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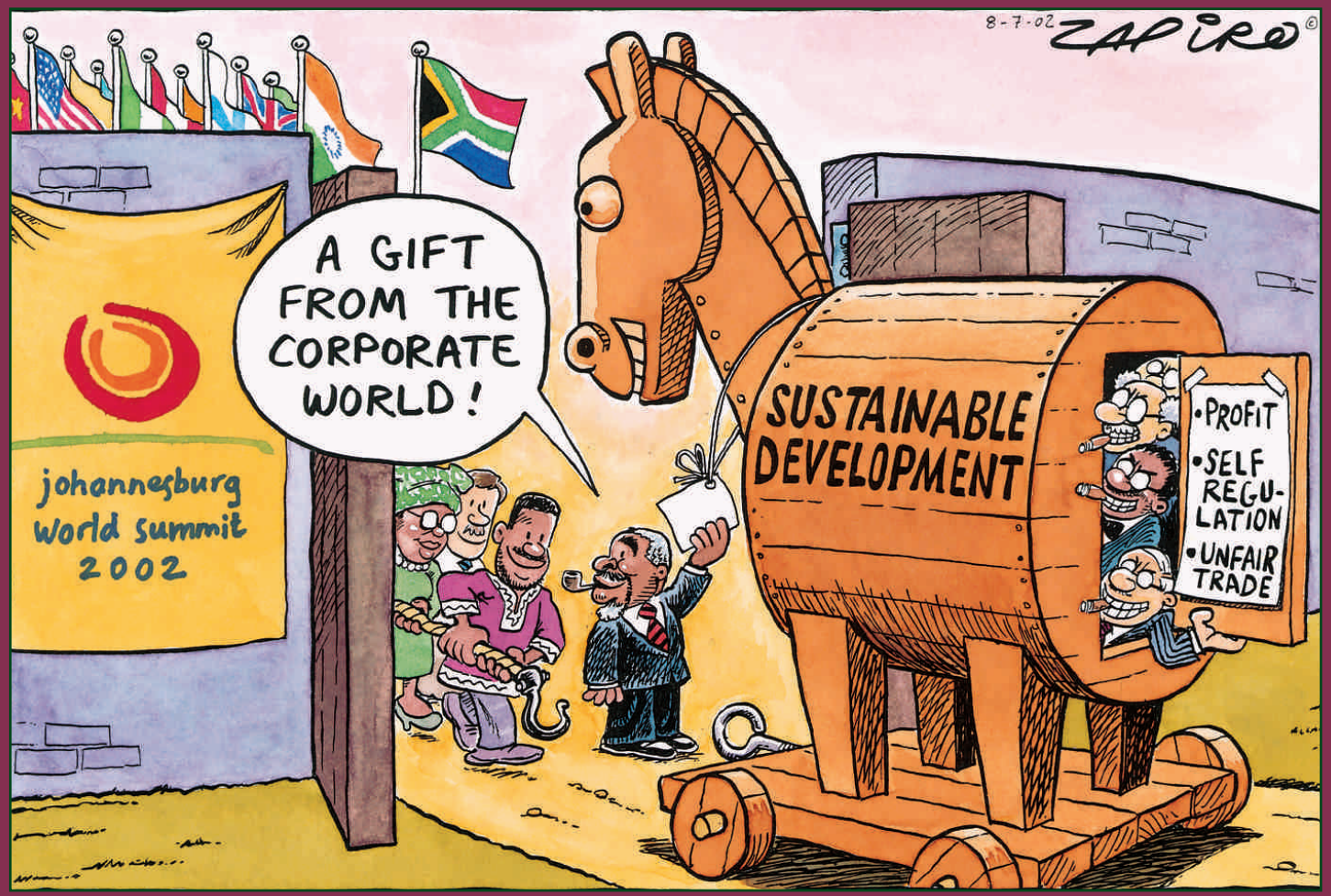
SOUTH AFRICAN PEOPLE AND ENVIRONMENTS IN THE GLOBAL MARKET

BOOKLET 5 OF 5

5

GROUND-ZERO IN THE CARBON ECONOMY:

PEOPLE ON THE PETROCHEMICAL FENCE-LINE



WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT • JOHANNESBURG 2002 •

SOUTH AFRICAN PEOPLE AND ENVIRONMENTS IN THE GLOBAL MARKET

Member of

Friends of the Earth International

Series edited by Mark Butler and David Hallowes of Critical Resource

Layout by Gillian Watkins

Front page illustration by Zapiro

Series published by groundWork, South Africa, August 2002.

Booklet 4 published by groundWork and Biowatch South Africa.

Contact groundWork at
P.O. Box 2375
Pietermaritzburg 3200
Tel: +27 -33-342 5662
Fax: +27-33-342 5665
Email: team@groundwork.org.za
www.groundwork.org.za

With the World Summit on Sustainable Development (WSSD) opening in Johannesburg, this series of five booklets gives an environmental justice perspective on key challenges for sustainable development in South Africa. Development largely defines people's relationship with their environments. Governance is about who decides that relationship. It is a means through which a global contest for control of resources, including environmental and labour resources, is fought out. The booklets report from several 'fronts' of the struggle we call development. They look at how South Africa has adopted critical aspects of international governance, at whose interests are served and at the impacts on people and their environments. They indicate that, while another world is possible, it is not being built in South Africa.

1. The invisible fist: Development policy meets the world
by David Hallowes
Booklet 1 focuses on South Africa's approach to development in relation to the global order defined by the neo-liberal agenda of the 'Washington consensus'.

2. Partners in pollution: Voluntary agreements and corporate greenwash
by Chris Albertyn and Gillian Watkins
The corporate push for self-regulation is part of the neo-liberal agenda. Booklet 2 looks at what advances they have made in South Africa.

3. The cost of living: How selling basic services excludes the poor
by Mark Butler
Booklet 3 picks up on the democratic promise to provide people with services, such as clean water and energy, in relation to global injunctions for cost recovery and privatisation.

4. The seeds of neo-colonialism: Genetic engineering in food and farming
by Elfrieda Pschorn-Strauss and Rachel Wynberg
Booklet 4 looks at the role of South Africa in the global battle over the introduction of Genetically Modified Organisms.

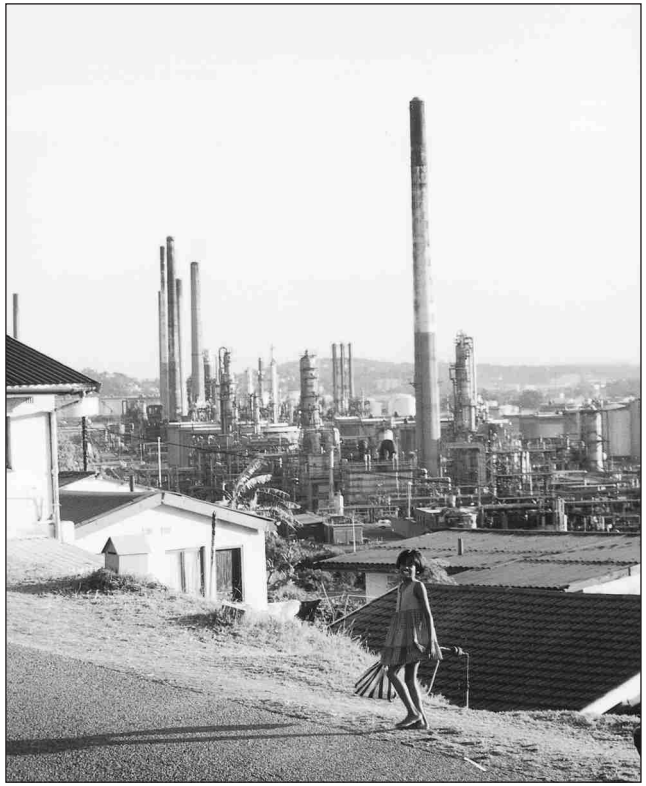
5. Ground-zero in the carbon economy: people on the petrochemical fence-line
by Rory O'Connor and David Hallowes
Booklet 5 touches on climate change, another point of conflict between the northern powers, so as to relate it to the local impacts of South Africa's oil refineries.

