

Resource Management



5 Resource Management

The COP17/CMP7 Greening Programme focused on the following four critical areas of resource management:

Energy Management: To encourage energy efficiency and renewable energy through appropriate technologies, management systems and responsible behaviour.

Water Management: To ensure that water was consumed in a responsible manner.

Waste management: To reduce the amount of waste generated prior to, during and post the event.

Biodiversity Conservation: To encourage local environmental protection and enhancement of biodiversity and ecological systems.

This chapter presents the event's impact in the earlier-mentioned four areas as well as the interventions that were undertaken to achieve the declared objectives. Appendix 10 provides an overview of the Flagship projects led by National Departments that also support South Africa's transition to a low-carbon economy and build climate resilience.

5.1 Energy

The greatest challenge to hosting a green event in South Africa, apart from the distance that visitors have to fly to reach the country, is the manner in which the country produces its electricity as it remains primarily coal-based. Table 25 summarises the amount of energy consumed during the event in terms of the venues utilised:

Table 25. Energy consumption per venue

Facility	Expenditure (KWh)
CCR Expo	182,860
ICC	1,200,582.9
Accommodation	4,318,508.7
Other Venues	1,176,555.6
Total (KWh)	6,878,507.2
Total (MWh)	6878.5

The event's energy requirements were adequately supplemented through renewable sources with the donation of green energy from Eskom and the Southern African Power Pool members (discussed in Section 4.3.1) and the establishment of the 500 kW PV farm north of Durban (referred to in Section 4.4.1).

5.1.1 Energy management at the Durban ICC

The focus of the energy management approach for the Durban ICC was the conservation of energy through the promotion of energy efficiency measures. A starting point was a retrofitting process to replace higher wattage light fittings with lower wattage light fittings (48w T5) in both the basement parking and management offices on levels four and five of the building. This retrofit culminated in an approximate 7% reduction of the current total energy demand. In addition, heat pumps were installed to existing water cylinders, energy efficient light bulbs were used for the exhibition booth lighting and there was also closer monitoring of lighting and air-conditioning to ensure that these were not in use in areas not being utilised. Further, energy savings were achieved through the once-off investment in trestle tables, negating the need for table cloths and hence eliminating the need for energy-intensive laundry services. The retrofitting process was extended to a 149 streetlights surrounding the complex, which created a further saving of 48 tCO₂e per year.

5.1.2 Energy management at the CCR Expo

A comprehensive approach to energy underscored the CCR Expo's greening strategy which comprised the following three main elements: energy efficient design, and energy efficient and renewable energy technologies. A vast wild banana canopy addressed the need for shaded area and avoided the use of air-conditioning; energy efficient lighting was used and two solar water heaters were installed for heated water requirements. For more information, refer to section 3.4.

5.1.3 Energy management within the accommodation sector

The eThekweni Municipality ran a Responsible Accommodation campaign that aimed to raise awareness within the accommodation sector on their environmental impact and included energy management measures. This was supported through the hosting of discussion fora, the distribution of a toolkit and a self-assessment tool. Further information may be obtained at www.durban.gov.za.

5.1.4 Promotion of renewable energy

The installation of solar water heaters in rural clinics in KwaZulu-Natal forms part of the fourth component of UNIDO/GEF Greening of COP17 Programme. This project has been designed to supply, install and maintain 69 solar water heaters in 19 rural clinics in KwaZulu-Natal. The process, which entailed the retrofitting of antiquated energy inefficient water heaters, aims to provide an affordable and sustainable source of hot water through a renewable source to these facilities as part of a larger programme to promote solar power in the KwaZulu-Natal province. The project was funded by the GEF whilst UNIDO was appointed as the implementing agency. At a national level, DEA and Department of Energy (DoE) were the key project partners. The KwaZulu-Natal Department of Health (KZN-Health) was a key partner at the provincial level.

As the responsible authority for health, KZN-Health's role was to identify the clinics to participate in the programme.

The main outcome of this component was to fund solar water heaters on several health clinics, to raise awareness of benefits of application of solar water heaters in public buildings, as a climate-friendly intervention. Other outcomes include support for the KZN Province in the implementation of its Solar Water Heater Programme. Furthermore, the installation and maintenance of the solar water heaters was designed to create jobs for local technicians who would be trained in the installation and maintenance of the solar water heaters thereby contributing to the notion of green jobs.

A service provider was contracted to retrofit the solar water heaters retrofit systems for 19 clinics in Msunduzi, eThekweni and iLembe Municipalities. Since all the selected clinics fell under the auspices of KZN-Health, the maintenance training was targeted at the KZN-Health maintenance personnel.

