

enviroworks

SPECIAL EDITION: CLIMATE CHANGE

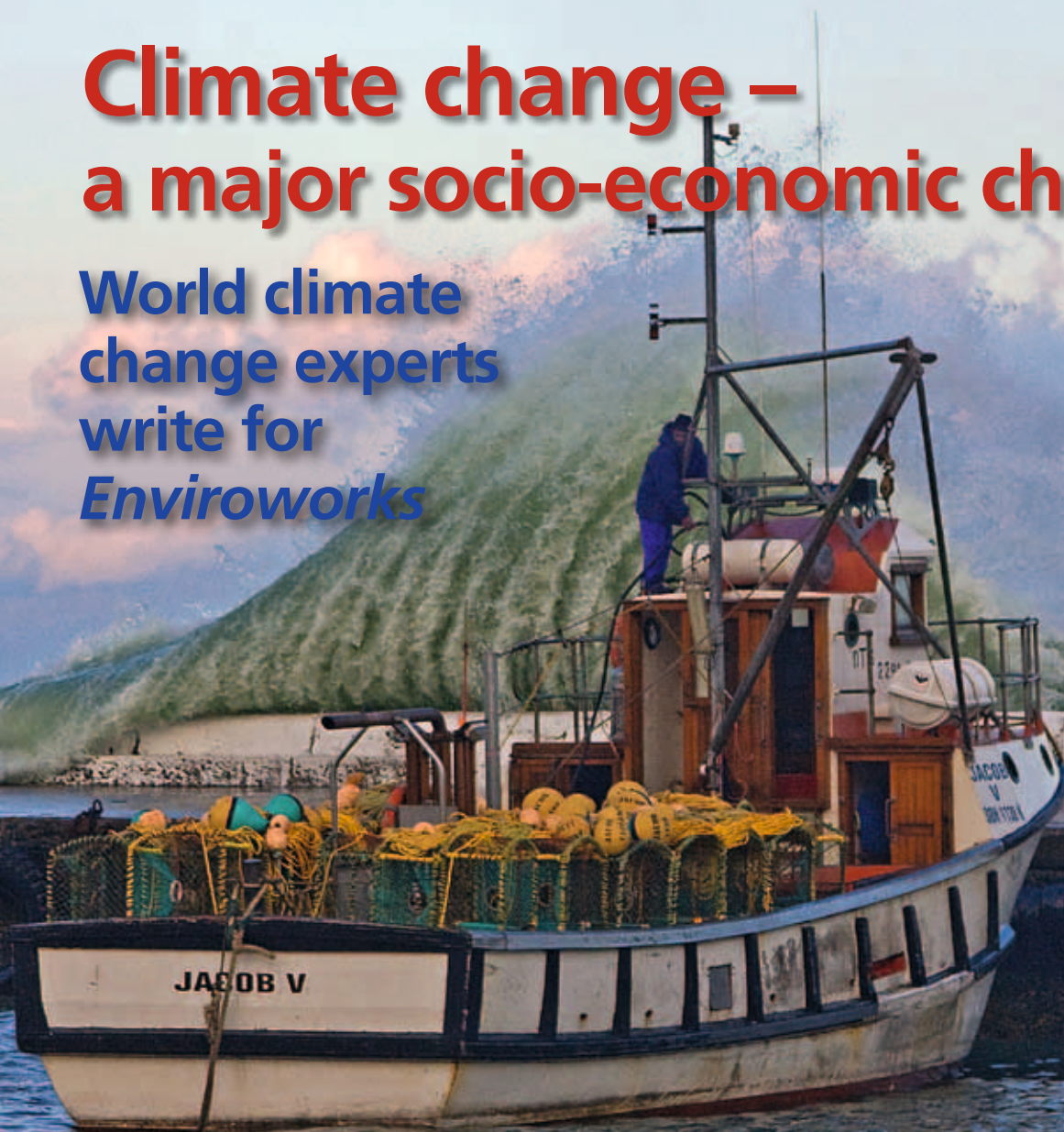
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Biannual environmental newsletter of the City of Cape Town

Published by the City of Cape Town Environmental Resource Management Department in partnership with a range of other City departments

Climate change – a major socio-economic challenge

World climate
change experts
write for
Enviroworks



Good COP, bad COP – all eyes on Durban

Learn ...

What you need to know about climate change

Enjoy ...

A fun look at the perils of taking a bath!

Win!

Give us feedback and stand to win a coffee-table book on environmental change in South Africa



CITY OF CAPE TOWN | ISIKHOKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU



Rob Tarr

FRONT COVER:

Large swells often turn Kalk Bay harbour into a photographer's dream, but sea level rise and storm surges associated with climate change pose a serious risk to Cape Town. The City of Cape Town has conducted a comprehensive sea level rise study to determine Cape Town's vulnerability to climate change. Similarly, the City has proposed a coastal protection zone (CPZ) designed to ensure that buffers such as dunes are not developed and/or removed and that development does not take place in high-risk areas identified in the sea level rise study.

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And the WINNER is...

The winner of the feedback competition in our previous issue is Mr Vuyisile Vincent Diba of Robben Island Museum, who has the following to say about the *Enviroworks* special edition on heritage:

"This rich publication is one of the instruments that would help humankind

to develop and conserve the heritage resources that have been bestowed upon humanity. If possible I am prepared to volunteer in the distribution of this lifetime heritage education publication. I think whilst it is a local publication, it has provincial, national and international empowering capacity.

It dovetails with the Millennium Development Goals."

Congratulations, Mr Diba. We trust you will enjoy your copy of Worden, Van Heyningen and Bickford-Smith's beautiful coffee-table book *Cape Town: The Making of a City*.

This newsletter is printed on SAPPI Triple Green paper, an environmentally friendly paper stock made from chlorine-free sugar cane fibre to support sustainable afforestation in South Africa.



FEEDBACK from readers

Thank you for all the feedback on our previous issue. To keep the conversation going, we offer a copy of the richly illustrated and multi-disciplinary publication *Observations on Environmental Change in South Africa* (with contributions by more than a hundred authors) to the best letter received – please see contact details below.



Write to us and stand to **WIN!**

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Climate change – is it real?

Guy Midgley, Chief Director: Climate Change and BioAdaptation Division, South African National Biodiversity Institute (SANBI), writes ...

If we continue to emit greenhouse gases at today's rates, we risk warming the earth's atmosphere by more than 5 °C by the end of this century. This would be damaging to human society, as it would significantly reduce food production in most of the world, introducing a vast array of health impacts from heat stress to disease, challenging water supply and water purification infrastructure, and straining disaster risk management and response.

Ultimately, the effects of sea level rise caused by climate change could displace large populations living close to the ocean, including some of the world's greatest cities. Renowned economist and climate advisor in the United Kingdom, Sir Nicholas Stern, estimated that the damage associated with climate change could cost as much as 20% of the world's economic output, every year, by the end of this century. Such a high level and rate of warming could

also cause poorly understood and unpredictable effects that would result in even faster warming and climate disruption.

Climate change now represents one of the most far-reaching socio-economic issues of our times, with implications for the global environment as well as for global development pathways for decades to come. It is a challenging issue, and one that presents human society with both threat and opportunity.

