lin state government has organised and hostedwith the city's rapid population growth, and as a annual three-day International Summit one with there are relatively few green spaces. The mate Change, which demonstrates its committeesure an estimated 34 square metres per per ment to improving sustainability and mitigations, compared with the Index average of 74 its environmental impact. Officials have absoare metres. Policies to contain urban sprawl been looking at ways to capitalise on globalarer-weaker than in many other cities in the bon credit trading schemes, such as the Kyobodex, and there are no clear policies protecting Protocol's Clean Development Mechanism, existing environmentally sensitive areas from

Performanc	e Lagos	o Oth	ner cities		
		below average	average	above average	well above average
Energy and QC	D	•••••	••••	• • •	• •
Land use	e •	• • • •	••••	••••	•
Transpor	t •	••••	• • •	•••••	
Waste	• •	•	••••	• • • •	•
Water	•	• •	••••	• • • •	
Sanitation	1 • •	• •	••••	••••	
Air quality	y	••••	• • •	••••	
Environmental governan	nce •	••••	••••	••••	•
Overall result	• •	• •	• • • • •	•••••	

The order of the dots within the performance bands has no bearing on the cities' results.

agos, located on the southwest coastness centre, and in the last decade have estab-L Nigeria, is the most populous city in lithed a dedicated environmental authority and African Green City Index, with an estimated the still in a mass transit plan. urban agglomeration of 10.6 million people. It Lagos ranks average overall in the Index, made up of Lagos Island, the original city, awith its best performance in the energy and CO the Mainland, which is comprised of rapidlyegory, where it ranks well above average. growing settlements. Lagos has a large condenis is driven by better-than-average levels of tration of multinational companies and is hor her tricity access, a very low rate of per capita to almost half of Nigeria's skilled workers. Itelectricity consumption and low levels of CO one of Africa's five biggest consumer marketsions from electricity use. Lagos also places and boasts a higher standard of living than above average in the waste category due to a where else in Nigeria. Nevertheless, rapidomparatively low rate of waste generation, banisation and population growth have in atthough challenges still remain in waste manificant challenges for its water, wasternent. The city's transport, water, sanitation, nt and sanitation infrastructure, aimquality and environmental governance results ressure on the energy supply and teafverage. Land use, where Lagos ranks below ment. However, officials are keeaverage, remains a particularly challenging area transform this mega-city into a first-class busin the city because of the demands of a rapidly

growing population, which is expected to under which developed countries can investdie velopment, although the state government increase by 33% by 2020, according to the blevelopingnations in exchangefor carbon has initiatives in place to plant trees and improve emissions credits. In 2010 the Lagos State gpreen spaces (see "green initiatives" below).

Energy and CQ Well above average ernment kicked off its National Carbon Credit

Lagos State as a whole consumes roughly 45% areness Campaign to raise awareness around initiatives: In 2008 the Lagos State govof the country's energy and is responsible fond potential benefits of carbon trading. It also ment, in collaboration with Clinton Clisignificant portion of its carbon footprint. In stapported the National Carbon Train, a coate Initiative, embarked on a beautification city, incinerated solid waste, bush burning, paign to encourage low carbon emissions amortogramme for its major open spaces and highdomestic cooking, vehicles and electricity getine potential for earning carbon credits. As poerts. A year earlier it had started an aggressive erators are the main sources of emissions. of this the Lagos State Environmental Protettemplanting campaign, with the commitment Still, Lagos performs comparably well on mosquency has established a Carbon Credit Center plant a million trees within four years, which indicators in the category. For example, to Meal with carbon credit consultations, transpould have a positive impact on air quality Habitat estimates that just under 100% of actions, applications and trading, and also titro two years over 500,000 trees had been householdshave accessto electricity more promote clean energy deals. In addition, the latitude. On top of this the state government than the Index average of 84%. In additionalloting various renewable energy scheenless on the private sector to partner with it in Lagos has one of the lowest per capita electiriciuding solar street lights and wind turbinesse greening of public spaces. A parks and garty consumption levels in the Index, at 0.8 gildareover, in July 2011 the Lagos State governen agency is being established to drive this projoules, compared with the average of 6.4 giggaent created a Ministry of Energy and Minegathme forward.

1) Lagos State, e = EIU Estimate

Background indic	ators	duced signifi
		managemen
Total population (million)	10.6	have put pre
Administrative area (र) ने		fic managem
Population density (persons/km	3,000	transform th











Transport: Average

waste management infrastructure. Still, onlyalaming with improved electricity supply to the With over six million cars on the road every estimated 10% of the city's rubbish is currenditer plants, will dramatically improve Lagos's thoroughfares are congested and polluted. Tolected. Waste pickers operate informally, water delivery system. Desalination plants are public transport system, consisting mainlalthough the city has tried to curb their activities urrently in use, though the city has considtens of thousands of privately owned buses, is ered this as a long-term strategy.

not directly controlled by city officials. Rail reten initiatives: The Lagos Megacity Project

works are limited, although the city introduce the overarching waste policy of the state force initiatives: The World Bank is currently bus rapid transit in 2008 to tackle the huge emansent. One of the most notable initiative conducting a west initiative across the states of transit challenges (see "green initiatives" befree past decade was the waste-to-wealth agrees and Cross River called the Second National As a result, the city's public transport networkaismme to convert various types of waste introduced waste introduced and waste introduced waste introduced and introduced waste interest. considerably shorter than the Index averassable materials. The programme was intainers: to improve the reliability of water supplies measuring 0.1 km per square kilometre, dozoend in 1999 but has gathered momentumpinoduced by the water treatmentworks in pared with the Index average of 2.7, though element years. As part of this programme, Labagos: to increase access to piped water netto data availability private operators werkeasnotestablished one of the biggest composities in four cities in Cross River State; and to included. However, the state has a comprehedants in Africa and converts 800 tonnesing frove the commercial viability of urban water sive urban mass transport policy in place and unaisipal solid waste into fertiliser each day utilities in Cross River and Lagos states. The proawarded contracts for two new rail linesadiction, the city has established four sitesati-was approved in 2005 and is expected to Lagos State Waterways Authority is considering plastic-recycling plants, which convertend in May 2013. Some of the practical outusing the city's waterways for transport anchinesis tonnes of nylon or plastic waste materialises of the project will be the installation of built jetties intended for ferry transport. into usable products like shopping bags. In April and suitable housing for pumps and gener-2011 the state waste management authoritings; hiring better-trained chemists, biologists

Green initiatives: In March 2008 the Lagassnounced that it had installed 20 recyclimal water scientists for laboratory work; com-State government introduced bus rapid transitinks across the state, with 1,000 more to potentially fencing-off the perimeter of water treatin conjunction with the private sector. This waithin two years. ment plants; using better and more secure manhole covers; and conductingmore frequent

promoted as an affordable, reliable and safe means of travelling while significantly reducing ter: Average

congestion on the city's roads. The buses, ruagos has one of the lowest water consumptibution.

ning in dedicated lanes, can reduce jourfiewres in the Index, at 90 litres per person per times by 30%. In 2010 there were 220 buseday, compared with the Index average data ration: Average

operation and 120 million passengers used tilbres. An estimated 88% of the population has estimated 83% of the population has access system in the two years of operation, reducingcess to potable water, versus the Index attensage tation, compared with the Index average carbon emissions by an estimated 13%. of 91%. The city's main water sources are logfaB4%. While there are no major wastewater rivers and it does not suffer from water scartificatment facilities in the city, Lagos State oper-

Waste: Above average

relative to the other 14 cities in the Index. Sables five smaller wastewater treatment plants Lagos generates an estimated 276 kg of watthe delivery system to provide water to endsesseing about 500,000 people, a fraction of the per capita annually, less than the Index aveisagesufficient, with treatment plants sufferited population. The state government set out a of 408 kg. Municipal solid waste is disposed for nate lectricity shortages and pipe infrastructive ear sanitation plan in 2010, which includes the state's three landfills and two temporary doesn't meet the needs of the population goal to improve water treatment infrastrucsites. City officials have stated a goal to Tennakhaditional mini-waterworks were unveiled in addition, the government conducts Lagos Africa's cleanest city by 2012, and ebreary 2011 and five more are under constspections of septic tanks and has ordered the working with the World Bank and the Clintonioni. but no target date for completion has been val of prohibited pit latrines (a dry toilet mate Initiative to establish modern, efficient The city has forecasted that these plantern that collects waste in large containers).

The exact nature of enforcement is unkmowne, than five years old. While the governmoentwater, sanitation and transport, though it but noncompliance is subject to prosecution as not put any other specific measures in pisacenclear how the results of that study were such as monitoring emissions from cars used.