1. Introduction

South Africa is recognised for its great natural beauty and abundant natural resources. It is a diverse land embracing a rich mix of culture, language and ethnicity, and a democracy guarded by a world-class Constitution. Prior to 1994, it was better known for the brutal apartheid regime that deprived the majority of its people of basic human rights. In law, and occasionally at gunpoint, it dictated where people should live and what their life chances should be. It did not stop at segregating people according to skin tone. White-owned industry required cheap and expendable labour and low waste-disposal costs. To meet these needs entire communities were relocated alongside polluting industries or, in other cases, land was expropriated to position polluting industries astride established communities.

With the political transition from apartheid to democracy, people can no longer be arbitrarily removed from their homes or subjected to racial discrimination. The Constitution entrenches certain fundamental rights including the right to life and the right to an environment not harmful to health and well being. New laws have been enacted to give effect to these rights, including the National Environmental Management Act (NEMA, 1998), the Access to Information Act (2000) and the Administrative Justice Act (2000). These laws purport to provide for equity. In theory, communities have the right to request information, from a polluter or the relevant regulator, necessary for protecting their rights as well as an expectation that their environmental interests and needs will be placed first. If it appears that this is not the case and that they have been treated unfairly, then a community can request reasons why this is so. If an environmental wrong is committed, affecting people or the environment, there is an expectation that the polluter will pay. These judicial enactments are all important milestones in the development of environmental rights.

This booklet investigates whether these rights translate into meaningful action in the context of the energy sector and the oil refining industry in particular. Energy is a necessity for modern life, but energy production from fossil fuels creates huge social and environmental problems. On the global scale, it is the major source of carbon emissions contributing to climate change. While carbon grabs the headlines, it is emitted from local sources along with a range of other substances which have more local impacts. South Africa ratified the United Nations Climate Change Convention (UNFCCC) in 1997 and this booklet opens with a snapshot of its contribution to global warming, but will focus on the local impacts. It explores the transition to the new environmental regime and looks at who benefits and what happens to communities burdened with high pollution loads and sandwiched between the interests of development and profit.



Refineries are located very close to communities in Durban, as shown in this picture of the SAPREF (Shell and BP) refinery. Picture: groundWork

2. South Africa's Carbon Age

Energy Rating

South Africa's Gross Domestic Product is the 26th-highest in the world, but its primary energy consumption ranking is 16th. This is above average and only 10 other countries have higher commercial primary energy intensities. The energy sector contributes about 15% of GDP and is said to employ 250,000 people. It is largely reliant on coal and oil and is the largest source of carbon dioxide (CO_2) and sulphur dioxide (SO_2) emissions.

South Africa's per capita carbon emissions are also among the highest in the world - higher than a number of European countries and almost on a par with the average for developed countries. US emission trading information reports South African consumption at 100 million btu/per person. This dwarfs consumption in most developing economies and compares to Thailand's 41.6 mbtu / person and India's 12.4 mbtu / person.[1] In 1999, South Africa's energy-related carbon emissions amounted to 99.4 million metric tons, equating to 42% of Africa's emissions and 1.6% of world emissions.

Energy consumers

Industry and Mining

South Africa's high energy intensity results from an economic structure dominated by large-scale, energy-intensive mining and minerals industries. In 1998, industry and mining consumed 57% of total primary energy, thus emitting 66.8 million metric tons of carbon. The chemical and petrochemical industry is the largest industrial sector consumer, accounting for 25%. Cheap energy contributed to this development and policy makers now regard cheap energy as critical to South Africa's international competitiveness.

Transport

The transport sector consumes 17.5% of total primary energy and emits 17.9 million metric tons of carbon. Apartheid's segregated cities imposed high transport costs on black people. Public transport was neglected, leaving the middle classes dependent on private cars and the working classes largely dependent on a volatile mini-bus taxi industry. Current reforms involve recapitalising the taxi fleet with diesel powered vehicles and are aimed at stabilising the industry rather than producing greater energy efficiencies. An over supply of diesel at South Africa's refineries may have provided an additional motivation.

Residential

The residential sector accounts for approximately 10% of South Africa's energy consumption. There has been little material increase in energy consumption over the past decades by this sector as they are largely not recipients of the cheap energy bonanza. Although South Africa supplies electricity to half of Africa, about 49% of its own population is without access and about 3 million South Africans depend on fuel wood, and coal and paraffin are widely used. Government has responded with a major programme of electrification providing approximately 500,000 new connections annually. The programme is based on cost-recovery and Booklet 3 examines the implications. About 50,000 homes are supplied with solar electricity in areas remote from the national electricity grid.

Energy Sources

Of the primary energy consumed in South Africa in 1999, 74.7% was derived from coal, 21.3% from oil and 1.2% from natural gas.

Coal

South Africa's reliance on coal is founded on massive reserves. More importantly, apartheid policies ensured cheap labour and permitted wasteful extraction methods to keep prices artificially low. Finally, the threat of sanctions drove a policy for maximising self-reliance in energy. In the 1980s, South Africa over-invested in coal-fired power stations creating surplus capacity. The generators use low-grade coal containing 31% of ash with high-grade coal reserved for export. Stack scrubbers were not fitted as original equipment resulting in phenomenal air pollution. To reduce its

dependence on imported crude oil, South Africa developed the largest synthetic fuel (fuel from coal or gas) capability in the world consuming around 41 million tons of coal in the process.

Post-apartheid, South Africa's carbon dependency has been further entrenched. It has increased exports of coal and become a major exporter of electricity, so absorbing some of its excess generating capacity. It now supplies two thirds of all of Africa's electricity and 92% of this is derived from coal. The environmental costs in terms of ash deposition, sulphur dioxide and acid rain are borne locally, while coal bed methane gas released during mining operations contributes to South Africa' greenhouse gas emission inventory.

Electric energy

Eskom, a state-owned company, produces 98% of South Africa's electricity. It operates ten coal-fired power stations and one nuclear power station along with two pumped-storage stations and two hydroelectric stations. It is the world's fourth largest producer of electricity, with an installed generation capacity of 39,000 MW in 1997. Within South Africa, coal produces approximately 90% of electric energy while nuclear and hydro power produce about 5%. Eskom is currently undergoing restructuring preparatory to privatisation.