Our scientific knowledge of possible impacts is far from complete, but this does not mean that we cannot plan. The key is to use what we know in ways that will create the space for us to adapt appropriately as we start to see how the climate may change and how the world around us – natural and man-made – begins to respond. Strong leadership is needed for effective action, and a focus on flexible responses that keep our future options open and are aligned

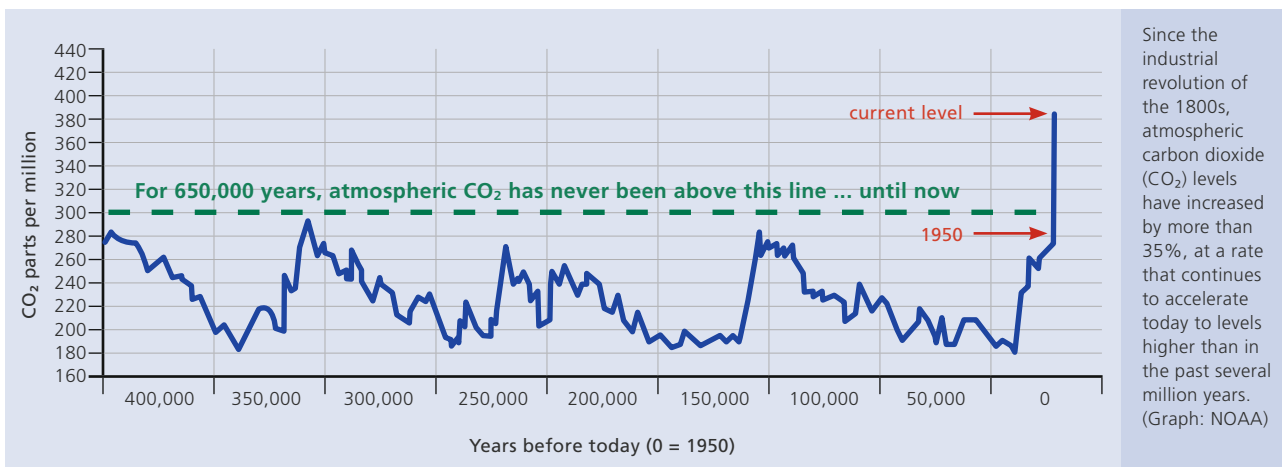


In short ...

Climate change is real. If we continue to emit greenhouse gases at the current rate, we risk seriously damaging our natural environment and human society. Urgent action is required.

with real present-day societal needs, would be of value.

It is for these and many other reasons that the world's nations are attempting to find a way of limiting greenhouse gases in order to keep projected warming to below 2 °C above the pre-industrial era level. This implies urgent action to reduce emissions. These efforts and actions are discussed and developed in global negotiations under the United Nations Framework Convention on Climate Change (UNFCCC) and its related Kyoto Protocol and Conference of the Parties (COP).



Did you know?

Greenhouse gases trap radiation (heat) from the sun, and warm the planet's surface. A certain amount of these gases is beneficial. But, as concentrations of these gases increase due to human activity, more warming occurs than would happen naturally. There are many different gases that contribute to climate change, but carbon dioxide (CO₂) is the biggest culprit. The burning of coal, oil and gas, known as fossil fuels, is the primary source of increased CO₂ emissions. Methane is 25 times more potent as a greenhouse gas than CO₂, but there is far less of it in the atmosphere.

More information

FOR THE FULL ARTICLE:
www.climatesmartcapetown.co.za/climate-change-guy-midgley



So, you think you have a good idea of what the future holds?

Bruce Hewitson, South African Research Chair in Climate Change and Director: Climate Systems Analysis Group (CSAG), writes ...

On some levels, everyone is an expert on climate change (it's going to be hotter!). The challenge comes when we want to make decisions about our issues – how will climate change affect our context; what will Cape Town experience? Suddenly, everyone is not so sure that they know anymore.

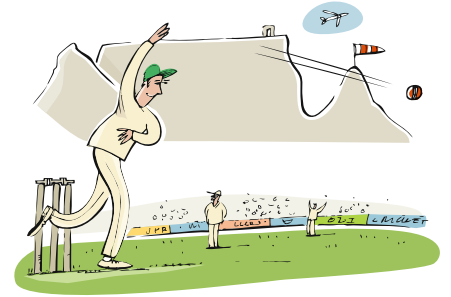
There is no one future. We may have one past, but the future depends on the global society's choices, and with a small degree of chaos thrown in for good measure! So, to say we know THE future is not possible, but we can certainly say some things about its characteristics.

In reality, we know a lot about climate change, just not everything. Consider: If I throw a cricket ball, I cannot say exactly where it will land. If I throw it many times, it will land each time in a slightly different place depending on how hard I throw, whether the wind blows, etc. I can however say with high confidence in which direction the ball will go, and I can identify with a great deal of probability the area within which it will land. So it is with climate change: We know the direction of change and have a good measure of understanding about the magnitude and characteristics of the change. From this, we can get a good idea of what the consequences will be. This is the state of the science as it is now.

As long ago as 1896, the Swedish scientist Arrhenius had identified the consequence of increased greenhouse

gas concentrations. He estimated a realistic consequence of global warming without any computer to help. Ever since then we've observed the climate system change and greatly expanded our understanding. We now know that climate change is real, and research is currently focused on the details we need for decision making.

So, what then are the scientific challenges for Cape Town? We have a good understanding that the region will continue to warm, and that the warming will be greater further inland away from the coast. Likewise, we are confident that, on average, the rainfall intensity will increase. We are reasonably confident that the large high-pressure systems that cause the south-easter in Cape Town will strengthen. We have an emerging understanding of the pattern of rainfall changes and the impacts on seasonality. We can develop messages that, in a risk management context, are useful information to inform our decision making.

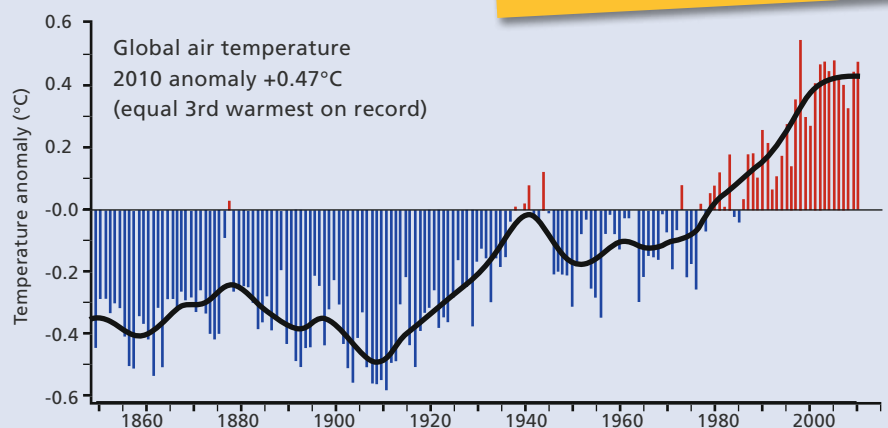


So, do we have a good idea of what the future holds? Yes and no. We have gaps in our knowledge. Crucially, though, we know the general direction of climate change; we have the capacity and scientific foundation to address the research needs, and with appropriate, resourced partnerships, we can meet the challenge.



In short ...

We know the general direction of climate change and what the gaps in our knowledge are, and we have the skills to address these.



Global land and sea surface temperature anomalies* since 1850: Last year (2010) was the third-warmest year on record (together with 2003). The year 2005 was the second-hottest. With a temperature of 0,55 °C higher than the 1961–1990 average, 1998 was the warmest year of the entire period. After 1998, the next nine warmest years in the series were all in this decade. Only 2008 was not among the ten warmest years. However, although the coldest year of the 21st century, 2008 was still the 12th-warmest year since 1850.

Source: Climate Research Unit, University of East Anglia [www.cru.uea.ac.uk/cru/info/warming]

* An anomaly is a deviation from a typical or normal condition.

Did you know?

The City of Cape Town has set up a 'climate change think tank' to assist in more fully researching and examining possible climate change impacts and their implications for local government.

More information

FOR THE FULL ARTICLE: www.climatesmartcapetown.co.za/climate-change-future



Imagine Cape Town – hotter, drier, windier, stormier and wetter

With inputs from: Chris Jack, Climate Scientist, Climate Systems Analysis Group (CSAG)

Is Cape Town going to become ...

Hotter?

Yes. We are confident in the projections that global average temperatures are climbing, and Cape Town is no exception.

IMAGINE...

Cape Town trains in summer are already hot, but think how hot it will become as global temperatures continue to rise.

- In order to adapt to this, public transport providers should start looking at ways of cooling trains, buses and taxis.