Air quality: Average

generators, preventing very old cars from enter-

Lagos has high concentrations of pollutantsianacthe country is expected to have a positive een initiatives: In 2006 the World Bank as carbon monoxide, sulphur dioxide and niteffect on air quality over time. started an initiative, the Lagos Metropolitan gen oxides, which explains why respiratory ail-Development and Governance Project, which ments due to air pollution are not uncommominyironmental governance: Averageaims to invest in critical infrastructureto Some monitoring of air quality is conducted lagos State Environmental Protection increase access to basic urban services. It non-industrial locations around the city, but Athency, created in 1996, oversees and implectudes programmes to improve the profession

system is far from complete. All pollutants arreents environmental policy for the city. In addicapacity of the Lagos State Urban Renew ularly monitored in industrial areas. Neverthiebes scitizens, non-governmental organisations to assess, develop, plan and coord with a rapidly expanding population, a liamidenther stakeholders have been involved ntate a city-wide infrastructure programme, and public transit network and an economy centrembe extent, regarding decisions on projectsupport public finance and budget reforms. largely on refining petrochemicals, Lagoswibleemajor environmental impact. One suithe project is expected to end in Septembe major challenges in improving air qualityor Theisation, Environmental Rights Action, 2013. In another initiative, the National Environnewly established National Environmental Staquilarly collaborates with the state governent Standards and Regulations Enforcement dards and Regulation Enforcement Agency, ramed to major environmentalissues and Agency launched a competition on environmenthe vision of a cleaner and healthier environmentatimes serves as an unofficial watchtddgrotection in July 2011 for senior secondary they intend to deliver, are positive steps for Most laws that deal with the environment schools, in an effort to improve sanitation

are not passed without a public hearing aimareness. The competition is aimed at encour-Green initiatives: The Nigerian governmette State House of Assembly. In 2008 the aging school children to adopt healthful environment

has a long-sinding ban on the import of carsstate government conducted a baseline reviewmental practices.

Ouantitative indicators

Category	Indicator	l	L a⁄gæs rag	e Year*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	8	34 99.8	2003	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)		0.8 .	4 2010	Lagos Bureau of Statistics
	2 er@Sions from electricity consumption per person (kg/person)	983.9	9 35 9	2009	Lagos Bureau of Statistics
LAND USE	Population density (pers d)ns/km	4,578 2	,957.2	2010	EIU calculation
	Population living in informal settlements (%)		66:03	.0 2006	World Bank
	Green spaces per paperon (n)n	73.	6 33.8	2009	Lagos Commissioner for the Environment
TRANSPORT	Length of mass transport network ² (km/km	2.7	0.1	2009	Lagos Metropolitan Area Transport Authority
	Superior public transport netwerk (km/km	0.07	0.01	2010	Lagos Metropolitan Area Transport Authority
WASTE	Waste generated per person (kg/person/year)		276.0.8	3 2009	Lagos Waste Management Authority
WATER	Population with access to potable water (%)		88122	2003	UN Habitat
	Water consumption per person (litres per person per day)		90.12	2009	GM Water Corporation
	Water system leakages (%)		30.0	302009	GM Water Corporation
SANITATION	Population with access to sanitation (%)		82.9	2003	UN Habitat

All data applies to Lagos unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed, e = FILI Estimate, 1) Lagos State, 2) National electricity generation mix use

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testing of water before it is pumped out for dis-



built suburbs, nearly all homes and busines best no details have been published. Angola has rely on diesel-powered generators. For reasoigned up to the Kyoto Protocol, and there are of data availability electricity produced and mational climate change action plans and CC sumed from these generators were not includeduction strategies. Although these strategies ed in the Index, nor were annual@@ssions endorse the concept of uniform standards, they from diesel generators. Electricity consumption to contain specific policy suggestions. per capita, at just under 1 gigajoule, is well below the Index averageof 6.4 gigajoules, Land use: Well below average though if diesel generators were taken iAtoestimated 69% of Luanda's population lives account consumption would likely be muich musseques, the informal settlements that higher. Annual @missions from electricity ave spread from the city centre in all directions consumption per person are 3 kg, compared 0 km. In recent years there have been with the Index average of nearly 984 kg. Greember of controversialnformal settlement energy also plays a part in keeping @nis- clearances with residents transferred to new sions down. The share of renewable energy aucommodations (although sometimes they are Luanda's electricity production, not includiust given tents) some 30 km from the city cenelectricity generated from diesel generatorstris in an area known as Zango. The land 96%, all of which is hydropower. Only Maputeclaimed from these clearances is usually sold in the Index has a higher share of renefinal telepensive office and luxury housing devel-

energy in electricity production. Other than one ment a number of large-scale national gov-

Performance	Luand	la Oth	ner cities		
		below average	average	above average	well above average
Energy and QO		•••••	• • • •	• • •	• •
Land use	•	••••	••••	••••	•
Transport	•	••••	• • •	•••••	
Waste	• •	•	••••	••••	•
Water	•	• •		••••	
Sanitation	• •	• •	••••	••••	
Air quality		••••	• • •	••••	
Environmental governance	•	••••	••••	••••	•
Overall result	• •	• •	••••	•••••	

The order of the dots within the performance bands has no bearing on the cities' results.

uanda is the capital city of Angola, a countowince, a collection of municipalitiessur-Lin south-central Africa. Located on Angolæsindingthe city. Luanda Provinceand the west coast, facing the Atlantic Ocean, Luandational government share the jurisdiction of also the country's major seaport. Angolalufamda. There is no separate city government. merly a colony of Portugal, has undergone endruanda ranks below average overall in the mous socio-economicupheavalsthat have African Green City Index. The city is average in impacted the capital city. The Portuguese bthile categories of energy and waste and Luanda to accommodate around 500,000 peanitation. Its placement in these areas is a ple but during the Angolan Civil War (1986ection of its low level of @Onissions from 2002), which followed independence from Polectricity, a low rate of waste generation and tugal, people flocked to the city in the beliefigh access to sanitation. However, in four catewas safer than other parts of the country. Liganies - land use, transport, water and environda's population has now swelled to 5.8 milliomental governance - the city is well below averwhich has put a strain on the city's few resource. Given the pressing need for more water and ces. Electricity supplies and potable waterleatricity, and the daunting challenge of manarce, and the majority of the city's population the sprawling musseques that surround es in informal settlements known as mustbe city, it is perhaps not surprising that Luanda ies. Luandais also the capitalof Luanda has yet to develop a strong environmental agenda. The city is trying to increase access to wastermitment hydropower, Luanda scores ernment housing projects are under way, but and electricity. That said, much-needed improvely in policy areas. In some ways that this ough many of the new apartment blocks are ments in waste, land use, sanitation and trainsderstandable. Policies aimed at reducing the day, the policy for allocation and their price port would improve living conditions, and aleavironmental impact of energy consumptions yet to be decided, and they remain empty. benefit the environment. Luanda's few gate runl ike ly to be a priority when the focus is in open spaces away from the urban initiatives are mostly led by the national governeas ing energy supply and access to the pleaw, these housing developments are dement and are short on detail. The absence definity grid.

Scribed as "new cities" but appear to have few city government, championing environmental public transport and road links between them. improvements for its citizens, seems to work initiatives: The national government also access to the urban centre and employment.

against Luanda. However, the city's overall **pas**-pledgedotspend US\$18 billion by 2016 tos limited. Luanda Province is short of green formance could improve with the recent addpaild new dams, and upgrade the electricitys**geic**e, with an estimated 0.09 square metres of tion of a master plan aimed at improving of the were lines. In 2010 there was a city-rugareen space per person. Some work is under city's water, land use, sanitation, transportation paign to introduce low-energy light broadlys however, to rehabilitate the green spaces and energy infrastructure.

but no data is available about how many hothsæt-remain. holds it served or its success rate. There are

some solar-powered traffic lights in the city anansport: Well below average

One in every four households in Luanda hasoffocials have discussed the possibility of Lunænda's transport infrastructure is sparse and access to electricity. In the city centre and rhexulsing developments incorporating solar poliværidated. At an estimated 0.2 km per square

Background indicators

Total population (million)	5.8
Administrative area (र्शक	2,300
Population density (persons/km	2,600
1) Luanda province	

72

Energy and CQ: Average

kilometre, the length of Luanda's mass triams and the new government housing devastnies are responsible for weekly rubbish collecport network is much shorter than the laplements in the east, and to the suburbs of Biemfs-in most parts of the inner city, but demand average, at 2.7 km per square kilometre. Luzanand Talatona in the south. The national day-outweighs collection capacity and large piles da is also one of only a handful of cities in tleenment has longer-term plans for a mebifowiaste on Luanda's streets are a common Index that has yet to embark on building a support building building building building building a support building b rior public transport network (defined as sulforward. In 2009 the national Ministry of Trainslimited and rubbish is usually dumped in open ways, trams, light rail or bus rapid transity rublished its 2009-2012 plan for transposent vers, often blocking them and causing flood-Luanda's roads are invariably clogged by dethese lopment in Angola, which discusses "estagb-And the law against littering is generally traffic. Office workers living in the new subulitibising strategies and plans", and develoipinimored. Luanda has no recycling schemes and of Talatona, just 15 km south of Luanda, fadecatter systems and services as well as an "iallewaste goes to a single landfill some 20 km three-hour commute into the city centre each transport network". There are few control to the city centre. morning. The heat and humidity, coupled withete plans in the document, however. There dusty streets where payements are rare harve also been several public pledges abou@geen initiatives: The national government

crime is common, mean walking is not an ating bus lanes, introducing maritime taxis bedan discussing plans for a recycling law i option for anyone working in an office or singlemerally reducing city centre congestion. 2008 and since then officials have held several environment. Cycling is also impossible due to workshops on the topic, but no concrete plans or