Three priority sites were targeted for retrofit prior to COP17/CMP7. These included the Mphumuza, Mphepheteni and Groutville clinics. The Groutville location was showcased for the Rural Energy event on Sustainable Energy Access for All initiative (please refer to 8.3.2 for more information).

5.2 Water Management

The primary additional water requirements for COP17/CMP7 included the hydration of the visitors to the city as well as their hygiene and sanitary requirements. Water conservation measures were therefore targeted at the venues and the accommodation sector.

Water for the event was supplied by the eThekweni Municipality, which has a reputation for its sound water management approach and high quality potable water. An important objective of the COP17/CMP7 Greening Programme was to promote the use of consumption of tap water, primarily because of its quality and secondly as part of a broader waste minimization strategy by avoiding the disposal of PET bottles generated as a result of purchasing bottled water. The quality of eThekweni Municipality's potable water is informed by its Blue Drop Certification, which is an excellence award for sustainable drinking water quality management. This certification system was introduced by the Department of Water Affairs. The programme, which was initiated in September 2008, is an incentive-based regulation for drinking water. The eThekweni Municipality was awarded the Blue Drop status in 2009 and 2010, implying that the city's drinking water is of exceptional quality.

5.2.1 Water management at the UN Precinct

It is estimated that 16 kilolitres of water was consumed on a daily basis at the UN Precinct, with a total of approximately 208 kilolitres for the duration of the event. Measures were put in place to conserve water and to promote the consumption of tap water. Water was conserved at the ICC by not using table cloths thereby avoiding unnecessary laundry and the use of intelligent sensor taps in the bathrooms, which controlled the amount of water utilised for hand-washing. The consumption of tap water was encouraged through the banning of bottled water and the provision of jugged water.

5.2.2 Water management at the CCR Expo

The total water consumption for the CCR Expo was 843 kilolitres, of which 15 kilolitres was consumed by visitors using water fountains. The Expo was the perfect setting to raise awareness on the importance of conserving water, promoting practical ways of diversifying the water mix and raising awareness of the linkage between the consumption of bottled water and the environmental costs of the production and disposal of plastic bottles. Awareness-raising was conducted by the prohibition of bottled water, conservation messages adorning water coolers and the installation of rainwater tanks to demonstrate the simplicity of rainwater harvesting. Furthermore, the portable toilets were equipped with the smallest available cisterns, reducing flushing volumes whilst the male's toilets were equipped with waterless urinals for water-efficiency.

5.2.3 Water management in the accommodation sector

The eThekweni Municipality's Responsible Accommodation campaign included the promotion of water conservation measures. Further information can be obtained from www.durban.gov.za.

5.2.4 Water management at side events

A host of side-events were tracked to assess the extent to which greening principles had been applied beyond the core event. Despite the excellent quality of the tap water in Durban, several events (31%) provided bottled water to the participants. It was, however, encouraging to observe that there was a fair amount of water coolers (13%) and a majority of the events (55%) provided jugs of water on the tables for participants. Overall, the promotion of consumption of tap water was evident at the side events tracked.

5.3 Waste Management

Major events produce great quantities of waste but with the right measures in place, waste can be re-used, repurposed and recycled. In line with national waste legislation and policy, the onus is on event organisers to effect the waste management hierarchy and dispose as little waste as possible. There are practical considerations as well, such as the cost of constructing and maintaining landfill sites and the creation of methane gas from landfill sites and its contribution to climate change.

5.3.1 Recycling system for the City

The municipality promoted recycling by placing a twin-bin system in high footprint areas such as the corridor linking the UN Precinct and the hub of accommodation establishments and the beachfront promenade. A twin-bin system was provided throughout the city to encourage the recycling of waste. Unfortunately no records were kept of the waste volumes collected from the areas that were serviced by Durban Solid Waste through the installation of additional dual-waste bins to encourage separation of recyclable waste at source

5.3.2 Waste management at the ICC

Additional recycling bins were located throughout the UN Precinct supported by a sorting area backhouse. Furthermore, biodegradable packaging was used, which has the added benefit of not requiring washing, culminating in water savings as well. The results of the waste management strategy is presented in Table 26.

Table 26. Status of waste management at the ICC

Waste management area	Weight (kg)	Percentage
Recycled waste	29,133kg	33.79%
Landfilled	57,080kg	66.21%
Total	86,213kg	100%

5.3.3 Waste management at the CCR Expo

The CCR Expo generated approximately 60 tonnes of waste, 13% of which was recycled. This quantity does not factor in the building materials that were salvaged after the event. Recycling was at a far higher ratio during the running of the event, with 44% of the waste produced in the operational phase of the event, being recycled.

A range of measures were put in place to yield the meaningful application of the waste management hierarchy.