As the global temperature rises, Cape Town will likely experience heat waves like those that struck Russia and Northern Europe in 2010. Although suburbs close to the sea remain cooler in heat waves, many suburbs are situated inland, away

from the cooling sea breezes, and get very hot. The city centre also gets very hot due to the 'heat island' effect,* which can be ascribed to urban development as well as waste heat generated by devices such as air-conditioning systems. People living in informal settlements or low-income houses, with no insulation to keep their houses cool, are particularly vulnerable to heat waves.

- A hotter Cape Town may be a breeding ground for diseases that would not have been found here before, and may increase the spread of diseases.

- Health authorities will have to be vigilant in order to detect such cases early on, so that they can manage the response as effectively as possible.

*The 'heat island' effect refers to an area with significantly higher temperatures than its surrounding areas. It is often called 'urban heat island', as it mostly occurs in cities.



Drier?

Yes and no. Global projections indicate that the Western Cape will become drier.

IMAGINE...

Climate change is likely to cause extended periods of dry weather, with little or no rainfall, alternating with more intense, short-duration rainfall events in a potentially reduced winter-rainfall season.

- Does this threaten our future water supply
 - Perhaps not, because fine-scaled climate modelling of the Cape Town area indicates a slight increase in rainfall on the mountainous areas surrounding Cape Town – i.e. our catchment areas.
 - However, those same projections indicate that it may either stay the same or become slightly drier on

the lower coastal plains.

- Either way, we cannot live without water, and a growing city – especially a hotter city – will have to be prepared for increased demands on its water supplies.


How can we adapt?

- The City has a 25-year planning period for bulk water supply, which factors in climate change.
- As the City relies primarily on surface water supply, it is exploring alternative supply sources such as desalination, reclamation and ground water.
 - Desalination, however, uses lots of energy.
 - So, we should save water to

reduce energy consumption, and

- ... reduce energy consumption to save water.

- Trapping rainwater on site could provide water for use in gardens and other areas where potable water is not required.



Windier?

Probably. Climate projections indicate the intensification of the south-easterly winds that dominate Cape Town's summer. This could add to drying trends by increasing evaporation.

IMAGINE...

If Cape Town becomes even windier, how can we adapt?

- By incorporating wind-resilient design into new buildings, houses, highways, etc.
- By avoiding creating wind tunnels when designing new areas or building new buildings
- By planting wind-resistant and water-efficient indigenous plants



Chris Preer

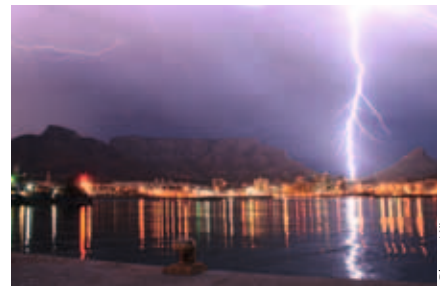
Stormier?

Almost certainly. A hotter world means increased evaporation, and more evaporation means more water vapour in the atmosphere, which in turn leads to more intense rainfall.

IMAGINE...

There are many images of extreme storms, but what matters is how we cope with them.

- We need to reduce vulnerability among our residents and our infrastructure.
- We need to build resilience among our people, in our landscape and urban form, and in our economy.
- We need to be able to secure water, food, energy and economic activity.



Glenn Käsner

Wetter?

AFFECTED BY STORM SURGES AND SEA LEVEL RISE?

Yes. We are already seeing a global average increase in sea level rise. Although this is still relatively small, the combined effect of sea level rise and increased storminess poses a significant threat to our coastline.

IMAGINE...

As people try to protect their properties and businesses against increased storm surges and sea level rise, Cape Town's beaches may become strewn with sandbags and rubble.

The beaches will be destroyed, tourism will drop, and those

beachfront properties will remain vulnerable to storm surges and sea level rise.

- In order to be prepared, the City has a cross-sectoral team working on coastal risk (see *Enviroworks* special edition on marine and coastal issues, December 2010, www.capetown.gov.za/enviroworks).



How do we know what will happen? We don't, but we have a good idea ...

Computer-generated models give us a rough picture of the future climate. However, for a city such as Cape Town, this approximate picture, which operates on grid cells of around 200 km and gives one value per grid cell for projected rainfall and temperature, is inadequate. One grid cell would cover an area from Cape Point to Saldanha, over to Porterville and down to Kleinmond, at least. These models do not even 'see' Table Mountain – it is simply too small a feature to be considered!

However, any Capetonian will tell you how our local climate can differ over distances as small as 5 km. Clearly, if we want to talk about climate in Cape Town, we need to take into account the effect of the local mountains and other locally specific conditions. To do this, a technique called 'downscaling' is used, which takes local conditions into account. For example, if you live in Cape Town, you will know that



Climate change poses a heightened risk to those already vulnerable.

when a large cold front moves past, it is very likely to rain. More than that, however, you will know that it will rain more in Newlands than in Blouberg.

Climatologists capture this information in computer models, which can then provide detailed projections of the local climate.



Did you know?

Looking at future climate projections for Cape Town, the City of Cape Town's Climate Adaptation Plan of Action (CAPA) identifies areas of climate vulnerability and the possible impacts on Cape Town. In this way, the City can think of ways in which to adapt to, or plan for, climate impacts. As residents, we also need to think about climate-related impacts, and how we can adapt to climate change as best we can.

Typical global climate model grid cell size, showing how one grid cell can cover a vast area, but only generate one climate projection per grid cell.

Source of figure: Climate Systems Analysis Group website. Climate Information Portal. [<http://cip.csag.uct.ac.za/webclient/map/south-africa>]

More information

CLIMATE MODELLING:
www.climatesmartcapetown.co.za/climate-change-cape-town



Our planet's energy picture

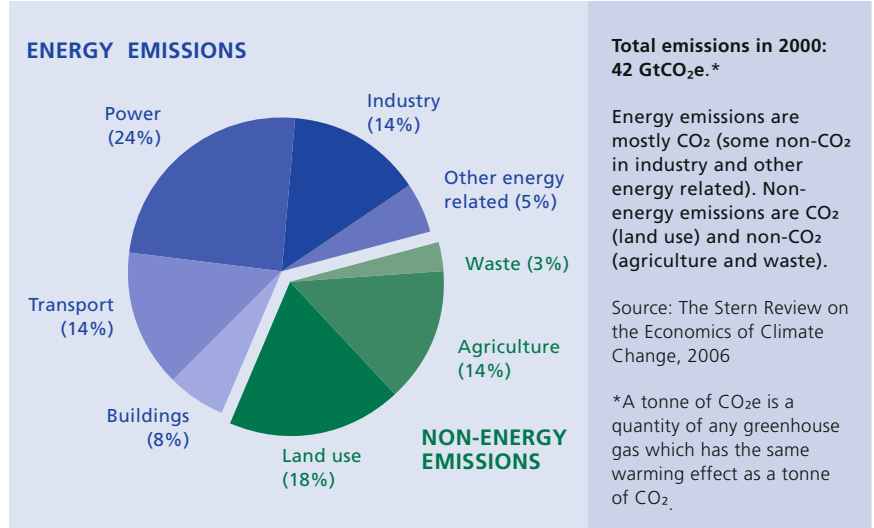
Stefan Raubenheimer, Executive Director of SouthSouthNorth, a network-based non-profit organisation working in the field of climate change and development, writes ...

The direct connection between the emission of greenhouse gases and the production and consumption of energy means that energy is one of the largest concerns we need to face in the world today.

All of our consumption when we travel, buy goods or cook food relates to a supply of energy. Some of these supplies emit more greenhouse gases than others, but all of them have some form of 'footprint'.

A nuclear power station is emission-free, but there are emissions associated with the mining of uranium. So, at the production end of energy, there are always emissions. Even electric cars cannot claim to be entirely emission-free if they are powered from an energy grid that is supplied by coal or gas-burning power stations.

The emissions profile differs between developed and developing countries. We find that as a country develops, (generally) its demand for energy grows, its use of fossil fuels increases, and its emissions attributable to fossil fuels rise.