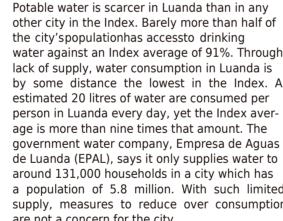
the level of congestion, poor driving, bad rolldaste; Average

surfaces and high temperatures. There are Roorer cities tend to generate less wast 6 outlitain African canned-beverage manufacturer, policies to reduce traffic congestion, although ther ones, and Luanda follows that trebulanched a programme called Reclatas to recycle road tolls and pedestrian areas are reported. Waiste per capita in Luanda is an estimate aluminium drinks cans produced by its the planning stage. There are some tranggoditg every year, which is lower than the Inediently-opened uanda factory. This is the and housing plans at a national level (see average of 408 kg and much lower than in the third in the city, but the com-"green initiatives" below), which, if carried outther South African cities. Luanda also spanneshas not released any more details. The should reduce congestion in Luanda's city cewell for its waste collection and disposal polarwincial Government of Luanda (GPL) runs bill-

It is one of only three cities in the Index that the the the cities in the Index that the the cities in the Index that the Index that the cities in the Index that the cities in the Index that the In enforces environmental standards for theindisdving pop stars, to try to discourage street

Green initiatives: The national governmenbosal of waste in landfill and incineration sitiatsering. has nearly finished a weing road linking the Littering is also banned. For all that, however,

town of Cacuaco to the north of Luandasignoificant waste problems remain. Private donater: Well below average



Green initiatives: The national Ministry of Health, UNICEF, and other international and national non-governmental rganisations un campaigns to encourage people to use sterilisation products to avoid cholera and other waterborne infections. EPAL and the Environment Ministry run water-conservationawareness campaigns through posters, television ads and radio ads encouraging people, for example, not to wash their cars with buckets in the street.



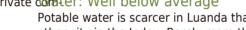


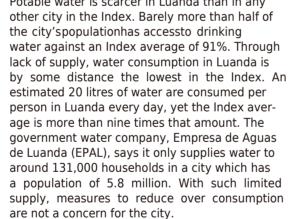




of Environment does not appear to make any

policies have emerged. In June 2011 Bevcan, a





because it wastes water.

Sanitation: Average

Luanda's sprawling musseques bring inevitable sanitation challenges. UN Habitat estimates 92% of the city's population has access to some Airequality: Below average at a time when the need to increase access to of sanitation system, but they are rarely the flust is no formal monitoring of air pollution water and energy is more important than cursystems used in developed cities. Drains and user but the level of contamination is like billing consumption. What is a concern is that tic tanks are widely used in formal areas. Exteen hirgh given the huge volume of vehicles using da has no direct control over its own envioffices and homes, it is common for lavatorithetooads, the heavy reliance on diesel-powemental affairs, which might hamper any be manually flushed with bucket water. Infommaterators and the number of air conditionifuture green efforts. The Provincial Governsettlements generally lack sanitation infrastsystems in operation. There are no specific injent of Luanda (GPL) has a Directorate of Pubture. Although the city promotes public awationiscs in place to improve air quality in theicityprks, Urbanism and Environment, but this about sanitation (see "green initiatives" blefrowigh Luanda makes some effort to infordepartment has neither a budget nor a clea there is no regular monitoring of on-site sanitaizens about the dangers of air pollution. purpose. Most GPL policy remains highly cention facilities, either in homes or communal areas. tralised, while the remit of the national Ministry

Environmental governance:

Green initiatives: There are some local gov-Well below average city or region-specific plans. No departments ernment postr campaigns, and television and uanda is the only city in the Index that fall switchen the GPL hold any city-specific environ radio advertisementsto discouragepeople the well below average category for envinnemental data, although plans are said to be from urinating and defecating in the open mental governance. There is some citizen place to rectify that. air, with some linked to wider health caimwolvementin decision-makindor projects

paigns run by agencies like UNICEF. Conthat might have a major environmental impacten initiatives: In July 2010 the Ministry of struction of latrines in informal settlements bas other than that Luanda fails to pick up at myironment began working on a national envibeen left largely to non-governmental organioints in this category. Developing a stroomgment database as part of a project being sations, such as Development Workshop, earnitronmental agenda is, understandably pfinanced by the African Development Bank, but haps, not a top priority for Luanda, particularlyrk on this is still ongoing. individuals.

Ouantitative indicators

Category	Indicator	Lua Ada rage	Year*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84 75.5	2006	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)	1º.0 6.4	2009	EDEL (state electricity company)
	₂ er69sions from electricity consumption per person (kg/person)	983.9 2¹.7	2009	EDEL (state electricity company)
LAND USE	Population density (perse)ns/km	4,578 2,554.3	2008	EIU calculation
	Population living in informal settlements (%)	69.4 8.0	2006	Care International Report
	Green spaces per per grecoro (rr)n	73.6 0-1	2007	Dept de Servicios Communitarios
TRANSPORT	Length of mass transport network ² (km/km	2.7 0.2	2010	TCUL (public bus operator)
	Superior public transport netwerk (km/km	0.07 0.00	2009	Caminho de Ferro Luanda
WASTE	Waste generated per person (kg/person/year)	292₹0 ′.8	2009	ELISAL (Empresa de Limpeza e Saneamento de Lua
WATER	Population with access to potable water (%)	51%4 2	2006	UN Habitat
	Water consumption per person (litres per person per day)	20% 0.2	2009	Development Workshop Angola (NGO) 2009 report
	Water system leakages (%)	29.9	302009	Development Workshop Angola (NGO) 2009 report
SANITATION	Population with access to sanitation (%)	9294	2006	UN Habitat

data. Almost all electricity in Angola is generated from hydro (IEA). 2) Luanda province. 3) There are no subway, tram, light-rail or BRT line:



consumption, at less than 1 gigajoule, ischaddenge of sprawl is increasing, with many well below the Index average of 6.4 gigajoukerkers in Maputo choosing to live in Matola, a Residents and businesses in the city centre floatmeally separate city of about 700,000 people access to fairly dependable power through the km west of Maputo. In a 2010 report th national power utility, Electricidade de MocaWorld Bank concluded that Maputo and Matola bique (EDM), but the situation is much less nedw form a single metropolitan area despite the able in informal settlements. These areas, waidhof formal metropolitan governmental strucdominate the city's landscape, are largely tures. Some observers now refer to a "great unconnected to the grid. Thus overall, Mapu**W**aputo" area that includes Matola. also has the lowest rate of electricity access in

the Index, at an estimated 29% of householdseen initiatives: Maputo's master plan calls compared with the Index average of 84%. for the "massive regularisation" of informal settlements, which means that ownership rights

Green initiatives: In 2006 EDM introduced awill be granted. The provision of ownership new plan to connect informal settlements tortiplets will increase residential security of tenure grid through a pre-paid system of electricity which leads to increased household income and vision, in which users buy a specific amountinofestment. By 2015 the government aims t energy credit up front, similar to a pre-patiovide ownership rights to over 30,000 house-

Performand	C C • Mapu	to Oth	ner cities		
		below average	average	above average	well above average
Energy and Q	0	••••	••••	• • •	• •
Land us	se •	• • • •	••••	••••	•
Transpo	rt •	• • • • •	• • •	•••••	
Wast	e • •	•	••••	••••	•
Wate	er •	• •		••••	
Sanitatio	n •	• •	••••	••••	
Air quali	ty	• • • • •	• • •		
Environmental governa	nce •	• • • •	••••	••••	•
Overall result	• •	• •	••••	•••••	

The order of the dots within the performance bands has no bearing on the cities' results.

aputo, the capital of Mozambique and inhich aims to improve the city's institutional largest city, is home to 1.2 million cepiacity, service delivery and infrastructure by dents, making it the second smallest city in 2005. Also, in 2008 Maputo's municipal council ulation terms in the African Green City language a master plan to guide the city's urban Although an estimated 70% of Maputo's priesining.

dents live in informal settlements that often laDespite positive strides, Maputo ranks well safe drinking water and sanitation, in rebeltw average overall in the Index. The city years the local government has made substachieves its strongest placement in the waste tial efforts to upgrade infrastructure and category, where it is average due to a relatively vices across the city. Urban planning is a solone-rate of waste generated per person. what new concept for Maputo, with officAtthough the city falls to below average in most having prioritised rural reconstruction and other categories, it excels in the area of electricidevelopment in the years after the civil twagenerated from renewables ources, with ended in 1994. Nevertheless, many promisingarly 100% of its power supply generated by initiatives are under way, including a term-year. Maputo also has reasonably low per capi-World Bank-funded project called the Matautelectricity and water consumption figures.

