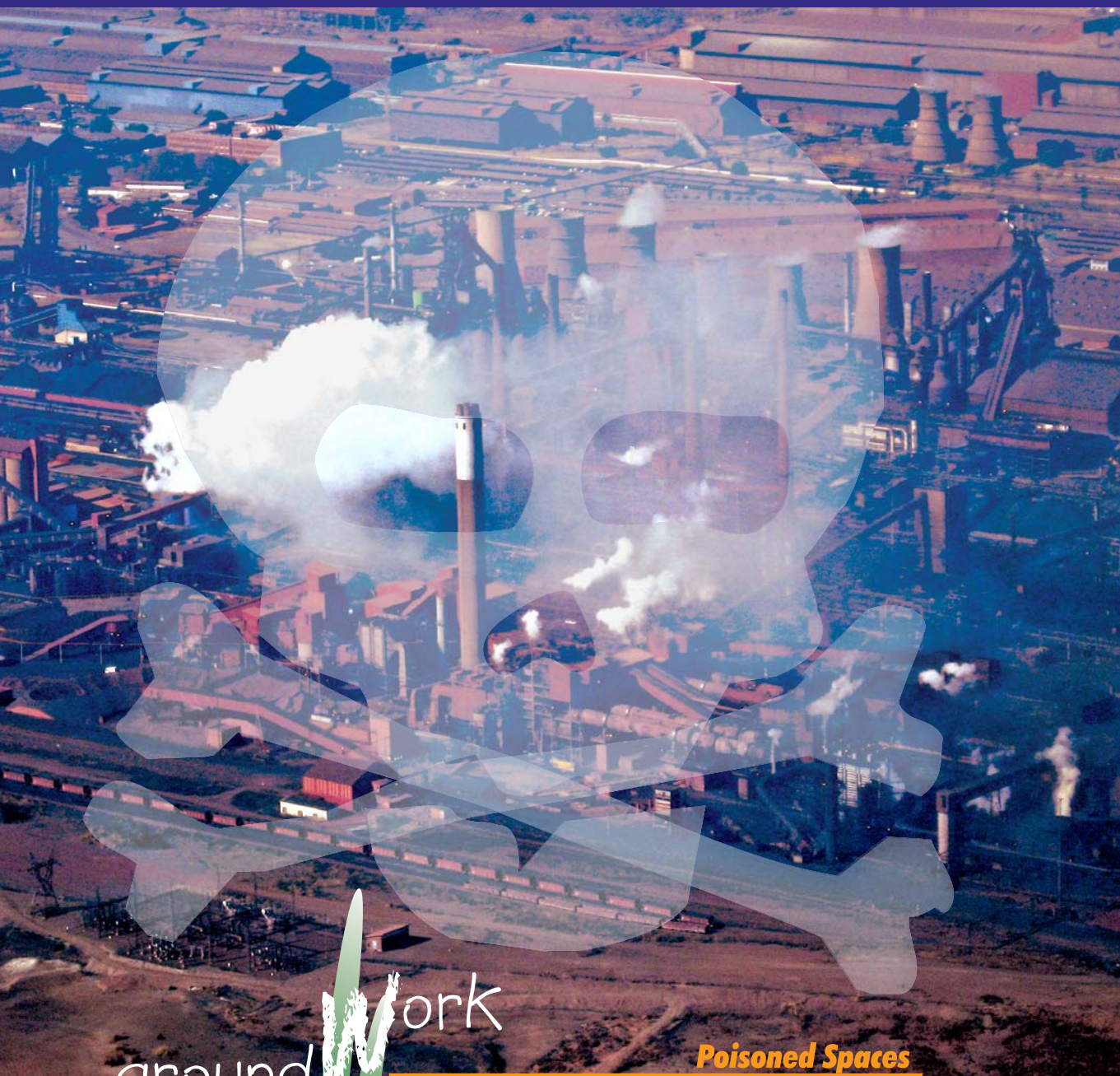
Poisoned Spaces

Manufacturing wealth, producing poverty



groundWork

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the groundWork Report 2006

The groundWork Report 2006:

Poisoned Spaces

Manufacturing wealth, producing poverty

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Cover page: Mittal Steel's factory in Vanderbijlpark (Iscor)
Photo by Victor Munnik

Foreword

Today, we celebrate Human Rights Day on the 22nd of March because of the struggles by Sharpeville residents in the Vaal Triangle against the Apartheid state, which resulted in the callous murder of at least 69 residents during a peaceful protest in 1960. Today, in this very same geographical and political space, resistance is emerging to the present corporate-led model of development that entrenches environmental, social and economic injustice. People are rising in resistance to the state's support for this model of development and proclaiming the challenge of democracy to deliver on another future.

groundWork is privileged to work and participate in the challenge to change the Vaal Triangle landscape. Whether, together with local people, we will be successful in creating and finding new democratic spaces to ensure a Vaal Triangle that delivers on the promises of the Freedom Charter and a democratic South African Constitution in the short to medium term is left to be seen, but the spaces we challenge for, and those that are created and held by local communities, will be the basis for long term change.

groundWork's interaction in the Vaal stems from a trip to Sasolburg in April 2000, when I, together with Desmond D'Sa, a member of the South Durban Community Environmental Alliance, met and talked with local community people to try to understand the problems they faced living on the fenceline of the Sasol petrochemical cluster. It was an amazing road journey that started at 4 o'clock in the morning and took us through the backwaters of rural Free State, to arrive in Sasolburg seven hours later to meet with community people we had only spoken with over the phone until then, and then back to Durban at 11 o'clock that same evening.

The first drive through Sasolburg sent shivers down my back – it terrified me, and it still does. Blue and yellow flares, tasting the smell of chemical emissions and being overpowered by the intensity of the visual intimidation of this industrial complex, was an experience that I have since relived in

various places in the Vaal Triangle. Since 2002 groundWork has developed a strong relationship with communities in the Vaal Triangle and has worked at developing relationships, both nationally and globally, between the Vaal communities and other civil society members who experience similar environmental injustices determined by global corporate-led states.

Corporate led injustices perpetuated against the people in the Vaal began in the apartheid era and are still starkly evident today, with environmental injustices perpetuated daily by state supported industrial pollution. This is a place where people are impoverished and denied their constitutional rights, not least of which their right to an "environment that is not harmful to their health and well-being", by capitalism.

This groundWork Report, our fifth in seven years, reflects on the challenges faced by people in the Vaal Triangle, builds upon the previous reports in the series and seeks to create a resource for people to strengthen their struggles, not only in the Vaal, but also nationally.

Acknowledgements

Thanks to the many people who gave their time to help with the making of this report. The idea of making the Vaal Triangle the focus of the fifth groundWork Report was largely inspired by the formation of the Vaal Environmental Justice Alliance (VEJA) in 2005. VEJA is composed of 12 organisations who have been active on different fronts of environmental justice. VEJA brings both the people and the issues together in a common front for the first time and so takes the struggle for people's rights and environmental justice to a new level. Organisations participating in VEJA are:

- African Genesis Heritage Environmental Club;
- Boipatong Environmental Working Group (BEWG);
- Christian Knowledge Independent Churches Forum (CKICF);
- Friends of Steel Valley (FoSV);
- Justice and Peace Desk of the Catholic Bishops' Conference, Bophelong;
- National Union of Metalworkers of South Africa (Numsa);
- Samancor Retrenched Workers Crisis Committee (SRWCC);
- Sasolburg Air Quality Monitoring Committee (SAQMC);
- South African National Civics Organisation (Sanco), Sedibeng region.
- Steel Valley Crisis Committee (SVCC);
- Tsebo (Adult Education and Training);
- Vaal Working Class Community Coordinating Committee (VWCCCC)

Activists from the member organisations took time out to show us around and introduce us to many other people in the Vaal Triangle. Our thanks to all for their extraordinary generosity in making us welcome and sharing their stories and insights. Our guides were Caroline Ntaopane and Belinda Ratau of SAQMC in Sasolburg and Zamdela; Matshediso Tsotetsi-Dhlamini of BEWG in Vanderbijlpark, Boipatong and Steel Valley, Phineas Malapela of VWCCC in Sebokeng and Evaton, and Thandekile Dodo of Tsebo in Bophelong.

The people that they introduced us to are not all activists within organisations but all are deeply engaged in the life of the area. They include Suping Mabifi and Elizabeth Mabifi of Zamdela; Themba Mjikane, chair of SAQMC; Mabuti Mlangeni of the Chemical, Energy, Paper, Printing, Wood and Allied Workers Union (CEPPWAWU); John Mbele, Israel Molefe, Freddie Mabaso and Setjele Mofokeng of BEWG; Lennox Msomane of Sanco and the Minister's Fraternal, Strike Matsepo of the Steel Valley Crisis Committee, Chakufmann Qhokoyi of Sebokeng Zone 15 and Ernest Sigaqana and the men of the KwaMasiza Hostel; Bafana Makhanya and Johannes Malindi of the Samancor Retrenched Workers Crisis Committee; Solomon Mtwala and Themba Joel Moko of the Wilderbeesfontein Evaton Community Organisation; Cyril Diwu of Bophelong.

We gained additional insights from a groundWork workshop with VEJA on air quality, facilitated by Bobby Peek, Siziwe Khanyile and Rico Euripidou. groundWork also organised a community exchange hosted by VEJA in the Vaal Triangle. Visiting organisations included the Voice of the Voiceless from Secunda and the South Durban Community Environmental Alliance. Collectively they gave us a good insight into the broader community of environmental justice organisations confronting industrial pollution and discrimination in spatial planning.

Anina van Wyk and the staff of the Vaal Teknorama Museum were most generous with their time while Tony Kent of the Bateleur's flew us over the area. Thanks also to Johann Tempelhoff, Jacklyn Cock, Stefan Cramer, Tshepo Sibusi and Neville Felix for discussions and information.

A reference group for the research team included Nina Benjamin, Peter Dwyer, David Fig, Siziwe Khanyile, Raj Patel, Bobby Peek and Salim Vally. A meeting of the group was a stimulating event in itself, fertile with ideas and suggestions, and the group's comments on the research proposal and on a draft of the report were most helpful.

Mark Butler has co-authored previous groundWork Reports but was unable to participate in writing this one. He nevertheless contributed substantially to conceptualising it and participated in the first research visit to the Vaal Triangle.

The team at groundWork were, as always, a pleasure to work with. This research is limited in terms of the longer term engagement with the people and environmental justice organisations of the Vaal Triangle. That commitment rests with groundWork and this research was intended contribute to it

without displacing it. Special thanks to Siziwe Khanyile who facilitated and accompanied our visits to the area.

The maps were produced by Brian Garman and based on those developed by Matrix Environmental Consultants for Yvonne Scorgie's 2004 report on air quality in the Vaal done for the Legal Resource Centre. This report has also drawn on previous groundWork Reports, on a report on energy policy by David Hallowes for the Sustainable Energy and Climate Change Project and on Jackie Cock and Victor Munnik's account of struggles over Iscor's pollution of Steel Valley.

This groundWork Report is dedicated to the memory of Thandekile Dodo who represented the adult education organisation Tsebo on the VEJA committee. He suffered from polio as a child and endured constant pain and ill-health throughout his life. He died on 17 July 2006. Dodo lived as an activist, fighting for access to education for poor children and organising adult education programmes as well as teaching classes. He also saw the broader context of poverty and linked the cause of education to that of environmental justice.

Contents

Introduction

This groundWork Report centres on the making of environmental injustice in the Vaal Triangle. There are three ways in which environmental injustice is imposed on people:

- By polluting them, degrading their environments and coercing labour to work for less than it costs to live. This is called **externalisation** because corporations get a free ride by off-loading costs onto communities, workers, the public purse and the environment.
- By dispossessing them and by privatising common or public goods. This is called **enclosure** because it eliminates or subordinates non-capitalist systems of production, so ensuring that all escape routes are closed and people cannot survive without capitalism.
- By **excluding** them from the political and economic decisions that lead to their being polluted or dispossessed.

This report argues that these processes are central to the larger process of accumulation that defines capitalist development and shows this for the Vaal Triangle.

Development is a highly unequal process, as is evident from the growing inequality of people globally and in South Africa. Those who control development do very well out of it as we shall see in Chapter Five. The poor who do not control development do rather badly.

Counting the money does not count the costs of environmental injustice. Pollution and environmental degradation affect everyone to some degree but the rich make sure that they live in pleasant places – less polluted, less dangerous and covered by insurance. The poor, by contrast, live with pollution and a variety of other environmental hazards. In short, the rich get the benefits of development while the poor carry the major costs of pollution and environmental degradation. With dispossession, the lines are even more clearly drawn. Dispossession is really theft, mostly accompanied by violence. The thieves get rich and those that they steal from are made poor. But these thieves are not brought before the courts of law because they, or their representatives, made

the rules that the courts will uphold. This is the point of exclusion. It is a matter of who really makes the rules.

The Vaal Triangle is one of the most polluted places on earth. This report is about how it got to be that way. So it is a history of the place – or rather, it is a history of the making of the space that we now call the Vaal Triangle. This history is not confined within the borders of the Triangle because those who managed its production did not live there and nor did they act in their own names. Rather, they represented interests in various companies or state formations which were in turn produced within broader webs of interest. The making of the Vaal Triangle is located within this wider history of development.

Contested development

Development was constantly contested by different elite interests located in various parts of the state and organisations of capital. These interests did, however, produce a more or less common language of development, an overarching story that defined what made sense – what issues and problems were important and how they could be contested, what kinds of statements were valid and should be endorsed or contested and what kinds of statements were invalid and could be dismissed, and whose voice carried authority. This story, or discourse, of development ran alongside and legitimated the material and physical processes of allocating money, commanding labour, appropriating land and other natural resources, mining into the earth and building infrastructure, factories and houses.

The central idea of this discourse was, and is, that profits must be accumulated and reinvested to make more profits. This is the basis of economic growth which is assumed to be a self-evident good. Just as the first priority of every private corporation is to make a profit, so the first priority of every government is to 'grow the economy'. Its performance is measured by gross domestic product (GDP) which adds up the 'value added' from all economic activity and represents the productivity of the economy. Similarly, big corporations now include a 'value added statement' in their annual reports to demonstrate their contribution to GDP and hence to society. It is their way of telling governments that they are, after all, indispensable. Statements that dispute the primacy of growth are dismissed as 'economically illiterate' and hence invalid. Chapter Five returns to this issue to show the power relations concealed through this discourse.

What remains to be argued about within the confines of this discourse is who controls the capital accumulated and decides how it should be distributed and reinvested. This is really an argument about who controls the direction of development. The participants in this discourse are always also trying to change the boundaries of what can or cannot be said. This is part of the game of power, and the opportunity to take command of policing the discursive boundaries is always presented in moments of crisis.

Regimes of power

In the 19th Century, British power was based on the liberal economics of 'free' markets and trade. As the leading industrial nation, this worked for Britain but not for the 'late industrialisers' – the US, the European powers, particularly Germany, and Japan. These states protected their 'infant industries' behind tariffs so that they could compete with lower cost production in Britain. Yet British capital, subsidised through its ability to extract value from the colonies, largely determined the flow of investment into these economies. Gold was a cornerstone of Britain's management of global economic dominance and its discovery on the Witwatersrand sparked the Anglo-Boer war. Chapter Two looks at how industry in the Vaal struggled into existence in the shadow of gold.

The two world wars of the 20th Century broke Britain's capacity for world leadership and its empire melted away. Anti-colonial liberation movements established independent states while the settler societies of southern Africa asserted independence from Britain. They did so within a new world order presided over by the US and policed through the mechanism of the Cold War with the Soviet Union. Following the US experience of the great depression and the New Deal, it was declared that the state should direct development and that growing GDP would lead to full employment. 'Keynesian' policies justified high tax levels and deficit spending to provide the 'developmental state' with revenues for investment. Trade tariffs protected infant industries while the US poured capital into the economies on the front line of the Cold War in Europe and the Far East. As Chapter Three describes, in apartheid South Africa the Keynesian benefits were reserved for white people while the Cold War served the interest of repressing the black majority.

The US did an about turn following the crises of the 1970s: its defeat in Vietnam and the 'oil shocks' that threatened its grip on the third world. The neo-liberal policies of the 'Washington consensus' aggressively asserted corporate capital's right to control the proceeds of accumulation and how to re-invest it and so to direct development. Tariff barriers were to be demolished and domestic

economies were forced to admit international capital on its own terms. These moves restored US power but did so at considerable cost to the global system as a whole and particularly to third world countries. Resistance to repression sharpened across the third world and a number of overtly repressive regimes were forced from power. In South Africa, the African National Congress managed a negotiated political transition and assumed power in 1994. Its accommodation within an increasingly unstable world economic and political system is described in Chapter Four.

The rise of giant private corporations was a particular feature of US power. Where British capital organised production and trade through networks of relatively small firms, these corporations were 'vertically integrated' to control and coordinate production from raw material input through all stages of manufacture to marketing the product. This model of centralised management was widely emulated, including by state owned corporations such as Escom. US power, however, ensured the international pre-eminence of its corporations which took "managerial control over substantial sectors of foreign economies" through foreign direct investments [quoted in Arrighi 1994: 73].

With the rise of neo-liberalism, the pendulum has swung back to networked production reminiscent of the British regime but with a difference: the leading transnational corporations have the power to dominate the new 'global production networks' and successive rounds of mergers and acquisitions have concentrated control of most industries in the hands of fewer and fewer corporations. But US dominance is no longer automatic and these corporations are now as likely to be Asian or European as American.

Resistance

Development was not all a one way street. Both the physical process and the discourse that shapes it have been resisted at every turn. People fought against the violent enclosures of colonialism just as they now fight against the privatisation or corporatisation of energy, water and waste services. They have fought in the great national liberation struggles to claim rights in decision making. And the civil society slogan, 'another world is possible', challenges the fundamental assumptions of the discourse of development at the global scale. People have not necessarily got what they want but these struggles have profoundly influenced the terms of development, shifting the lines of inclusion and exclusion, creating new alliances, provoking counter strategies from those whose interests are threatened, and opening new arenas of struggle. They are responses to the crises that development

visits on people and they feed back – for better or worse – into the world-changing crises of development.

Most commonly, on a daily basis, such struggles are waged on the local scale on the front lines where people come into direct confrontation with the orders of development. The environment, whether spoken or not, is always at issue in these struggles because people's environments are the places where they live, work and play, the air they breath and the water they drink. Defending environmental rights is finally about defending the means to life.

Yet the history of development has created different interests in, and relationships to, the environment. It puts environment at the centre of complex and contradictory interests. It creates different fronts of environmental struggle as people defend their rights from different positions: in the mines, factories and farms, as permanent, casual or seasonal labour, on the land, in formal or informal settlements, across the gender divide, and in the politics of consumption, of technology development, of media representation etc. These do not automatically add up to a common front. Rather, the fronts of development are scattered and contradictory.