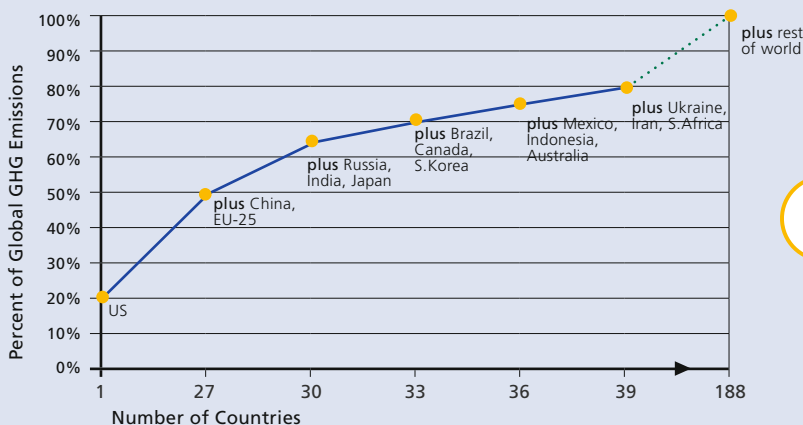
As this trend continues, so our global emissions rise and rise.

The projected trend is nothing short of alarming, and while there was a slight dip in emissions during the financial crisis, 'business as usual' and successful economic growth are still coupled to high fossil-driven emissions. In simple figures, our global energy-related emissions in 2000 were 42 gigatonnes (Gt) CO₂, which are projected to rise to 80 Gt CO₂ by 2050. The goal should be a reduction to 23 Gt CO₂ (figures from Stern Review).

Seen collectively, our current emissions worldwide will take us into dangerous climate change by mid-century.

Coal and oil are the problems: In developing countries especially, coal is the mainstay of energy production, and China and India are the big ones. In 2010, there was an overall 5% growth in global energy demand. According to the International Energy Agency, in the four years from 2004 to 2008, the world population increased by 5%, annual CO₂ emissions increased by 10%, and gross energy production increased by 10%. In 2000, China used 28% of the world's coal production; in 2009 that figure grew to 47%.

Aggregate Contributions of Major Greenhouse Gas (GHG) Emitting Countries



Adapted from: The World Resources Institute (WRI)

In short ...

Our biggest challenge is to eliminate coal almost completely from our energy system by around 2050.

More information

FOR THE FULL ARTICLE: www.climatesmartcapetown.co.za/planet-energy

Oil, coal and gas take up the lion's share of energy production. In fact, the contribution of the low-emitting energy sources is less than 20%. It is obvious that a huge shift in this ratio is required to 'decouple' emissions from energy production.

So, where does South Africa fit in? Altogether 80% of world emissions come from 39 countries, and we are one of them.

Most of our emissions are generated in our energy sector, and most from coal-fired power stations. Also, given that we have a relatively small population and GDP, our emissions rate is one of the highest per capita and per product in the world.

Clearly, South Africa needs to act and play its part in the world effort to decouple energy production from emissions.

But what are our options? Many say that because our economy is driven by our rich mineral endowment, and because mining is an energy-intensive industry, our options need to focus on nuclear energy in order

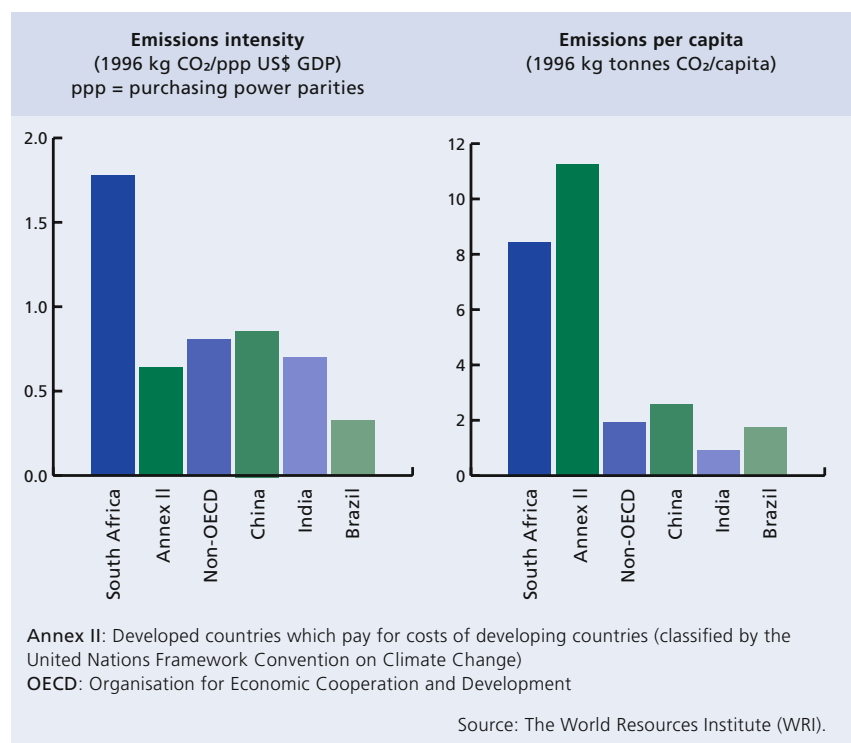


to achieve this decoupling. This is because nuclear energy is the only constant base-load technology* available to us today. However, we also need to look at changes in our economy: Today, over 70% of our gross domestic product (GDP) is attributable to the service sector, and so we do have opportunities to diversify our energy mix. There are

intense differences about the make-up of this mix: Should we incorporate more wind energy? Karoo gas? Solar thermal plants? Nuclear?

As it stands, our energy mix policy is contained in the Integrated Resource Plan, which projects that the dominant technologies in 2030 will be nuclear and solar stations. The plan shows emissions from electricity generation climbing all the way to 2023 (by around 50%) and then beginning to decline. The biggest challenge is the almost total elimination of coal from the system by the half-century.

The truthful picture is that South Africa will need the political will to drive the planning, and ambitious pace in the implementation of this plan, and large investments will be involved. For our cities, and for Cape Town, we can start by first reducing energy demand, and later, as our electricity supply systems open up to multiple producers, by looking to purchase from low-carbon sources.



*Base-load plants are facilities used to meet some or all of a given region's continuous energy demand, and produce energy at a constant rate.

But where will I put all that coal?

Peter Willis, Director (South Africa): The Cambridge Programme for Sustainability Leadership, Responsible Business, writes ...

Recently, I took my friend, Hilton Trollip, out to lunch to congratulate him on his recent appointment as a specialist on energy and climate change in the City of Cape Town. Our food had arrived and I was about to ask him how he was planning to engineer climate change for the city, when Hilton leaned towards me and asked, rather conspiratorially, "Peter, how much coal do you reckon you get through in a month?"

"Can't say I use the stuff at all these days, Hilton. Why, do you? I thought we were all trying to avoid burning coal because of its high carbon dioxide emissions. Don't tell me you do, of all people! Haven't you got electricity in your house?"

"Of course I have, and that's just the point", he replied.

Puzzled, I pressed on. "So, are you recommending I switch to coal?" The idea didn't appeal to me – I was thinking of the mess.

"You don't have to," he said, helpfully, "Eskom are burning it for you in their Mpumalanga power stations. Just by switching on your lights you're effectively burning coal. But you need never handle so much as a lump of the stuff."

"I see what you're driving at," I said, "Eskom have taken on the dirty work of burning my coal for me so I can live a clean, healthy life here in Cape Town.

That's kind of them." Then a small bulb flickered on somewhere in the back of my mind. "But it doesn't really matter who burns it, does it? If it gets burnt and I use the electricity from it to heat a bath, let's say, then it's my coal, isn't it? It doesn't matter where the carbon gets released from the coal; it spreads out in the atmosphere, I'm told, and affects everyone."

"Afraid so, Peter."

"Go on, then," I sighed, "you'd better tell me how much coal I do burn each month. And let's start with that hot bath I just imagined sinking into, shall we?"