significant percentage of the population taxely expanded access to electricity. green spaces as well as introduce new ones. In access to basic services. The city has the most the north of the city, a 600-hectare green area is room for improvement in sanitation, where no use: Below average currently occupied by the national defence minranks well below average due to the high percording to the World Bank, an estimated 30% and used to store military equipment. centage of inhabitants left without accessf to aputo's residents live in informal settleder the master plan, the military equipment sanitation services. ments, a result of low incomes coupled owithhis land will be moved outside the city rapid urbanisation. This is well above the Indexke way for a public park.

ronmental footprint, they also illustrate that me. The programme appears to have effeolds. The city also intends to protect existing

Energy and CO: Below average

average of 38%. The city performs more Almost 100% of Maputo's energy is generated our ably in the area of green spaces, boasting sport: Below average by renewablesources, primarily hydropower an estimated 115 square metres of green spaiker many cities in the developing world, from the Cahora Bassa dam in northern Mozaem person, compared with the Index averadeamuto's rapid urbanisation as not been bique. On a per capita basis, Maputo perfor 174 square metres. Maputo has at least had caped with public investment in an efficient favourably for @missions from electricitylozen parks and gardens in the city centre, mass transit system, and the city lacks a trans-

Administrative area (4)m

Background indicators

Total population (million) consumption, at an estimated less than one wello as a few coastal ecological zones. Howevert, master plan. Private vehicles and share gram per person, compared with the Index Magnuto would benefit from stronger policities ivan taxis called chapas are the primary Population density (persons/km 4,100 Municipal Development Program (PROMARWITTO), these low figures lessen Maputo's enviage of 984 kg. In addition, per capita electricityed at containing urban sprawl. Indeed, troems of transportin the city. Since 2009

three-wheeledmotorised rickshaws, called plastic bags. By December 2010 the progratione, so that they can begin selling treated txopelas, have also become popular. Mapuats extended to include the majority of the water to end users. The improvement of the has a long way to go in terms of transport, bottmal neighbourhoods, according to city offiitighs water supply and services is also a priority of the World Bank's PROMAPUTO programme. the city appears poised to improve its perfor-

mance in this area in the coming years as ultrater: Below average

transport is a major priority of the World Babbatil December 2010, the city's water station: Well below average sponsored PROMAPUTO project. was operated by a private company under & anitation is a major challenge for Maputo, Only cession contract that was scheduled to end am estimated 49% of the city's population h

Green initiatives: In 2011 the government 1014. However, because of concerns over paccess to sanitation, compared with the Index ordered 150 compressed atural gas (CNG) formance, the public Water Supply Investments are of 84%. Informal settlements frequently buses, which emit fewer air pollutants. The first Assets Fund (FIPAG) assumed control of the accessto sanitations ervices; residents batch of 32 CNG buses arrived in June and thiev's public water system in January 2011. Costead use latrines that are not only insufficient rest were scheduled to arrive later in 2011, rently. UN Habitat estimates that only 88% unfiber and sometimes shoddily constructed. Maputo's population has access to potable watealso subject to collapse during periods of compared with the Index average of 91%. Bleevavee mainfall and flooding. Even in the city cen-

Waste: Average

The city produces an estimated 294 kg of was to 600 small, private - and frequently utmb; which is served by both a sewage system per person per year, well below the Index avensed - water suppliers serve as much as 25% septic tanks linked to the storm-water drainage age of 408 kg. Households and businesses ppf/Maputo's water market, primarily in informet/work, inadequate infrastructure and maintewaste collection fee, which is collected throwattlements that are not yet connected toartobe remain persistent problems. This often the electricity company. This fee is prorated water supply system. These operators example to raw sewage emptying into the nearby based on energy consumed, on the logisetheralmethods, including the provision of Maputo Bay. Though overlapping national and consumers using less energy also produce less reat ed groundwater from shallow wells, litreal institutional roles have somewhathin-







waste. However, only about 19% of Mapræssalse of water from the water company or thered progress on sanitation policies to date, generated waste is collected and the citalistribution of piped water from bore hopeans are in place to promote environmentally rently lacks environmental standards for walthese methods, though undoubtedly entreprestainable sanitation services under the PRO disposal. Most collected waste is depositeduirial, have potentially negative implical MARSJTO umbrella (see "green initiatives" below). Hulene, a large open-air dump that extends for public health and groundwater sustainabili-

17 hectares on the outskirts of the city and ty, and are also more expensive than the publicen initiatives: The improvement of sanitawidely considered a threat to public healthater system. In Maputo an estimated 50% toofin services is a priority of the World Bank-Maputo officials intend to close Hulene by 20/24er is lost to leakages, compared with the under PROMAPUTO plan over the next five and open a new sanitary landfill in the near by erage of 30%. The city's per capita water was a very landfill in the process of developing a city of Matola. This costly project will rely upcommption is an estimated 99 litres per persocity wild Sanitation Strategy through consultacentral government funding and approval frday, almost half the Index average of 187 litres with donors and non-governmental organi-Matola, which has not vet consented. sations. Since 2004 a raft of national-level sani-

Green initiatives: City officials are currentation policies have been drafted: a Seven Cities Green initiatives: For informal settlements, which included alternative methods formal settlements, which included lack proper roads, in 2007 the city piloted a water distribution. Recently FIPAG began coMatputo and Matola; a Strategic Plan of Urban iect to contract with micro-enterprises to collecting with the small water providers to affoitation (2006); and a National Water Policy household waste on foot, going door-to-doomwitbe, legalise and professionalise their ope 2007), which had implications for Maputo's



Air quality: Below average





sanitation services. Though strategies and plater than four years. One category for inspeceen initiatives: In 2011 the Maputo munihave proliferated at the national level, a cityipag-is carbon emissions, with high-emissionisal council's environmental department itation strategy is a necessary first step to cvehicles banned from the roads. It is unlawarched an awareness campaign to educate ing synergy among public officials, comrhowi-much progress has been made so far. students about the importance of protecting ties and non-governmental organisations. the environment.According to the depart-

Environmental governance: Below average

ment's director, representatives have visited most of Maputo'sschools, highlightingthe The main sources of air pollution are information city has experienced a degree of instituition are information are information and keeping shared taxis, chapas, that ply the streets despired orm from the first phase of the World Barrak-ches clean. The department also initiated a their poor emissions standards, as well as neapportedPROMAPUTOprogramme. This in - tree-plantingprogrammein schools and by by aluminium and cement factories. The citylbdes the establishmentof the Maputo mid-2011 an estimated 2,800 trees had been not yet created an air quality monitoring systemicipal council, which now oversees envigoranted. Another new initiative concerns clinor does it regularly monitor or promotemæintal decision-making. Though the countaite change Becauseit is a coastal city, quality.Independentair pollution studies in has the ability to issue environmental licensidaputo is extremely vulnerable to rising sea Maputo indicate "exceedingly high" concentrenitor water and sanitation quality, and mlawels, flooding and erosion. In April 2010 UN tions of particulate matter. Developing enfoace waste, it is staffed with only ten full-abitet signed an agreement with city officials able regulatory standards is among the employees and is limited in its ability to imple-conduct a study on the potential impact of

enlargement of this agency, both in terms of stizes the risks. The city hopes to develop a Green initiatives: In March 2010 the city and authority, will be a key indicator of Maploutorial climate change adaptation plan based adopted a new initiative to inspect automobileffectiveness in environmental governance on the results of the research.

lenges city officials will face in the years aheaent environmental policies. In the future, thienate change on Maputo and suggest ways to

Ouantitative indicators

Category	Indicator	Maput o Aver	akgear*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	28.8	2003	UN Habitat
	Electricity consumption per capita (GJ/inhabitant)	0.8	6.4 2006	Electricidade de Mocambique - Annual Statistical Report
	2 erûðsions from electricity consumption per person (kg/person)	983.0.04	2009	Electricidade de Mocambique - Annual Statistical Report 20
LAND USE	Population density (pers d)ns/km	4, 37,147.4	2006	EIU calculation
	Population living in informal settlements (%)	7090	382010	World Bank
	Green spaces per paperson (n)n	7114:9	2009	Directorate of Urban Plannification and Environment
TRANSPORT	Length of mass transport network²(km/km	2.7 0-0	2011	-
	Superior public transport netwe)k (km/km	0.07 0.00	2011	-
WASTE	Waste generated per person (kg/person/year)	293990	7.2010	Maputo Waste Management Department
WATER	Population with access to potable water (%)	82:89	1.22003	UN Habitat
	Water consumption per person (litres per person per day)	99:18	7.2010	Mozambique Country Water Resources, Assistance Strateg
	Water system leakages (%)	50⁴0	20095	Fundo de Investimento e Patrimonio de Abastecimento de A
SANITATION	Population with access to sanitation (%)	48 984	.12003	UN Habitat

All data applies to Maputo unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed, e = EIU Estimate. 1) National electricity generation mix used to estimate ci data, Almost all electricity in Mozambique is generated from hydro (IEA), 2) There are no dedicated bus routes in Maputo, 3) There are no subway, tram, light-rail or BRT lines, 4) Unclear whether data refer to "unaccounted



Green initiatives: Kenya's first wind power water, energy, waste and sewage treatment. plant, completed in 2010 with six turbines pltoremains to be seen whether the development, ducing up to 5 megawatts of power, is located ifirst phase of which is due for completion by the Ngong Hills 22 km outside Nairobi. Fina 2020, will have a demonstrable impact on land ing has been announced for a second phase of in the rest of the city, or exist mainly as a luthe project, which could bring the total capacity suburb.

to 11 megawatts, enough to power 2,000 house -

holds. The national government is also exploreen initiatives: The Kenya Wildlife service in ing more wind power projects in other partsportnership with private companies is managing the country. Although hydro-power is still a thery Green Line Project, an initiative to plant forsmall part of the energy mix in Kenya, nations along 30 km of the perimeter of Nairobi officials are looking at ways to diversify Navigonal Park in the south of the city. The profrom it because of unreliable rainfall.