Gas

South Africa's natural gas reserves amount to 33 billion cubic metres. Larger reserves in neighbouring Namibia and Mozambique are now being developed. Sasol, South Africa's synthetic fuel corporation, plans to pipe gas in from Mozambique but only as a fuel supplement and not to replace coal. Emissions will remain the same because an expansion of production will absorb any savings. In principle gas appears to offer environmental advantages over coal or oil based fuels in terms of reduced carbon dioxide and particulate emissions. However, South Africa's own gas production involves the burning of coal so impacts remain high.

Renewable energy sources

Renewable energy is obtained primarily from firewood and bagasse[2]. South Africa's potential for solar energy is huge with an average isolation figure of 2500hours/year. Supply from this source amounts to less than 1% of the potential market. The low cost of electricity and the effective limitation of renewables to off-grid applications serve as disincentives to development.

Oil

Oil is South Africa's second largest source of energy and the petrochemical industries and their impacts on local people and the receiving environment are the focus of the following sections.

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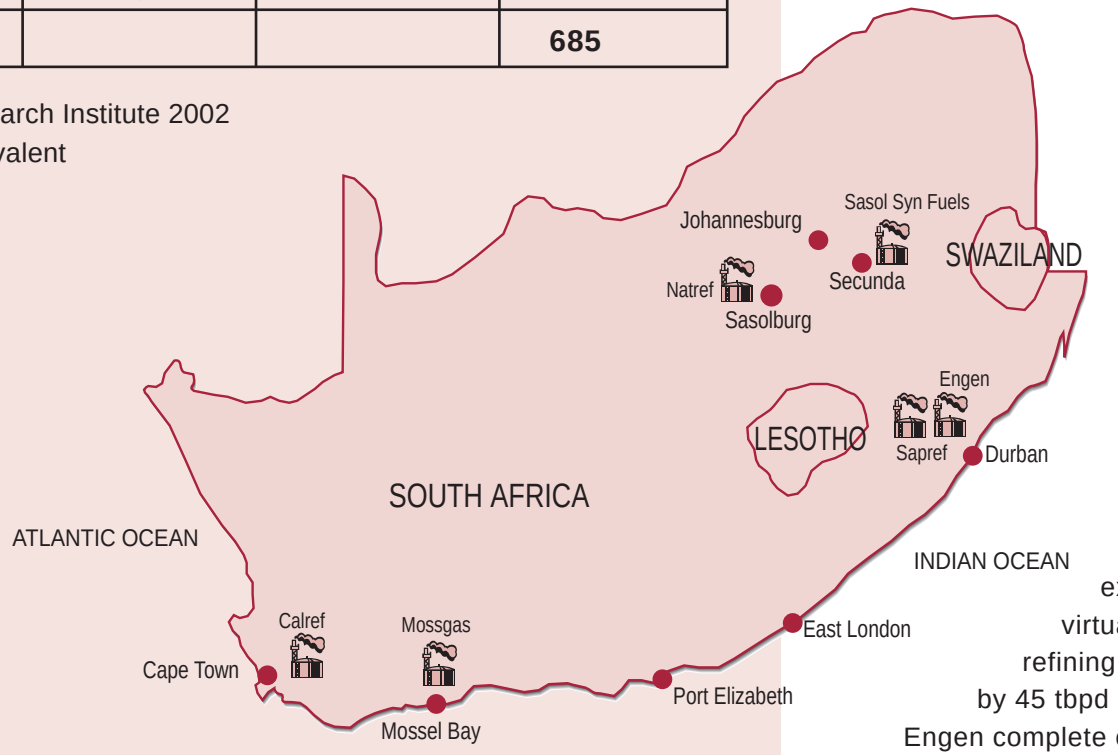
3. A well oiled industry

Table 1: South Africa's refining capacity (crude and synthetic)

Refinery	Location	Owned by	Fuel source	Capacity
Calref	Cape Town	Caltex	Crude oil	110 tbpd*
Engen	Durban	Petronas	Crude oil	125
Sapref	Durban	Shell/BP	Crude oil	165
Natref	Sasolburg	Sasol/Total	Crude oil	90
Sasol Syn Fuels	Secunda	Sasol	Coal	150
Mossgas	Mossel Bay	Mossgas	Gas	45
Total				**685**

Adapted and updated from: Energy Research Institute 2002
* thousand barrels per day crude or equivalent



South Africa's refineries

Three methods are used to produce liquid fuels in South Africa: a) crude oil refining; b) coal to liquid fuel; and c) gas to liquid fuel. 15% of the country's primary energy consumption is met by imported crude oil that amounted to 23.6 million tons in 1997 and represents South Africa's largest import item. There are four crude oil refineries, three in coastal cities. The two largest refineries are located in the port city of Durban where most crude oil is landed. Crude is also pumped 600km inland from Durban to the smaller Natref refinery. The fourth crude oil refinery is in Cape Town. Table 1 lists the refineries.

Refining capacity is constantly growing with expansion plans in place at virtually every refinery. Crude oil refining capacity will likely increase by 45 tbpd by year end if Sasol and Engen complete expansion plans.

Securing apartheid oil

Shell, BP, Mobil, Caltex and Total all operated for years in apartheid South Africa and collaborated in breaking the oil embargo. Mobil eventually disinvested but other corporations devised ingenious plans to stay in business with the apartheid government. Shell went as far as to set up a black anti-sanctions group[3] and was also discovered to have been importing South African coal to the European market.

In return the refineries were protected from scrutiny and competition through a complex arrangement of laws and institutions. A somewhat arbitrary mechanism for fixing the petrol price guaranteed refinery profits, subsidised the synfuel industry and provided government with substantial revenues. Controls on refinery profit margins were dropped in 1991 but the pricing mechanism remains in place. Gritzman (1999) estimates that wholesale petrol prices are at least 32% higher than they would be in a fully competitive market. This means that consumers are paying oil companies about SAR2.2 billion every year in excess of normal profit.

Tacit assistance is also provided to refiners in the form of weak environmental laws that allows them to externalise their costs with resulting hardships for those who have the misfortune to live nearby. Under apartheid, they were also protected from scrutiny by security legislation.

National Key Point legislation (1982) designated a range of facilities as national strategic assets and made disseminating information on these facilities an offence punishable with a lengthy jail term. The refineries and other major oil and chemical facilities are all key points.

Expansion in Africa

In the early 1990's the World Bank commissioned research on the supply and distribution of petroleum in Sub-Saharan Africa. According to Mbendi (2002), key recommendations were that smaller refineries should be rationalized and the industry consolidated to cut costs, and that a regional road fund be established to promote transport uniformity. This would presumably also encourage an expansion of the market.

The World Bank has subsequently rebranded its consolidation proposals as a clean air initiative, suggesting the promotion of unleaded fuels across Africa. While this is desirable in itself, only the larger and more sophisticated refineries are capable of producing fuels of this specification. The end result is that large transnational corporations (TNCs) located in South Africa and Nigeria, which together make up 68% of Africa's refining capacity, will dominate the market.

By 2001 Bank specialists appeared impatient, suggesting that African countries face reality, that

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a corporate "oil champion" should lead the consolidation process and concluding with a message to "get on with it" (World Bank 2001). South African refineries certainly are getting on with it, producing a stream of expansion plans. They are already exporting refined products mainly to Southern and East African but also into the Indian and Atlantic Ocean rim markets.