"Well, if you're sure. Here goes. A bath of water heated to 60 °C requires some 3,5 kilowatt hours (kWh) of electricity, for which Eskom need to burn about 2 kg of coal in Mpumalanga, which in turn releases about 3,5 kg of CO₂ into the atmosphere, where it will stay for about a hundred years, acting as a 'greenhouse gas'."

I did a quick calculation using all my fingers plus three belonging to our waiter. "So, if I or my family have just one bath a day, by the end of the month, we would have asked Eskom to burn 60 kg of coal on our behalf, right? That must be quite a sack full ..."

Hilton was getting into his stride now. "Think of it in bathtubs: Your family's annual bathing habit would need

Eskom to burn 700 kg of coal, which is about three bathtubs full. Oh, and then there's the water ..."

"Of course there's the water," I snapped. "Believe it or not, that's what my family like to bathe in."

"No, I mean the water Eskom need to process the coal and cool down their coal-burning boilers. We're looking at just more than 2 l of water for every 1 kg of coal. So, every bath you run uses about 5 l of water to get it heated."

"Water that my family never sees."

"Indeed."

I asked for the waiter's fingers again and did another calculation. "That means that to heat a year's worth of our daily baths, my family is responsible for about six bathtubs worth of water that we never bathe in. Presumably, Eskom don't either – they just evaporate it as steam?"

"More or less."

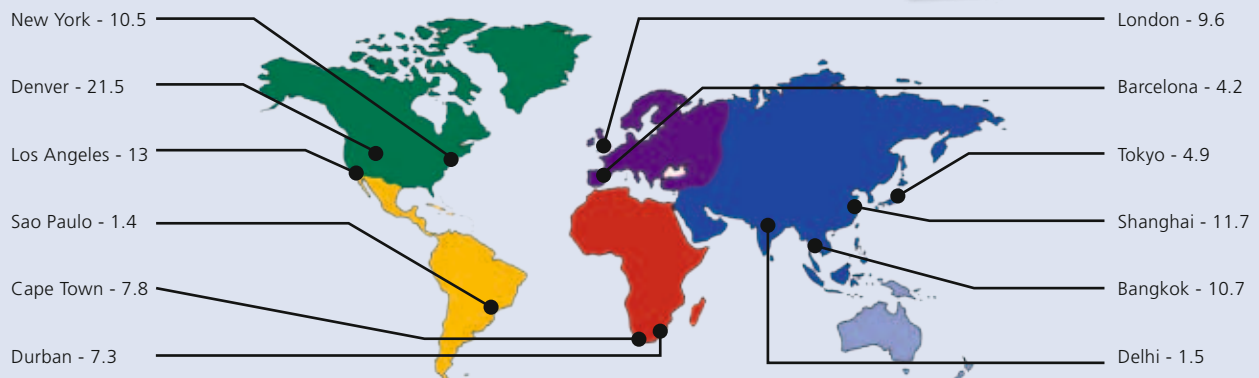
"So, I now have Eskom taking care of three bathtubs of coal and six bathtubs



In short ...

In Cape Town, households are the biggest single contributor to CO₂ emissions. About all of this is from mid-income to high-income household electricity usage, and nearly half of it is for hot water.

City tonnes CO₂e / capita



Source: Greenhouse Gas Emission Baselines for Global Cities and Metropolitan Regions by Kennedy et al, 2009. Source for Durban value: GHG data collection and emissions inventory report 2005/2006 prepared for eThekweni Municipality by ECOSERV (Pty) Ltd

of water on my behalf ... and that's just for our nightly bath! What if we add the lights, the fridge, the aircon and all the rest?" In my mind's eye, the entire house was turned into a coal storage depot surrounded by great tanks of water.

"Well, Peter, a middle-class household in Cape Town typically gets through enough electricity annually to need about 33 bathtubs of coal and around 20 000 l of water. In CO₂ terms, you'd be looking at sending around 14 tonnes into the atmosphere ... every year. Of course, less well-off households tend to use a lot less electricity, and so use less coal and water."

"Fourteen tonnes!" I gasped. I slumped back in my chair.

"Yes," murmured Hilton uneasily. "And that doesn't of course include any driving you might, er, do ..." But I'd stopped listening. I looked out of the restaurant window at the blue sky above Cape Town, and for a moment thought I could see my family's 14 tonnes of CO₂ hanging there, quietly trapping heat for the next hundred years. I felt cross with myself that I hadn't understood this earlier.

"Alright, Hilton. You're going to have to help me on this one. Tell me how I can be responsible for a little less coal and CO₂. Even a couple of bathtubs would be a start."

I leaned forward again and pulled out my notebook and pen. I felt like a patient seeking advice from a doctor.

Hilton was smiling again – a different smile, one that didn't look as though it was followed by a scary statistic. "That's easy, Peter. Because, in Cape Town, residential emissions are the biggest single contributor to CO₂ emissions, and just about all of this is from mid-income to high-income household electricity usage, and nearly half of this is for hot water. So, the quickest and easiest contribution that ordinary citizens can make is to have short showers instead of baths, use low-flow shower heads, and best of all, install a solar water heater, which gives similar levels of service to a pure electricity system, although without using that much electricity; in fact, often using none for at least half the year."

I scribbled furiously. These didn't sound too hard. I know several people who've

installed gear like this, and there and then I decided to ask them for tips. As for the baths, I resolved to talk with the family, hoping they would feel the same way as I did about those 33 bathtubs of coal.

"Hilton", I said. "One more thing. I'll do my bit, but what about Eskom? Are they going to cut down on their coal usage – maybe even stop burning coal, and use something else, like wind or solar energy? It would help me to know we're all in this together."

"Ah ... that's a good question, Peter, and one you, as a concerned customer, might think of putting directly to Eskom. They are being as efficient as they can be. Yet, they're still burning a lot of coal. But Government is planning to require Eskom to take some quite substantial amounts of wind and solar energy onto their grid. So, watch this space, and one day you should have the satisfaction of knowing that all the electricity you use in your house is made in ways that don't damage the atmosphere or the environment."

With that enticing prospect, Hilton and I parted ways: he to take care of the city's energy, and I to buy a low-flow shower head ... and a couple of second-hand bathtubs, just in case.



Good COP, bad COP

Tasneem Essop, Head of Climate Strategy and Advocacy, Global Climate and Energy Initiative, WWF International, writes ...

It has been almost 20 years since the 1992 Earth Summit in Rio de Janeiro, where the United Nations Framework Convention on Climate Change (UNFCCC) was first signed by 154 countries. Since 1995, signatory countries (called 'parties') have been meeting each year to continue their work of reducing atmospheric greenhouse gases and to discuss climate change issues.

At the end of this year, South Africa will host the UNFCCC. This 17th session of the Conference of the Parties (COP17) is a critical moment in the ongoing negotiations to reach a multi-party agreement on climate change.

In terms of the convention, rich nations have an obligation to take the lead in cutting their emissions deeper and faster than developing countries. Currently, they do this under the Kyoto Protocol, according to which they have legally binding commitments to reduce their emissions.

COP17 takes place in Durban, a year before the first commitment period* of the Kyoto Protocol ends in 2012, and is essentially the last opportunity for parties to reach agreement on the future climate regime. One of the

Did you know?

- In 2001, George W. Bush rejected the Kyoto Protocol and, as a result, the United States delegation did not participate, but only observed. The other parties negotiated the key issues and, surprisingly, reached agreement on most of the major political aspects.
- COP3, held in Kyoto, Japan, in 1997, saw the formulation of the Kyoto Protocol. Signatories agreed to reduce greenhouse gas emissions by 2012 to 5% below the 1990 levels. Unfortunately, the Kyoto Protocol was seen by many countries as a threat to their economy. By 2007, only 37 countries had signed.

critical decisions that this COP would have to take is whether or not there will be a second commitment period of the Kyoto Protocol. Some key countries, such as Japan, Russia, Canada and Australia, have already signalled their intention not to join a second commitment period of the Kyoto Protocol. These countries, together with the United States, who is not a signatory to the protocol, represent a large proportion of the major emitting countries. They want a legally binding agreement that will include all major developing countries, such as China, India, Brazil and South Africa.