Land use: Average

eral thousand trees, and organisers continue to raise money from the private sector to plant rottect trees and pay for patrolling the area. The

The city has relatively strong regulations protect-trees and pay for patrolling the area. The ing green spaces and environmentally sensitives is to create a visible boundary between the areas, but the total amount of green space **per**k and surrounding new developments, and person, at 37 square metres, is below the Interest of the park. The tree planting is also part

Performanc	e Nairo	bi Oth	ner cities			
		below average	average	above average	well above average	
Energy and QC)	••••	• • • •	• • •	• •	
Land use		••••	••••	••••	•	
Transport	•	• • • • •	• • •	•••••		
Waste	• •	•	••••	••••	•	
Water	•	• •	••••	••••		
Sanitation	• •	• •	••••	• • • •		
Air quality		••••	• • •	••••		
Environmental governan	ce •	• • • •	••••	••••	•	
Overall result	• •	• •	••••	•••••		

The order of the dots within the performance bands has no bearing on the cities' results.

Kampala Railway, Nairobi is now homestone to create a capital city that is more liveable, 3.1 million people. It is one of Africa's ratistand environmentally friendly. important cities and a major hub for financheirobi is below averageoverall in the media, technology and air travel. Its altitude for Green City Index. It achieves an average well over 1,000 metres above sea level resultantinin four categories – land use, waste, water a moderate climate, which means there is liable sanitation. Particular strengths in these need for air conditioning or heating. The reity include good policies to protect existing receives much of its energy from renewable n spaces and other environmentally sensihydro power, but insufficient generation tained areas, as well as a relatively robust code covtransmission infrastructure leads to the frequenting surface water quality. The city receives use of diesel-fuelled generators. Like other laetone average rankings in energy and CO African cities, growth remains haphazard trainsport, air quality and environmental govermanagement of waste, sewage and waterance. A wide range of challenges still confront urgent challenges With Nairobi's population Nairobi, including a low level of access to elecexpected to more than double to 7 millimitity and relatively weak policies covering pub-

2020, the city government and the Kenyan lic transport and air pollution.

Initially a railway outpost for the Mombassional government are under increased pres-

Background indicators

Total population (million)	3.1
Administrative area (4)m	700
Population density (persons/km	4,500

Energy and CQ: Below average relatively high percentage of people living anwider initiative led by Nobel Prize winner Although Nairobi generates 62% of its electing rmal settlements at an estimated 50%, Wangari Mathai to plant new trees throughout ty from renewables, mostly hydro and some pared with the Index average of 38% aim bi to improve water catchment and bio geothermal power, poor generation and trace 08 the national government unveiled Naidobersity.

mission infrastructure often forces utilitie Mettoro 2030, a blueprint for the capital city's

rely on diesel-powered generators. An estimate an development. The plan envisions rapadisport: Below average

ed 75% of households have access to electricity environmentally sustainable development than 90% of city commuters depend on below the Index average of 84%, and black-metropolitan region, and already severiariately run, frequently over-crowded miniouts are common. The reliance on renewables winitiatives are underway. The most bussless called matatus. City efforts to replace drives down Nairobi's per capita coordinated Tatu City. Designed around the concepts of sults, and the density of the public translated average of 984 kg. Per capita electricity ficient urban development, plans call for Taxtut network in the city is below the Index average average, at an estimated 6.5 gigajoules preserving wetlands, forest areas and confined recommended with the average of 2.7 kn person versus the Index average of 6.4 print average of the African city of the future ving the city, consisting of suburban railways many of the energy policies evaluated in the holds virial will be predominantly self-sufficientiations.



source, the Nairobi River, using support from the United Nations Environment Programme, which is headquartered in Nairobi. In addition, the Nairobi City Water and Sewerage Company has increased the supply and quality of water in recent years. Nevertheless, the city is likely to face water shortages unless major capital investments are made into new reservoirs. At the same time, piped water is currently somewhat unreliable and expensive. An estimated 50% of the system's water is lost to leakages, well above the Index average of 30%. Addressing these issues effectively, and tackling a dropping water table believed to be the result of unregulated bore hole drilling, will be critical tasks for local government officials in years to come.

Green initiatives: The Ngong, Mathare and Nairobi rivers meet in Nairobi and flow from there to the Indian Ocean. The three rivers are clogged with waste and during rains the rivers are thick with human excrement washed out of informal settlements. The Nairobi River Basin initiative, run by the Kenya Ministry of Environment, aims to recover the rivers, providing clear flow through the city, and increasing land and recreational value along the river bank. Initia surveys have been completed. There is no dead line year to finish the entire project, but initiative planners hope to have reclaimed city centre sec

square kilometre, just over the Index averagevailable public service, but remains limited items of the river before 2020. Some progres 0.07 km per square kilometre, although onlyweelthier residents and businesses that been made clearing the Nairobi River around estimated 19,000 commuters use the syafford to pay for it. There is some recycling the municipal dump at Dandora in the east of daily. Al though officials have discussed a raphieutrical waste, glass, paper and plastics, bulnte city.

rail system, no concrete plans have been inthis-is also conducted by private waste-manage-

mented. Nairobi's efforts to implementan ment companies. The city governmenthas Sanitation: Average

advanced traffic-management system throughade several positive strides - it monitons estimated 83% of the population has access the application of traffic light sequencing another industrial sector's disposal of traganitation, about equal to the Index average to introduce some limited-vehicle zones ardous waste, discourages the public from litt 84%. The city's wastewater treatment plants tering or dumping through the installation reofunable to accommodate the total wastepositive steps. additional waste bins, and has established a

Green initiatives: Nairobi is seeing major policy to reduce, recycleand re-use waste.

investment in its road network. A ring rotatese public initiatives give reason for optiplanned since the 1970s will finally be built bysm, even though it is not entirely clear he 2012. Even more significant is an eight-tatrietly these standards and rules are enforced superhighway linking Nairobi to the neighboil city government also organises the ing town of Thika. This US\$310 million projected collection and disposal of medical a looks likely to be finished by 2012. The project waste. Overall, however, waste make will set new standards for Kenyan roadsagendent remains a significant environment includes underpasses and footpaths. challenge.

Waste: Average Water: Average

Nairobi residents generate an estimated 318 kgestimated 93% of residents have accompanied by the state of the of waste annually, compared with the Inpletable water, narrowly more than the I average of 408 kg, although collection remainerage of 91%. The city consumes an estimate limited to about 40% of the total waste general-litres of water per person per day, less than ed. Collection consists mainly of private them average of 187 litres. Nairobi draw tractors picking up, sorting and transportive supply from local rivers and reservoir the trash to landfills outside the city. Becauses of in the middle of a major project to rehabilithis, waste collection in the city is not a widely and conserve the city's main surface water

water generated each day in Nairobi. In informalironmental governance: settlements access to toilets is limited, resulting w average

in the pollution of local streams. To combatobi has a dedicated environmental authori-

these issues, the Kenyan government adopted that oversees and implements environmentatives: Numerous new technology the National Environmenta Sanitation and policy, as well as some ability to implementatives are tracking Nairobi's environmental Hygiene Promotion Policy in 2007 to explandly environmental legislation. In addition addition, A new government online data poraccess to and the quality of sanitation services city involves external stakeholders, stakehonounced in July by President Mwai Kibaki around the country. How much has been image-citizen groups and non-governmental will allow Kenyans to identify spending on water mented is still unclear. organisations, to some extent in decision-maked energy, and to keep track of the state of the ing for projects with major environmental hydropower dams that provide the city most of

Air quality: Below average

The main causes of air pollution in Nairobi a2010 Nairobi's annual environmental budfuedded by the World Bank and the Danish govidling cars in traffic jams and faecal dust frowns about US\$5.9 million, or roughly 5% of thement aims to make Najrobj a centre of green informal settlements during dry months. that is annual city authority budget of US\$4077nology,creating4,600 jobs within five hoped that new limits on importing old cars rthibiton. Challenges remain, of course. New years. As the third capital of the United Nations, do not meet emission standards will imputevelopment in Nairobi is supposed to be overtrer New York and Geneva, Nairobi is the world conditions, though in the long term regulatiseen by the National Environmental Managed quarters of the organisation's environmental of vehicles running on leaded petrol, such as least Agency (NEMA). Some have been critical and urban planning programmes. The UN ries and buses, would likely yield more drammatithe agency's effectiveness, but the agencyous in Gigiri was overhauled in 2011 with results. The city lacks an air quality code anshair it is moving forward with plans to betternergy neutral offices. The new building for 1,20 monitoring in Nairobi is conducted only on æhiforce environmental laws. The city's planoeloyees includes 6,000 square metres of sola ited, ad hoc basis, which negatively affects intent in this category is hindered because niels. The UN says the energy savings should placement in this category. does not appear to regularly monitor its enviray for the investment within seven years.