South Africa based corporations are also joining the rush for oil exploration around Africa's coast. Sasol and Energy Africa, in which Engen has a majority stake, are competing with the likes of Total Fina Elf, Shell, BP, Petronas and Exxon Mobil for prospecting and drilling rights.

Refinery emissions

Information on emissions in South Africa is generally poor. The figures given in table 2 are calculated by the refineries and not independently verified. Sasol reports emission and waste data extensively through annual Health, Safety and Environmental Reports. Unfortunately the other refineries do not report in similar detail.

Refinery expansion plans are accompanied by reassurances that expansion provides the scale necessary to reduce local emissions. Neighbouring communities are sceptical of the claims.

Routine refining and associated chemical processes are responsible for air, water and marine pollution while several incidents have also resulted in ground pollution. Carbon, sulphur, nitrogen and particulate pollution is supplemented by a smorgasbord of chemical delights. As long ago as 1989 a study (reproduced in SATS 1998) at Island View, a petrochemicals storage facility at the port of Durban, found over 50 volatile organic chemicals in the air with 20% of them detectable in the garden of a nearby resident.

The paucity of credible information on emissions has been used both by industry and the regulator to dismiss the concerns of neighbour communities as uninformed. groundWork and the US based Communities for a Better Environment (CBE) therefore introduced the inexpensive 'bucket brigade' air monitoring system to refinery affected communities.[4] Results showed the presence of multiple pollutants - with 16 chemicals on the official US list of hazardous air pollutants at Sasolburg. Readings for benzene, vinyl chloride and methylene chloride were particularly high. Chemicals on which there was no prior information in South Africa were revealed: carbon disulphide, 2-butanone, toluene, ethylbenzene and xylenes. According to CBE, the xylene levels measured under normal operating conditions at Engen in South Durban were four to five times higher than that found during upset conditions at US refineries.

Table 2: Emission data for selected refining and chemical processes (tons p.a.)

Atmospheric Emission	Sasol/Total Natref	Sasol Chemical Industries	Sasol Secunda	Caltex Calref	Petronas Engen	Shell/BP Sapref
Sulphur Dioxide	19,140	26,000	248,000	8,760	4,745	13,140
Nitrogen Oxides	1,380	22,000	143,000	-	-	-
Carbon Dioxide	819,000	7,100,000	49,607,000	-	947,905	1,236,000
Particulate matter	1,150	3,000	8,000	-	-	-
Ash	-	1,792,000	10,030,000	-	-	-
Volatile Organic Compounds	-	42,000	404,000	-	-	-

Information as reported by industry

Apartheid planning put black communities downwind and downstream of polluting industries. This pattern is evident in the location of the major petrochemical installations.

The location of pollution

Apartheid planning put black communities "downwind and downstream" (Durning 1990: 17) of polluting industries. This pattern is evident in the location of the major petrochemical installations although there are exceptions. Cape Town's Caltex refinery and Island View, a chemical storage facility within Durban's port, are adjacent to white suburbs. Durban's refineries are located in black areas but also impact directly on a white area.

The testimonies of three local activists speaking on racist planning are reproduced in Box 1.

Regulation

Democratic South Africa inherited a weak and fragmented environmental management system. The apartheid government developed policy piecemeal "with almost every central government department ... involved in some aspect of environmental administration, and both resource allocation and pollution control ... sub-divided between different legislation and different departments" (Whyte et al 1995: 20).

While the NEMA is designed to give effect to the constitutional right to a clean environment, specific laws remain weak and fragmentary and an environmental law reform process intended to address this has been stalled for over three years. In the case of air quality, comprehensive reform is promised and this will be discussed below. At present, however, the Department of Environmental Affairs and Tourism (DEAT) is responsible for air quality under the very dated Air Pollution Prevention Act (APPA) of 1965.

Permits

APPA provides for permission to pollute and establishes 'guideline' values for pollutants but has neither enforceable standards nor credible provision for penalties. It requires that 'scheduled processes' (specified industrial processes) are subject to an operating permit from the DEAT. The permit will usually specify the control devices to be used and may require some form of reporting to the regulatory authority. In the event of a contravention, the worst that can happen is that the operating permit is withdrawn. In 1994, APPA was enforced throughout the country by only seven officers under the authority of the chief air pollution control officer (CAPCO). This capacity has deteriorated and there are now just five.

Permits for the Durban refineries specify the maximum permissible daily tonnage of sulphur dioxide, include instructions on measurement, and require monthly reports on sulphur emissions. There are no reporting requirements for other pollutants (such as carbon, benzene etc). The CAPCO has preferred negotiation to enforcement. Despite numerous violations of APPA guidelines and 'exceedances' of permit conditions, refineries have neither been prosecuted nor suffered the withdrawal of operating permits.

Whereas developers need only know their own business, communities have to become expert in everybody's business if they wish to participate effectively. In fact, very few local communities have any real capacity and those that do are soon overwhelmed. No provision has been made to resource them.

Local authorities may also enact by-laws to regulate local industries. This happens independently of CAPCO. Consequently an oil refinery may need two authorising permits that deal with the same subject matter but are not cross-referenced to each other. There is thus little coordination between local and national levels and considerable variance between South Africa's urban centres. Local authority penalties are traditionally very weak with maximum fines as low as R500 (about US $50) for some offences.

The manner in which these permits have been issued has been a source of concern to local communities. First, the system produces very little information about pollution volumes for anything other than SO_2. Second, neither national nor local authorities have developed air quality management plans. The permit setting process has not therefore been informed by any concept of the sustainable carrying capacity of the air-shed or of the end fate of emitted substances. Third, relevant health issues were not investigated. Fourth, communities do not have access to the permit setting process.

Environmental impact assessments

Environmental impact assessments (EIA) were introduced to South Africa in 1997 as an additional instrument for environmental management. An EIA is required for any new development or any expansion to existing plant, and the final record of decision is authorised by the provincial government. In contrast with the permitting process, consultation with all 'interested and affected parties' is required.

Implementation of EIAs remains problematic in the view of civil society. First, as with permits, the assessment of impacts is project-specific and takes no account of cumulative impacts. Second, the process is driven by consultants who are appointed and paid by the developer. The authorising officials do not attend the public meetings and therefore rely on the consultants' interpretation. Third, EIAs are inherently biased towards the developer because they involve highly technical issues specific to the proposed project. Local communities therefore always start at a disadvantage. Fourth, this is compounded by the sheer volume of EIAs in certain areas. Whereas developers need only know their own business, communities have to become expert in everybody's business if they wish to participate effectively. In fact, very few local communities have any real capacity and those that do are soon overwhelmed. No provision has been made to resource them. Fifth, the capacity of the responsible authorities is similarly overwhelmed. The majority of EIAs therefore escape serious scrutiny. Finally, compliance with requirements that result from the EIA is not reviewed by the authorities or any other independent party. Monitoring is therefore left to the voluntary initiative of the community who may appeal to the provincial authority or, failing a response, resort to a potentially expensive court process.

BOX 1: Testimonies to racist planning

Ike Ramatesela, Local Councillor, Sasolburg.
Apartheid planning located the black township in an area surrounded by chemicals industries. Residents suffer high levels of child mortality and respiratory illnesses. Workers suffering occupational diseases are retrenched and sent home to die. There is high unemployment and people are too poor to afford medicines. In white areas, industry maintains pollution monitoring but claims there is no money for effective monitoring in black areas. Recent action linking wealthy whites living on a polluted water frontage with black residents resulted in industry withdrawing social responsibility funding from a local environmental organisation.