Under apartheid, mining and industry were virtually immune to effective environmental regulation and workers suffered the negligence of health and safety standards. For the majority, access to wages took precedence over labour conditions. This placed them in an ambiguous relationship to the environment. Peter Lukey observes that "workers are closely linked to environmental degradation both as victims or, as labour in dirty industry, directly involved in the generation of toxic pollution" [1995, 16]. The point is poignantly confirmed by Josiah Makola who worked at a vanadium mine in Mpumalanga:

> Even though I know I am dying, I am just persevering because I was told by the company that I will not be employable anywhere else when I leave the company. So I think I am going to die here for the sake of keeping a job so that my child can finish school. [Quoted in Nyandu 1998, 16]

Nevertheless, the fronts of development can be linked through people, through activists recognising a call to solidarity with others fighting on different fronts and seeking to work through the contradictions that separate them to find a common language of struggle and a common

humanity which enables others without seeking to subordinate one struggle to another. The idea of environmental justice is precisely such an attempt to create a common language. And it is in the spirit of solidarity that various people's organisations in the Vaal area have come together to create the Vaal Environmental Justice Alliance (VEJA). Chapter One explores the fronts of environmental injustice that define their struggles.

Crisis and change

The groundWork Report 2005 argued that the world of US imperial capitalism is in trouble. It highlighted three global dimensions of this crisis. First, the pace of climate change is picking up. It is a further aspect of environmental injustice in that the poor will suffer first and worst. But finally, none will escape its consequences. It threatens the order of industrial development as such. Second, industrialisation has been based on cheap energy. The global depletion of conventional oil resources threatens the end of this. Nevertheless, using only a fraction of the oil that is now available will make climate change irreversible. Third, the US is rapidly losing the authority to lead the global regime of accumulation. Throughout the period of its dominance, it has used force. Increasingly it seems that force is all it has left and, despite its formidable military capacity, force is not enough. In Chapter Five, we review aspects of the progression of the crisis focusing particularly on Venezuela as a flag bearer of anti-imperialism. This provides for comparison with South African responses but also indicates the limitations of a state led project reliant on fossil fuels and, ultimately, on the imperial growth economy.

This crisis poses a massive challenge to civil society. In September 2005, civil society activists met in opposition to the agenda of the World Petroleum Conference in Sandton, Johannesburg. This agenda proclaimed the oil elite's intention to shape the world's energy future. Mindful of the scale of human and environmental atrocity associated with big oil's activities all along the production chain as well as the consequences of climate change, the activists responded that 'another energy future is necessary'. They endorsed the conclusions of the 2005 groundWork Report, that the oil elite's power "is neither stable nor inevitable and that it is always and everywhere contested and renegotiated" and that the potential for people's energy

> … lies in connecting the promise of renewable energy sources and technologies with social movements struggling for deep transformation of the way the world works. And even if these social and environmental justice movements do not succeed against the enormous power of

> the current regimes, and the descent into a post-fossil-fuel (and post-US empire) era of uncertainty and collapse continues, then the spaces of self-reliance and local democracy created through such struggles will emerge as the only viable basis for rebuilding a new world. [121]

Making another energy future is unthinkable unless is it part of making another world. Making another world is unthinkable unless it is driven by people and anchored in the reality of the places where they live. This reality is grounded in the everyday crisis in the lives of the poor described in Chapter One. Chapter Five contextualises it within the global crisis. It concludes that another Vaal Triangle is necessary as part of the broader necessity for change. It describes how VEJA and the organisations that participate in it are struggling for change. In doing so, they are increasingly linked with other organisations struggling for another South Africa and another world.

This report is part of a dialogue. It has been deeply informed by our conversations with people in the Vaal and we hope it rings true to them. It is not just about the Vaal but looks out from the Vaal to the rest of South Africa and the world that has shaped the Vaal. We hope that it helps get the story of the Vaal out but also contributes to ongoing discussion and dialogue within and beyond the Vaal.

This is not an easy story. It is filled with violence that is sometimes direct and brutal but always also insidious – a slow atrocity that periodically produces flashes that glare into publicity. We hope we have done some justice to the history but believe that it is more cruel and more destructive than we can describe.

1. The Vaal in South Africa

From a distance it seems that a number of hills rise prominently over the landscape of the Vaal Triangle. Coming closer, the hills turn to black and barren slag or to grey ash with a thin covering of vegetation. They are toxic solid waste dumps and at the foot of each hill of waste is the industrial plant that made it – Eskom's Lethabo Power Station just south of Vereeniging, Mittal's Vanderbijlpark steel works (formerly Iscor), Sasol's coal-based chemicals industries.[1] These plants themselves are impressive for their sheer size, and their smoke stacks and flares dominate the urban skyline. Enormous volumes of gas flow up these stacks and carry millions more tons of waste into the air. Hidden within the landscape are the lakes and pools of liquid waste and, beneath the ground, poisoned aquifers.

What is turned to waste comes from the ground. The towns of the Vaal Triangle are built on coal and black valleys are cut in the open cast mines while vast caves are dug out underground. Coal is moved by heavy trucks or conveyor belts, some stretching over 20 kilometres across the countryside, to feed a voracious industrial appetite for energy. Remote from the Vaal, but linked to it by the heavy industry infrastructure of railways, pipelines, power lines and roads, are the iron mines of Sishen and Thabazimbi, the manganese mines of Hotazel in the Northern Cape, the coking coal mines of Witbank, the gas fields of Temane off the Mozambique coast, and the oil fields of the Middle East and West Africa linked through Durban. The infrastructure also carries the product to market. The dominant domestic market of the Johannesburg conurbation is just 50 kilometres to the north and the northern Free State gold fields lie just to the west. Much of the product is exported through Durban, Richards Bay and Saldanha to the wealthy North or the booming economy of China.

This industrial space is also linked to the far corners of southern Africa, to Asia and to Europe in the lives and histories of the people. Its construction was a profoundly masculine as well as a racist enterprise and the men who designed, managed and built it came for opportunity or were driven to

[1]Eskom was Escom – The Electricity Supply Commission – until 1987 when the Afrikaans acronym was preferred. Iscor was taken over by Mittal and renamed Ispat Iscor in 2004 and then Mittal South Africa in 2005. In this report, we follow the historical usage.

work there by coercion. Many of those who are settled in the area have families in rural South Africa, in Lesotho and Mozambique and a part of the labour force still migrates for work.

The concentration of power

The Vaal Triangle is a major centre of the 'minerals and energy complex', founded on cheap coal and energy intensive mining and industry, that dominates South Africa's economy. For most of its history it has had a subordinate place within that complex – the poor relation expected to deliver cheap inputs for the greater profits of gold production. It has also been central to state strategies, first for 'inward industrialisation' which, in the 1970s and 80s, was reinforced by apartheid's security needs, and more recently for export oriented production. Its economy is still reliant on the 'primary' industries of energy and steel and on cheap labour.

The minerals and energy complex has made for a highly concentrated economy – one in which wealth and the power to direct development is held by a very few large corporations. This concentration of power is magnified in the Vaal where the giant state owned corporations have largely dictated the production of space and built instant towns on the open veld to serve their needs. The relationship between these state corporations and private mining and industrial corporations, as well as state and private finance corporations, has been close. It was founded on often tense negotiation and deal making relating to such issues as the price of energy and steel to the mines as well as the cosier co-operation on a variety of joint projects – 'public-private partnerships' as they would now be called. The 'mega-projects' give physical form to the concentration of power, first in the Vaal Triangle and later at Secunda (energy and chemicals), Richards Bay (aluminium smelting and coal exports), Saldanha (steel) and Maputo in Mozambique (aluminium smelting). Coega is the latest initiative in this line, although years of negotiation have not yet secured the aluminium smelter that government hopes will be the 'anchor' tenant for a larger industrial park.

The major towns of the Vaal Triangle are named for the industries that founded them and dominate their economies.

Vereeniging pre-dates the age of the mega-project. It was founded in 1892 on the vast Vereeniging Estate belonging to the partnership of Lewis and Marks.[2] The town only really developed as more than a coal mining village after 1910 with the building of the first Vaal power

[2] The Estate was named after Lewis and Mark's Zuid Afrikaansche en Oranje Vrijstaatsche Kolen en Mineralen Vereeniging – the South African and Orange Free State Coal and Mineral Mining Association.

station and the Union Steel Corporation works. Lewis and Marks' interest in the Free State gold fields, its collieries and the Vereeniging Estate were taken over by Anglo American in 1945. Anglo Coal remains South Africa's largest collier and one of the top global producers. It owns the New Vaal Colliery, a vast open cast mine covering 2,275 hectares on the bank of the Vaal River opposite Vereeniging. The colliery supplies Eskom's very large Lethabo Power Station, the latest of a succession of power plants in the area. The transnational Mittal corporation, which controls 10% of global steel production, has taken over Iscor and its Vereeniging plant produces 'long steel' products. There are several downstream metal and engineering works in the town as well as refractory, ceramics and brick and tile industries.

'Top Location' in Vereeniging was once the social melting pot of the Vaal area but now stands empty apart from the local museum. People were moved to the 'Sharpe Native Township', later Sharpeville, between Vereeniging and Vanderbijlpark. The specific intention was to move black African workers away from the town. Shortly afterwards, Indian and 'coloured' workers were moved from Top Location to Roshnee and Rust ter Vaal well north of the town. The elite of Vereeniging, meanwhile, have settled on the banks of the Vaal River upstream from the town.

The smaller town of **Meyerton,** north of Vereeniging, originates in late 19th Century land speculation. Samancor Manganese, jointly owned by global mining giants BHP Billiton and Anglo American, is the most significant industry with two plants: Metalloys produces manganese used as an alloy in steel production and DMS Powders makes ferrosilicon powders also for steel producers. Other industries in Meyerton produce bricks, tiles and domestic ceramics.

Vanderbijlpark is a company town planned by Hendrik van der Bijl to house workers for the giant Iscor works constructed in the 1940s. This is South Africa's original mega-project. Van der Bijl set up the state owned Iron and Steel Corporation in the late 1920s and the Vanderbijlpark plant represented the massive expansion of capacity necessary to establish the corporation as an 'integrated' steel producer controlling production from the iron ore mines, through iron smelting and raw steel production, to the manufacture of finished steel for sale to industry and the mines. Iscor was privatised in 1989. Now owned by Mittal, the plant produces 'flat steel' products. It occupies a massive site astride a ridge above the town. Several lesser, but nevertheless substantial, downstream metal and engineering plants are clustered around Mittal.

The formerly white town stretches south to the river some eight or nine kilometres from the plant. It

starts with white working class housing, separated from Mittal by a light industry buffer zone, and gets richer with the distance from the plant. Nearest to the river and furthest from the blast of air pollution, wealth is visibly displayed in opulent houses. The brassy Emerald Casino, occupying a good stretch of river front, fits the neighbourhood. A park, the last public access to the river, is now being privatised. The real wealth of Vanderbijlpark, however, is overseas in London where corporate boss Lakshmi Mittal splashed R840 million on a house of unrivalled extravagance.

Bophelong and Boipatong, located west and east of the Mittal plant, are Vanderbijlpark's original townships. They were designed to house black workers close to work and so that the way to work would not take them through the white town south of the plant. Sebokeng lies to the north of Mittal. It starts with worker hostels built in the 1960s and 70s and recently converted to residential units. To the north again, Sebokeng merges with the older settlement of Evaton where a history of black freehold has created a mix of owners and tenants and of middle and working class residents. Beyond this is Orange Farm, a settlement of iron 'shacks' which was originally a last refuge for people who had nowhere else to go and which remains at the economic periphery of the Vaal to the south and greater Johannesburg to the north.

Sasolburg was established four years after Vanderbijlpark on the other side of the Vaal River. It is also a company town, taking its name from Sasol, the South African Oil and Gas Corporation initiated as a state owned corporation. The town is now a major hub for the petrochemical and chemical industries. The major plants include Sasol and Total's Natref refinery, Sasol Gas, Sasol Chemical Industries (SCI) – producing olefins and surfactants, fertilisers and explosives, waxes and a variety of other chemicals – Sasol Polymers, Karbochem and Dow Chemicals. Sasol's Sigma Colliery supplies SCI as well as Sasol's own power plants which supply electricity and steam to the chemical works. Sasol was privatised in 1979 and, since 1994, has developed into a substantial transnational corporation. It is now tied into petrochemical global production networks through a web of partnerships which include the oil super-majors ChevronTexaco and Total and chemical giant Mitsubishi.

As at Vanderbijlpark, Sasolburg's white suburbs were designed as a 'garden city' with tree lined avenues. The white working class areas are closest to the chemical plants and dumps while wealthier Vaalpark is to the north closest to the river. Zamdela, the black township, is separated from Sasolburg by the dumps. It lies in a triangle of land formed by the chemical works to its north and mines and dumps to the west and is in the path of the prevailing plume of pollution.

Industrial energy

The concentration of economic power in South Africa has led to one of the most energy and carbon intensive economies in the world, second only to Venezuela. Table 1 is based on the Digest of South African Energy Statistics 2005.[3] It shows where the energy comes from. Primary energy is the original source of energy. Final energy is the form in which energy is actually used. The table shows both the absolute amount of energy in PetaJoules (PJ)[4] and the proportion of energy (%) supplied from each source.

In 2002, South Africa's total primary energy supply came to 4,630 PJ. 64% of this energy came from coal, down from nearly 80% in 2000 according to the Digest. Coal is the dirtiest possible source of energy. It is used in three ways: it is converted into electricity by Eskom; it is converted into liquid fuels and chemicals by Sasol; or it is used directly as 'final energy' in industrial processes. The best quality coal is exported. Imported crude oil is the next largest source of primary energy and increased its share of the energy supply from 9.7% in 2000 to 22% in 2002. This suggests increased dependence on imported crude oil.[5] It is mostly converted into liquid fuels by the oil refineries.

Table 1: Primary and final energy in South Africa in 2002.

	Primary energy		Final energy	
	PetaJoules	%	PetaJoules	%
Total	**4,629**	**100.0**	**2,368**	**100.0**
Coal	2,961	64.0	663	28.0
Crude oil	1,019	22.0	n/a	n/a
Renewables	426	9.2	189	8.0
Natural gas	84	1.8	47	2.0
Nuclear	131	2.8	n/a	n/a
Hydro	8	0.2	n/a	n/a
Electricity	n/a	n/a	665	28.0
Liquid Fuels	n/a	n/a	805	34.0

Compiled from The Digest of South African Energy Statistics [DME 2005].
Primary energy is the original source of energy. Final energy is the form in which energy is used.

[3] The Digest of South African Energy Statistics 2005, produced by the Department of Minerals and Energy (DME), is the most recent source of energy information. There are major discrepancies between its figures and those of the Energy Outlook produced in 2002. The DME says this is the result of improved information, minor changes to methods of collecting data and what appear to be substantial changes in assumptions used in allocating energy use to different sectors. In general, the Digest makes South Africa's energy performance, and the energy sector's environmental performance, look better than the Energy Outlook did.

[4] A joule is a basic measure of energy. A PetaJoule is 1,000,000,000,000,000 joules. 3.6 PJ is equivalent to one TeraWatt hour (TWh), or 1,000,000,000 KiloWatt hours (KWh), of electric energy.

[5] Given that oil prices have more than doubled since 2002, coal sales may have rebounded.

The final energy available for use comes to 2,368 PJ. This means that more than half the primary energy is lost in the process of converting it into electricity and liquid fuels. A large proportion of the lost energy literally goes up in smoke through the chimney stacks at the power stations and refineries.

Box 1: Greenwashing renewables

The figure given for renewable energy in Table 1 is deceptive. It is almost entirely accounted for by biomass while the supply from wind and solar energy is minute. Over half the biomass supply is from sugar and wood pulp wastes used to generate energy for sugar and pulp mills. Biomass is properly renewable only if its production is sustainable. High energy mono-crop sugar and plantation forestry do not meet this criterion. Moreover, Mondi has introduced an incineration technology to convert pulp waste to energy at its south Durban plant. It says the waste will not be contaminated with toxic substances used in its processes but there is no clarity on how this will be independently monitored. And Mondi will in fact burn more coal than before.

Classifying these wastes as renewable seems designed to 'greenwash' the figures and to anticipate 'bio-fuel' production. Plans to build refineries to produce ethanol and bio-diesel from sugar and maize are already on the drawing boards with support from DME and other government agencies such as the Industrial Development Corporation (IDC). Again, the inputs will come from unsustainable agriculture and less energy will come out of these crops than went into the growing of them. The implications for people's food security are severe. Lester Brown notes that, "The grain required to fill a 25-gallon SUV gas tank with ethanol will feed one person for a year" [2006].

The rest of the biomass supply is from fire wood used for domestic consumption. Information on this is very unreliable and the figures may be exaggerated. The use of fire wood is sustainable only if harvesting is balanced by new growth. In many areas of rural South Africa, where people are starved of energy, this is not so. The burden of collecting wood falls mainly on women who have to walk further and further as supplies are depleted. This results from the unequal distribution of energy resources and the long history of repeated dispossessions.

Industry uses the largest part of South Africa's available energy as shown in Table 2. Within the industrial sector, the steel (29%) and petro-chemicals plants (22%) are the two biggest users. Over 45% of the energy used in steel making comes directly from coal and coke with a further 23% coming from electricity [Outlook 2002: v]. Mittal's four South African plants[6] consume about 169 PJ and the Vanderbijlpark plant alone consumes a massive 76 PJ.

Sasol's coal-based processes are largely responsible for the extraordinary intensity of energy use in the petro-chemicals sector. Over 80% of the energy used to make liquid fuels and chemicals is directly supplied by coal and Sasol is the only producer that uses coal to drive its plants. Sasol's global energy use is 443 PJ excluding coal, oil or gas converted into liquid fuels and chemicals. Most of this energy is consumed in its South African plants at Sasolburg and Secunda. Sasol's Sustainable Development Report does not give the figures for South Africa or for Sasolburg. It states that locally relevant information is available from the company. In response to a request for this information, Sasol officials said this statement "may be a bit misleading" as the information was not available to the public.[7] The crude oil refineries are also intensive energy users by any measure other than comparison with Sasol.

The big industries of the Vaal Triangle are thus both major producers and consumers of energy. Eskom's 3,700 MegaWatt (MW) 'six pack' Lethabo Power Station is one of the largest in the country. The Sasol One plant in Sasolburg started off making synfuels from coal but now uses the same

Table 2: Final energy demand by sector in 2002.

	Total energy		Electricity	
	PetaJoules	%	PetaJoules	%
Total	**2,368**	**100.0**	**665**	**100.0**
Industry	840	35.5	417	62.7
Mining	184	7.8		
Transport	636	26.9	22	3.3
Residential	425	18.0	109	16.4
Agriculture	73	3.0	17	2.5
Commerce	144	6.0	66	10.0
Other	35	1.5	34	5.1
Non-energy	32	1.3		

Compiled from DME 2005
'Non-energy' includes chemicals, plastics and paper made from coal, oil, gas or wood.

[6]Apart from Vanderbijlpark and Vereeniging, Mittal has plants at Newcastle and Saldanha.

[7]Personal communication 11 May. Sasol did make available its Sasolburg SH&E (Safety, Health and Environment) brief for 2005. The brief gives figures for water consumption but not energy consumption. It also gives figures for ambient air quality as measured by Sasol itself, but not air emission figures.

Box 2: Tricky statistics

Energy statistics are tricky things. While the Digest allocates 18% of energy consumption to households in 2002, the earlier set of official figures given in Energy Outlook 2002, allocated just 9% in 2000. So the Digest doubles the proportion of energy used by households.