ronmental performance and publish informa-

tion on its progress.

impact. For the fiscal year ending June 2001bpergy. A Climate Change Innovation Centre

Ouantitative indicators

Category	Indicator	NairobiAve	r Yegar *	Source	
ENERGY and CQ	Proportion of households with access to electricity (%)	75.0	2010	University of Nairobi, Department of Urban and Regional	Planr
	Electricity consumption per capita (GJ/inhabitant)	6 ¹ 5	2008	International Energy Association	
	₂ er 6 Bsions from electricity consumption per person (kg/person)	98 181.3 5	2008	International Energy Association	
LAND USE	Population density (pers d)ns/km	4, 47509.0	2007	EIU calculation	
	Population living in informal settlements (%)	50:0	32010	University of Nairobi, Department of Urban and Regional	Planr
	Green spaces per paperon (n)	73 37 93	2009	UN Environmental Programme	
TRANSPORT	Length of mass transport network²(km/km	2.7 139	2009	Kenya Bus Service Management Ltd	
	Superior public transport netwerk (km/km	0.07 0.09	2009	Kenya Railways Corporation	
WASTE	Waste generated per person (kg/person/year)	317.54	72008	City of Nairobi Environmental Outlook 2007	
WATER	Population with access to potable water (%)	93:39	12003	UN Habitat	
	Water consumption per person (litres per person per day)	111.5	372/005	City of Nairobi Environmental Outlook 2007	
	Water system leakages (%)	5090	2007 .5	City of Nairobi Environmental Outlook 2007	
SANITATION	Population with access to sanitation (%)	82:9	1.2003	UN Habitat	

All data applies to Nairobi unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed, e = FILI Estimate, 1) National data used as proxy for city level data



Energy and CO: Below average to create jobs and tackle high levels of unem-An estimated 78% of households have acceptotyment, people in the target communities electricity, less than the Index average of 84% been trained to install the heaters them-However, the city has set a target to insurbasse

this to 100% of households by April 2016.

Despite low access levels, the city consumed use: Average

12.0 gigajoules of electricity per person – netwee centre of Pretoria is not densely populated ly twice the Index average of 6.4 gigajoulesaAd most of the people who work there comis the case for the other South African citiesmute from nearby Johannesburg. Indeed, Pretothe Index, over 90% of Pretoria's electricity is the least densely populated city in the generated using coal, while nuclear power dedex, with only 1,100 people per square kiloerates about 5% and renewable energy in threetre compared with the Index average of form of hydropower less than 2%. As a result.600 people. An estimated 27% of the populathe city emits an estimated 3.048 kg20fetO tion lives in informal settlements, below the person from electricity consumption, more Index average of 38%. Like in many cities i than three times the Index average of 984 Kiputh Africa, Pretoria's population is growing Pretoria introduced an integrated environmenpidly, which has resulted in the appearance of tal policy in January 2005, which aims to informal settlements. In recent years, though diversify the energy supply, encourage energy to redevelop these area efficiency and promote cooperation betweed provide more access to municipal services, government, business, labour, communities including sanitation and electricity. Regarding and other stakeholders, among other goals. Then space, the city's development strategy document says the city should discourage thells for investments in new parks as well a use of inefficient and high-pollutingfuels, proposing a number of sprawl-prevention polialthough there are no specific action pointes. Already, Pretoria has 13 nature reserve The plan also calls for reducing energy and-ten bird sanctuaries, along with other recresumption in all municipal operations and imational nature areas. However, on a per capita menting "green procurement" policies baseblassis there are only an estimated 39 square energy efficiency, but again no specific phatrses of green space per person compared are included in the document. with the Index average of 74 square metres.

Green initiatives: During the past two yearseen initiatives: The city is prioritising sothe city has installed more than 12,000 cadled integrated land use, in which housing for water heaters in a number of communities inffluent residents is in close proximity to les the metropolitan area through an investimeatthy developments. This is an attempt to by the national Department of Energy. As wedderess the legacy of Apartheid planning that as reducing energy consumption and associateliberately created black townships without ed emissions, the water heaters have noncomests to basic services on the peripheries apart from their initial installation and are pointies. There are plans to formalise all informal ular among lower-income households. In a biettlements(providingelectricityand water

African Green City Index

retoria is South Africa's administrative capies were not included in the Index. Pretoria is tal, housing the government ministries, fdosely connected to Johannesburg, both geoeign embassies and various academicand graphically and economically. Situated approxiresearch centres. The city centre is highly deneately 50 km from Johannesburg, Pretoria's oped, with a mix of historical and modern buildan area is growing ever closer to its neighings. Compared with other cities in the Africaour, and housing developments are being con-Green City Index, Pretoria has a relatively sistable ted along the corridor that links the two. population of 2.3 million residents. It is Program and Johannesburg are also connected seen by an entity called the City of Tshowaaeeew commuter railway.

which includes many different municipalities in The city places average overall in the Index, the Gauteng Province, and was expanded ith some mixed results in the individual eight everal additegories: it achieves above average results in wane's **bloe**-transport, air quality and environmental ea grew fromernance categories. Pretoria boasts a transunder 6,400 network more than double the Index averditional area. It also has a relatively strong environmental 1,100 is rural and undeveloped), but these newer **fig**partment and a comparatively high level of

public participation in projects with environ Performar	1CE • Preto	ria Oth	ner cities		
mental impact. Pretoria is average for land use and water. Although the city has introduced water quality standards, some residents are still	well below average	below average	average	above average	well above average
without access to potable water. Officials are Energy and	I ÇO	••••	• • • •	• • •	• •
also working to improve overall environmental conditions in informal settlements. Pretoria's	use	••••	••••	••••	•
performances in the categories of energy and Trans	port	••••	• • •	•••••	
CO ₂ and sanitation are below average, driven by	este • •	•	••••	••••	•
high levels of @ missions from electricity consumption – electricity for the city is mainly pro-	ater	• •	••••	••••	
duced from coal – and relatively low levels of Sanita	tion	• •		••••	
access to sanitation. The city is well below aver- age in the waste category, due mainly to gener-	ality	••••	• • •	••••	
ating the most waste per capita in the Index.vironmental gover	nance	••••	••••	••••	•
There is nevertheless a variety of notable green overall res	sult • •	• •	••••	•••••	

The order of the dots within the performance bands has no bearing on the cities' results.

Background indic	ators	2011. Following the absorption of setional municipalities, the City of Tshv ulation rose to 2.5 million and its are
Total population (million)	2.3	2,200 square kilometres to just ui
Administrative area (4)m	2,200	square kilometres (much of this addi
Population density (nerson@km	1 100	is more land on developed but the











supplies, tarring roads and replacing shacksawithmative to driving between the cities and his llprogrammeentails. Pretoria consumes brick houses) by the end of 2016, and delivereatly reduce the amount of traffic in centra 10 litres of water per person per day, above more services to less developed townships. Pretoria. The system also includes buses linkinguladex average of 187 litres. The city's envi-Gautrain stations to locations in the city centorementalpolicy includes a goal to reduce water consumption.

Transport: Above average

Pretoria's public transport network, consistante: Well below average

mainly of buses and commuter trains linking lite city's result in this category is due to a fight initiatives: Aside from the investments in to Johannesburg, measures 6.4 km per squdewel of waste generation, at 1,070 kg per pites water system, the city is raising public awarekilometre, more than double the Index average per year. This is the highest rate in the highest around water efficiency. The Water-Wise of 2.7 km. However, despite the network's vaidde well above the average of 408 kg. However, on its website offers tips on how to save coverage, as in the rest of South Africa, privalted the South African cities in the Index generater in the home, including encouraging homeautomobiles remain the primary form of transe relatively high levels of waste. The city loweners to turn taps off whenever possible and portation for those who can afford themwaste management division responsible fortable quick showers, and asking residents to use arteries around the city centre are regulædtion, transportation, treatment and dispoisadigenous plants in their gardens, since they clogged by high volumes of commuter that flight of the high level of waste generated the to use less water than non-indigenous breeds. travelling to the various government officesaity could improve its waste management and

Pretoria, According to a 2008 city household expeling policies. There is an informal sector of itation; Below average vey, most respondents expressed concern aboutestimated 6,000 waste collectors who usift over three-quarters of the population has

their personal safety while using buses, duetbroaugh bins and collect items they can sellatocess to sanitation, below the Index average of high number of traffic accidents on the meads ing firms but the city lacks regulation \$40%. The city originally had a target to provide free between Pretoria and Johannesburg. this group. Pretoria also lacks standards govbersic sanitation for all residents by December ing disposal of industrial hazardous waste, b2010. Because that target was not met due to a