Alex Percent, Secunda.
Black people used to live in Secunda, which was called Driefontein. When the Sasol refinery industry was developed, black people were relocated downwind at Embalenhle. Secunda became a white town. Embalenhle is now surrounded by mines and adjacent to the local dump. The fence is not maintained and children have access to the dump. The older people do not understand the environmental issues and environmental organising is supported mainly by the youth.

Desmond D'Sa, South Durban Community Environmental Alliance (SDCEA)
The South Durban basin is home to 285,000 people and numerous industries, located in five 'industrial belts'. It is repeatedly claimed that people followed industry into the area, but this is false. Industries were located next to people in the '50s on land taken from local market gardeners. The industries include two large oil refineries, major chemicals manufacturers and chemicals storage facilities. A toxic landfill servicing these industries has been closed down but not rehabilitated. Local people suffer from high levels of respiratory illnesses and cancers. Apartheid planning forced racial segregation of South Durban's communities. Recent planning exercises have concluded with proposals that would result in the removal of people. The SDCEA is organising across these divisions to speak out on environmental justice at local, national and international levels.

Source: Environmental Justice Forum: Speak Out! Hosted by groundWork, the South African Exchange Programme on Environmental Justice, and International Possibilities Unlimited, August 25, 2001.

4. Oil in the hood - South Durban

Pollution event at SAPREF (Shell and BP) refinery, Durban, 1995. Picture: Bobby Peek

The city of Durban is said to have the best environmental monitoring capacity of any of South Africa's local authorities. This is in some part due to the fact that it is also home to the South Durban Community Environmental Alliance (SDCEA), one of the most active community environmental groups in the country. Hence, more is known about environmental impacts in Durban than elsewhere. It also presents the best case scenario for environmental management in South Africa.

The Setting

Durban is the sub-tropical home to Africa's busiest port and the primary route for imported crude oil and exported refined petroleum and petrochemical products. Petrochemical and chemical industries are concentrated in the South Durban area. In the port itself is the Island View bulk chemical storage which contains an extensive infrastructure of tanks and pipelines, some running inland to Natref while others lead directly, beneath residential streets, to the South Durban refineries - Sapref, jointly owned by Shell and BP, and Engen, controlled by Petronas. Island View and the two refineries were designated as 'national key points' of strategic significance to the apartheid government. This was to have a profound influence on the environmental behaviour of these facilities.

As long ago as 1931, the pre-apartheid Durban Town Council started planning to segregate people on lines of colour to provide cheap labour for industry. The plans were initiated at the behest of the local Chamber of Industries and imposed an industrial zone on already settled residential areas (see Box 1). They were later consolidated under the apartheid government's infamous Group Area's Act. In the process, thousands of black people were forcibly removed, restricted and/or resettled in South Durban.

Community environmental protest pre-1994 was viewed as political dissent and silenced by the state policing instruments. The National Key Point legislation shielded the petroleum refining and chemical storage industry both from concerned local residents and from the local regulators. It was not until July 1997 that national government approved local authority access to information on the chemicals stored at Island View.

Official protection bred a curious arrogance amongst industrialists who appeared to believe that the law provided an exemption from environmental and planning laws. They paid little attention to environmental safeguards, and local government requirements were largely ignored. When

questioning occasionally got tough a retreat behind the legislation was all too easy.[5] Today more is known about the chemical and refining processes but the information is far from complete and industry frequently cites 'commercial confidentiality' to avoid disclosure. The Key Point Act remains in place and site access remains strictly controlled.

Communities in South Durban have a long history of political activism. They also articulated environmental concerns throughout the period during which the area was industrialised. Despite the history of segregation, local activists recognised that pollution does not respect boundaries and, in 1996, community based organisations from the different communities in the area joined together with local NGOs to form SDCEA.

A single DEAT air pollution control officer has been responsible for the whole of the province of KwaZulu-Natal including Durban. This officer died in December 2001 and the post is yet to be filled. Durban's Environmental Health Services, the local regulator, must therefore take on this responsibility but there is a snag. They have not been granted delegated powers under the APPA so they cannot apply it. Further, they are not in possession of the relevant permits because the DEAT is seemingly unable to locate them.

The KwaZulu-Natal provincial government authorises EIAs. It has had to build the relevant administrative capacity from scratch. For several years the director of pollution control presided over an empty organogram and was able to start filling posts only in 2001. In the year to March 2002, there were 65 EIAs in South Durban alone. 29 of these had direct relevance to the concerns of SDCEA and included major infrastructure and plant expansion projects.

Atmospheric pollution

Before 1998, Engen's APPA permit allowed them to emit 72 tons of sulphur dioxide (SO2) a day while Shell/BP's Sapref could emit 50 tons a day. Other pollutants were unregulated and the volumes open to speculation. Refineries profess to operate below their SO2 permit levels and, from calculated[6] (not measured) emission levels, this appeared to be the case. However, the emission data is not independently verified so its credibility depends on the honesty of the polluter.

In the 1995/1996 period, data provided by eight SO2 emitting industries, including the two refineries, showed average daily emissions of 95.73 tons. Of this Sapref claimed 45.48 tons or 48% of the total, indicating that they were operating close to their maximum permit level. By contrast Engen was well under its permit contributing 26.6 tons. The following year Sapref stated in their annual environmental report that their emissions were reduced to 37.97 tons/day and that further reductions would be dependent on expansion of the refinery. At this point, SDCEA was informed by a technical advisor that there was cause to doubt the authenticity of the emission figures but this could not be substantiated. Three years later in March 2000, Sapref admitted they had been under-reporting by as much as 12 tons/day (nearly one third) for the past 5 years, claiming an error in calculation. In effect they had been operating in contravention of their permit for several years. Government reaction was muted. It imposed no penalty for the contravention and did not investigate the matter.

Toxic incidents

Fires, explosions and leaks have become so common that they can almost be considered a normal operating condition for Durban's industrial plants. Both industry and the authorities have appeared reluctant to inform the community of potential hazards and, as yet, there is no coherent off-site emergency or evacuation plan to cater for this community of approximately 270,000 despite sustained lobbying by SDCEA. There are no buffer zones and people live on the fence-line of their polluting neighbours.

The graph (overleaf) shows a rapid escalation in hazardous events in 2000 and 2001. Some of them resulted in evacuations and mass hospitalisation and several people have died. A number have involved the release of oil to sea or the saturation of land with petrochemicals. Most constitute gross violations of the archaic APPA guidelines.