The difference seems to lie in 'non-energy'. Non-energy includes chemicals, plastics and paper made from coal, oil, gas or wood. In other words, it is products made from energy resources but which are not used to produce energy. While the Digest allocates 1.3% to non-energy, Energy Outlook allocated 16%. So most of what was defined as non-energy is now defined as household energy use.[8]

There are two significant implications: The first is that non-energy makes up nearly half of the energy that goes into households. This would include all sorts of household items that are now made from petrochemicals. Packaging, however, presumably makes up a significant portion of this non-energy. Much of it is designed for instant dumping, having no use other than for marketing, and most of it goes to the town dump sooner or later. Municipal dumps are mostly located in poor areas. In 2005, they took 20 million tonnes of waste, most of it from rich households.

Waste policy mandates the minimisation of waste as its first priority. This would imply measures to eliminate unnecessary packaging but is largely ignored. Recycling is the second priority but there is not one municipality that has developed systems to do it. The last resort, according to policy, is 'safe disposal'. Most of South Africa's dumps are not safe and they pollute their neighbourhoods. But dumping is in fact the only real waste management strategy in place.

The second implication relates to the politics of statistical representation: packaging foisted on more or less unwilling consumers is allocated to household energy consumption rather than being attributed to the commercial (retail) sector that requires it, or to industry that produces it or to the municipalities whose dumps are in fact the 'end user' of most packaging.

[8] Energy Outlook's figures are for 2000. The figures for 2000 given by the Digest are 16.4% to residential and just 1% to non-energy

basic process to make heavy chemicals. Sasol and Total own the Natref crude oil refinery in Sasolburg, the oil being piped up from Durban. Mittal's Vanderbijlpark plant's consumption is nearly equivalent to Lethabo's annual output,[9] while the Vereeniging plant, at one tenth the size, is a significant consumer.

The cost of electricity to energy intensive industries is the lowest in the world. The cost to households is relatively high and higher still for poor people on 'pre-paid' systems. The Digest allocates 18% of total energy consumption to the residential sector. On these figures, all South African households consume 425 PJ. The Vaal's 1.5 million people would thus consume about 15 PJ and the larger part of this would be consumed by the richer minority.

Fronts of environmental injustice

The history of development has created many fronts of environmental injustice. Thus far, the costs have been mostly displaced onto the poor but the economy as a whole will soon start feeling the pinch as development pushes up against ecological limits while making those limits ever tighter.

The Vaal Environmental Justice Alliance (VEJA) was formed at a meeting of community based organisations and groups fighting for environmental justice on different fronts of development. The meeting drew groups from across the political spectrum because "everybody in the Vaal is polluted".

Taking inspiration from the well established South Durban Community Environmental Alliance (SDCEA), VEJA is inclusive. Some organisations bring large constituencies while others are small activist groups. The Vaal Working Class Crisis Committee, formed in response to mass retrenchments in 1998, has successfully challenged Iscor on unfair evictions from houses and hostels, unfair labour practices connected to outsourcing, and corruption. The Samancor Retrenched Workers Crisis Committee represents workers unfairly retrenched and not compensated for damage to their health. The Sasolburg Air Quality Monitoring Committee and the Boipatong Environmental Working Group are specifically focused on pollution and are sharing ways of building resistance while the African Genesis Heritage Environmental Club has a conservation focus. Tsebo is a socially engaged educational organisation. VEJA itself is politically non-partisan but includes the local branch of the ANC-aligned South Africa National Civics

[9] According to Mittal South Africa's 2005 Annual Report, it consumes 23.99 GigaJoules (GJ) of energy per tonne of steel produced compared with an international industry benchmark of 19 GJ/tonne. Vanderbijlpark produced 3,166,000 tonnes in 2004. Assuming that its energy intensity is the average for Mittal South Africa, it therefore consumes 75.9 PJ which is equivalent to 20.8 TWh. Lethabo produces 21.5 TWh annually which is just more than one tenth of Eskom's total production of 205.5 Twh.

Organisation which has a strong history of local activism. It also includes religious organisations. The Christian Knowledge Independent Churches Forum of South Africa has brought thousands onto the streets in protests against poor service delivery while the Catholic Justice and Peace groups draw on a long history of committed social engagement. Trade unions have shown a more cautious interest. The National Union of Metalworkers of South Africa formally participates in VEJA while Solidarity has participated in some meetings. The immediate spur to VEJA's formation was the catastrophic poisoning of Steel Valley's groundwater. The Steel Valley Crisis Committee was formed in response to this tragedy. The Friends of Steel Valley was formed to network solidarity and support for their struggle. The resolution to establish VEJA was taken at a workshop organised by the Friends of Steel Valley.

VEJA's expressed demands are:

- The end of pollution in the Vaal Triangle
- The repair of pollution damage to the environment
- Compensation for pollution damage to people's health & livelihoods

The struggles brought together in VEJA mark out different fronts of environmental injustice. The process of producing the space of the Vaal Triangle, of turning what was the open veld landscape of the pre-colonial Tlhaping people into an industrial and urban space, was dominated by the powers of the state and of capital and driven by conflict. It has not been a tidy process as different elements within the state and within capital have come into conflict with each other or made alliances according to the contingencies of the day. More broadly, these powers have sought to control labour and people and have, at every turn, met with resistances which profoundly influence the process itself. This section hopes to give a sense of the fronts of environmental injustice and the struggles that shape them in the Vaal today.

Toxic externalities

Bad air on the fencelines

Despite its relatively small economy, South Africa is the 14th biggest carbon emitter in the world and a major contributor to climate change. In their annual reports,[10] the Vaal Triangle's big corporations all state their commitment to reducing carbon emissions but the results that they report are not impressive. Eskom says its overall carbon emissions increased in 2005 due to increased electricity demand. Sasol's total carbon emissions were down, partly because it switched

[10] Eskom 2005; Sasol 2005a; Mittal 2004 & 2005.

from coal to gas as the feedstock for chemical production at Sasolburg but mostly because of interrupted production. Its carbon intensity – emissions per unit of production – actually increased because more of its product came from carbon intensive processes. Similarly, Mittal's carbon intensity increased substantially from 2003 to 2004, although it achieved a marginal decrease in 2005.

Along with carbon comes a cocktail of other air pollutants with immediate consequences for people's health and well-being and for the productivity of natural resources.

Table 3: Air emissions and ash from main energy and chemical producers in 2004

Pollutant	Eskom	Sasol Synfuel (Secunda)	Sasol Chemical Industries	Crude oil refineries
Carbon dioxide	197,700,000	52,164,000	7,100,000	3,570,894
Sulphur dioxide	1,779,000	189,923	26,000	18,212
Nitrogen oxide	797,000	148,300	22,000	4,790
Particulates	59,170	8,000	3,000	*898
VOCs	-	409,783	42,000	**7,724
Ash	33,100,000	10,030,000	1,792,000	

Compiled from industry sources
*** Excludes Sapref. ** Excludes Natref.**

The Vaal Triangle has, not surprisingly, been declared an air pollution 'priority area' by the national Department of Environmental Affairs and Tourism (DEAT). It is the first pollution hotspot to be declared a priority area.[11] Yvonne Scorgie produced a comprehensive report on air quality in the area in 2004 based on available information. She warns that this information is far from complete, mostly not validated and often dated. It should be added that all information on industrial source emissions and most information on ambient air quality comes from industry and that, throughout the world, industry commonly under-reports or conceals emissions. Scorgie lists a total of 58 polluting industrial and mining activities and the top polluters for particulates, sulphur dioxide and carbon dioxide are ranked in Table 4 based on information that dates from 2000. The Vaal Triangle totals at the bottom of the table include emissions from all the industries listed by Scorgie.

Other big ticket pollutants are nitrogen oxides from all the big plants and hydrogen sulphide from Sasol's coal based processes. Sasol is South Africa's biggest source of volatile organic compounds (VOCs)[12] while Mittal also emits significant amounts but does not report them. VOCs include a

[11] Other pollution hotspots include Secunda, south Durban, Richards Bay and Table View in Cape Town, areas in which groundWork is active.
[12] VOCs are also reported as 'non-methane hydrocarbons' in corporate reports.

Table 4: Ranking of top industrial polluters in the Vaal Triangle in 2000. Emissions given in tonnes per annum (tpa).

Particulates (PM10) / tpa		Sulphur dioxide / tpa		Carbon dioxide / tpa	
Iscor Vanderbijlpark	8,990	Eskom Lethabo	219,868	Eskom Lethabo	21,920,000
Eskom Lethabo	8,150	Sasol SCI	33,061	Sasol SCI	7,100,000
Iscor Vereeniging	8,046	Iscor Vanderbijlpark	23,203	Iscor Vanderbijlpark	6,244,000
Sasol SCI	6,618	Sasol/Total Natref	19,144	Sasol/Total Natref	3,076,950
Vaal Triangle Totals	43,040		298,624		38,565,422

Compiled from Scorgie 2004.

heady range of chemicals which evaporate easily into the air and most of them are highly toxic. Sasolburg Air Quality Monitoring Committee (SAQMC) activists, using low tech 'bucket' sampling, revealed some 16 different VOCs in Zamdela's air in 2000. Several of these compounds had not previously been reported in South Africa. Samples showed dangerously high levels of benzene and high levels of toluene and xylenes at some sites.

Sasol has recently switched from coal to gas piped from Mozambique to provide the feed stock for chemical production. According to its annual report, this has reduced its sulphur dioxide and nitrogen oxide emissions in South Africa and eliminated "hydrogen sulphide odours" at Sasolburg [2005a: 58]. It also promises to reduce emissions of eight VOCs – benzene, butadiene, ethylene oxide, propylene oxide, vinyl chloride monomer, acetaldehyde and formaldehyde – by 50% over the next ten years. Mittal reports only its greenhouse gas emissions. It ignores all other emissions but claims to be implementing several dust abatement projects. Eskom says it reduced particulate emissions per MegaWatt hour by installing filter bags at Hendrina and Arnot stations and by "optimisation of the sulphur trioxide flue gas conditioning plant at Lethabo Power Station" [2005: 120]. The improvement has, however, been largely off-set by increased production. Its sulphur dioxide and nitrogen oxide emissions have increased in line with production.

Scorgie shows that industry emits 90% of total air pollution in the Vaal Triangle. Much of it is emitted from high stacks claimed to reduce the local impact. During winter, however, temperature inversions trap pollutants in the lower atmosphere, creating a visible brown haze, and down-drafting brings the pollution down to earth. Most high stack emissions in fact come to earth within a 10 kilometre radius. Further, particulates from Mittal and VOCs from Sasol are emitted close to the ground while dust from coal, slag and ash heaps blows across neighbouring settlements. Spontaneous combustion at New Vaal Colliery results in repeated fires at ground level, emitting the full range of pollutants without abatement [See Box 9 in Chapter Three].

Throughout the Vaal Triangle, people complain of itching eyes and burning mucous membranes whenever the wind is in their direction. Zamdela, across the road from the Sasol One chemical plant and downwind of it, is particularly hard hit. Even following Sasol's conversion to gas, the air has a sharp chemical smell and people complain of constant headaches.[13] Health impacts, and struggles for information on health impacts, are reported in more detail in Chapter Four.

Metal pollutants are a growing area of concern. Samancor releases manganese to the air. Mittal releases manganese, chrome, iron and other heavy metals. Coal also contains trace metals including mercury which is highly toxic even at very low levels of exposure. Mercury is present in minute proportions but the massive scale of coal burning by Eskom, Sasol and Mittal makes it significant.

Incidents – fires, explosions, leaks and flaring – occur with alarming regularity at many South African plants. As well as adding to the overall burden, incidents produce pollution spikes that result in intensive exposure. Even where the duration of such exposures is limited to a few minutes, the impacts on people's health are often severe and can be long lasting. Moreover, successive exposures have a cumulative effect which comes on top of the background exposure from normal operating emissions.

In April 2004, Lethabo's sulphur trioxide flue gas conditioning plant sprang a leak. This is the plant that Eskom now claims to have 'optimised' to reduce particulate emissions. While the plant was down Eskom simply by-passed it. The DEAT allowed Eskom to multiply by four the volume of its emissions for a period of twenty days.

Sasol's disastrous record of incidents in South Africa in 2004 was reported in The groundWork Report 2005. Table 5 below shows the number of environmental incidents in Sasolburg that Sasol itself reports. They include incidents affecting water and land as well as air. The bottom row shows complaints from the public as well as neighbouring industries. Releases to the air are commonly through the flares or directly from equipment which leaks or explodes. In the two months of February and March 2006, Sasol reported four major and serious incidents, including a major release of 5.74 tonnes of vinyl chloride which is highly toxic.

In July 2005, Sasol recorded "a few exceedances of the proposed annual standard of 1.6 ppb" for benzene.[14] This followed the release of 'cracker petrol' from the Sasol One plant. SAQMC reported

[13] The researchers can verify these symptoms from personal experience, even from relatively brief exposure during visits to the area.
[14] Sasolburg Community Working Group Minutes, 31 August 2005. Ppb is parts per billion.

petrol odours to Sasol on 26 July and took a bucket sample that showed benzene concentrations of 900 ppb. Exposure for one hour to this level of concentration results in serious symptoms. Sasol took its own sample 37 hours after SAQMC raised the alarm and after corrective actions had been initiated. It found 13 ppb and concluded that this did not warrant classification as a reportable incident. groundWork and SAQMC concluded that its sampling methodology was "clearly flawed if not deliberate".[15] SAQMC and groundWork sent all relevant information to the DEAT, which has regulatory authority for the large industries in the area, and called for Sasol to be prosecuted. The DEAT took no action to sanction Sasol.[16]

Table 5: Incidents reported by Sasol One and Sasol Midlands.

	2005/06			2004/05		
	Sasol 1	Midlands	Total	Sasol 1	Midlands	Total
Minor	52	70	122	40	66	106
Moderate	54	52	106	25	26	51
Serious	13	14	27	14	19	33
Major	1	8	9	0	1	1
Complaints	17	8	25	22	7	29

Compiled from Sasolburg Community Working Group Minutes 28 June 2006.
Note: Sasol's reporting period is 1 July to 30 June.

Sasol appears to benefit from a very relaxed definition of flaring incidents. Flares are safety devices. If there is a sudden build up of gas in the plant, it is directed to the flare to be burnt off. Notionally, the flare should need little more than a pilot light during normal operating. Sasol's flares burn brightly 24 hours a day. A flaring incident is then seen as a major emission of smoke from the flare. Local people say this happens almost daily but that Sasol does not have to report it unless the incident lasts longer than ten minutes. Moreover, in the absence of official monitoring, reporting is entirely at Sasol's discretion and its 2005 Sustainable Development Report makes no mention of flaring. In contrast, tighter regulation by the local authority resulted in the Engen Refinery in Durban reporting 109 flaring incidents in 2003.

Reporting by other industries in Sasolburg seems less consistent and less systematic. Between May 2005 and May 2006, Natref reported 18 incidents, Omnia 10, Karbochem and Senmin 19, and Dow 3. There is no independent verification of these reports nor any guarantee that there were not in fact more incidents.

Incidents are not accidents. They are in principle avoidable. An industry that cannot manage its processes without endangering workers and neighbours has no business being in business.

[15] Letter to DEAT, 2 December 2005.
[16] It made some recommendations to Sasol but there is no indication that their implementation will be monitored or, indeed, that the corporation is obliged to implement them.

Incidents are a sign of negligent environmental management. As such, serious incidents should attract punitive sanctions. None of the Sasolburg incidents has attracted sanction or any other visible enforcement from the DEAT.

Sasol manages four monitoring stations measuring a variety of pollutants. Its Sasolburg SH&E Brief [2005b][17] reports only the results for sulphur dioxide, hydrogen sulphide and particulates. Between July 2005 and May 2006 it recorded 14 exceedances of the air quality guidelines for sulphur dioxide, seven of them in July during winter inversion conditions. This seems very modest. In Durban by contrast, the number of exceedances recorded increased dramatically when the local authority took responsibility for monitoring, and new on-line monitoring equipment was installed. Chapter Four returns to the question of monitoring.

Poisoned waters

Intensive energy use is associated with intensive water use and pollution, which is ill-advised in a dry country. The water supply to Gauteng, the northern Free State and Mpumalanga is increasingly met by cross-watershed transfers from Lesotho and KwaZulu-Natal to the Vaal River and further transfer schemes are planned. At the upstream end, rural communities have been removed to make way for the large dams that supply the water and have lost their best land. At the downstream end of this massive 're-plumbing' of waterways, users across half the country – as far south as Port Elizabeth – will find themselves in competition with inland industry in years of widespread drought. Climate change greatly increases the likelihood of such droughts.

Eskom's national use in 2005 amounted to 347,135 million litres, Sasol's global use was 163,203 million litres – most of it in South Africa – while Mittal SA used about 19,833 million litres in 2004. The Vaal River Eastern Sub-System Augmentation Project, to be completed in 2007, will pipe additional water from the Vaal Dam to the eastern highveld and is particularly intended to secure the water supply to Eskom's Mpumalanga power stations and Sasol's plants in Secunda. In the Vaal Triangle, Lethabo draws 76,650 million litres annually from a specially constructed weir just downstream from the Vaal Dam, Sasol's Sasolburg plants draw 19,436 million litres [18] while Mittal's Vanderbijlpark and Vereeniging plants respectively draw 8,928 and 939 million litres.[19]

Much of the water used by industry is recycled or returned to groundwater or rivers but not necessarily cleanly. Indeed, transferring water from upstream locations is intended to compensate for the declining quality of the Vaal River water as much as to increase the supply. The additional

[17] SH&E stands for safety, health and environment.
[18] Calculated from daily average for February and March 2006, including raw and potable water, given in Sasolburg Community Working Group minutes for 26 April 2006
[19] Calculated on Mittal's reported consumption of 2.82 kilolitres per tonne of steel produced..

water is now causing the groundwater table to rise in much of Gauteng and this water is also highly polluted. In short, many parts of the province are sitting on top of a rising tide of toxic groundwater.

Nationally, according to the draft National Strategy for Sustainable Development, 82% of river systems are now threatened while half the country's wetlands are already destroyed. A number of small rivers and streams feed into the Vaal River through a complex of wetlands in the Triangle. The wetlands served both to regulate the flow of water and to filter it clean. These environmental services are now destroyed and the Rietspruit and Klip rivers carry a heavy load of pollution from the Reef mines and industries into the already polluted Vaal.

Mittal does not report effluent quantities although it produces it in large quantities. In 2005, Sasol produced 44,082 million litres of liquid effluent globally. Its Sasolburg operations produced 17,111 million litres which were treated and returned to the Vaal. The returned water carries a heavy 'salt' load into the river. [20] Before the conversion from coal to gas feedstock in 2005, the salt loading was 30% higher still.

Box 3: Industrial water pollution south of the Vaal River

Knowledge of pollution and its sources is becoming essential for local councillors and municipal officials. In training given to officials in June 2006, the DWAF identifies the following water pollution problems and pinpoints the sources.

- **Natref:** Contaminated groundwater in vicinity of evaporation dams; groundwater contamination in tank farm area.
- **Omnia Fertilizers:** Contaminated groundwater in plant area; spillages and seepages from hydrochloric tanks.
- **Sasol Chemical Industries:** Salt loading in surface water to Vaal Barrage. Discard dump causes groundwater pollution.
- **Dow Plastics:** Overflowing of effluent pond; storm water run off from site; currently no water use authorisation.
- **Karbochem:** Legacy issues regarding waste dumped on site; historic groundwater pollution.
- **Lethabo Power Station (Eskom):** Groundwater pollution at ashing facility.
- **New Vaal Colliery:** Groundwater pollution due to mining activities.