Green initiatives: The city has plans to com+the city does provide for recycling of glass, beautering funding, the city set a new deadline of pletely revamp its public transport system aaddsardboard. December 2016. The city has allocated US\$55 million to tackle this issue and invest in overall refur-

currently developing an integrated rapid public

transport network (IRPTN). At the heart of the ater: Average

bishment of the infrastructure, but details are will be a bus rapid transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system, which estimated 97% of Pretoria residents transit (BRT) system (BR will run along dedicated lanes through the categories to potable water, compared with rtheent of wastewater and regularly monitors treatto avoid congestion and have sealed stations dex average of 91%. Additionally, Pretorianheast, but it does not monitor on-site sanitation create safety. However, as of December in 12001 mented a water quality policy and tytes them the facilities (such as those found in homes the BRT had been put on hold due to concertards for the level of pollutants in surface and communal areas), nor does it publicly promote about the feasibility of the design. Through drienking water. It also boasts the second lowdest nliness when using sanitation facilities. IRPTN the city also plans to assess ways to realized rate in the Index, at 18%, compared

traffic congestion and connect different formath the Index average of 30%. The city is work quality: Above average

of public transport. In another initiative, thei @auto improve further, however. To meethets ity's strong performance in this category is train, a high-speed line linking Pretoria to downted goal of providing potable water farreflection of a robust set of policies to ensure town Johannesburg, is already operational, residents by April 2016, the city is investigated ambient air quality. The national Departalthough construction continues on one files 35 million to upgrade the water systement of Environmental Affairs' weather service station. The new service offers a long-awaitethough few details are available about wheeqularly monitors air quality and publishes results

online. Several monitoring stations around timental management department under whize 11 Integrated Development Plan. There is also municipality test for sulphur dioxide, nitriadletwo environmentally related divisions: eavi-rovincial-level Gauteng State of the Environdioxide, suspended particulate matter, suspended in 2004. The ed fine particulate matter and carbon monomidet. The environmental management depaitty has a public participation process in place for ment is responsible for all environmental policy jects with an environmental impact.

Green initiatives: The city has an Air Qualityand information, management systems, audit Management PlanQMP) that aims to minand promotion, as well as the day-to-da@reum-initiatives: Since 2003 the city has been mise the negative impact of air pollution on pieg-of parks, cemeteries, urban forestry, strabeing its Sustainable Energy and Climate ple's health and wellbeing, and on the enviropirc-open place planning, air quality, climate@harmqeeprogramme, which aims to "encourage ment. Reducing domestic fuel burning, suchand sustainable energy policies. The waste the integration of sustainable energy and envithe burning of charcoal in informal settlemembastment manages waste collection and memory ent concerns into urban development in

is also a key priority stated in the AQMP. cling. In 2001 the city published a State of theuth Africa". All departments are required to EnvironmentReport, which was followed in make sustainable energy objectives part of their 2005 by the integrated environment policy autivities and functions, although few specific

tioned above. Additional environmental inditatails are available about how this policy has

Environmental governance: Above average

The city has a dedicated agriculture and entriores and planning were covered in the Aquerien implemented.

Ouantitative indicators

	Indicator	Pret évia rage	Year*	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	84. 78.0	2010	National Department of Cooperative Governance and Traditional Affairs
	Electricity consumption per capita (GJ/inhabitant)	12.0 .4	2005	State of Energy Report 2006
	2 erûðsions from electricity consumption per person (kg/person)	983 3,047:6	2005	State of Energy Report 2006
LAND USE	Population density (pers d)ns/km	4,578 1,066.3	2007	EIU calculation
	Population living in informal settlements (%)	26:8 .0	2007	Community Survey 2007
	Green spaces per β /preιατο(τή)	73.6 39:2	2005	2005 Report - Proposed Tshwane open space frame
TRANSPORT	Length of mass transport network ² (km/km	2.7 6.4	2010	Tshwane Bus Service
	Superior public transport netwerk (km/km	0.07 0.04	2010	Sapromo Magazine, Pretoria
VASTE	Waste generated per person (kg/person/year)	1,070 .0.8	2005	Tshwane environment education and awareness stra appendix to report 2005
WATER	Population with access to potable water (%)	9342	2007	Community Survey 2007
	Water consumption per person (litres per person per day)	319.7 2	2008	Miyawater
	Water system leakages (%)	18 90 3	3(2009	Department of Water Affairs – 2009 Water Services Development Plan
ANITATION	Population with access to sanitation (%)	76:3	2007	Community Survey 2007

data applies to Pretoria unless stated otherwise below. * Where data from different years were used only the year of the main indicator is listed. e = EIU Estimate. 1) City of Tshwane Metropolitan Municipality. routes (545) multiplied by average length of bus routes in Cape Town, Durban and Johannesburg (26 km), 3) There are no subway, tram or light rail line.



electricityconsumption.compared with the metres. The exception is the 100-hectare Index average of 984 kg. Most of the city's elebedere Park, known as the "lungs" of the city tricity is generated using natural gas, with little of the city's poorer residents live in crumrenewable power in the mix, but solar produding buildings in the city centre, but one partiction has been increasing in recent yearsulander active non-governmentalorganisation has been leading a revitalisation of these neigh-"green initiatives" below). bourhoods (see "green initiatives" below).

Green initiatives: In 2005 the government

adopted a programme to promote solar energizeen initiatives: Over several decades the PROSOL. The programme is a joint initiative Accident de Sauvegarde de la Médina de the government-run National Agency for Energy's (ASM), a non-governmental organisation, Conservation, the state power company Sodiátébeen responsible for a series of rehabilita-Tunisienne de l'Electricité et de Gas (STEG) tibre projects in the historic city centre. The ASM UN Environment Programme and the Italiangaramme, supported by organisations such as environmentministry. The scheme includes the World Bank, has reversed the creeping disre loans and subsidies to offset the cost of pair left the old city by upgrading electricity conwater heaters. More than 50,000 families beneetions and street lights, restoring monufited in the first two years of the programemts, clearingwaste from the streetsand saving an estimated 240,000 tonnes of Coating pedestrian areas. Under one of ASM's emissions. Ultimately, through a series of relaitestives, Project Oukalas, three new neigh

Performan	Ce •Tunis	• Oth	ner cities		
		below average	average	above average	well above average
Energy and Q	6 0	••••	••••	• • •	• •
Land us	se •	• • • •	• • • • •	••••	•
Transpo	ort •	••••	• • •	••••	
Wast	e •	•		• • • •	•
Wate	er •	• •	••••	••••	
Sanitatio	on •	• •		• • • •	
Air quali	ty	••••	• • •	••••	
Environmental governa	ince •	••••	••••	••••	•
Overall resul	t ••	• •	••••	••••	

The order of the dots within the performance bands has no bearing on the cities' results

runis is the capital of Tunisia. It is the smallest will have an opportunity to build on severcity in the African Green City Index in teachexisting environmental strengths in its capital of population, with only 1 million residentisy.

though the greater metropolitan area is home Tonis ranks above average overall in the roughly 2.4 million. With an administrative angles, and is above average in the individual catestimated at just 200 square kilometres, Tueispoises of transport, waste, sanitation and air also the second smallest city by area inqubaty. The city has the longest superior mass Index, just marginally larger than Accra. transit network in the Index, with a well-develpared with other major cities in North Africaophed system of light rail and suburban trains. city is relatively well managed and prosperofusis ranks average for land use, water and enviand benefits from a tourist industry that bringsmental governance. Sprawl is an ongoing visitors to Tunisia's beaches and historicissibes, but the city is emphasising pedestrian-The overturning of the previous national friendly development and increasing green ernment in January 2011 and the installation postces. Likewise, Tunis currently faces water an interim regime means that environmesulapply and wastewater discharge issues, but governance, like much else in Tunisia, is cuireptoving water infrastructure has been a top ly in a state of flux. However, the new goverpriority in recent years. The city falls below aver-

age for energy and code to relatively highitiatives, the national government wantbotorhoods were built to accommodate some CO₂ emissions and electricity consumption. increase its renewables from 0.5% of production households who had been forced to move However, recent investments in solar potweit 0% by 2020. In addition, the World Bankbeasuse their former homes were dilapidated. could bolster its performance in this categorinanced a programme to examine how Theisesidents were provided with 25-year rent-

Energy and CQ: Below average

and the rest of the region can adapt infrastrpurchase plans with low monthly repayments. ture for the potential effects of climate change demolished buildings were then replaced Tunis has the highest electricity consumption as increased coastal erosion or natural with newer accommodations. In another per capita in the Index, at 18.1 gigajoules pasters such as extreme storms and floodingUS\$19.5 million project, carried out between capita, almost three times the Index average of 1994 and 2007, the ASM led the restructuring of