Zero waste

There was zero waste of food that was still fresh, healthy and edible. This food was distributed through the Food Bank and approximately 3,000 kg of food was distributed.

Waste Minimisation

The Expo's eco-procurement strategy required suppliers to use minimal packaging and further encouraged the recycling of packaging material that was disposed of. Bottled water was prohibited ensuring an avoidance of 40,000 PET bottles into the waste stream. Furthermore, exhibitors were required to distribute minimal printed materials and gifts, with greater reliance on electronic measures instead.



Waste re-use and re-purposing

Many aspects of the Expo could be re-used or re-purposed. These included used carpeting, tables, benches, construction materials and timber beams. No banners went to landfill as these were diverted to an income-generating project to be re-purposed as handbags for the benefit of people affected by HIV/AIDS. Please refer to Section 3.11.2.

Waste recycling

Waste recycling was facilitated by the implementation of a twin-bin system enabling the separation of recyclables and non-recyclables at-source. On-site waste management staff sorted the recyclables into various grades of paper, cardboard, plastic, glass and tin, which were distributed to appropriate recycling markets. A recycling centre was placed in a visible location where people could learn about the process of recycling and this contributed to the role of the CCR Expo as a space to build awareness on sound waste management strategies.

Composting

Organic waste was disposed of through composting by means of a large, commercial worm farm. Only a minimal amount of organic waste was produced at the Expo for the worms, as potential food waste was minimised due to the Food Bank donations.

5.3.4 Waste management at the side events

The greening team tracked 90 side-events to establish the application of greening principles beyond the official event and it was established that the largest type of waste produced at these events was paper. Furthermore, the majority of the events (69%) did have some form of recycling in place although a key weakness was the communication of these systems to ensure maximum participation. For more information, refer to Appendix 1.

5.4 Biodiversity Protection and Enhancement

South Africa is regarded as a country with a rich biodiversity and an array of unique biomes and plant kingdoms. However, it is also a natural heritage that is greatly threatened by development trends that destroy natural habitats and deplete them of essential natural resources. This, in turn, compromises the production of ecosystem goods and services on which human beings depend. These destructive patterns of development are also a major contributor to climate change and consequently the impacts of climate change have negative impacts on our biodiversity, fostering the growth of alien plant species that thrive in dryer and warmer conditions. It is for these reasons that the country pays particular attention to the sustainability theme of biodiversity protection and enhancement: partly to protect the country from the negative impacts of the events that it hosts and partly to raise awareness among the populace and visitors to the country on these impacts and how to mitigate them.

5.4.1 Biodiversity awareness at the CCR Expo

The greening of the CCR Expo was a great success in its ability to raise awareness on South Africa's biodiversity through its approach to landscaping. The landscaping was based on the creation of representation of the province's biomes (wetland, woodland, grassland, forest, dune and river). All the plants were locally sourced and were later donated for the development of a park in Inanda. Please refer to Section 3.11.1 for details on the development of the park.

5.4.2 CEBA initiative

As mentioned in section 4.6.1, eThekweni Municipality embarked on the development of its own climate adaptation and mitigation project, the Durban CEBA.

The Durban CEBA Initiative at Paradise Valley is an ecosystem restoration project involving the clearing of invasive alien plants in the first phase and the replanting of indigenous plant and tree species in the second phase. A team of people employed from previously disadvantaged communities in Durban have been working as part of eThekweni Municipality's 'Working for Ecosystems' programme to clear invasive alien plants from the site in Paradise Valley. The number employed on site has increased from month to month, and in March 2012, 72 people were employed on the project, working a total of 1237 'Person Days' in that month.

The Wildlands Conservation Trust has worked to establish 'trepreneur' nodes in the Nazareth community. There are currently 40 trepreneurs who are growing tree seedlings from seeds. The trepreneurs are coordinated by 8 community facilitators. In addition, 11 people are employed as part of the restoration team who are responsible for planting the tree seedlings at the



Figure 25: Tree planting at Paradise Valley.

project site. In March, the community facilitators and ecosystem restoration team worked a total of 418 Person Days.

By the end of March 2012, 123.5ha of land had been cleared of invasive alien plant species at the Paradise Valley site, with the end goal being a total of 200ha cleared. The planting of indigenous species at the site in Paradise Valley will help to restore the catchment of the uMbilu River, thus contributing to the enhanced provision of ecosystem services such as water quality and water supply. This is particularly important for Durban under a climate future where water is likely to become more scarce.

The Municipality intends to expand this model of ecosystem restoration work that simultaneously enhances climate change adaptation and contributes to social upliftment, throughout the uMbilu River catchment and to other catchments in the city.