BOX 2: Three incidents

Refinery explosion

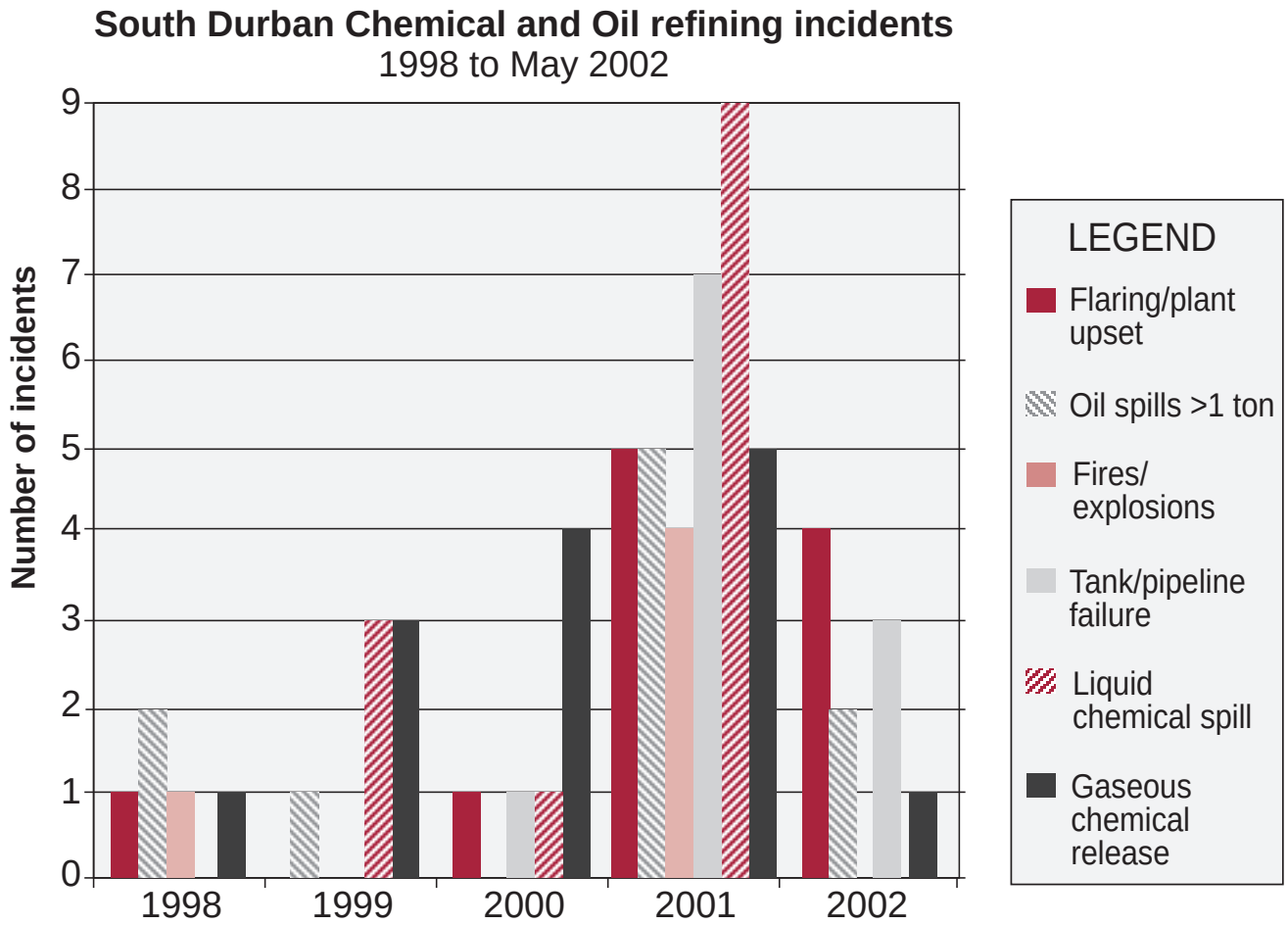
On the night of 19 May 1998, a spectacular explosion occurred at the Sapref alkylation unit resulting in the release of 5 tons of hydrogen fluoride (HF), tiny amounts of which are sufficient to kill. This Shell/BP refinery is located directly opposite the Durban International Airport with residential areas to the north and south. A crowd of local people, drawn from their beds by the explosion, gathered to watch the burning plant from across a canal. Refinery officials did not notify residents of the potential for disaster and, when contacted the following morning, made no mention of the loss of HF but referred only to possible emissions of hydrocarbons and particulate matter. That no one was killed was, in the view of community members, attributable to an offshore wind carrying the plume away from the community.

Storage tank failure

In March 2001 a toxic tetra ethyl lead (TEL) tank ruptured. The tank, owned by Shell and BP through Sapref, is situated at Island View a short distance away from fence-line residents. The rupture proved uncontrollable and 26 tons were lost from the tank over four days. When the tank failure was detected neighbouring chemical industries evacuated their employees. In contrast, fence-line residents were not informed despite being downwind at the time. Monitoring of lead levels began only several hours after the event and after emission controls had been initiated. No one knows how long the tank had been leaking prior to detection, but it could have been for 8 hours or more for there appeared to be 9 tons of TEL missing from the tank. No lead level testing was ever done in the local community despite the delay in initiating mitigation and the downwind position. Alarmingly, there appeared to be active collusion between industry and the authority to keep the incident secret and, if it were not for an alert journalist, it might have remained so. The City is now reported as preparing to sue Sapref in connection with this incident.

Pipeline failure

In July 2001, a pipeline from Shell/BP's Sapref refinery ruptured spilling somewhere between 1 and 2 million litres of fuel. Despite the scale of the loss, Sapref appeared unaware of it. The pipeline is buried beneath a residential street and people had been complaining of an overpowering stench of gasoline for several days before the cause was discovered and the pipeline shut down. The spilt fuel formed a vast underground hydrocarbon pancake overlaying the groundwater and contaminating a significant area of land. Above ground rising levels of benzene in the air forced the evacuation of several households. Sapref have so far recovered just over 1 million litres of the spilt fuel, and have patched the line and put it back into operation. This pipeline is 28 years old and one of seven that carry combustible fuels and gases beneath the streets of South Durban. Pressure from SDCEA resulted in pipeline testing and the discovery of unexplained corrosion and several more leaks on this and other refinery pipelines. Both refineries claim that their meters cannot detect small losses. In response to the incident, City regulators proposed a long overdue review of pipeline management. Shell and BP's management have refused to cooperate with this, citing the City's proposed legal action for the TEL tank failure as their reason.



Health Impacts

In South Durban, members of the local community have consistently complained of high levels of cancer and respiratory illnesses. Studies undertaken within the community concluded that respiratory illnesses were clearly elevated when compared to areas outside of South Durban. These studies did not have official sanction and were dismissed by both the regulator and industry as being 'unscientific'. At a refinery permit review meeting (June 1996) the CAPCO claimed that a Cape Town study at Calref showed that refineries do not pose a health risk.

In 2000, a local journalist wrote a series of articles on the impact of pollution in South Durban, focusing particularly on the incidence of cancer. He asked a medical researcher to review his investigation and the latter concluded that it suggested a leukaemia rate 24 times the national average (Carnie 2001).

As a precursor to a larger study, the Universities of Natal and Michigan and the Natal Technikon conducted a health study at the Settlers Primary School situated between the two Durban refineries. The study found that 53.5% of students suffered from some type of asthma, a prevalence higher than any comparable findings reported in the scientific literature. It also found strong evidence that ambient air pollution exposures were associated with acute changes in the health status of pupils with moderate to severe asthma. It

South Durban playground. Children outside Engen/ Petronas refinery. Picture: Skip Schiel

concluded that current guidelines may not be adequate to protect the health of susceptible portions of population. Government is still to react to the findings.