The fact that they will not be party to the Kyoto Protocol after 2012 is a major setback for dealing with the threat of climate change. It implies that they will not be taking on legally binding emission reduction targets. This also has implications for reaching agreements in Durban, as the developing countries have voiced their strong requirement for agreement to a second commitment period under the Kyoto Protocol forming the basis for any progress in the talks. The European Union has a key leadership role to play in this regard, as it is the only other powerful bloc** that can help save the Kyoto Protocol. Will they be able to rise to the challenge, and will developing countries find a way to assist them to do so by also agreeing to a negotiated outcome that is legally binding for all parties by at least 2015?

Should we be letting Japan, Russia, America and the like off the hook?

What is becoming clear is that parties are not ready to reach a fair, ambitious and legally binding agreement in Durban. What we need in Durban, therefore, is for the Kyoto Protocol to be saved, for developing countries to agree to a mandate to negotiate a legally binding agreement that will include them in the future, and for all parties to ensure that the agreements reached at COP16 in Cancun are implemented, especially the establishment of the Green Climate Fund, Adaptation Committee and the Technology Mechanism as well as securing long-term finance for climate action.

Political will and a sense of urgency are essential for COP17 in Durban to be successful.

* The first commitment period stretches from 1 January 2008 to 31 December 2012.

** A bloc is a group of countries or political parties who have formed an alliance.



In short ...

In terms of COP17, we need the Kyoto Protocol to be saved, for developing countries to agree to be included, and for agreements reached at COP16 to be implemented.



Grace Stead

Yvo De Boer, internationally-recognised climate change expert, addressed the Accelerate Cape Town/KPMG Green Champions' Forum in August 2011, in the lead up to COP17.



More information

United Nations Framework Convention on Climate Change (UNFCCC): <http://unfccc.int>
 COP17/CMP7 United Nations Climate Change Conference 2011: www.cop17durban.com
 Fact sheet on the Kyoto Protocol: http://unfccc.int/press/fact_sheets/items/4977.php
www.climatesmartcapetown.co.za/resources

Cape Town to COP – the Climate Smart Cape Town campaign

The Climate Smart Cape Town (CSCT) campaign is calling on Capetonians to take action!

The aim of the campaign, driven by the Cape Town Climate Change Coalition, aims to take advantage of the hosting of COP17 in Durban from 28 November to 9 December this year to promote actions that Cape Town residents and decision makers can take to reduce their carbon footprint. The campaign recognises that the climate crisis is our joint responsibility.

CSCT brings the challenges surrounding climate change into the mainstream, and engages the people of Cape Town in conversation about how to solve them. The campaign encourages citizens to discover the truth about climate change and to take meaningful steps to bring about change.

The campaign vision is for Cape Town to become more compact and resource-efficient; a lower-carbon city adapting well to the impacts of climate change, protecting its most vulnerable citizens and building an economic future based on clean development, localisation and jobs for all. Cape Town aims to inspire and assist other regional, national and continental cities to achieve similar ends. Partners of the Cape Town Climate Change coalition will participate in COP17 through the CSCT campaign.

Everyone can be involved in the CSCT campaign. Keep up with the latest news and happenings by following the campaign on **Facebook (www.facebook.com/climatesmartct) and Twitter (@ClimateSmartCT)**.

The website and blog (www.ClimateSmartCapeTown.co.za) will ensure that Capetonians are up to speed with the latest information with regard to climate change. Everyone in Cape Town can write their own 'take action' slogans and post them on the website.



In short ...

The Climate Smart Cape Town (CSCT) campaign calls on Capetonians to take action to make Cape Town a resource-efficient, lower-carbon city.



Executive Mayor of Cape Town, Patricia de Lille, officially launched the Climate Smart Cape Town campaign and signed the Cape Town Climate Change Coalition Charter on 1 September 2011.

Cape Town Climate Change Coalition

The Cape Town Climate Change Coalition represents an alliance of more than 20 organisations and partners who came together in June 2010 to support Cape Town's bid to host COP17. They are committed to working together to champion a programme that helps to reduce carbon emissions in Cape Town, and to mitigate and adapt to the impacts of climate change, thereby protecting and enhancing our natural, cultural, social and economic environment.

Coalition partners: City of Cape Town, ICLEI - Local Governments for Sustainability, Cape Town Partnership, Cape Town Tourism, Cape Town Routes Unlimited – Cape Town Convention Bureau, University of Cape Town (African Centre for Cities and Graduate School of Business), EXSA, WWF-SA, Environmental Monitoring Group, Stellenbosch University, University of the Western Cape, Cape Town International Convention Centre, Accelerate Cape Town, FEDHASA, Western Cape Provincial Government, Cape Chamber of Commerce, Cape Higher Education Consortium, Desmond Tutu Peace Centre, International Polar Foundation, Optimal Energy, SANParks – Table Mountain National Park, Sustainable Energy Africa, Wesgro, WESSA, CSIR (SOCCO) and The Green Cab

Striving for an optimum energy future

All modern economies depend on, and are driven by, energy. Cities, as highly populated areas and drivers of economies, are energy-intensive by their very nature. Energy in itself is not the problem – we all need energy to live and work – but it is the current reliance on burning fossil fuels to generate this energy that is creating atmospheric pollution, which is driving human-induced climate change.

As a result, until we are able to generate vast amounts of energy from renewable sources, and for as long as we remain dependent on fossil fuels to create our energy, we must focus our efforts on reducing our energy consumption, and thereby reducing the amount of fossil fuel burnt and CO₂ emitted into the atmosphere.

South African cities in particular are very inefficient in their energy use, and rely on energy that is almost entirely provided by burning fossil fuels: Our cars run on petrol and our electricity comes mostly from coal-burning power stations.

Cape Town is no exception and, as such, the City of Cape Town is focusing its efforts on three main areas in order to reduce its carbon footprint: renewable energy, energy efficiency and transport efficiency. In its aim to achieve an 'optimum energy future', the City has developed an Energy and Climate Action Plan (ECAP), which draws together over 130 projects.

An optimum energy future is one in which the City starts building an energy sector now that serves social, economic and environmental goals into the future. This means adequate safe energy for low-income households, efficient energy supply and use by all, energy services that maintain competitiveness for city businesses, and an energy sector that provides jobs in the city and surrounds, and takes us into a low-carbon future.

Generating energy through renewable sources, such as wind, sun and wave action, simply must be a priority, not only in Cape Town, but on a global scale. Besides reducing the city's carbon emissions as well as our reliance on fossil fuels, the development and promotion of renewable energy have the potential to boost our economic



An artist's impression showing a Climate Smart Cape Town Campaign message on a MyCiti bus.

development through the creation of a 'green' sector in Cape Town, where renewable-energy technologies are manufactured and installed. If successful, this 'green' sector would create many employment opportunities in Cape Town.

Favouring local electricity generation through renewables will also help to reduce our reliance on electricity generated almost 2 000 km away in Mpumalanga, thereby increasing our energy security (no more rolling blackouts). As renewable technology develops, we can also begin to increase the role of renewable energy in replacing our current reliance on petrol and diesel for transport, thereby further reducing our contribution to global emissions, with the significant benefit of reducing our vulnerability to global oil prices.

The City is currently working with the Western Cape Provincial Government and National Government to determine what role it can play in promoting and supporting the use and uptake of renewable energy within Cape Town.

While we remain dependent on fossil fuels as our main source of energy, we can achieve a great deal by simply not wasting energy, by using less, and by

being more efficient in the energy that we do use. Until recently, South Africa has had one of the lowest electricity prices in the world, which has made us very wasteful. By being less wasteful and more efficient with our energy, we can dramatically reduce the costs of energy, reduce our contributions to global emissions, reduce our vulnerability to energy shortages, and ensure a more efficient economy, where less energy is consumed while economic growth is still supported.