Source: Overview of Sustainable Environmental Management for Local Government Councillors and Senior Municipal Officials, 27 June 2006.

[20] The salts include a range of dissolved minerals not the stuff in table salt.

The industries of the Vaal Triangle itself have unerringly located their dumps and slimes on water courses. Eskom's Highveld and Taaibos Power Stations are now demolished but five hills of ash still leach contaminants into the Taaibosspruit. Lethabo is on the bank of the Vaal while the New Vaal Colliery that supplies it is bounded by a bend of the river. A few kilometres downstream, Sasol's Wonderwater open cast coal mine, recently closed, occupies another bend of the river. Sasol's ash dump and effluent ponds, as well as Sasolburg's town dump, are all located above the Leeuspruit.

Mittal's massive site is located astride a ridge above Vanderbijlpark and contains the mountainous slag heap and very large effluent dams. The dams have been in use since 1952 when Iscor started production but have never been lined to prevent effluent drainage into the groundwater. The ridge is a local watershed. In a detailed study, Cock and Munnik note that the site was purposely chosen "to allow for waste water to drain away effortlessly" [2005: 12].

To the west, it drains through what was once the smallholder farming area of Steel Valley. More than five decades of unmitigated pollution has poisoned the groundwater with a toxic mix of heavy metals, dissolved salts and hydrocarbons derived from coal. It has also raised the water table. By 1996, the poison plume from the effluent dams was thought to cover up to seven square kilometres. It is supplemented by leachate from the slag heap which rises darkly over Steel Valley and has not been capped. Farming is no longer possible: "People and animals have been poisoned, crops have failed and lives have been devastated" [18]. The area is now all but deserted. Just two of 500 smallholders remain and they live behind high electric fences, recently erected by Iscor, which mark what is effectively an environmental sacrifice zone. One of them, Strike Matsepo, says it feels like his home has been turned into a prison. This western drainage flows on to the Rietspruit River and thence to the Vaal downstream at Lochvaal.

To the east of the ridge, water drains through the populous black townships of Boipatong and Sharpeville before emptying into the Vaal. This was previously a complex of wetlands and streams and local people say they once found fresh water crabs. Now it is stagnant and lifeless. An unlined canal drains water from the Mittal site and runs below the town dump but groundwater still rises to the surface in many places. Local people believe that a "pollution plume is moving east, it is already in Boipatong and will soon be in Sharpeville" [quoted in Cock and Munnik 2005: 33]. They have seen what appeared to be scientists doing tests along the water course, but have received no clarity on the status of the water and have seen no action from the national Department of Water Affairs and Forestry (DWAF).

Steel Valley residents have challenged Mittal in a number of court cases and through direct action. The local and national media have also spotlighted their pollution. In Mittal's own words, "because of legislation, legacy issues, legal action against the works and increased pressure from state departments during the late nineties, the need was identified to develop an environmental masterplan."[21] Said to be 6,000 pages, the plan is secret so communities have to guess how much they have been polluted and trust Mittal to remedy it. Mittal says it has committed close to R1 billion for environmental mitigation. This includes what it claims is a 'zero effluent' water treatment plant opened in 2005. There has been no indication that the plan includes cleaning up the Steel Valley aquifer. At the same time, Mittal plans to spend R8 billion on expansion. The end result may be more, not less, pollution.

As with air, business as usual pollution is supplemented by incidents. Mittal reports a 'serious incident' in July 2004 when it spilt a "significant amount of 'Spent Pickle Liquor'" – a hazardous waste composed of acid contaminated with heavy metals and sludge[22] [2004: 64]. That this was reported represents some improvement on 1994 when Iscor failed to report a major spill of highly toxic chromium salts. Mittal says it has taken action to "prevent future similar incidents" but makes no mention of remedial action. Nor is there any reference to action or penalties by the regulator. Sasol reports three spills at the Sasol One site, including a serious spill of vanadium, in just the two months of February and March 2006.

South Africa is prone to floods as well as droughts, and the severity of floods will increase with climate change and so increase the likelihood of effluent overflows. Following rain, a white powdery substance – associated with sulphuric acid contamination – "covered the veld" in Steel Valley and flooding in 1996 increased the general levels of contamination according to erstwhile residents [Cock and Munnik 2005: 14]. In January 2005, oil contaminated water overflowed from Sasol's Secunda effluent dams into the Klipspruit River following heavy rain. Sasol reported the incident and took remedial action. What Sasol reports as 'very low volumes' overflowed from a Sasolburg ash dam into the Leeuspruit following rain in February 2006.

Floods also flush accumulated silts from river beds and wetlands. In the Vaal area, these silts are heavily contaminated. During flooding in January 2006, sewage works overflowed and contaminated silt was flushed into the Vaal River, resulting in major fish kills and the virtual destruction of the river's ecosystem, according to Die Beeld.[23] Sewage was identified as the primary

[21] Mittal Steel Vanderbijlpark and the Environment, brochure, 2006
[22] Pickle liquor is usually sulphuric or hydrochloric acid used to clean scale and oxides from steel.
[23] Die Beeld, 17 January 2006.

destroyer but it is most probable that there was also a heavy load of industrial pollution. This probability has not been investigated.

Poisonous work

South Africa's industrial workplaces are generally highly polluted environments and workers are often not provided with proper protective clothing and masks. Workers who live near polluting industry thus get a double dose – at work and at home.

In 1999, medical tests were carried out on 509 workers at Samancor. The results showed that most workers, from all sections of the plant, suffered from manganese poisoning. This affects the mind – creating dizziness and confusion – as well as organs such as the kidneys. Ex-workers believe that a high proportion of their comrades have died as a result, both before and after 1999.

The medical report to Samancor recommended that workers should be informed of their individual results. The corporation did not do this. Instead, it proposed voluntary retrenchments and, when workers did not agree, implemented forced retrenchments. Samancor agreed the redundancy deal with the National Union of Metalworkers of South Africa (Numsa) but the union did not consult its members – it merely informed them and, indeed, put pressure on them to accept the deal. The retrenchments gave redundancy but not illness benefits.

In the meantime, the report was leaked to workers. Having lost their union membership along with their jobs and finding no support from Numsa, they formed the Samancor Retrenched Workers Crisis Committee (SRWCC). SRWCC mounted a campaign demanding full reasons for their retrenchments and proper compensation for occupational illness from the corporation. In September 2006, Samancor offered the workers a deal in which all workers who suspect they suffer from manganism would be tested by a medical expert chosen by the workers and, if medically certified as suffering from manganism, would be compensated. The company would carry all costs for testing plus additional expenses like transport. In return, the workers must agree to participate in a new study on manganism and participate in clinical trials of drugs that could relieve the symptoms. At the time of writing, the workers had not yet responded to this offer.

Workers retrenched by Iscor before Mittal's takeover also observe that they received no compensation for occupational illness. They note that manganese from Samancor is just one of a number of toxic substances used or emitted at the plant at Vanderbijlpark and workers at the coke

ovens, smelting furnaces and tapping floors are also subject to extreme heat. Coke oven workers are typically exposed to a variety of volatile organic compounds, including benzene, and to hydrogen sulphide, carbon monoxide, ammonia and particulates. Furnace and tapping floor workers are exposed to heavy metal fumes, carbon monoxide and particulates. Further down the line, they are exposed to vapours from solvents and acids (pickle liquor) used to clean metal surfaces and to various chemicals used to coat it. Workers say typical symptoms include "high blood pressure, kidney problems, headaches, swelling feet, eye problems, ulcers [and] body swellings" [Cock and Munnik 2005: 41]. Respiratory illnesses are also widely reported while cancers should be expected.

Several workers observe that they were retrenched when they showed signs of occupational disease. They are unable to corroborate this because the corporation says that their health records were lost in a fire. The story of the fire is both convenient and vague and workers suspect that is more smokescreen than fire. More generally, they believe that Iscor used mass retrenchments to dispose of occupational health liabilities. The corporation agreed with Numsa to retrench workers over 45, reversing the common practice of 'last in, first out' and enabling Iscor to rid itself of workers who were already sick or whose long term exposure put them at risk. As at Samancor, workers say the union did not consult them on this policy change.

Throughout the Vaal Triangle, at Sasol as well as at Iscor and Samancor, workers and activists say that company doctors cover up occupational and environmental illness. Thus, it was said that company doctors always prescribe the same remedy irrespective of symptoms, that independent doctors give different diagnoses and frequently identify occupational and environmental causes, and that most workers cannot afford such independent advice but those who do risk losing their jobs if they talk about it.

Back at Samancor, many of the jobs have now been outsourced to contractors. Ex-workers see this as the continuation of a strategy, already evident in the corporation's approach to retrenchments, designed to reduce the corporation's liability for worker health and safety, while also limiting workers' rights. They say that those still working at the plant know that the job may cost their lives but cannot afford to lose their livelihoods. Numsa has apparently abandoned responsibility for health and safety at both Samancor and Iscor, accepting it as a management prerogative.

Throughout the Vaal Triangle people observe that outsourcing is now common practice. It takes

two main forms, with some variations in between. First, work is contracted out to small firms whose survival depends on the corporation and who must cut costs to meet the price terms dictated by the corporation. According to Mabuti Mlangeni, Sasolburg organiser for the Chemical, Energy, Paper, Pulp, Wood and Allied Workers Union (Ceppwawu), Sasol has now added to the price pressures by coordinating bidding for outsourced work and so intensifying competition between small firms. Cutting wages and health and safety standards are then made the basis for that competition. Second, jobs are made temporary as individual workers are employed on fixed-term contracts and redefined as contractors. Such contractors are often supplied through labour brokers, who are supposedly responsible for benefits such as pensions and medical aid, and contracts are managed to prevent claims for permanent employee status.

The effects of these practices are devastating. As reported in The groundWork Report 2005, 10 workers – 6 contractors and 4 employees – were killed and 360 injured in an explosion at Sasol's ethylene plant in Secunda in September 2004. In response to this incident, Sasol has undertaken a major safety review and promises a makeover of its safety training programme and safety 'culture' including "contractor management standards" [2005a: 45]. But it appears to duck the central issue of using contracting to cut costs and limit liabilities. This results in the long term erosion of institutional memory and intimate knowledge of complex plants. More immediately, it increases the likelihood of poor coordination and communication between different work teams.

In June 2006, despite the safety makeover, 19 people were injured in an explosion in Sasolburg. According to Sasol, an 'independent' contractor was clearing chemicals left by another contractor "after vacating the premises". Sasol's reporting is calculated to distance the corporation from responsibility, although it clearly controls the site as well as the terms on which both contractors operated. [24]

Enclosed economies

Jobs, income and poverty

Mining and heavy industry in the Vaal Triangle created a mass workforce largely made up of men. Workers faced the brutality of racist baasskap [25] and wages were below the costs of household maintenance. This regime was increasingly challenged by union organisation but much of the cost of production was transferred onto increasingly stressed families both in the townships and in the rural homes of migrant workers.

[24] Sasol press release, 6 June 2006.
[25] See Chapter Three for a description of baasskap.

Industrial restructuring since the late 1980s has torn apart and reconfigured this masculine workforce. Across the Vaal area, people see the same pattern: massive redundancies have left a core of workers at the big plants while what the corporations redefine as 'non-core' business is contracted out. Between 1993 and 1998, 46,000 jobs, including 20,343 manufacturing jobs, were cut on the Gauteng side of the Vaal Triangle according to development researcher Wim Pelupessy [2000: 8]. This followed the broader national trend. In the first decade of democracy, about two million full time formal sector jobs were cut in the name of competitiveness and productivity. Iscor alone cut 30,000 jobs nationally and Eskom cut over 10,000. Nor has the massacre of people's livelihoods been reserved for the urban areas. Many thousands of farm workers in the Free State have lost both their jobs and their homes and moved into the towns of the Vaal Triangle to find somewhere to stay.

What people see happening in the Vaal is what is evident at national and indeed global levels. Labour scholars Edward Webster and Karl von Holdt [2005] observe that the world of work is increasingly unequal and divided into three major 'zones': the core, non-core and peripheral zones.

Box 4: Retrenched and destitute

Workers retrenched from the Vanderbijlpark plant believe they were cheated out of their full entitlement. Many have given up and returned to their rural homes but a group of men living at the KwaMasiza hostel have remained to fight for their rights and are engaged in a protracted court challenge to the legality of their retrenchments.

It is a hard road. "I am here in prison waiting for the money due to me," says Ernest Sigaqana. He was offered a retrenchment package of R32,000 but refused to sign for it or to take it, believing that this was not the amount due after 22 years working at Iscor. The money nevertheless appeared in his bank account the next day.

All the men were migrant workers and their families still live at their rural homes. Sigaqana came to work at Iscor from Qumbu in then Transkei in 1979. The men observe that the policy of retrenching older workers left them without hope of getting another job. Most of them are in their late 50s and early 60s. The retrenchment money has long since run out but they are not yet eligible for pensions. Their families no longer visit them and nor do they go home. "There is no money here and no money there."

At the centre is the core zone of permanent full time workers, numbering 6.6 million nationally. Changes in the workplace regime have been highly uneven depending on the strategies and coherence of management and of unions at particular corporations and plants. Authoritarianism and racism remain entrenched in many plants and migrant workers are still employed, particularly in the mines including Sasol's Sigma Colliery.

In general, core workers' skills and wages have been upgraded and they have a degree of security both in their jobs and in benefits such as medical aid and pensions. They have access to legal rights under the post-apartheid labour laws and most are organised in trade unions. At the same time, they work under intense pressure to increase productivity and often in a dangerous environment. Mittal has two strategies for increasing productivity: multi-skilling to create a more flexible workforce, and retrenchments. It has a two year 'no forced retrenchments agreement' with unions but reduced its permanent workforce by 9% through voluntary retrenchments and by not filling posts during 2004 [54] and by a further 8.5% in 2005 [45]. Nevertheless, people in the Vaal Triangle observe that the big corporations find ways to get rid of workers who challenge them. Core workers are always at risk of being ejected from the inner zone.

Outside the inner core are the outsourced workers employed by contractors or employed as fixed term contract labour, numbering about 3.1 million. They may be part-time or temporary workers, many are 'permanently temporary' and most are poorly paid. They, and the small contracting firms, are at the beck and call of the corporations – available when work picks up, dispensable when it falls off and vulnerable to arbitrary reductions in pay. Mostly, they are not organised, partly because unions have not come to terms with organising them and partly because they are threatened with losing their jobs, or their opportunities for work, if they join one. Their insecurity is heightened by the knowledge there is a 'reserve army' of unemployed workers desperate to take their place. In Sasolburg, Sasol employs about 9,000 outsourced and contract workers as against 6,000 permanent workers.

The peripheral zone is made up of about 2.2 million informal workers and 8.4 million unemployed people. In Emfuleni Municipality north of the Vaal River,[26] Tielman Slabbert [2004] of the Vaal Research Group shows that about 9% of workers are active in the informal economy. They are regarded as employed however meagre or irregular their income. The garbage trucks arriving at Vanderbijlpark dump are met by more than 50 dump pickers. They compete for recyclables such as plastic sheets and metal, packing them into large bags. The market in recyclables yields slim

[26] Meyerton falls outside Emfuleni. Vereeniging, Vanderbijlpark and all the major black settlements of the Vaal Triangle north of the river fall within Emfuleni.

pickings but the pickers count as having jobs. Street traders set up their stalls mainly at taxi ranks but, because the people are poor, their income from trading is small. Unemployment in Emfuleni, using the broad definition,[27] was 51% in 2001 and rose to 54% in 2003 according to Slabbert. More than half the households in Emfuleni cannot afford the costs of bare subsistence and 64% cannot afford additional necessities such as school fees and medicines as well as subsistence.

South of the river in the Free State, Metsimaholo Municipality uses the narrow definition of unemployment in its Integrated Development Plan (IDP). It puts unemployment at just over 26% for the Sasolburg area. If the broad definition was used, the figure would be significantly higher. Further, this figure does not "accommodate the outflow of farm workers from farms to towns as well as growth in townships due to other reasons of urbanization" [Metsimaholo 2003: 5-3]. The way the figures are done, Metsimaholo's economically active population makes up only 42% of adults aged from 20 to 65. Local people believe something like 80% of all adults have no jobs and, according to the IDP, 63% "of the potential labour force earn no income" [5-3]. Many of these people are supported by others but more people now depend on fewer incomes. Fully 9% of households have no income whatever.

Throughout the Vaal, more men than women have jobs and women are more likely to have low paying work. Women are thus more likely to be poor. Poor households also tend to be larger than better off households, so what money comes in has to support more people. Most of those supported are children. They are the majority of the very poor. Pensions and child support grants mitigate this poverty to some degree but do not reverse it.

Government claims that over 2 million jobs were created in the first decade of democracy. Webster and Von Holdt note that most of these new jobs are either 'non-core' or informal. They conclude that "the erosion of core jobs, the growth of insecure and low-wage non-core jobs, and the expansion of the peripheral zone have generated a widespread increase in poverty" [2005: 23]. As with the apartheid work regime, the costs are transferred to households. Insecurity is taken home with alcohol abuse and conflicts over who spends what, and home becomes a fragile refuge, a place "to hide one's poverty" [24].

Enclave development

Clearly jobs are at a premium in the Vaal and local people say they want the big corporations to clean up, not to shut down. The corporations themselves see jobs as central to their 'social licence

[27] The narrow definition of unemployment includes only those of working age who are actively seeking work. The broad definition includes those who would like to work but have given up looking. The 'economically active population' is the number of people employed added to the number unemployed. The 'potential' work force includes all adults of working age who are able to work.

to operate'. Yet people are increasingly questioning the logic. They remark that those born in the Vaal Triangle are less likely to get jobs than newcomers to the region. One reason is that, having grown up in the bad air of the Vaal Triangle, locals tend to fail the pre-employment medical test.[28] The corporations, it seems, rely on the fresh blood of people they have not yet contaminated.

They also observe that these industries are capital intensive and are making very substantial profits but few jobs. After so many rounds of retrenchments, Iscor is no longer seen as a source of work. The local economy may be heavily dependent on the corporations but more and more local people see less and less benefit. They are 'de-linked' from this formal economy and the money simply by-passes them. This is the logic of 'enclave' development.

The most extreme examples of enclave development are associated with extractive industries – mining and particularly oil – in poor countries with 'failed states'. The groundWork Report 2005 described ChevronTexaco's luxury Malongo compound in Cabinda, Angola, which is separated from the surrounding poverty by several rings of security. Corporate personnel, all foreign, never step into the local community. The flow of oil money is equally divorced from the local economy but tightly integrated with the global money centres. It is repatriated to the US in corporate profits, it returns to global finance capital through Angola's endless repayments on national debt, and it lines the pockets – or international bank accounts – of the corrupt ruling elite. Angola's GDP growth is now turbo-charged to 19% with windfall oil profits and massive foreign direct investment but no expansion of local jobs or income. As James Ferguson puts it, "The movements of [global] capital cross national borders, but they jump point to point, and huge areas are simply by-passed" [2005: 379].