Local Agenda 21 in action

Durban was the first local authority in South Africa to adopt Local Agenda 21. In 1996, city authorities responded to mounting community pressure for a holistic review of their health and environment by commissioning a Strategic Environmental Assessment (SEA) as a way of taking "responsibility to resolve the conflict between industrial and local community needs" (SEA Report 1999: i) The SEA was launched as a Local Agenda 21 process that would ensure full participation of all stakeholders and particularly the community. The initial reports were bleak: Durban had a hazardous waste crisis and the assimilative capacity of the air was near exceeded. A major effort would be required to provide for an acceptable living environment.

However, it seemed that the SEA was being conducted in the shadow of a process driven by the national Department of Trade and Industry (DTI) relating to the development of an Industrial Development Zone (IDZ) in Durban (see Booklet 1 on IDZs). While business was intensively consulted in the IDZ process, the community was effectively excluded. At the same time, proposals to relocate Durban International Airport promised the opening up of land for development in the heart of South Durban.

In this context, the SEA shifted focus to two very concrete planning options: the expansion of the port had the support of the provincial government, while the development of a 'petrochemical industrial cluster' was supported by the DTI. This second proposal included a massive expansion Shell and BP's capacity at Sapref[7] and appears to give expression to the World Bank's strategy for African oil refining. The SDCEA proposed a third option, for mixed residential and light industry, but this did not appear to receive significant attention.

The SEA study concluded that the port and petrochemical options could be combined for maximum benefit to Durban's economy. Accompanying maps indicated that substantial residential areas would be converted to petrochemical and light industry zones but the document made no mention of the implied relocation of people. For local communities who had experienced apartheid relocations, this was provocative. Several thousand people attended a series of public meetings organised by SDCEA and condemned the plans as perpetuating environmental racism. As yet, no formal decisions have been taken on the SEA recommendations.

5. Changing the guard?

The Constitution says that national and provincial government share the overall responsibility for environmental management within South Africa's quasi-federal system. It makes local government responsible for actually delivering on people's right to a clean and healthy environment. The National Environmental Management Act (NEMA) of 1998 establishes the DEAT as the 'lead agent' on environmental management within a system of 'cooperative government' involving other national departments, provincial government and local authorities. It also requires the participation of all 'interested and affected parties'. In affect, this translates as 'stakeholder participation'.

The NEMA frankly admits government's weak capacity for enforcement. It enables private prosecution if government authorities do not take up a case. This puts civil society at the centre of the regulatory regime but also imposes a considerable responsibility. Use of these powers is inhibited because specific laws and regulations governing the behaviour of polluters are weak and fragmented (see above). There have in fact been very few prosecutions under NEMA and none relating to air pollution. On the other side of the coin, NEMA makes provision for Environmental Management Cooperation Agreements (EMCAs) between one or more government agencies and polluting industries. This provision responds to industry's agenda for self-regulation although EMCAs are supposed to supplement legal standards rather than supplant them. It also enshrines the concept of public-private-partnerships within the regulatory system. (See Booklet 2 for a more detailed discussion on self-regulation.)

Following the enactment of NEMA, it seemed that the DEAT was winding down its already weak capacity for enforcement. Its small pollution control budget was reduced and it gave priority to development focusing on tourism and wildlife conservation. Doubting government's commitment and frustrated by its inability to answer requests even for basic information, organisations in civil society increasingly turned to protest and the media to get the message out.

In 2000 a string of incidents across the country received good publicity. Growing media interest, and particularly the articles on health impacts in South Durban, provoked an intense public reaction and the KwaZulu-Natal provincial legislature passed a motion calling for a health study in the area. Civil society's perception that government had lost - or surrendered - regulatory control of polluting industries was fast becoming the public perception.

In 2000 a string of incidents across the country received good publicity. Growing media interest, and particularly the articles on health impacts in South Durban, provoked an intense public reaction. Picture: Gillian Watkins

Partners in implementation

In December 2000, the national and provincial ministers responsible for the environment, for health and for industrial development, together with the Durban City Mayor, responded with the announcement of a multi-point plan (MPP) for environmental management. The plan combined action at national and local levels and signalled the intention to give concrete meaning to cooperative government. The inclusion of Trade and Industry was particularly significant because this portfolio is seen as having real clout in government. For SDCEA it was also ambiguous as DTI clearly has an interest in the credibility of its proposal for a 'world class' chemicals cluster in South Durban.

The MPP is also represented as partnerships in action. Alongside inter-governmental task teams, multi-stakeholder forums embracing community, labour, industry and the three tiers of government have been established. SDCEA welcomed this as a step forward for participatory democracy and a solution to its difficulties in accessing key decision-makers. In addition, however, the plan is to be financed by government and industry in partnership. For the community group, already alerted to the pitfalls of partnerships by the SEA experience, this seemed more problematic since it gives industry an inside track on negotiations.

The key points in the plan include: setting SO_2 standards aligned to World Health Organisation standards; strengthening enforcement by introducing new legislation; banning of the use of dirty fuel by industry in South Durban; improving air pollution monitoring; identifying and minimising fugitive emissions; and assessing community health impacts. The intention is to use South Durban to test new approaches to devolved environmental management and, if successful, to use the experience as a model for other pollution hotspots.

Alongside the MPP are two national processes. First, a national air quality programme overlaps with, but has an ill-defined relationship to, the MPP. It promises an Air Quality Management Act setting legal standards to replace the APPA. SO_2 standards have been devised but cannot be enforced until the Act is passed. The legislative process appears to be delayed. Second, the DEAT's Environmental Protection Support Unit (EPSU) is developing a national framework for compliance and enforcement, including incident response, in terms of NEMA. Civil society originally understood that it would become something like a national Environmental Protection Agency, but it in fact provides for coordination (not implementation) within the system of 'cooperative government' and devolved implementation.

Back in Durban, the experience is ambiguous. Delays in delegating authority downwards have placed local officials in an enforcement vacuum and without the legal mechanisms to action the local content of the MPP. And some elements of the plan have been blurred. Prioritising non- SO_2 pollutants for standard setting seems to have fallen ambiguously between the national air quality programme and the MPP. Vehicle emissions, which require a separate national process and have frequently been used by polluting industry as a decoy issue, have been thrown into the MPP. Dirty fuels, on the other hand, were floated out of the MPP following industry demands that a socio-economic impact report be performed prior to any regulatory initiative. Government agreed and located money for the study in a research fund managed by the National Economic Development and Labour Council (Nedlac), a permanently established and powerful stakeholder forum composed of government, industry and labour. This led to two unexpected results: first, a report has now been commissioned by Nedlac, locating it outside the MPP and beyond the influence of those stakeholders not represented in Nedlac; and second, the terms of reference to the study are national, rather than specific to South Durban, and include all sectors of the economy.

Stakeholder blues

The experience thus illustrates several problematic features of the emerging governance regime. First, the locus of decision-making has become mobile and subject to hijacking or uncertainty. The meaning of the issues for decision also changes along the way. Tracking where real decision-making power

resides at any one time requires substantial resources. Second, the regime gives scope to what O'Riordan (1981) calls 'nondecision-making'. This is a way of holding issues in suspension by pretending to address them but ensuring that decisions are perpetually delayed, and it is used by powerful groups to limit the political process to innocuous issues while holding big issues off the public agenda.