Most of Cape Town's energy is consumed through meeting our transport needs. Many people rely on private vehicles in their daily commute, and Cape Town's public transport infrastructure is ageing. Improving people's access to a safe and convenient public transport system will help reduce the amount of energy used, the resultant carbon emissions, as well as our dependence on imported oil products. Through its Integrated Transport Plan, the City aims to provide affordable and reliable public transport modes to help make economic opportunities in the city more available to residents, particularly those living in poorer communities far from the city centre.



More information

City of Cape Town Energy and Climate Change Strategy: www.capetown.gov.za/energystrategy

City of Cape Town Energy and Climate Action Plan (ECAP): www.capetown.gov.za/energyactionplan

Electricity saving campaign: www.SavingElectricity.org.za

Energy scenarios for Cape Town: www.capetown.gov.za/energyscenarios

African mayors unite to tackle climate change

Over 50 African local governments and local government associations formulated and adopted the African Mayors Climate Change Declaration during the Local Climate Solutions for Africa 2011 congress (LOCS 2011) held in Cape Town earlier this year.

The African Mayors Climate Change Declaration calls on nations to deliver an equitable and comprehensive global deal at COP17. It urges nations to recognise Africa's local governments as pivotal partners in implementing climate change action, and to build and develop a just and pro-poor framework for the global response to climate change.

In the months ahead of COP17, the declaration is being taken forward by the City of eThekweni/Durban (as hosts of COP17), the City of Cape Town (as hosts of LOCS 2011) and others, and will be represented to the nations and the international community at COP17.



ICLEI – Local Governments for Sustainability, a steadily growing and widely recognised global association of more than 1 220 cities, local governments and their associations in 70 countries, plays a leading role in convening local governments in various international and United Nations forums related to sustainable development.

Some of the commitments made by the signatories include the following:

- Mainstream climate change action to local government through high-level political commitment and enabling local policy and institutional mechanisms
- Utilise, draw upon and share appropriate indigenous knowledge in finding solutions to the global climate crisis
- Promote the empowerment, participation, involvement and contribution of local communities, specifically including marginalised groups, in addressing climate change
- Develop and implement localised medium and long-term adaptation strategies, low-carbon development plans and green economic actions that address poverty and development needs
- Mainstream climate change action in all local decision making, day-to-day operations, planning and development, financial systems and human resource allocations
- Recognise and commit to the need for rapid change and more radical solutions toward resilient cities and communities in addressing climate change



In short ...

The African Mayors Climate Change Declaration urges nations to recognise Africa's local governments as pivotal partners in implementing climate change action, and to build and develop a just and pro-poor framework for the global response to climate change.



More information

ICLEI, Local Governments for Sustainability: www.iclei.org

ICLEI Africa: www.iclei.org/africa

Local Government Climate Roadmap: www.iclei.org/climate-roadmap

The African Mayors Climate Change Declaration: www.iclei.org/index.php?id=12202

The rands (and no sense) of doing nothing about climate change

Anton Cartwright, Economist and Researcher: Climate Change CityLab, The African Centre for Cities, University of Cape Town, writes ...

It now seems inevitable that the world will become at least 2,2 °C warmer sometime this century – probably sooner than we had anticipated. Unless the economic messages coming from the current climate change analyses are heard and heeded, so as to stabilise temperatures at these levels, there is the very real likelihood that mean temperatures will accelerate towards 4 °C or 5 °C above pre-industrial levels. When this happens, economies change drastically – with profound implications for the things and people that we hold dear.

A recent World Bank study estimated the cost of adapting to a world that is 2 °C warmer than pre-industrial levels to be between US\$70 billion and US\$100 billion per annum, with 80% of this cost being incurred by cities in developing countries.

Economics and its agencies, such as the World Bank, occupy an uncomfortable position in the climate change arena. The suspicion is that economists' preoccupation with ensuring 'more-of-the-same' economic growth, and their associated disregard for the environment other than as an economic resource, underpins the problem of climate change.

At its core, however, economics is a social science that speaks to how people (and countries) take decisions to satisfy multiple needs and wants in the face of resource constraints and environmental uncertainty. Effective economics should include the value of not only the money, goods and services that we exchange on a daily basis, but also the environmental goods, services and ecological stability that support our societies.

Not being able to fit things that we know are valuable into our existing money metrics is not a good reason for omitting their value from our decisions, or assuming they are free and endlessly abundant.

Seen through this lens, climate change clearly has economic impacts that include, though also go beyond, the US\$50 billion per annum that is incurred globally in insured weather-related losses. Equally, a 'solution' to climate change will not be found without changes to the economic systems that currently produce greenhouse gases.

Economists such as Sir Nicholas Stern and Tim Jackson, together with many others, have worked on ensuring that economics speaks to the problem of climate change. The emerging consensus recognises the limitations of traditional economics in dealing with the deep uncertainties, the lags between emissions and impacts, the complex set of threats and the potential for radical changes when biophysical thresholds are breached.

However, it also provides the following powerful messages:

- As much as two thirds of the costs that climate change will impose can be avoided by timely and well-conceived interventions that will also save money and support development.



In short ...

We will not be able to find a solution to climate change without dramatically changing the traditional economic systems that currently produce greenhouse gases.

- Early action on climate change will prevent the need for more expensive reactionary measures when impacts become more severe.
- Climate change is likely to reconfigure competitive advantage, and create a new set of national and local winners and losers in the global economy.
- Markets, left to their own devices, are unlikely to meet the scale of the problem in time. Rather, a carefully crafted combination of markets, legislation as well as technological and policy innovations will be required to change collective behaviour.
- Some responses to climate change are more cost-effective than others, and the natural environment provides critically valuable and effective buffers in the face of climate change threats, especially in developing countries.



We are *all* in this together

Kofi Annan, the former United Nations Secretary General, said that climate change is the greatest threat facing humanity. The key message here is that we are all in this together – we all contribute in some way to climate change happening, and we are all at risk of its impacts and effects.

The countries of the world will be meeting in Durban at the end of this year at COP17 to discuss and come up with plans to try to address this threat, but we would be unwise to leave such a critical issue up to global politics and interests. We need to act, and we must act collectively as government, business, civil society and individuals, if we are to secure our future.

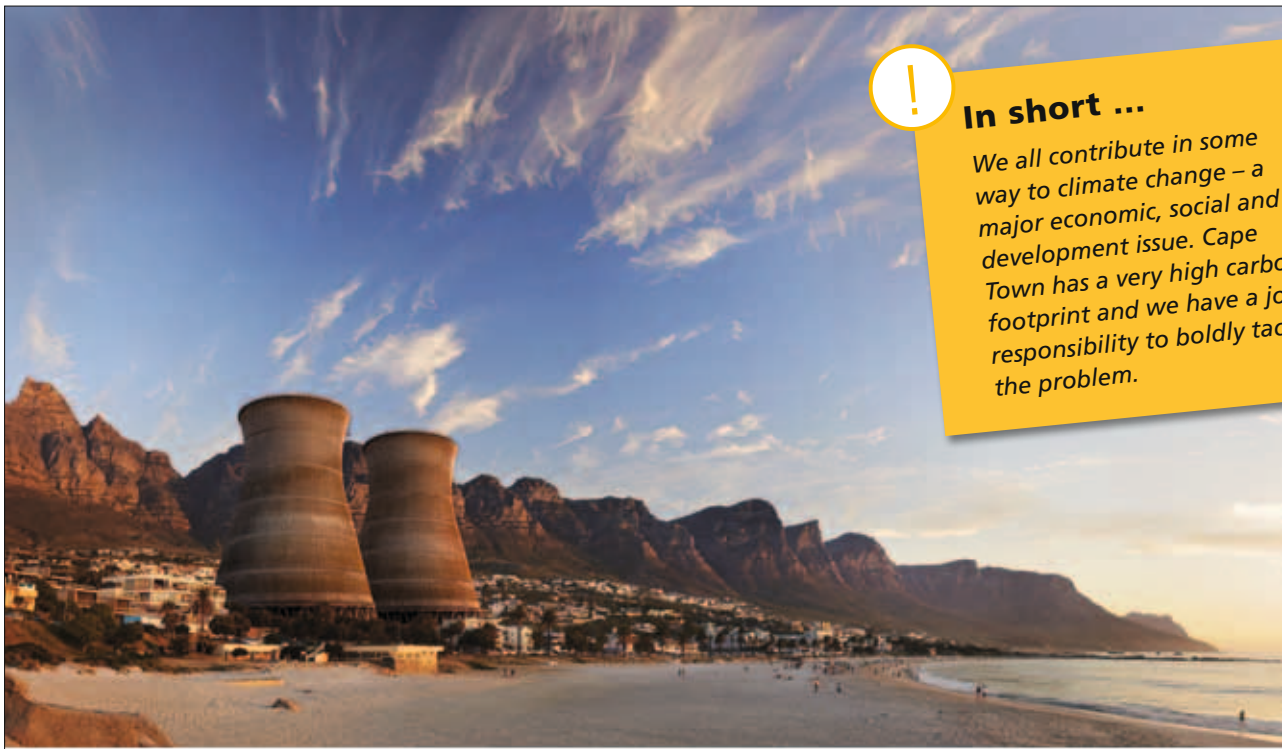
We cannot escape the reality that Cape Town has a very large carbon footprint. As a city, we need to reduce our own carbon footprint and our contributions to global CO₂ emissions dramatically. We cannot point fingers and expect others to play their parts if we do not play our part in reducing atmospheric pollution. By acknowledging our own contribution – as a city – to the global problem, we begin to understand what we need to do.