South Africa is not Angola and the Vaal Triangle is not Malongo. Yet the enclave logic is powerfully at work as the economy is increasingly integrated into the circuits of global production networks. If apartheid attempted to confine poverty to the homelands, townships and hostels, wealth is now securing itself within gated residential estates. The most extravagant is Sandhurst in Sandton where 640 houses, with an average value of R30 million each, are protected by kilometres of high security fencing. The logic is actively extended through government economic and spatial planning and the ambition of the big metropolitan municipalities to create competitive 'world class cities'. Under the banner of Gauteng's Blue IQ project, Johannesburg and Ekurhuleni have defined 'development corridors' linking with prestige industrial developments such as the Johannesburg Airport Industrial

[28] This observation accords well with the results of the Durban Health Study [see Box 14 in Chapter Four]. The findings suggest that long-term exposure makes people more vulnerable to further exposure. People's bodies do not get used to pollution.

Development Zone.[29] In Bénit and Gervais-Lambony's analysis, these spaces are produced as glittering 'shop windows' specifically designed to attract international investments. Thus Johannesburg's Security Strategy focuses on "areas which are visible to investors and will have an impact on their perceptions" [quoted in Bénit and Gervais-Lambony 2005: 6].

As part of 'cleaning up' these visible areas, the poor are driven out to spaces on the periphery where the language of 'participatory democracy' is invoked, with more or less sincerity, to manage poverty in the decay at the back of the shop. The 'red ants' have come to symbolise forced removals but are themselves impoverished casual workers hired by firms contracted by local government. In the new South Africa, even removals are privatised. The poor do not necessarily go quietly. Local government removals have met with fierce resistance as people defend their homes and access to work. In Durban, this has given rise to a new movement of shack dwellers, the Abahlali Base Mjondolo, which has networked resistance across the city and successfully used legal action to challenge the municipality's attempts to suppress protest.

Back door delivery

At the edge of Gauteng, much of the Vaal looks more like the back of the shop than the shop window. As the jobs are swept out of the factories and neighbouring farms, delivery is the primary means for managing poverty. It is the supplement to enclave development, held out as the life-line to many people and so also the measure of government legitimacy.

Since municipal restructuring in 2000, delivery has been increasingly devolved to local government. However, if South Africa is far from being a 'failed state' at the national level, there are many failed municipalities at local level. Emfuleni fits the bill. According to its IDP, its bureaucracy is over-staffed but under-skilled. Thus, its Finance Department has 230 staff where it should have no more than 150 but its work is "seriously substandard" [2005: 14]. Accountability is consequently lacking and local people observe very high levels of official corruption. This has been confirmed by charges of corruption being laid against 30 officials as one result of national government's Project Consolidate which aims to restore local government capacity.

The logic of enclave development supplemented by delivery is overlaid on earlier rounds of the Vaal's developmental history. What it gives rise to is not the single citadel of wealth surrounded by poverty but a variable pattern of inclusion and exclusion, of wealth and poverty, as the new logic is patched onto and into the old.

[29] The corridors are a continuation of national government's earlier Spatial Development Initiatives (SDIs) such as the Maputo Corridor, most of them 'anchored' on IDZs. See The groundWork Report 2003: 68ff.

Housing is both the most visible evidence of this and at the core of delivery. For many people, a home is their first need and their last refuge. The history of apartheid removals has left many with a deep sense of insecurity and housing has been central to the conflicts that have escalated around the country in recent years. In the Vaal Triangle, the sense of vulnerability is palpable in some communities. And just as people are inhibited from criticising the corporations for fear that more jobs will be lost, so complaints about pollution have been muted in some areas for fear that they will result in removals rather than in the clean-up of pollution.

Housing delivery in the Vaal started with the conversion of hostels to family housing, and site and service schemes and the roll-out of 'RDP' housing followed. In the first decade of democracy, government approved two million housing grants nationally but said housing demand was outstripping supply as people opted to live in smaller households. This resulted in "an increase of two million additional households over and above that generated by population growth" [SAG 2003: 26] and led to the proliferation of shack settlements. However, this trend was already evident in 1994. In the old township of Bophelong, apartheid policies confined three or four generations in the same home. Despite the relative generosity of the original houses and the addition of backyard shacks, families had long since outgrown the space. In Evaton, many people rented backyard shacks densely packed into the same 'household'. People moved out from these cramped conditions when they could and this movement itself was part of what cracked open the apartheid confinement. At the same time, just as farm workers have lost their homes with their jobs, so too have many industrial workers who lived in 'tied' housing belonging to Sasol or Iscor. Many of these people have found no alternative but to house themselves in shack settlements.

The trend to smaller households has also been encouraged by government's own housing and service delivery programmes. Most RDP houses are two small rooms, including kitchen and washing areas, with limited space for extension while the free basic electricity and water supply penalises larger households because they get the same amount as small households. Houses are also poorly built and the basics of environmental design have been neglected. They are not energy efficient and poor people must either pay for warming or cooling their homes or they must live with extreme cold or heat. People in Bophelong remark that the old houses built in the 1940s are more comfortable than new RDP houses simply because they have double skinned outer walls. The saving on quality goes to government and contractors but is passed on as a cost to the 'beneficiaries'.

Harry Gwala is a new RDP housing estate built in Sasolburg beyond Zamdela. People forced to fit the standard two roomed houses have added shack extensions to accommodate their families. The local council is evidently not happy with this and want the shacks taken down in the next five years. Nearby is Iraq, set up by people who refused housing in Harry Gwala because their households didn't fit into the RDP houses. It is termed a shack settlement because the houses are built of iron sheeting. Yet they are large by comparison with the RDP houses, well built and freshly painted with door and window frames picked out decoratively in the Sotho style. Plots are neatly fenced off and many have food and flower gardens.

In Sebokeng Zone 15, the five old Iscor single story hostels have been converted into 'family housing'. A first plan, dating from the early 1990s, was to demolish the hostels and put up houses in their place. R43 million was set aside for the job but nothing happened. Following the 1994 elections, people were told that the money had disappeared. A new scheme followed. The hostel residents formed a Community Property Association and pooled their R15,000 housing grants which added up to R22 million. The conversion was a cheap job. First, 16 man dormitories were divided into two apartments with internal walling to make two or three roomed units. Second, internal toilets were to be installed in the corner of a room and connected to existing sewage lines which served outside toilets. This was completed for two hostels before residents were told that the money had run out. Third, new units were to be built so that all claimants would have a home. This was not done.

The result is that three or four beneficiaries have to share each of the apartments supposed to be family units. Most of them are unemployed following the Iscor retrenchments, their once in a lifetime housing subsidies are used up and they are effectively trapped there. The families of some have come to live there and crowding is evident. For others, the family has been more effectively separated than under the migrant labour system. In the common refrain of retrenched workers, “There is no money here and there is no money there.” Visits to or from families are rare.

Local authority officials who administered the scheme could not account for spending. Residents say that one man who kept records and asked questions which the officials could not answer was pressured into returning to Lesotho. They believe that the job was not completed because officials pocketed the money. Whichever way – through negligently poor planning, maladministration or corruption – the residents were dispossessed of housing rights in the very moment that these rights were created. Residents acting through the Vaal Working Class Crisis Committee (VWCCC) have

demanded that these rights should be restored. If they are not restored, it must be concluded that government expects people to pay for its own failings.

At minimum, restoring these rights would mean completing the hostel conversion plan to the specifications originally presented to the residents. This plan did not, however, include environmental design criteria. Full restoration of rights would upgrade the earlier plan to create a sustainable settlement.

Corruption is also alleged at the nearby KwaMasiza Hostel where the retrenched Iscor workers are holding out for a just settlement. In 2002, Iscor's property company, Vesco, sold the hostel to Vicva Investments, a company owned by local council officials. The workers heard about the sale only when the new owners told them to vacate the hostel. They refused and the issue went to court. Before the hearing, Vicva decided not to proceed and agreed to negotiate with residents. Instead of negotiation, the police arrived to evict them in September 2002. Their possessions were thrown out onto the fields and police tried to drive them out by force. The workers resisted successfully and remain in residence. They believe the police were acting illegally for the council officials who owned Vicva. They also believe the hostel was sold cheap and that Iscor was buying influence.

Stories of corruption are common in every corner of Sebokeng and Evaton. Officials and politicians are seen to be making good with property development companies and shares in shopping centres and businesses. Local people see a repeat of the patterns of enrichment through office that defined the collaborationist black councils of the 1980s and provoked the Vaal Uprising. For some, however, holding onto a claim for formal housing has become too much. Boipetlong is a shack settlement on the edge of Sebokeng. The name, says Phineas Malapela of the VWCCC, means 'rest in peace': it is where people go when they have given up the struggle.

For the most part, the enclave logic has drained money out of the Vaal townships along with the jobs. But those who have found a place within the 'core' labour zone are now highly visible. They are not part of the new elite settled on the river frontage, but full time operatives – the new word for multi-skilled flexibly tasked full time workers – and professionals, mostly employed by the state, such as teachers. In Bophelong, isolated face brick houses tower over their neighbours in the new RDP housing estates. Their owners claimed the housing grant to access land but immediately demolished the RDP house and rebuilt. In Zamdela, private developers built face brick houses in the area now known as Success. They were bought by full time Sasol operatives and middle ranking

Box 5: Corporate license

The corporate value added statement is a way of validating what the corporations now like to call their 'social licence to operate'. This is a rather curious phrase. First, it goes beyond the official licence, or permits, granted by governments and implies a mandate – a positive injunction to operate – from society as a whole. Second, the mere fact that a corporation does operate can be taken as evidence of its 'social licence'. Third, the phrase has been put in play alongside the concept of 'self-regulation' which asserts the corporate right to do as it pleases. Finally, the official license may be withdrawn, at least in theory, but no-one in particular can withdraw the social licence. In reality, it can only be withdrawn through strike, riot or revolution that forcibly closes down the operation. That, of course, is impermissible as (white) workers discovered during the 1922 Rand Revolt. If all else fails, the state brings out the army to secure the corporation's social license through violent force.

The social license to operate is the central statement of the new discourse of corporate legitimacy in the enclaves produced by corporate capital. As part of this discourse, the value added statement patches itself onto the older and more constant trope of economic growth. It is an explicit statement that the corporation's operations are directly linked to the central interest of the state.

Corporate Social Responsibility (CSR) provides a different dimension to the discourse. CSR usually includes environment, health and safety, labour relations and employment equity, and social grants made by the corporation. The groundWork Report has previously noted that CSR is used to compensate for the 'ethical deficit' that comes from putting profits before people [2003: 61ff]. It is essentially about public relations and securing the 'social licence to operate'.

CSR has become a corporate necessity as a result of the corporate agenda for voluntary regulation in the place of compulsory regulation by the state. It also works as a sort of surrogate for taxes following the success of corporate lobbies in driving down taxation globally. It thus represents a transfer of public spending from the state to the corporations, leaving the latter in control of how much to spend, where and on what. It is as flexible in corporate hands as the flexible labour regime demanded by capital and, while it seems almost mandatory at present, it can be withdrawn in whole or in part at any time.

It dresses up in moral clothing what is in essence a form of patronage that can be exercised at different scales to fit with advertising or to buy complicity or silence. Such patronage works most powerfully in company towns. Local officials are wined, dined and constantly reminded of the corporate contribution to local government revenues. Local people are discouraged from criticisms that are said to threaten jobs. And as the corporation sheds jobs and job security, the silence thickens. 'Participation' in corporate hand-outs becomes a way of getting by.

Such participation is also made into evidence of support for the corporate 'social licence to operate'. Samson Mokoena of the Steel Valley Crisis Committee recalls that the SVCC and VWCCC challenged Iscor's application for a water use license in 2002. Iscor then claimed that all the organisations who participated in the Iscor Environmental Forum[30] supported the process which included this license application. This was patently untrue as the SVCC representatives pointed out. The SVCC then left the meeting in protest but DWAF still granted Iscor the license.

professionals. Cars are parked or garaged in most yards behind the usual security gates but, after work, people are out strolling on the streets.

Corporate patronage is also visible. As company towns, Sasolburg and Vanderbijlpark received corporate largesse from the start. In the 1990s, the focus of patronage shifted from the white town centres to the townships and took the new name of Corporate Social Responsibility. In Zamdela, Sasol funded the well appointed community centre which occupies a prominent and spacious block. It has also entered a public-private-partnership with the Free State government to give the township's library a makeover. On the periphery of the Vaal Triangle, by contrast, Orange Farm remains remote from any benefits of the enclave.

Back door services

Around the corner from Success and close by Zamdela's 'business centre' in Joe Slovo, a shack settlement is squeezed into a lane between formal houses. On a winter's evening, men and women are in the street preparing for the night. The men are cutting up wood scrounged from old pallets while the women make balls of coal from a mixture of coal dust, ash and water. The coal dust is trucked in by entrepreneurs who get it free from Sasol. Like paraffin, it is sold in small quantities

[30] See Chapter Four for more on the Iscor Environmental Forum.

because people cannot afford to stock up – even if it costs more in the long term, the poor must budget daily. The braziers are lit in the street so that the worst of the smoke disperses into the outside air. They are then taken indoors to provide both for cooking and heating. The only ventilation is the gaps left by ill-fitting doors and the holes in the iron roofing and walls.

The variable pattern of enclave development supplemented by delivery applies to services as much as to housing. In old Bophelong, the houses were originally fitted with iron coal stoves ventilated through chimneys. Bophelong is upwind of white Vanderbijlpark and, in the 1970s, there was growing concern about pollution. The old stoves were then replaced by newer models which could take smokeless coal. Both ordinary and smokeless coal is now available from Bophelong coal merchants. These houses also had full services from the start in 1948 – electricity, water, sanitation and rubbish removal.

Total emissions from domestic coal burning are comparatively minor. According to Scorgie, some 20% of homes in the Vaal Triangle rely on coal and they emit 2.8% of particulates compared to industry's emission of over 95%.[31] Just the low level emissions from industrial combustion are 2.5 times greater than household emissions.[32] Nevertheless, household emissions have a significant impact on health because they are emitted where people live and close to the ground. The effects of indoor emissions, where coal smoke or paraffin fumes are not ventilated, are many times greater for the household concerned. Indoor braziers and paraffin stoves also create fire hazards, particularly in crowded households, where accidents are more likely, and in densely packed shack settlements where fires spread rapidly.

Noting that energy is necessary for life but that, for poor people, it has become hazardous to life, social movements have demanded delivery of clean, safe and affordable domestic energy. In practice, this has translated into a demand for electricity and it is twinned with a demand for clean water. Government's water and electricity roll out figures are impressive. By 2004, the President's Ten Year Review claimed that 70% of the population was provided with electricity compared with only 32% in 1994 [25] and energy analyst Anton Eberhard comments that "doubling access to electricity … in a matter of years is probably without precedent" [2005: 6]. Similarly, 9 million more people gained access to clean water bringing the total to 85% of the population.

However, the poor pay very dearly for their electricity and water and millions cannot afford it. In 2000, under pressure from civil society and with local elections looming, government announced

[31] This figure combines industrial, mining and power station sources. See Scorgie Table 5.1.
[32] Industrial combustion does not include particulate dust blown off industrial waste and coal heaps. See Scorgie tables 3.35 and 3.36.

'free life-line' supplies of water and electricity. The life-line proved miserly: 6 thousand litres of water and 50 KWh electricity per month per household. Few can make it on this life-line and, in the Vaal, the poorest households tend also to be the largest households and so are least able to manage. In most distribution areas, the price rises sharply once the free allocation has been used and people end up paying as much as seven times more than industry per unit consumed.[33] By 2002, David McDonald reports that about 10 million people had experienced periodic water cut-offs and 10 million had experienced electricity cut-offs [2002]. Many still face disconnection, whether by officials or because they have no money to feed the pre-paid meters.

Pre-paid meters and other technologies such as trickle-feeds, for both electricity and water, have come to symbolise government's insistence that delivery must be based on 'cost recovery' and are associated with privatised or commercialised service delivery. Johannesburg contracted transnational corporation Suez to provide water management services in 2001. Anti-Privatisation Forum (APF) researchers remark that Suez was heavily indebted and saw Johannesburg as a good cash cow [Fiil-Flynn and Naidoo 2004].

Most households with electricity connections in the Vaal area are on pre-paid meters and must cut themselves off before the end of the month. Indeed, many are cut off the moment their pre-paid allocation is used up. In Emfuleni, however, the situation for water is anomalous because of the chaotic state of the council administration. In Boipatong, people say that water is effectively free. In old Bophelong, they believe their water is paid for under a flat rate for all services. Nevertheless, in 2003 council demanded a top up payment of R500 per household in return for a suspension of their debts to the council. Local people say the debts were a fiction. Council could not show how they were incurred and nor can it show what it has done with the money. Most householders are pensioners who could ill-afford the R500 but they paid up because, as one resident put it, they "accept the word of authority" from the council and local ANC politicians. Their supposed debt remains on record, however, and can be used against them in the future. In Sebokeng, the council charges people on the basis of bulk deliveries. This implies that everyone should pay for extravagant users as well as for the leaks in the council's poorly maintained water pipes. People have refused payment. At a local 'summit' on services, people proposed a flat rate of R50 a month. Council refused this outright. It was then agreed that people would pay if there was proper metering and billing, if broken pipes were fixed, and if the council reported on progress to a similar meeting every three months. The report backs have not happened.

[33] By comparison, Patrick Bond notes that in Europe people pay twice as much as industry [2005: 8].

The council is meanwhile preparing to introduce pre-paid water metering. This is likely to meet with concerted resistance throughout the area. Pre-paid water meters were pioneered where people are most vulnerable – in Stretford which is on the periphery of the Vaal Triangle in a part of Orange Farm administered by the Johannesburg Council. A high proportion of households are headed by women, all are poor and 30% have no income [Fiil-Flynn and Naidoo 2004: 16].

The pre-paid system replaced communal tap stands where water was free. It was justified as saving water and enabling the delivery of the free basic water supply. A year after it was installed, half the households ran out of water at some time because they had no money to pay for more units. Others ran dry because either the meters or the computers at the sales point broke down. Most had to restrict water use and local people remarked that children from Stretford were easily recognised because they "go to school in dirty clothes" [20]. Caring for sick people became more difficult and costly. For the most part, women carried the responsibility of managing water use, of begging from neighbours or of walking to find free sources. The system also provoked conflict in the neighbourhood over allegations of water theft and in households, where people experienced increased domestic violence.

The system works well for the managers. The cost of providing the free basic supply is off-set by the reduction in administrative costs, the need for billing systems and staff to read meters is eliminated as is the cost of cut offs and the potential for conflict between people and utility staff – whether municipal or privatised. Beyond this, Greg Ruiters argues that the technologies of 'delivery' are also technologies of political and social control. They are part of a discourse that represents the "empowered citizen as the customer … who pays for services, only uses as much as she can afford and makes wise, sovereign and informed choices with her limited means" [2005: 7]. Discipline at the back of the shop is thus individualised as self-discipline divorced from social action: the poor must know their place in the order of the market, they must learn to be frugal consumers.

The system both reveals and hides poverty. Poor people must show their poverty to the authorities by registering to qualify for the free basic supply but pre-paid meters erase politically embarrassing statistics on how many people are cut off because they cannot feed the meter. The effects of poverty are removed from the social realm and confined to the household. Yet the system computers still return a constant stream of information, creating banks of data which make 'customers' visible to managers while managers are largely invisible to the people.