Third, national government increasingly sees itself as a facilitator with 'delivery' - in pollution control and much else - devolved to lower levels of government. For their part, provincial and particularly local government complain of 'unfunded mandates' - i.e. legal responsibilities that they do not have the resources to fulfil. Many towns in South Africa are exposed to high levels of air pollution but, of the 284 local authorities, only 131 performed any air quality monitoring in 2001 and only 97 took steps of any sort towards assuring compliance. Even when the requisite authority for enforcement is in fact delegated to them, they will still be under-capacitated and ill-equipped. But while formal state responsibility is being devolved, political power in South Africa is highly centralised. Mayors tend to be 'deployed' by the party hierarchy rather than chosen through the local political process. The local level is thus susceptible to political pressure from above. SDCEA believes that large companies are using political contacts, and the threat of relocating from Durban, to exert pressure on local officials responsible for regulating compliance. In this context, credible enforcement seems optimistic.

Finally, "...'transparency', 'good governance' and the other talismans of anti-politics of our time cannot, by themselves, redress power balances" (Patel, forthcoming). Within the MPP, the community contingent is troubled by a sense of entrapment. The agenda of the MPP certainly has its origins in the concerns expressed by organisations in civil society but the process itself is subject to more powerful actors. At the same time, the invitation of multi-stakeholder democracy distances and defuses popular activism as a mechanism for change. For grassroots organisations entering the 'partnership', the problem becomes one of preventing themselves from emerging as compliant activists whose participation provides a democratic stamp to outcomes determined by dominant interests. And as they weigh up the options, they are overwhelmed with calls to participate in multiple processes, from EIAs to national policy, with the subtle sub-titling that absence equals consent to whatever is on the table.

Yet the record of environmental regulation in South Africa suggests that civil society, and particularly local organisations, now carry the critical responsibility for monitoring both the regulator and the polluter. Government has in effect outsourced its responsibilities to the people themselves - and it does so very cheaply since it provides no resources whatever to community groups who take on this responsibility. In South Durban it is very doubtful that the majority of incidents would have been recorded but for the active monitoring of SDCEA and its constituent organisations. In most other towns, local people are unaware of the connection between pollution and what have become routine ailments.

Many towns in South Africa are exposed to high levels of air pollution but, of the 284 local authorities, only 131 performed any air quality monitoring in 2001. Picture: Denny Larson

Following international trends, petrochemical upgrades included the restructuring of work with 'multi-skilling', substantial redundancies, and outsourcing of work redefined as 'non-core' business. High rates of unemployment in the communities neighbouring the refineries provide a cheap source of seasonal maintenance labour.

6. Conclusion

Management of environmental pollution in South Africa has entered an interregnum. The old APPA regime is crumbling. No-one will miss it. Industry claim that its failure is evidence that regulation by 'command and control' does not work and argue that market forces and self-regulation are the real drivers of environmental improvements. Civil society find it hard to discern command or control in this regime. groundWork describes it as 'negotiated non-compliance'. The new regime, however, is undergoing a very protracted birth and what will emerge is uncertain. Meanwhile, the semblance of regulatory control has been lost.

In many respects it seems that business is right in its claim that environmental regulation is now market driven. And the energy market is being framed by the big players. In the electricity supply industry, the expansion into Africa and the promotion of energy-intensive industries based on the 'competitive advantage' in cheap energy has entrenched South Africa's carbon technologies. Eskom exercises effective monopoly control of the sector. As a parastatal, it was historically regarded as an arm of government and has captured the resources of government in respect of energy information, expertise and R&D. It is over-invested in coal-fired generation and has long term contracts guaranteeing cheap coal supplies. It also inherited a vested interest in nuclear technologies from its links with the apartheid state's weapons programme. This has translated into a massive investment of R&D resources into nuclear energy. In contrast, its investments in renewables are relatively minor. These appear to be 'Trojan Horse' investments, designed to secure a dominating influence within the emerging renewables industry. Renewables have been kept off-grid ensuring that they will be confined to a marginal niche and stigmatised as a second-class technology reserved for those who are marginalised in the economy. While a national choice for renewables would better serve the objective of job creation, this option could threaten the cheap energy policy.

In liquid fuels, the concentration of market power called for by the World Bank is fuelling a programme of capitalisation in the South African refineries. The environmental branding on this has its local dimension in the claim that only a major expansion in refinery capacity can justify cleaner technology investments (principally conversion to gas for fuelling the refinery plant). This environmental tagging is ironic - the South African government, together with its southern colleagues, has repeatedly denounced what they interpret as a northern agenda to use the environment as a barrier to trade (see Booklet 1). Yet the corporate use of the environment as a barrier to entry and a tool to consolidate power apparently meets with its approval.

Actual environmental benefits remain in doubt, however. In the case of Sasol, emissions will remain constant as expanded capacity absorbs the benefit of cleaner production. In Durban, SDCEA fears a similar outcome despite industry claims to the contrary. And there is considerable concern that the proposal for a 'world class' chemicals cluster in South Durban is tantamount to designating it as an environmental sacrifice zone.

Houses alongside industrial pollution in Zamdela, Sasolburg. Picture: Heeten Kalan

In the minds of many South Africans, environmental costs must be weighed against jobs. In the City of Durban alone, about 10,000 manufacturing jobs have been lost each year since 1996. Chemicals is the only industrial sector that has shown real growth in the city, but it is not a significant employer. To the contrary, major investment is aimed at greater automation and resulted in job losses throughout the 1990s. Following international trends, petrochemical upgrades included the restructuring of work with 'multi-skilling', substantial redundancies, and outsourcing of work redefined as 'non-core' business. High rates of unemployment in the communities neighbouring the refineries provide a cheap source of seasonal maintenance labour which is now supplied through labour brokers. Outsourcing exposed a gap in South Africa's labour legislation, allowing corporations to dodge responsibilities relating to wages, pensions and occupational illness and injury. This gap has been squeezed as government has tightened the definition of an employer. Casualisation, however, remains a feature of the labour regime. It makes workers and their families insecure and has a destabilising effect on their communities.

Even assuming the long term future of oil, this looks like a bad deal. But this assumption bets against evidence that the petrochemical industries themselves are in decline. Campbell (2002) argues that 2000 was oil's peak year and that consumption now exceeds discoveries of new reserves. He calculates an overall depletion rate of 2% a year. This would suggest that oil is destined for extinction by 2050. Yet the choice for petrochemicals will lead to irreversible change. This is not acceptable to the present generation of refinery neighbours and unlikely to be justifiable to future generations. The grim legacy of the carbon age will leave them with major clean up costs and severely restricted options for future development. And South Africa will have excluded itself from any significant role in the innovation of successor technologies.

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Endnotes

1 A btu is defined as the amount of heat energy required to raise the temperature of one pound of water by one degree Fahrenheit.

2 Bagasse is the residue from sugar cane milling.

3 Shell's 1987 Neptune Strategy was used to counter a boycott aimed at Shell's business dealings in apartheid South Africa.

4 The bucket technology is approved by the US Environmental Protection Agency. Results are valid for the moment and place of sampling - like a snapshot rather than a video.

5 Legal protection is matched by physical security. A huge wall topped with barbed wire, watch towers and electric fence ensures no entry.

6 Emissions levels are calculated on the basis of inputs, such as crude oil and plant fuel, and the technological process used for production.

7 Expansion entailed increase in throughput to 330,000bpd with high octane unleaded fuels as the main product.