This is what we need to acknowledge as our joint responsibilities:

1. Climate change is not a 'green' or environmental issue. It is an economic issue, a social issue and a development issue. It challenges every aspect of our collective futures, and to categorise it as simply an environmental issue will ensure that it remains somewhat on the periphery of governance and adequate planning.
2. Energy underpins our lives, our economy and our future. We cannot live without it, but we must prioritise the introduction of renewable sources, reduce our use where possible, and increase our energy efficiency as a matter of urgency.
3. We have to move away from 'business as usual' and think differently about how we plan our city, our economy and our collective future. We will have to be progressive and bold, not only in dealing with change itself, but in stimulating a change of thinking in our city and our communities. This shift has to happen quickly if we are to avert disaster.
4. Climate change demands strong leadership at government, business and community levels. Climate change and the challenges it brings demand leadership that is informed and willing to make bold decisions, that integrates competing issues, and follows decisions through – even when they cause some discomfort; leadership that leads by determining a clear development path founded on resilience and sustainability.
5. We need to trust science. It needs to be acknowledged that climate science is developing all the time; that current models and predictions are at best open to variability, and will improve in due course. However, if we are to address the issue, we have to trust science, as we have no other reliable information to guide us at this critical time.
6. We need to see climate change as an opportunity. It is not all doom and gloom, not by any means. Building a green economic sector holds many opportunities for economic growth and job creation; introducing renewable energy brings energy security and reduced costs in the long term; better public transport means a more mobile and equitable society, and a more liveable city, using less energy and saving us all money; no-regrets planning means our coastline, ecosystems and natural spaces are protected for us and future generations, all to enjoy. Let's acknowledge climate change and our response to it as an opportunity to build a better future for all.



Environmental Resource Management Department staff shape the figure '350' – which is what is believed to be the safe upper limit for carbon (in parts per million) in the atmosphere (www.350.org)




! **In short ...**

We all contribute in some way to climate change – a major economic, social and development issue. Cape Town has a very high carbon footprint and we have a joint responsibility to boldly tackle the problem.

Electricity could cost more than you think.

Now more than ever, we need to save electricity. If we don't, it's not just higher prices that will affect us. The extra power stations we'll have to build will cost us our environment too. Visit www.SavingElectricity.org.za for 10 very simple electricity saving tips you can follow.



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THIS CITY WORKS FOR YOU

What is the City doing?

The City prepared an Energy and Climate Change Strategy in 2005, and has subsequently formulated a detailed Energy and Climate Action Plan (ECAP) and Climate Adaptation Plan of Action (CAPA). These action plans are 'living' plans – they compile and co-ordinate projects across the City, and ensure that the City reduces its carbon footprint while planning for a future in a changed climate. Key components of the plans are reducing emissions and implementing actions to adapt to climate change.

The City is devising plans for an 'optimum energy future', and has begun implementing these. Council has set a target of 10% cleaner or renewable energy by 2020, and a 10% reduction in electricity consumption by 2012. A comprehensive electricity-saving campaign has been ongoing; the City has implemented energy-

efficiency retrofits in some of its own buildings as the start of an ongoing programme, and it convenes a very successful forum for energy efficiency in commercial buildings. Other projects, such as the integrated rapid transit system, do not have emissions reductions as their primary goal, but contribute significantly to achieving an overall reduction in CO₂ emissions.

The City has established a climate change think tank – a research group that creates an ongoing dialogue between academic institutions, researchers, specialists and local government officials to inform the implementation of effective local policies, programmes and interventions aimed at understanding and preparing for climate change. The think tank helps key leadership sectors of society to share the responsibility for developing and implementing pragmatic mitigation and

adaptation measures and to better understand the full implications of climate change for the City of Cape Town and its citizens.



The Cape Town Green Map encourages people to live and 'play' more sustainably and to make 'greener' lifestyle choices. The map features City of Cape Town Executive Mayor, Alderman Patricia de Lille, on the cover setting a fine example by riding a bicycle. www.capetowngreenmap.co.za

The climate is changing, what about you?

We cannot leave the responsibility to the authorities alone – we can and should all do our bit, be it ever so small. Here are some ways you can start living smarter in a world challenged by climate change:

1. Residential electricity use is the largest contributor to Cape Town's CO₂ emissions. You can save money and the environment by installing a solar water heater, low-flow shower heads and energy-efficient light bulbs and switching things off when not in use, or by just showering instead of bathing.
2. Commercial electricity use is the second-largest contributor to Cape Town's CO₂ emissions. If you own or manage a business, use your position to do an energy audit – in most cases, it has been shown that not only will you save energy and the environment, but the interventions will be quickly paid back and you will increase profits.
3. Transport is the biggest energy user in Cape Town, and private vehicles, which are often occupied by only the driver, are responsible for this. Plan your life and your transport to minimise wasteful transport practices: Try to work and play close to where you live, share private transport, use public transport, or ride a bicycle.
4. Think carefully about your personal transport choices: Big, heavy gas guzzlers are not climate-friendly, and smaller, fuel-efficient cars will also save you money.
5. Save water through reducing your water use, and consider installing a rainwater tank for watering your garden. Our water security is threatened by climate change, and water pumping and purification take up precious energy.
6. Become involved through being civically active. Climate change will affect us all. Make sure that you participate in society and through your local ward councillor and subcouncils to ensure that the correct climate change choices are made. Join a community organisation.
7. Comment and participate in the development of Council policies and regulations.
8. Do not build your house in areas that may be at risk from the impacts of severe weather events, such as floods and storm surges (big waves), as climate change will increase their frequency and severity.
9. Actively look after what remains of our natural environment: These ecosystems are critical as natural buffers to future climate shocks, climate change, and severe storms.
10. Be conscious everyday of how you can reduce the pressure on our world, its resources and its climate. Participate in events that raise environmental and social consciousness – keep yourself and others informed.



In short ...

By changing your lifestyle you can contribute to national and global efforts to address climate change.



Cover



Wrap



Install

Electricity is expensive. Saving is simple.

Fit a geyser blanket and insulate all your hot water pipes to save up to 5% on your electricity bill. Install a solar water heater to save 25% or more on your electricity bill. Visit www.SavingElectricity.org.za for more electricity saving tips.



Smart Living. Smart Saving.
For all the right reasons.



CITY OF CAPE TOWN. TOGETHER. WE THRIVE.
THIS CITY WORKS FOR YOU



More information

Smart Living Handbook: www.capetown.gov.za/smartlivinghandbook
Electricity saving campaign: www.SavingElectricity.org.za