Delivery of sanitation has lagged behind water but, in 2004, government promised to 'eradicate the backlog'. At Orange Farm, the promise of flush toilets was used to win acceptance of pre-paid meters. People were given to understand that pre-paid meters provided the means to getting flush toilets. They later discovered that the water to flush the toilets was more than they could afford. Water-borne sewage without water doesn't work so the pipes are constantly blocked. Johannesburg Water, however, has refused to allow that this is their problem. Instead it "relies on the sheer necessity for hygiene and sanitation … to make residents provide this service for themselves" [Fiil-Flynn and Naidoo 2004:17]. Without proper tools, that means digging faeces out by hand.

If the plans for pre-metering are carried out in the Vaal Triangle, many of the people living in formal housing with flush toilets will also discover this cost and it is likely to have major public health consequences. Flush toilets are not universal, however. In the Sebokeng hostels where indoor toilets were not installed, outdoor toilets are situated over a drain flushed with a constantly running stream of water. This wasted water is part of the bulk supply that the council want to charge to residents. Pit latrines are common in the shack settlements and have also been built in some RDP developments. Outside Boipatong, latrines stand in ranks across open ground. It is a development that was abandoned because people rejected it. Located on a wetland above the Sharpeville Dam, flooding of the pits and contamination of the water were entirely predictable.

Waste management has the lowest profile of domestic services and did not get a mention in the President's Ten Year Review. Services have been expanded in black urban areas but research carried out in 2003 for the South African Municipal Workers Union (SAMWU) showed that, "Wealthy and working-class areas did not receive the same quality of service – apartheid still existed" [Samson 2003: 100]. This is largely because cost-cutting and privatisation has been imposed unevenly: the suburbs are generally still serviced by municipalities or commercialised companies owned by municipalities, while townships are frequently serviced by private contractors. Cleaning streets and open spaces are most likely to be neglected because this service cannot be charged to individual households. Samson shows that the costs of privatisation fall heaviest on women, both as workers and residents. The level of service throughout the Vaal is visibly inadequate. Litter is commonly encountered, particularly around taxi ranks, and open ground is frequently used as informal dumps.

Box 6: Orange Farm blockades the Golden Highway

Some two hundred people from Orange Farm blockaded the Golden Highway, which runs from Johannesburg to Vanderbijlpark, before dawn on September 6, 2006. 'Public order' police confronted them and fired rubber bullets at them to make them disperse. Instead, the sound of gun fire attracted more people, numbering in the thousands, to defend the action.

They were protesting the failed promises of delivery, the privatisation of services and the costs of 'cost recovery' to those who have no money. They were protesting the failure of councillors to come to public meetings called by the Orange Farm Water Crisis Committee (OWCC). And they believed that these meetings were ignored because they were not called by the ANC. They decided to blockade the highway in protest at a series of house meetings in the weeks before the action. Bricks Mokolo of the OWCC sums up the feeling of the protestors:

> Every five years a new Councillor is elected and makes the same promises and asks us to give them a chance as they are 'still learning'. But for over 15 years now the people of Orange Farm have been waiting. Under apartheid, we refused to pay for substandard development and poor quality of services. With our new government, we were never consulted about what kind of development we want. Now we are expected to live with and pay for even poorer quality of services than under apartheid because our government says that it has no budget. Having no budget is just an excuse to open up the delivery of basic services to the private companies to make profit. How can we be hosting an international World Cup when we have no budget? We fought for a better quality of life under apartheid, and we are fighting for it now. We are not afraid to die in this struggle as we are already dying at the hands of our government.

Source: Prishani Naidoo: No Freedom Without Basic Services, 10 September 2006.

At the end of the waste pipe, sewage works and waste dumps are poorly managed throughout South Africa and have a major impact on rivers. Thus, overflows from wastewater works during the January 2006 floods washed raw sewerage into the Klip River contributing to fish kills downstream in the Vaal. Even when it is dry, however, some streams in the area smell strongly of sewerage.

2. Violent origins

The making of what is now the Vaal Triangle had its most obvious origins in the discovery of coal in 1878. For a capitalist enterprise, however, coal has little value without labour to extract it, a market to buy it, transport to get it to that market and the state institution of property relations.

Securing the region

The previous year, the British had annexed the failing Zuid Afrikaansche Republiek (ZAR) and declared it the Transvaal Colony. The ZAR was more fiction than substance. Much of the territory over which it claimed sovereignty remained under the authority of independent African polities. It had instituted private property in land but its economy was driven by speculation rather than production. Moreover, the speculation that made the Boer elite rich was often in land that did not belong to them and frequent raids against African territories were as much to make good on speculation as to exert sovereignty. The Pedi repeatedly repulsed these assaults while the administration was too weak to establish control even where Boer commandos won on the battle field.

Britain regarded this as a threat to the stability of the broader region. It was determined to subjugate independent African authorities and particularly to deny them modern weaponry. Imperial troops had recently defeated the Zulu while the Cape government provoked the 'gun war' to disarm the Basotho in 1880.[34] In the Transvaal, the British did what the republic had failed to do. They defeated the Pedi, gave force to fictional property claims and instituted administrative systems and controls to exact taxes from the African population who had previously failed to notice the sovereignty of the ZAR. On this rather more solid foundation, the Transvaal Boers reclaimed independence after defeating a British force at Majuba 1881.

[34] The Cape had recently annexed the protectorate of 'Basotholand' although the Basotho themselves did not know it. When they found out, they demanded the restoration of their status as a Crown protectorate. The Cape, meanwhile, was ready to let it go as the 'gun war' cost more than it anticipated.

If regional stability was one aim of the British strategy, securing a labour supply, particularly to the Kimberly diamond mines, was the other. Taxes were imposed on subjugated people with increasing rigour both to pay the costs of government administrations – while excluding them from any decision making power – and to coerce them into labour by imposing a need for money.

Market access and infrastructure

The coal deposits lay on both sides of the Vaal River that then marked the border between the Transvaal and the Orange Free State. The Kimberly diamond house of Lewis and Marks bought up a large block of farms which became known as the Vereeniging Estate. Lewis and Marks intended to corner Kimberly's energy market. At the time, the mines were powered by steam engines fuelled by wood but the surrounding area was stripped of trees and prices escalated as wood was gathered from further and further away. However, the costs of transporting Lewis and Marks' coal were as high as for wood. The mines were 230 miles from Kimberly and transport by ox wagon was expensive and unreliable.

In 1884, the Cape railway reached Kimberly and brought in imported British coal at relatively cheap prices. This collapsed the wood trade and appeared to seal the fate of the Vaal coal mines. In the same year, however, gold was discovered on the Witwatersrand and created a new and even larger market within 35 miles of the coal mines. By the late 1880s, the mine was producing 200 tons a week but needed 50 wagons to bring them to market. But in winter there was little grazing for the oxen and the gold mines faced closure for want of coal. Sammy Marks, who oversaw the operations for Lewis and Marks, calculated that rail would slash costs by over 80% and give him an advantage over competing coal mines.[35]

The Transvaal state was already dependent on gold for its revenues. In 1890, to maintain production, President Paul Kruger negotiated a deal with Cecil Rhodes, who was by then Prime Minister of the Cape Colony as well as a major mining magnate: the Cape government would raise the money to connect Johannesburg with the Cape railway. Marks, a consummate lobbyist, got two things from the deal: the new line would pass through Vereeniging and he would supply coal to the railway itself. He thus secured a market at the colliery pithead, supplying 7,000 tons a month in 1893 and expanding to over 100,000 in 1895. The railway's quality requirements meant a high proportion of discard coal had to be dumped. By the time of the Anglo Boer War, the hill of waste dominated the landscape and retreating Boer snipers used it as a vantage point against the British advance.

[35] Information on the development of the Vereeniging Estates, up to 1920, is largely based on Richard Mendelsohn's [1991] biography of Sammy Marks.

Labour

This enormous expansion in production at the colliery required a corresponding expansion of labour. From its beginning the operation had difficulty getting labour because the majority of people were not yet wholly dependent on wage labour and were particularly averse to coal mining. Most of the 1,000 black workers employed in the mid 1890s were recruited as migrants from the wider southern African region, particularly Mozambique. Migrant workers, however, would stay for only two or three months so the entire workforce had to be replaced four or five times a year.

If people did not want work, they did want land. Boer farming practice was mostly based on share-cropping – owners rented the land to African farmers in return for half the crop but also demanded free labour from one or more members of a household according to seasonal needs. This clashed with the labour needs of the share-croppers themselves and the demand was deeply resented and resulted in constant movement as share-croppers searched for better deals. Marks adapted the same system on the extensive land holdings of the Vereeniging Estate, making the availability of a household member for work on the mine a condition of tenancy but paying for that labour at the going rate. By 1899 there were 352 tenants, of whom 14 were white. They were producing 31,210 bags of grain, of which the estate took half, and 47,520 of oats with four fifths going to the estate. This resident population did not, however, constitute the labour pool Marks hoped for. They resisted work in the mines and provided little more than back-up labour.

War and Union

Gold sealed the fate of the ZAR. Mostly British 'uitlanders' poured into boom town Johannesburg and would clearly vote the republic back into the British empire if allowed to do so. To retain political power, the Boers excluded them from the vote but this gave Britain the pretext for war. This political conflict was shadowed by the conflict of economic interests. The mining industry, led by Lionel Phillips and his fellow 'Randlords', was driven primarily by British capital who wanted profits to reinvest wherever in the world offered the best returns. They had no interest in developing the local economy beyond the enclave of mining. The Boer government relied on revenues from gold but wanted to be economically as well as politically independent of Britain. It instituted a rudimentary form of 'inward industrialisation' based on concessions, awarded to cronies of the Boer elite, which gave monopoly rights for manufacturing specified goods in the Transvaal.

Establishing actual industries was difficult, however, for reasons that remain familiar in 2006:

- the local market was too small for large-scale production that could compete with imports;
- investors were therefore not interested;
- capital goods (manufacturing plant) had to be imported at huge expense;
- the local skills base was inadequate.

Rather than promoting industrialisation, the ZAR's policy created a class of parasitic capitalists. With few exceptions, concession holders either sold their concessions to speculators or used them to make big profits by exercising monopoly rights on imports. This drove up the cost of mining inputs and ate into mining profits. The Randlords were incensed and called on Britain to protect their interests.

The Anglo-Boer war interrupted production throughout the ZAR. The railway was critical to maintaining British supply lines and the Vaal collieries became a strategic target of the British advance. Vereeniging was taken in May 1900 and the gold mines – the real strategic prize – shortly thereafter.

Resisting wage labour

After the war, the economy of the Transvaal was slow to recover, largely because cheap labour was not available. The war had temporarily restored autonomy to black people in the two republics. With Boer landowners off on commando, black tenant farmers were simply relieved of a burden on their production. Many Boers returned to nothing – their stock was lost and their houses stripped. Impoverished and indebted, they sold out to land speculators and migrated to the cities to find work. According to Marks:

> As to the Natives, they are in many cases affluent, they have plenty of cattle and are therefore able to plough at will. They have become quite unmanageable and absolutely free and appear to have come to the conclusion that, as they live under the British flag, the whole country and everything in it is at their disposal. I have determined to do my utmost to remedy this state of affairs and have already approached the Attorney General … [quoted in Mendelsohn 1991: 158].

Established tenants on the Vereeniging estate refused all mine work. Marks nevertheless tried a variation on his earlier settlement scheme, bringing in new share-cropping tenants but making it

compulsory for each family to provide a permanent mine worker. But this attempt at 'labour stabilisation' could not be more than a partial solution.

The Randlords established the Witwatersrand Native Labour Association which recruited throughout southern Africa as far north as present day Tanzania, and regulated labour conditions in order to restore the labour supply. Workers allocated for the collieries, however, had to be tricked into it. Many deserted – or rioted – as soon as they understood that they were heading for Witbank or the Vaal.[36] Marks attempted to circumvent the system by using freelance labour agents based in Mozambique, but evidence soon emerged that his agent was press ganging labour – marching them "on board ship at Inhambane with their hands tied behind their backs" and taking them from Lourenco Marques port "under armed escort to the railway station" [Mendelsohn 1991: 169]. Denying all knowledge of this, Marks returned to the cover of the Witwatersrand Native Labour Association.

Workers also deserted the mine itself: 1,100 workers, equivalent to the total workforce, deserted the Cornelia colliery compound in one six month period. Deserters who were caught were imprisoned or fined for breach of contract and then returned to the mine. Conditions at the compound and in the 'native hospital' were appalling while the rate of injury and death on the mines was high. 'Improvements' to stem the rate of desertion were grudging: buckets were introduced in place of open pit latrines, a shower bath fitted, iron double bunks installed and dreadful rations were somewhat improved.

Industrialising Vereeniging

The Union of South Africa, constituted in 1910, was the final political outcome of the war. Under the leadership of former Boer generals, Louis Botha and Jan Smuts, it signalled a reconciliation of sorts between the English and Afrikaner elites but to the exclusion of black people. By this time, the economy had recovered and the interests of imperial capital, manifest in the demands for an open trading regime and cheap labour, appeared secure. Gold dominated the national accounts and the Randlords called the shots.

Marks had long nurtured the vision of an industrial centre on the Vereeniging estate. Mostly, he wanted to capitalise on natural resources: a power station could provide an additional market for coal at the pithead; the Vaal could supply water to Johannesburg; clay deposits could support brick

[36] Peter Alexander [1999] gives a good account of labour dynamics in the period leading up to the Rand Rebellion of 1922.

making; mechanised agriculture could replace 'inefficient' peasant share-cropping. At the core of his vision was the idea of a centre for iron and steel production – a South African Sheffield.

Already in 1892, anticipating that industrialisation would draw in a substantial population, Marks got the ZAR to proclaim the town of Vereeniging, and laid out a grid plan and plots for housing. As the name implied, it was to be a company town. The plots would be sold freehold, but mineral rights were reserved to the company and all public services – water, energy, telephones and public transport – would be supplied by the company. Mendelsohn comments that:

> These prerogatives, together with the Association's status as the major local employer and as the dominant local landowner, gave the company a hold over the town that it would retain for decades [1991: 55].

The plan was premature, however. Marks did establish a brick factory but industrial Vereeniging only really took shape following Union. The economy was again growing rapidly and the mines were mechanising and increasingly wanted electric power. Marks revived his proposal for a power station on the Vaal but faced a formidable rival – the Victoria Falls Power Company (VFP) controlled by the Chartered Company, established by Rhodes, and German manufacturers AEG.[37] To avoid competition, explicitly because a monopoly would be more 'efficient and profitable', the rivals did a deal: the VFP would build two power stations, the first on the Rand and the second at Vereeniging. The power company's monopoly was further entrenched through an agreement with the major mining houses to supply them cheap electricity plus a portion of profits. In return, the mining houses agreed to stay out of the power business.

The Vereeniging plant was built in 1912 next to the planned town and on the Vaal River bank. It established a number of norms that shaped the future of the industry:

- It was located at the pithead and so substituted the cost of transporting coal with the cheaper transmission of energy through power lines.
- It provided a long term supply contract to the colliery (for a minimum 200,000 tons of coal a year) with a guaranteed profit.
- It was designed to use low quality discard coal refused by the railways and so improve the economic efficiency of the colliery. The effect was to substitute the discard dumps with ash dumps.

[37] VFP was so named because its initial idea was to generate electricity at the Victoria Falls for transmission to Johannesburg. This grandiose scheme now finds its echo in Eskom's Grand Inga power project.

- It was very dirty. The ash dump was located on the bank of the Vaal River and would leach pollutants directly into the river. River water was used for cooling and simply sluiced back to the river. Air pollution was emitted without limitation.

At the time, it was one of the largest power stations in the world with 40 MW capacity and was constantly expanded in subsequent years reaching 140 MW in the 1930s and 160 MW in the 1950s. It was finally demolished in 1974 but the site remains a wasteland of old mine shafts.

The power station was followed by the first steel plant. Lewis and Marks established the Union Steel Corporation of South Africa but needed government support in the face of cheap British steel imports. This posed a dilemma since the mining industry would not tolerate tariffs or other measures to raise prices. Marks dropped the politically popular idea that production should be based on locally mined iron ore because the cost of capital was too high. Instead, the plant would process scrap. Marks negotiated state support in the form of a contract with the state owned railways both to supply scrap metal and to procure steel goods from Union Steel subject to quality assurance.

The First World War, the culmination of imperial rivalries as Germany challenged Britain's global dominance, broke out in 1914. In South Africa, access to capital and imported production equipment and supplies was abruptly cut off as British industry redirected production to supply the military market. Initially production came to a stand still, but war effectively provided the protection to infant industries that was previously denied. Union Steel expanded production from 2,000 tons worth £23,600 in 1914 to 8,000 tons worth £250,000 in 1918, reaching the limits of the scrap supply.

The gold mines' water demand increased alongside energy demand. Milling one ton of ore required 2,000 litres of water.[38] The mines were also polluting the local water supplies with cyanide to the extent that cattle died after drinking from the Klip River. The Rand Water Board, which was established in 1903 and presided over by the Chamber of Mines and the Johannesburg Municipality, therefore looked further away for clean and abundant water. Marks agreed that it could drown land on the Vereeniging Estate and also gave it land for a pumping station. Construction on the Vaal Barrage, 40 kilometres downstream from Vereeniging, started in 1916 and took seven years to complete. 300 black workers were drafted in and housed in a compound.

[38] Before the Anglo-Boer War, in 1899, the mines were milling 7.3 million tons of ore. Cooks 2003 tells the history of the Rand Water Board from RWB's own perspective. Tempelhoff 2003 gives a more independent reading.

The compound acted as a vector for disease and over two thirds of the workers died in the global 'Spanish flu' epidemic of 1918.

Labour conflict

The Anglo Boer War profoundly reshaped South Africa's labour regime producing, as Nancy Clark [1994] observes, a three tiered regime that persisted through to the 1960s: the lowest tier was composed of cheap black labour, next up were unskilled white workers while skilled white artisans occupied the top tier.

The brutal coercion of black labour to submit to low wage employment was increasingly effective. In 1905, the Bambatha rebellion against escalating taxes in the Natal Colony was ruthlessly suppressed and, following Union, the 1913 Land Act limited black people to 13% of the land set aside as 'reserves'. Harold Wolpe [1972] shows that these reserves were intended to preserve non-capitalist property relations because privatising the land would create a landless class and lead to unrest. They were also intended to maintain subsistence agricultural production at a level high enough to feed the families of migrant workers but not high enough to allow the worker to escape the necessity of labour on the mines and farms. The reserves were thus forced to subsidise the cost of labour to employers. At the other end of the migrants' journey, the compounds were managed as virtual labour prisons, maintaining strict segregation between black migrant and other workers including black urbanised workers who were themselves restricted in terms of where they could live.

After the war, impoverished white Afrikaans people who had lost their land streamed into the cities. More followed after the First World War. Most were unskilled and many found no work. But they did have the vote and white unemployment and poverty was made a central political issue. Women were drafted into the growing textile industry while men relied on the 'colour bar' – job reservation – to distinguish them from black workers on the mines and in infant industries such as metals. The colour bar, however, pushed up production costs and was constantly being eroded by capitalist managers even as it was defended by politicians. Segregation effectively shut down class based solidarities, which had shown some signs of emerging in the early years, in favour of racial solidarities.

At the top of the labour pile were skilled workers imported mostly from Britain. Their skills were in high demand and they brought with them the traditions and capacities of British unionism.