5.4.3 Living Beehive Project

In partnership with the DEA and eThekweni Municipality, the South African National Biodiversity Institute (SANBI) planned and implemented the Living Beehive project. This is a large living art installation in the shape of a traditional Zulu Beehive hut erected in the Durban Botanical Gardens. A smaller replica of the beehive was also placed at the CCR Expo.

The structure is 10m in diameter and 5m high and made of stylized "living walls", growing plant foliage and flowers. It features grassy textures that dominate the display to represent the grasslands biome of South Africa, supplemented by wetlands type vegetation. A water feature inside the structure provides a soothing element of movement and sound. Artefacts derived from natural resources that reflect traditional Zulu culture are subtly woven into the design. This structure symbolises the links between natural systems and cultural values, and will resonate with South Africa's

growing practice of using ecosystem approaches to environmental management and 'climate proofing'. Please refer to section 8.7 for further information.

5.4.4 Nongoma Biodiversity Conservation Programme

The annual Reed Dance held at the Enyokeni Royal Palace in September 2011 was not only a celebration of traditional norms and values but a celebration and acknowledgement of Nongoma's natural heritage. A total of 35,000 trees were procured. Along the access road to the palace, 808 trees were planted and a further 34,192 trees were planted to the south and south east of the palace.

The trees were sourced from Wildlands Conservation Trust's Indigenous Trees For Life projects and grown from locally collect seeds and propagated by the project beneficiaries.

Another benefit was the creation of 330 work opportunities for local community members who were employed to prepare the site and complete the planting. A further 16 local community members have been employed to continue with after care on the project – watering the trees for the first two months and keeping the area clear of weeds and alien invasive species. They are also required to keep livestock away from establishing plants.

5.4.5 KZN Integrated Greening Programme

The KwaZulu-Natal Government, and its implementing partner, the Wildlands Conservation Trust, embarked on its KZN Integrated Greening Programme. Its aim is to develop a comprehensive community greening programme, which ultimately hopes to green several areas of the province through a reforestation process.

The programme supports a wide range of developments, including the creation of "treepreneurs" growing indigenous, edible plants, "wastepreneurs" collecting recyclable waste, "greenpreneurs" trading in bicycles, water tanks and solar devices and conservation projects linked to reforestation and eco-tourism.

Treepreneurs

The treepreneurs propagate large numbers of indigenous fruit and ornamental trees. The seedlings are traded for food, clothes, building materials and educational support with greenpreneurs. The trees will eventually be cared for by local communities, working as "green teams".

A network of carbon farmers is being facilitated, with each farmer securing 1ha of land. The farmer will then be given 1,500 indigenous trees, 500 fruit trees and agricultural support. It is estimated that within a five year period, these farmers will appreciate a sustainable return in the form of carbon credits and within seven years, they will realise a financial return on their orchards.

Wastepreneurs

Wastepreneurs barter their recyclable waste for livelihood support. The Wildlands Trust facilitates the sale of the recyclables and reinvests the resulting income into the programme. It is anticipated that the treepreneurs and wastepreneurs who show enterprising qualities will be encouraged to become entrepreneurs in this bartering process and will be encouraged to grow and trade food for other necessary items.

In 2011, the Greening Programme employed 8,400 community facilitators and 25,200 greenpreneurs. Approximately 116,400 trees were planted, 232,800 propagated, 23,800 ha secured for carbon farmers and 397,130 kg of recyclable waste collected.

Chapter five addressed the interventions undertaken within other key thematic areas of greening. The four major areas of resource management affected by the hosting of a large event are energy, water, waste and biodiversity. In each of the four areas, specific initiatives were put in place to minimise the impacts of the event. In respect of energy, the focus was on energy efficiency measures applied to the primary venues (i.e. ICC, CCR Expo and accommodation sector) and diversifying the energy mix through the promotion of renewable supplies (i.e. PV farm, solar water heaters, hydrogen fuel cell). Water management focused primarily on the promotion of the consumption on tap water and therefore the importance of water quality as well as avoiding bottled water and its waste implications. Waste management was concerned with the application of the waste management hierarchy with the promotion of separation at-source through a comprehensive twin-bin system in selected nodes and venues. The CCR Expo demonstrated the role of composting, re-purposing of banners and re-use of useful materials as further ways of avoiding unnecessary waste disposal. Biodiversity protection and conservation was achieved through the procurement of indigenous species for the CCR Expo landscaping, alien vegetation control and reforestation. Demonstration projects such as the representation of the KZN biomes and the Living Beehive art installation further communicated the value of indigenous biodiversity of the province. Therefore, the approach to resource management both minimised the impact of the event on these resources and raised awareness amongst delegates and visitors on the preservation and conservation of these resources.