6.4 gigajoules. A major driver of this high cdnand use: Average

public spaces on two avenues, making them sumption has been the government's pustinis performs well for its relatively high populæfly pedestrian. The organisation also listed recent years to continually expand access thighedensity, at an estimated 4,700 people party restored landmarks, including the Tunis grid. An estimated 99% of households have are kilometre, versus the Index average notifical theatre and the central market. access to electricity, exceeding the Index a 4e600. However, this also leads to a relative lack

age of 84%. Air conditioning in the summer callspreen space. The city only offers an estimated sport: Above average

drives up Tunis's electricity demand. Tunis & Situation metres of green space per parisons, residents have the choice of bus, light rail an estimated 1,044 kg of ©er capita from well below the Index average of 74 squaned suburban rail services. The city's light r

Background indicators

Total population (million)	1.0
Administrative area (ধুন	200
Population density (persons/km	4 700

e = EIU Estimate



Green initiatives: The city is investing US\$2 uniauthorised dumps and increasing treatment lion in public transport network improvementates of industrial and special waste to 70%. November 2008 Tunis completed a 6.8 km exten-

sion to the light rail network in the south of Weter: Average

city and in December 2009 a 5.3 km waternresources in Tunis are limited because of extension. Two further extensions are undethwarid climate. Despite this, residents consume An additional suburban network is planned dwerage of 299 litres of water per person per 2016. The city also plans to introduce 14 neglethyswhich is well above the Index average of corridors totalling 90 km. 187 litres. It is estimated that nearly 100% of the

population has access to potable water, above the Index average of 91% and the second high-

On a per capita basis, Tunis generates an estit rate in the Index. Tunis's water system leakmated 173 kg of waste annually, compareds, at 28%, are slightly lower than the Index with the Index average of 408 kg. This is oneverage of 30%. Several international agencies. the lowest rates in the Index and the main dricluding the World Bank, the French Developver of the city's performance in this categorment Bank and the African Development Bank, The government adopted a ten-year strabous invested and loaned large sums in recent frameworkfor waste managementin 1995 years to upgrade infrastructure and manageknown as PRONAGDES. It was designed to provent practices (see "green initiatives"). In large mote reuse and recycling, as well as reducthese investments have paid off in terms of waste generation and improve cost manageater water access for residents and a more ment. The PRONAGDESwaste management efficient water system. The city has relatively frameworkwas followed by a second pro- strong policies, including regular monitoring of gramme covering the 2007-16 period and surface water quality, a water quality strategy

by a high rate of access and strong policies are bastance from the World Bank and other in the fixed stations had been established tive to the other cities in the Index. An estimmate and organisations, it has introduced a piladuding three in Greater Tunis at Bab Aliou 95% of the population has access to sanitattonincrease the use of treated wastewateratorupa and Ghazela. A total of 15 stations well above the Index average of 84%. Regardingulture rather than discharging it into athe now been completed nationally, nine o policies, the city is covered by a sanitation code of Tunis. which are located in Greater Tunis in Bab S doun, El Mouroui, Ariana, El Nahli, Ben Arous and has wastewater treatment standards, and moni-

tors on-site treatment facilities in homes Aanduality: Above average

communalareas. As in the water category, Tunis city officials conduct regular air quadrity to a total of 25 stations by the end of 2011 many international gencies have extended monitoring in locations around the city and loans and financial assistance to upgrade wastern citizens about air pollution. The air qualivironmental governance: Average water treatmentand sewage networks in ty in Tunis is better overall than in other mallor city's environmental policy is managed by Greater Tunis and the rest of the country bian centres in North Africa. Compared the inhational ministry of environment, with difrecent years (see "green initiatives" below) cities in Egypt and Morocco. Tunis's roadswent state-owned agencies carrying out specifhave less congestion, though pollution frignolicies in different areas. The overturning of

Green initiatives: In 2006 the European Investaffic and industry is still a significant probleme.regime of Zine El Abidine Ben Ali in January ment Bank irrested US\$121 million to upgrac@n a national level, energy generation c@011 and the replacement of the government sewerage networks in Greater Tunis and setribultes 31% of the country's air pollution abd an interim regime means that environmental other towns in the country, and to constraint port contributes 30%. new wastewatertreatmentplants. Also, the

French Development Agency is financing a procent initiatives: The government has implered initiatives: The Tunis International Cengramme to expand and rehabilitate 19 watered a national plan to survey air quality.tenfor Environmental Technologies (CITET), a treatment stations and 130 pumping stations foresees the installation of a networker to agency, was created in 1996 to develop throughout Tunisia. Additionally, the government stations and the use of mobile laborat quiet first for better mastery of environmentment is prioritising the local eco-system.tdWittbnitor and control the sources of pollutitant technologies to ensure sustainable develop-

> ment in Tunisia as well as the Arab and Mediterranean region. The organisation promotes environmental issues in the private sector, offer training and distance learning programmes to raise awareness about the environment, and helps companies comply with international en vironmental standards. The National Agency for Energy Conservation (ANME), establishedn 1985, aims at improving the level of energy efficiency and diversifying energy sources around Tunisia. In addition, the Association de Sauvegarde de la Médina de Tunis (ASM) serves as a meetingpoint and researchcentre on urban, architectural and socio-economic aspects of the old centre of Tunis.

> Radès. The government plans to extend the net-

governance is currently in a state of flux.



Waste: Above average







system, known as the Métro Léger de Tlamosyn as the Programme National de Gestiamd a policy aimed at conservation. These poliopened in 1985 and carries more than 460,000@grée et Durable des Déchets (PRONGIDED, have also received input from Tunisia's interpassengers per day. Tunis has the longest ssmetioreen initiatives" below). national partners. transport network (defined as light rail, subur-

ban trains, bus rapid transit or metro) in refree initiatives: PRONGIDD focuses on Option initiatives: In 2005 the World Bank Index, at 0.27 km per square kilometre, versussing the financing, collection, transport applicated a loan of US\$38 million to the statethe Index average of 0.07 km. The light rail saysycling of waste, and on promoting privatewsed water company to upgrade water infratem is integrated with other forms of publicity of public transport, linking to suburban lines at the Tumusnities. The nationwide programme contatnesa The project, which is set to finish in 2012, Marine station and to the Tunisian state rails were of key targets, including reducing here the components: The first entails upgrading vice at Place Barcelone. As part of a comprementation by 20% by changing consumptable infrastructure to improve delivery capacisive urban mass transport policy, the cityathasns, increasing composting levels byty15% the second focuses on upgrading manbeen working on plans to extend both the lightly household-wasteecyclingby 20% and agement systems, including information sysrail and suburban railway systems. Tunis ensuring 100% of municipalities have accestetos, planning, cost control and customerreceives full marks for encouraging citizemastee transfer stations and landfill facilities. Addice procedures.

take greener forms of transport, and many tesmally the framework calls for: raising private-

dents walk to and from work in the pedestriaector participation in waste collection and faritation: Above average friendly historic centre. structure development to 30%, closing 701% city's performance in this category is driven

Ouantitative indicators

Category	Indicator	Tun <i>i</i> Asve	ra ğear *	Source
ENERGY and CQ	Proportion of households with access to electricity (%)	99.0	2010	Goliath Business Knowledge
	Electricity consumption per capita (GJ/inhabitant)	18:1	6.2008	Annuaire Statistique de la Tunisie 2008
	₂ er 6 @sions from electricity consumption per person (kg/person)	1;044.31	2008	2006 IPCC Guidelines for National Greenhouse Gas In
LAND USE	Population density (persòns/km	4,47698.1	2009	EIU calculation
	Population living in informal settlements (%)	25:0	38.2001	Tunis City Development Strategy Report 2001
	Green spaces per plepeoso(n)	73 14 95	2004	l'Institut National de la Statistique
TRANSPORT	Length of mass transport network ² (km/km	2.7 243	2008	Sociéte du Métro léger de Tunis
	Superior public transport netwe)k (km/km	0.07 0.27	2008	Sociéte du Métro léger de Tunis
WASTE	Waste generated per person (kg/person/year)	172 1 5	07.82002	Mediterranean Environmental Technical Assistance Program Report 2002
WATER	Population with access to potable water (%)	99 97	1.22009	Société Nationale d'Exploitation et de Distibution des
	Water consumption per person (litres per person per day)	299.3	37.2 2008	Ministry of Environment
	Water system leakages (%)	28.4	302008	Ministry of Environment
SANITATION	Population with access to sanitation (%)	9590	4.1 2009	Office National de l'Assainissement
All data annlies to Tuni	s unless stated otherwise below * Where data from different years were used only the	vear of the mair	indicator is list	ted e = FILLEstimate 1) National data used as provy for city data 2)

3) National electricity generation mix used to estimate city level 1604) Greater Tunis, 5) There are no subway, tram or BRT lines

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Corporate Communications and Government Affairs
Wittelsbacherplatz 2, 80333 München
For the publisher: Stefan Denig
stefan.denig@siemens.com
Project management: Karen Stelzner
karen.stelzner@siemens.com
Contact Siemens Africa: Jose Machado
issemar.hado@siemens.com josemachado@siemens.com

Economist Intelligence Unit project manager: Emily Jackson, Frankfurt Editorial office: Jason Sumner, Vanessa Barchfield, Economist Intelligence Unit, London and Vienna Research: Harald Langer, John McNamara, Economist Intelligence Unit, London

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