However, many of them were placed in supervisory positions and they quickly adapted themselves to their privileged position and negotiated benefits with little sense of a broader class solidarity.

Following Union, conflict centred on the relationship of management and labour at the workplace. In June 1913, 60,000 troops were used to put down a general strike of white workers, protesting wage cuts and the use of black labour in place of higher paid white labour. In September, black workers walked off the job and were forced back at gun point. According to Peter Alexander, the white miners made "a concerted attempt to win solidarity from black miners" for the June strike [1999: ft nt. 31]. He suggests that their limited success entrenched their sense of a segregated solidarity. At any rate, there was no white solidarity for the black workers in September. Following the First World War, a series of strikes by white workers won higher wages. In 1920, troops were brought out to brutally suppress what the Chamber of Mines saw as the first black strike "organised on the European model" [quoted in Clark 1994: 47].

The Chamber nevertheless raised black wages and called for an end to the colour bar. It also prepared for a showdown with white workers, deliberately provoking what came to be known as the Rand Revolt. Coal provided them with the flashpoint. The international price was falling and wage cuts had already been forced on coal miners in Britain. Bosses demanded even more radical cuts at South African collieries but their real objective was, in the words of Randlord Lionel Phillips, "getting back to control, discipline and efficiency" [quoted in Alexander 1999: 38]. Unions had asserted increasing control of working practices on both the coal and gold mines during the war and the Randlords determined that they should be smashed to eliminate this challenge to managerial authority.

The coal strike began with the new year in 1922 and by mid-January white gold miners and workers at the VFP stations and in the engineering industries had joined them. The strikers specifically excluded black workers and even encouraged them to keep working – almost as if class war were a matter between whites just as the Anglo-Boer War had been represented as a 'white man's war' – with the result that production was disrupted but not halted. In March, the unions called a national general strike but a 'race riot', possibly provoked for the purpose, gave Prime Minister Smuts the pretext to declare martial law. Alexander sums up the consequences thus: "More than 200 lives were lost, the workers and their unions were crushed, and an era of working-class militancy was brought, abruptly, to a close" [1999: 31].

Origins of state corporations

White unemployment increased rapidly following the revolt as capital opted for cheaper black labour. Smuts was punished in the elections of 1924, losing to the 'Pact' government of the Labour and National Parties whose platform of 'civilised labour' combined the rhetoric of labour militancy with racial bigotry. Effectively, the representation of the interests of the white working class was claimed by the Pact in the place of the emasculated unions. In government, however, the Pact adopted exactly the policies that had been developed under Smuts. It promised accelerated industrialisation and white job creation through state support to two sectors regarded as critical to building an industrial economy – electricity and iron and steel.

Already in 1922, the Smuts government passed the Electricity Act which created the Electricity Supply Commission (Escom). In 1928, the Pact government passed the Iron and Steel Industry Act to create the Iron and Steel Corporation (Iscor). Hendrik van der Bijl, a Smuts man and, ironically, an advocate of private enterprise, was appointed to head up both corporations.

Industrial historian Nancy Clark observes that "the proliferation of [state] corporations in the twentieth century began in parallel but ideologically opposed movements" – from capitalist to communist regimes and in developed and developing economies alike. She notes that they were commonly motivated by the desire to initiate "broad-based national industrial development" but argues that their particular character is forged locally: "they reflect, rather than contradict, national social forces" [1994: 2, 3]. Nevertheless, 'national forces' are not simply national. Imperial capital, represented in South Africa by the gold mining industry, dominated the economy and vigorously opposed anything that it saw as raising input costs and so reducing the profits that it extracted from the country.

The state itself depended on the revenues from gold and, more broadly, on its relation to the leading imperial power which required that it secure the conditions for imperial capital accumulation. This accumulation was founded on dispossession – the violent enclosure of black economies. Continuing enclosure required that the state vest its legitimacy in the white nation brought into being by a contested imperialism. Yet the process of accumulation itself was eroding white supremacy from the bottom by threatening the distinction between white and black working classes.

Power

In the power sector, the debates leading up to the Electricity Act centred on prices and who controlled prices. The Randlords already exercised some control over the price of energy through their grip on the VFP and, although the company made considerable profits from its monopoly on supplies to the mines, this was off-set by an agreement that returned 25% of 'surplus profits' to the mines. While VFP itself saw Escom as a threat to its monopoly, the Randlords feared it would be used by government to erode their profits to the benefit of developing other economic sectors and the railways in particular. For its part, the state owned South African Railways believed that it could exercise more control over its own input costs through a state utility. Its negotiating position was enhanced by the fact that it was the single biggest employer of white labour and it was frustrated by the failure of imperial capitalists to invest in the development of cheap and plentiful electricity. The last interest group was the local municipalities who had established their own power stations and wished to protect their revenues.

The Electricity Act reflected these tensions. It put in place a central principle of all subsequent industrial policy: Escom's "primary duty was 'to stimulate the provision … of a cheap and abundant supply of electricity'" [Clark 1994: 57]. It would not make a profit and it would be exempted from taxation but it would, nevertheless, be run on 'business lines' independent of direct state control and, unlike the railways which were constantly bailed out by government, it would not make a loss. In the beginning, Escom accessed some capital through loans from the state but, in the main, had to raise capital on the market. It was thus corporatised at its inception.

Escom faced the same problem as any new entrant into an established industry: it had to gain access to markets. In this the Electricity Act gave it an advantage. It established a separate regulatory body to license all private generators but Escom had the right to approve their tariffs. It could also object to any new power plants if it could show that it could produce electricity more cheaply. Municipal generators were exempt from licensing and retained control of all municipal distribution. Escom could, however, negotiate its way into bulk power supplies by showing that it could meet expanding demand more cheaply.

The results of this were ambiguous for the corporation. It rapidly established dominance in the generating industry by blocking rival plans but remained dependent on existing utilities for distribution to markets. It therefore had to cut deals. The key market was the mines where VFP's

monopoly was secured by supply contracts. The company tried to pre-empt Escom's move into the market with plans to build a new 100 MW power plant at the Witbank coal fields. It was vulnerable, however, because it had concealed its profits to minimise the mines' 25%. Van der Bijl exploited this to make an ally of the mine owners and supported their demands to renegotiate their contracts with lower prices.

The effect of the final deal was that Escom would pay for and own the new power station, VFP would build and operate it and buy the electricity at cost. But the financial benefits of the new plant were split between VFP and the mines with the profits from both returned to imperial capital. Escom had secured its position in generating but at the cost of being able to build capital for further investment. Escom also cut deals with the railways and a number of municipalities, notably Cape Town and Durban, but paid a similar price for gaining market access – it could not realise its ambition for 'vertical integration' with control over distribution as well as generation. Nor would it do so until after the Second World War when VFP was exposed for excessive war time profiteering. The mine owners were incensed and, having lost its most important ally, the company was bought out by Escom.

Following the economic depression of the late 1920s and early 30s, the price of gold went up sharply and the demand for power increased dramatically. Escom focused its own expansion in the Vaal area, building new and larger plants. In 1934, still in partnership with VFP, it built the 400 MW Klip Power Station just north of Vereeniging to supply the Rand. It was on the Klip River at the pithead of the Springfield Colliery which was developed by the Vereeniging Estate specifically to supply the new plant. The smaller Vaal station followed in 1940 although construction was delayed as war interrupted the delivery of equipment. It was built opposite the Vereeniging station on the south side of the Vaal River specifically to supply the newly discovered northern Free State gold fields. Following the war, two more stations were built alongside each other at the Clydesdale Colliery pithead at Kragbron near Sasolburg – Taaibos in 1951 and Highveld in 1959. All these plants have since been decommissioned and demolished. In their time, they produced mountainous ash heaps and major air pollution.

During the 1920s and 30s, Earnest Oppenheimer's Anglo American group rose from being a junior mining house to become southern Africa's most powerful corporation. By the late 1930s, it had acquired a monopoly of diamond production through De Beers and also established a major

position on the East Rand gold fields. It consolidated its position in gold by taking over the two firms which had secured the richest Free State gold deposits: SA Townships and Lewis and Marks. Lewis and Marks was the largest coal producer, with mines in Witbank as well as the Vaal. Along with the gold fields, Anglo acquired these assets together with the Vereeniging Estate in 1945. Henceforth, it would be the major supplier of coal to Escom as well as the largest consumer of Escom's electricity.

Steel

The mineral resources for steel production are readily available in South Africa. As Sammy Marks discovered, the capital to develop it was not. In the 1880s he was already aware of iron ore deposits and dreamt of an integrated steel plant. But when he finally established Union Steel he had to be satisfied with processing scrap. The plant got a boost from the enforced protection of the First World War but it was running into trouble in the 1920s as the price of steel imports dropped. A rival producer, Cornelius Delfos, also failed to raise sufficient capital for his plant in Pretoria.

The interests that shaped Iscor were substantially the same as those that shaped Escom. The railways and mines were the main steel consumers just as they were the main energy consumers. Both were concerned about the costs of steel but each was suspicious that the other would win benefits at its expense. The Pact government wanted more jobs for white men but, despite its rhetoric, was no more willing than Smuts had been to threaten the profits of mining. In 1925 it introduced tariffs on imports, ostensibly to support local industry, but was careful to exclude any items – including steel – which increased costs either for the mines or for Prime Minister Herzog's key farming constituency. It also passed new legislation on job reservation and wages for white workers. White employment in industry and in the mines nevertheless continued to decline.

In 1926, British and German steelmakers formed an international cartel to eliminate competitive pricing and restore their own declining profits – largely at the cost of colonial economies that had no domestic industry. This threatened the mines as much as the railways and so created an unusual alliance of interests within South Africa. Negotiations were nevertheless intense and government backed down on issues thought to have an impact on the price of steel or on who controlled that price:

- Direct government control of Iscor was dropped in favour of an independent board similar to that at Escom and with Van der Bijl as its chairman;

- Provisions allowing government to determine white employment and wages were dropped although all parties, including the mine owners, adopted the posture that Iscor would mostly employ white workers and Van der Bijl committed himself to doing so;
- The railways refused to guarantee a market for Iscor;
- Steel was kept outside the tariffs regime so the new corporation would have to compete directly with the European cartel. Since the cartel was in a position to manipulate prices, Iscor was vulnerable to dumping – that is, to under-pricing designed to put it out of business.

Like Escom, Iscor was strapped for cash. Government wanted an integrated industrial corporation covering the whole steel production chain, from raw material inputs to raw steel to finished products, but was not prepared to provide sufficient funding. Iscor therefore focused on making raw steel at its new Pretoria plant but could only sell it to downstream industries which produced finished goods for the wider market. Union Steel had faced similar problems and had entered a variety of partnerships to attract mostly British steel makers to set up shop in Vereeniging and so create a market for its product. Iscor adopted this strategy and supplemented it with strategic acquisitions. Union Steel itself was close to bankrupt and, in 1930, Van der Bijl acquired a controlling stake in the company and so secured Iscor's position within the network of steel makers.

He reinforced this position by creating a string of new companies in partnership with private firms. Downstream partnerships included firms manufacturing wire, nuts and bolts and chains at new plants in Vereeniging. Upstream, the African Metals Corporation (Amcor) was established to produce iron ore from Iscor mines as well as other inputs into steel making, and involved Union Steel, Stewart and Lloyds, Baldwins, Dorman Long, Lewis and Mark's African and European Investment Company and Anglo-American. Similarly, Van der Bijl created the Phoenix Colliery in partnership with JCI to provide coking coal. While not itself integrated, Iscor's production of steel from ore for the first time created the basis for integration in the South African industry as a whole.

Finally, having lobbied for protection from European dumping without success, Van der Bijl simply joined the European steel cartel which then agreed to push up South African prices to guarantee generous profits all round. At this the mine owners, key advocates of the free trade policies that gave power to the cartel, cried foul. They had enjoyed the benefits of under-price dumping designed to eliminate local competition but now claimed that Iscor was acting as a "privileged Government monopolist" [quoted in Clark 1994: 95]. Their challenge, however, was suspended

by the declaration of war. Imports were cut off and Iscor found unexpected protection in the Second World War as just as Union Steel had found it in the First. As well as being sole suppliers to the mines, the South African industry also expanded to supply munitions for war and, as Cock and Munnik argue, established the basis for the apartheid arms industry [2005: 10].

Industrial form and labour

The two world wars marked what sociologist Giovanni Arrighi [1994] calls the terminal crisis of the British regime of accumulation. As Britain's global power waned, the power of the US was on the rise and, following the Second World War, the US vigorously asserted leadership of the global system.[39] This change in the world order was accompanied by a change in the organisation of production as the American model of 'Fordist' production dominated by giant corporations superseded the British model.

Both Escom and Iscor clearly aspired to the US model from the beginning but were forced into partnerships and production networks involving relatively small and decentralised firms "held together by a complex web of commercial transactions" typical of Britain's imperial capitalism [Arrighi 1994: 283]. The system as a whole relied on the brutal dispossession of people in the colonies and, notably in southern Africa, on the institution of migrant labour within the broader three tiered labour regime. The spatial order produced by the system involved a series of geographical hierarchies, transferring wealth from the colonies to the imperial capital through the conduit of colonial cities.

Migrant labour was integral to this order, enabling Capital to substantially displace labour costs onto the reserves and particularly onto women left to supplement men's wages, to care for those disabled on the mines and factories or too ill or old to work and to receive the bodies of those killed. The migrant system also spread tuberculosis and other diseases contracted in the compounds throughout southern Africa. By the 1930s, the reserve economies and environments were buckling under the stress. The land was eroding rapidly and production was in decline.

While increasing numbers of black industrial workers found residence in the towns, the majority remained migrants. Escom and Iscor retained the system both at their mines and their industrial plants and the brutality of compound discipline tended to increase in proportion to the remoteness of the area. Nevertheless, labour militancy and union organisation was on the rise as production in

[39] See the groundWork Report 2005 [16ff] for a fuller description of the transition from British to US global hegemony.

Box 7: Segregation: the case of Top Location

Discrimination was built into the fabric of urban life from the start. ZAR regulations applied to early Vereeniging and allowed black workers to live in the backyards of 'white' stands but not on the street front. By 1910, Vereeniging Municipality had made available a commons for black self-housing. This was Top Location, home to 576 people in 1919, while more than two thirds of black people in Vereeniging still lived in backyards and in industrial compounds.

The lives of the people of Top Location were governed by a set of rules enforced by a 'native' administration under a white superintendent. Residents had to be approved by the superintendent and approval was linked to work permits. They had to provide their own dwellings and could sell the buildings (but not the land) only to persons approved by the superintendent. Only married men could lodge with residents before 1935 and they had to get a monthly lodgers' permit.

Buckets were used for sanitation and removed three times a week. Water was provided in standpipes. Later, public shower facilities were provided with separate blocks for men and women. There was no drainage system, however, so water ran into neighbouring yards.

The administration, determined by the Black Urban Areas Act, was funded from the 'Native Income Account'. Services and amenities were limited to what could be paid out of this account after the salaries of the superintendent and his black policemen had been met. Its income came from rents, fines and licences and from the administration of work permits. It also earned income from a monopoly on brewing and selling beer and waged war on women who brewed beer to supplement their incomes. People thus had to pay for the means by which they were oppressed, a principle that served apartheid well and which endures in the administration of 'cost recovery'.

In 1935, a Native Advisory Board (NAB) was established with seven representatives elected by the residents of Top Location. Also in 1935, the municipality decided that the people should be moved from Top Location. It therefore halted all expansion and improvement in services. Conditions quickly deteriorated leading to outbreaks of pox, typhus, dysentery and infantile paralysis. This provoked local activism and organising, including by the ANC. The NAB was caught between activists who criticised its

ineffectiveness and white administrators who rebuked even the mildest demands. The representatives finally started a boycott of NAB meetings with the support of the ANC.
Source: Prinsloo 1992.

the reserves declined and workers' families became increasingly dependent on their wages. War time inflation added to the pressure and, in 1944, power workers ignored the advice of their moderate unions and went on strike. It was quickly resolved with false promises and identified militants were sacked, but it nevertheless proved the prelude to what government most feared – a major strike on the gold mines.

Despite the 'civilised labour' policy, the ratio of white to black workers in industry and at the state corporations declined throughout the 1930s. During the depression years, the Pact government briefly subsidised white construction jobs at Iscor's Pretoria works as the corporation argued that its priority was to reduce labour costs. In 1933, the economy and the demand for labour started picking up. At the same time, Herzog dropped the Labour Party and formed a new government in alliance with Smuts. With this, the promise of an all white work force at Iscor was allowed to fade. When its Vereeniging works opened in 1934, white men made up 55% of its workforce. Only 28% of workers were white at Iscor's Union Steel subsidiary, and 23% at its partner Stewart and Lloyds.

Unskilled white workers protested both the substitution of black for white workers and their low wages as compared with the elite skilled workers imported from Europe by both state corporations. Management responded with a sleight of hand, raising nominal wages but restructuring work and extending training periods to effectively lower the wage bill.

More broadly, according to Clark, Van der Bijl adopted two strategies in response to labour unrest. First, workers should be isolated from the centre of labour militancy on the Rand. Escom would therefore build new plant in relatively remote areas while Iscor would establish its new works in the purpose built company town of Vanderbijlpark, down the road from Vereeniging. Second, "rather than being the nemesis of employers" unions could serve "to defuse worker agitation" [1994: 129]. For black workers, however, the National Party government elected in 1948 had different ideas.

3. Apartheid

In 1948 the white electorate voted the National Party into power, on a minority of total votes but a parliamentary majority of five seats, and so initiated 46 years of apartheid rule and Afrikaner Economic Empowerment. White, and particularly Afrikaans workers, mobilised through a network of political, cultural and economic organisations aimed at strengthening the position of the Afrikaner in both politics and the economy, were at the core of their constituency . [40]

Their central demand for a 'civilised labour' policy recalled the slogan on which the Pact government was elected in 1924. Their desire to differentiate themselves from black workers, and to earn enough to maintain a 'civilised lifestyle', had been sharpened since then. During the depression of the 1930s many were thrown out of work and 80% of the large number of 'poor whites' were Afrikaners. More immediately, the colour bar that prevented competition from black workers was effectively suspended during the Second World War. The 'liberalising' agenda of capital, intent on reducing overall wages, was also increasingly evident. Black education was no longer limited to the amount raised through 'black taxes'. In 1947, the Department of Native Affairs recommended the abolition of the pass laws. The Fagan Commission, reporting in 1948, recommended that permanent black urbanisation should be unrestricted in order to meet the needs of industrial expansion and to provide a settled, stable and skilled workforce with better education and wages – which could in turn provide a bigger market for consumer goods.

A second core National Party constituency was also threatened by this agenda. White farmers wanted to retain cheap black labour and feared that increasing competition from manufacturing would drive up farm wages. Further support came from ambitious Afrikaner entrepreneurs intent on securing state support to gain 'their share of the economy' and from a restless class of cultural activists and politicians.

[40] See O'Meara [1983] for a full account. This chapter draws on a wide range of sources, most of whom informed far more of the text than the specific references indicate.

The Smuts government also played out a politics that echoed 1924. It did not in fact contemplate political reforms but seemed to assume that white superiority would simply continue in the natural order of things. It was thus content to let business determine the labour market while displaying its authoritarian nature in the brutal repression of a strike by black mine workers in1946.

Enforcing superiority

This laissez faire approach was sharply reversed by the National Party. It introduced a series of discriminatory laws which later became the basis for 'separate development'. These laws controlled the lives of black South Africans in more and more minute detail and reshaped the spatial organisation of the Vaal Triangle. First they sharpened and made explicit discrimination in the workplace and in everyday life; then, in a fantastical version of 'decolonisation', they attempted to make black people citizens of foreign 'homelands'; and finally, they created a virtual police state and then a regional military rogue state.

Afrikaner economic empowerment

The reservation of jobs for whites has its roots in the colonial conquest of territories and white lordship over indigenous people, the institution of slavery and the early pass laws which made unemployed black South Africans liable to be arrested for 'idleness and loitering'. It was also kept in place by industrial action from white unions as well as their participation in fora and committees where decisions were taken about job specifications and artisan training.

The legal architecture of the colour bar built on the Mines and Works Act of 1911 which stipulated that only whites could do blasting. It was bolstered by the 1911 Black Labour Relations Act which "made it an offence for a black miner to break his employment contract or for anyone to attempt to persuade a worker, by offering higher wages, to break his contract. The 1913 Land Act not only restricted black access to land, but also introduced strict measures against 'squatting' on white land, in order to increase the supply of cheap black labour" [Terreblanche and Nattrass 1991: 8]. Laws from 1920s enabled the white trade unions and government to exclude blacks from skilled jobs and secure preference for whites in other jobs. The 1953 Natives (Settlement of Disputes) Act forbade Africans from being members of registered unions and provided for them to be represented through a system of works committees. In 1956, the Industrial Conciliation Act moved beyond these partial measures to enable the Minister of Labour to reserve jobs for specified racial groups.

Box 8: Laws of the 1950s

Apartheid policy meant a return to the 1922 Stallard principle "that Africans should only be in the white areas on a temporary basis, and for a limited purpose, that they should retain their links with the reserves to which they must eventually return, and that the means of enforcing this was by stricter influx control and the extension of migrant labour" [quoted in Lipton 1986: 22]. A battery of laws was passed to make the return to this principle a reality.

1950: Population Registration Act classified South Africans into members of different race groups.

1950: Group Areas Act reserved residential areas for specified race groups.

1950: Suppression of Communism Act enabled government to suppress opposition using a very loose definition of 'communism'.

1951: Bantu Authorities Act provided the basis for making black people foreigners in 'white South Africa', and excluded 'Native representatives' from parliament.

1952: Abolition of Passes and Co-ordination of Documents Act extended the pass laws to black women.

1952: Native Services Levy Act imposed monthly taxes on employers of urban Africans.

1953: Bantu Education Act limited the scope of and finance for black education. Verwoerd, then minister of Bantu Affairs, explained:

> There is no place for [the Bantu] in the European Community above the level of certain forms of labour … it is of no avail for him to receive training which drew him away from his own community and misled him by showing the green pastures of the Europeans but still did not allow him to graze there … [This led to] the much-discussed frustration of educated natives who can find no employment which is acceptable to them … it must be replaced by planned Bantu education… [with] its roots entirely in the Native areas and in the Native environment and community. [Quoted in Lipton 1986: 24].

1953: Reservation of Separate Amenities Act legalised the provision of unequal facilities for different races.

1956: Separate Representation of Voters Act removed 'coloured' people from voters' roll

1957: Native Amendment Act introduced compulsory segregation in churches, entertainment, buses and sport.

1959: Promotion of Bantu Self-Government Act created the legal framework for 'separate states', like the Transkei, for black South Africans.

Afrikaner jobs were created in many ways. In the civil service, white English speakers were purged or sidelined to make way for Afrikaners. Afrikaner (and other white) small traders were assisted by removing competition from Indian South Africans. In 1957, government prohibited Africans from trading outside the reserves and townships. The Railways, the Post Office and the growing Bantu administrative and later security apparatuses would all provide white and specifically Afrikaner jobs. The strategy of white votes for white jobs had worked.

Behind this struggle for white jobs lurked another, less obvious logic: that of making available cheap, controlled black labour for mines, farms and industry. Migrant labour kept wages low, because the migrants' families in the labour reserves – later to become homelands – took care of families, old age pensioners and sick workers. In other words, the costs that are necessary to maintain a labour force were externalised to the black homelands.

Cold War capitalism

Apartheid did far more than intensify racial segregation. It secured a renewed foundation for capital accumulation and, in the period 1948-1970, only the Japanese economy grew faster. It also positioned South Africa within the global politics of the post-war order presided over by the US. The European empires crumbled into an international system of independent states which enabled US corporations to penetrate territories previously reserved for exploitation by the imperial powers. At the same time, the US needed the means to discipline these states and found it in the Cold War. This enabled the wholesale abrogation of human rights, even as the discourse of rights justified the defence of liberty against communism. It was a system of global governance that enhanced the power of national elites over those that they subordinated, and over the environment, in return for fealty to the US.

The assertion of an Afrikaner nationalism hostile to the old imperial order was thus entirely compatible with the new order and the relationship was consolidated with a virulently anti-communist rhetoric. The US itself retained segregation in the southern states during this period and the brutality of apartheid was more than matched by numerous third world regimes in the 'free world'.

Apartheid produced cheap black labour and enforced this labour regime in the workplace by denying black workers trade union rights while excluding black South Africans from political

decision making. It also squeezed another four decades of migrant labour subsidies out of the already desperately impoverished native reserves, so ensuring that industry would not pay what it cost black people to live.

Apartheid achieved this by rewarding white workers with a white welfare state and the opium of white superiority. In return, they had to enforce this system of domination as overseers in the workplace and as administrators, soldiers and policemen in society at large. White domination was thus made to serve capitalist production, as labour analyst Karl von Holdt argues: "The coercive and despotic regime secured the compliance of black workers to hard, dangerous work and low pay. It also secured an apartheid form of flexible labour, where workers could be hired and fired at will, or shifted from department to department as the need arose" [2003: 39]. But it also produced inefficiencies in allocation of labour, and skills shortages: some blacks could not use their knowledge while some whites were promoted beyond their skills. This led to overstaffing and low productivity, not least because informal resistance became routine for black workers.

Industrialising apartheid

The war effectively enforced inward industrialisation – replacing imported with local goods – and the performance of the iron and steel industry gave industrialists confidence in their own capacities. It also constrained expansion, however, because industrial machinery could not be imported. Following the war, two state owned corporations – Iscor and Sasol – led a huge expansion of industrial activity in the Vaal Triangle with the support of the third parastatal, the electricity provider Escom. For the first time manufacturing – largely metal products – accounted for a larger share of national production than both agriculture and mining. The war had also shown industrialists, and Van der Bijl in particular, the advantages of central control.

South African industry adapted the 'Fordist' production model of corporate America. This meant increased control by management over the labour process, via continuous or assembly line production where machines, not artisans, set the pace of work. Both Iscor's integrated steel production plant at Vanderbijlpark and Sasol's liquid fuel-from-coal plant at Sasolburg introduced this new style of work. In South Africa it was given a racial twist, as this snippet from a trade magazine in the mid-forties illustrates: "… the only way to bring a native into industry was to put him on a conveyer belt, where if he stopped working for a moment something red-hot fell on his foot" [quoted in Webster 1985: 85]. These massive plants were made the centre of a larger system of

'vertical integration' of production under the control of the corporation. This meant controlling the entire chain of production from raw material inputs to the marketing of products.

Putting this in place required very large capital investments and keeping it going required a supplement to cheap black labour: cheap and plentiful energy from cheap coal which was guaranteed by state control of the price, imposed during the war and maintained until 1987. This process of industrialisation both created the giant corporations, private and state owned, necessary to manage vertical integration and concentrated economic power in their hands. And just as labour was used and discarded, so too the wastes of production were discarded onto the environment under the strong compulsion to externalise costs.

This model of production was pretty much what Van der Bijl had aspired to from the beginning. Escom and Iscor had been forced to operate as subordinate partners to private firms for two decades but, by the late 1940s, Van der Bijl saw the opportunity to move them into a stronger position. In doing so, he had the support of his new found ally: Anglo American. Having taken over the assets of Lewis and Marks, Anglo became Iscor's main partner in upstream and downstream businesses while it was also both the main supplier of coal to Escom's power stations and the power utility's largest customer.

The new round of industrialisation focused on the Vaal Triangle with its large supplies of coal, easy access to water, established infrastructure in Vereeniging and Meyerton, and its location close to the major markets of the Rand and the new Free State gold fields.

Escom's monopoly

In terms of the original legislation that established Escom, the corporation had a right to buy out VFP in 1948. The mining industry had traditionally opposed the formation of a state owned monopoly but, when Van der Bijl was able to show that VFP had made war time profits at their expense, Anglo American was ready to provide both the political support and the finance necessary to buy out VFP. In 1952, Escom returned the favour by drastically lowering the price of electricity to the mines.

With a guaranteed monopoly, Escom had access to a stream of income that would leverage capital for future expansion. The US Export-Import Bank provided a $7m loan to pay for US generating

equipment and it secured a $30 million long term loan for new power plants through the World Bank in 1950, and another $30 million in 1954. Finance to develop the recently discovered Free State goldfields was also raised from US banks [Fine and Rustomjee 1996: 158].

Escom now controlled the three Vereeniging stations and built the Taaibos and Highveld power stations to make the Vaal the power centre of South Africa. It fed a rapid increase in demand for electricity after the war led by the nearby Free State goldfields. From 1945 to 1955 the capacity of Escom's power stations more than doubled despite constraints on the supply of machinery and raw materials like copper just after the war. "[G]rowth in Escom's electricity demand averaged 8.7 % between 1954 and 1980" [Leger 1991: 150].

Iscor's Integrated Steel Plant

During the war, steel imports from overseas were cut off. In 1940, Iscor was able to meet only a third of the South African demand for steel. It acquired the Vanderbijlpark site in 1941 and constructed a plate rolling mill, but expansion was limited by war time constraints on importing new plant and the corporation could not capitalise on its captive market. As a result of post-war reconstruction in Europe and Japan, steel shortages continued. This gave Iscor the opportunity to break out from the unstrategic role as maker of mainly raw steel that the pre-war arrangements had locked it into, and which saw its profits decline as those of private firms' rose.

Van der Bijl's strategy was vertical integration "with Iscor mining iron ore and coal, producing raw steel, and manufacturing the steel billets into finished products in mills and manufacturing works for which Iscor subsidiaries had provided the machinery" [Clark, 1994:116]. The physical base for production was to be the Vanderbijlpark steel works.

Iscor needed big capital to build its new plant at Vanderbijlpark. Smuts approved the plans, but provided only half the necessary funds. By 1947 costs were rising and the shortfall was even bigger. The new National Party government was equally cautious but also suspicious of Van der Bijl's political allegiance to Smuts. Van der Bijl died in December 1948 and was succeeded by Frederik Meyer, who was close to the National Party and rumoured to have connections with the Broederbond, a secret organisation that coordinated strategies for Afrikaner empowerment. Meyer got the money.

Construction of the new Vanderbijlpark plant started in 1948. It was a modern integrated steel works where all of the country's requirements for flat rolled products – plates, sheets, tube strip and tinplate – could be made. Its continuous production embodied the ideas of the Fordist assembly line and it raised Iscor's total production capacity to one million tons in 1952.

In the eight years from 1951, sales more than doubled and Iscor showed growing profits throughout the 1950s. The Vanderbijlpark plant was continually expanded from 1953 to 1974. By 1975, Iscor was producing 5 million tons of steel. Further very large expansions were planned – to raise capacity to 7 million tons by 1976 and then to reach 10.5 million tons by 1983 – but these plans had to be trimmed back and expansion stopped altogether in the period between 1980 and 1986.

Iscor supported the immigration of skilled artisans from Europe, paid at a premium, and trained large numbers of white artisans to create its skills base. Under apartheid, in contrast to the Pact period, white union demands for 'civilised' wages were readily met by the corporation's policy of pay based on race. Black wages were suppressed for the same reason, despite black workers doing more skilled jobs. Iscor thus reproduced the three tier labour regime that dated back to the beginning of the 20th Century.

From the start, in the construction of the new Vanderbijlpark plant, the corporation exhibited a grim determination to externalise costs onto the environment. Or, to put it another way, the heroic story of corporate industrial development had no place for its own wastes. They were made unmentionable and to be got rid of expeditiously and at least possible cost. As its neighbours in Steel Valley would discover, Iscor did the minimum necessary to flush away the large volume of toxic effluent that it would inevitably produce. It constructed unlined effluent dams and an unlined canal to the Vaal River via the Rietspruit – no more than the plumbing necessary to handle the volume of liquid. Similarly, its air emissions were simply to be vented through chimneys.

Sasol the money guzzler

Like the new Iscor plant, Sasol's coal-to-liquid 'synfuel' plant required a greenfield site – previously farm land – to construct its massive industrial plant without the constraint of having to fit into an already built environment. It also required the location to be on top of the main Vaal coal fields and close to a copious supply of water. Finally, it required very large capital investments.

Its development is an example of government providing capital where private capital sees high risk or low chances of profit. The first plans to make fuel from coal came from Anglovaal, one of the smaller mining conglomerates, in the 1930s. It acquired a license and some guarantee of funding from government by 1949, but lost interest as the Free State gold fields proved much more attractive in the early 1950s.

Nobody in fact knew what it would cost as the technology, the Fischer-Tropsch process, had not been applied commercially anywhere in the world. Estimates grew from £18 million in 1951 to £33 million in 1953. By 1956, the Industrial Development Corporation (IDC), through which government funds were channelled, had invested £40 million into Sasol and costs were still rising. The parliamentary opposition was outraged by this bottomless pit of spending and even the National Party economic minister, Klasie Havenga, was distressed:

> I am very disappointed that Sasol's capital requirements have increased to such an extent and would probably not have approved of the scheme had [I] visualised that the cost would reach such dimensions [quoted in Clark 1994: 160].

The project had no doubt made sense in the immediate post-war period. Rising oil demand in the industrial countries was matched by anxieties over supply shortages. By the mid 1950s, however, big oil was more concerned about a supply glut which threatened to evaporate the price of oil and their profits. Government could then either abandon its huge investment or keep spending. The confidence of Sasol's founding director, Etienne Rousseau, was perhaps decisive. A chemical engineer who had been involved in Anglovaal's original project and had also worked as a research engineer at Iscor, Rousseau built an organisational culture centred on high technology innovation and fierce loyalty which translated well into apartheid's self-aggrandising narrative of racial superiority. Sasol became a symbol of Afrikaner nationalist modernisation.

Two thirds of the capital cost of Sasol went to the gasifiers and plant to make oxygen and steam – not needed in a conventional refinery – and the extraordinarily high energy process of production is high cost even in the context of cheap labour and coal. It is, in short, inherently uncompetitive unless crude oil prices are high. It therefore became profitable when the 1970s oil shocks multiplied the price of oil and is again profitable now as prices are driven up by US imperial wars and the prospects of peak oil.

Sasol also led the mechanisation of coal mining in South Africa. Its plant required a constant and voluminous feed of coal, both for productivity and for operational stability. Handpicking and loading was still the norm and half of South Africa's coal was still hand mined until the 1970s. For its Sigma colliery in Sasolburg, Sasol redesigned the continuous miner – a monster drill machine – to handle the harder South African coal, and experimented with long wall mining and mechanised loading.

In 1952 Sasol started mining, and in 1955 produced its first petrol. Sasol had integrated two systems into its Sasolburg plant: the German (Arge) and American (Kelloggs) technologies. Over the next two decades, it experimented and redesigned these technologies to the point where they could be patented and now provide a competitive edge to the globalised and privatised Sasol. This learning, bought at public expense, was accompanied by a succession of incidents. The Kelloggs reactors were shoddily made and "over the next decade or two, Sasol would lose several of these reactors to fire" while repeated "explosion and deaths occurred at the gasification and units downstream from the reactors too" [Collings 2002: 51].

Regular incidents also took the lives of mine workers. In 1964, an underground fire at Sasol's Sigma mine killed 20 black miners. This was the worst incident at Sigma but by no means an isolated one. It was part of a pattern that made black lives cheap in order to keep coal cheap.

Sasol seriously underestimated the volume of its effluent, producing five times more than its first treatment plants were designed to handle, according to Meintjes [1975]. It disposed of the surplus by irrigating it into farm land, leaving soil bacteria to break it down. The resulting stench was known as the 'Abrahamsrust smell' after the name of the farm. It eventually expanded its treatment works sufficiently to deal with the smell, but it continued ploughing waste sludge into the ground into the 1990s.

Similarly, air pollution was utterly neglected until 1967 when Sasol began to address the most offensive and most visible emissions – hydrogen sulphide[41] and smoke. In 1973, The Star trumpeted that, "Sasolburg was no longer under a shroud of smoke and dirt" and dutifully echoed Sasol's own claim that "no harmful or dangerous concentrations of gases or solids are emitted from the Sasol plant" [quotes in Meintjes 1975: 137ff].

[41] Sasol generally represents hydrogen sulphide as an odour problem. Its health impacts are well documented, however [e.g. Elsom 1987, Hamilton and Hardy 1983]. Intense exposure can lead to respiratory injury or death while exposure to lesser concentrations can cause eye and respiratory irritation.

That this absurd claim was allowed credibility indicates that environmental issues were entirely subordinate to the heroic story of industrialisation. The costs of Sasol's financial subsidies were questioned, but its environmental costs were scarcely recognised. In the very act of dealing with visible pollution, a monstrous slate of emissions was excluded from public discourse.

Cheap coal & cheap lives

The low price of coal resulted in wasteful and dangerous mining methods. According to Sasol's historian John Collings:

> The traditional way of mining coal, which still prevailed in southern Africa at the middle of the 20th century, was to drill holes in the coal, using hand-held drills; pack them with explosives; detonate the charges to blast the coal; remove the coal from the face of the seam by pick-axe; manually load coal hoppers with lumps of coal; then push the hoppers along rails in the working section before attaching them to an endless-rope haulage system. [2002: 28-29]

Many mines left coal pillars to support the mine roof rather than buy wooden supports. They also 'picked the eyes out', taking the better quality coal and leaving less valuable coal behind. The Petrick Commission into coal mining, reporting in 1973, lamented this state of affairs as a national disaster. But the power of the gold mining magnates, the railways and Escom, Iscor and Sasol combined to keep coal cheap with government controlling the price.

Black lives were cheap in the coal mining industry. As Allen [2003] documents, miners were exposed to black lung disease for want of protective equipment. Underground explosions were common. From 1891 to 1995, some 70 methane explosions resulted in the death of miners. In one incident in 1926, the entire night shift of 125 men was killed. Roof falls were also common. 431 black and 6 white miners were killed in the Coalbrook disaster in January 1960. Coalbrook sold low quality coal, the market for which had recently expanded to include Sasol's oil from coal plant in nearby Sasolburg. As the demand increased, mine management resorted to 'top coaling' – taking coal from the roof of the tunnels – and 'robbing the pillars' – splitting coal from the side of the pillars supporting the roofs. This produced a number of roof falls, which were ignored by management, prior to the huge rock fall of the disaster. The bodies of the dead were never recovered from the collapsed mine. The meagre belongings of the black miners were packed into new suitcases with a "Bantu DL 10 Form containing details of the death of each mine worker" stuck on the outside and sent to their relatives [Allen 2003: 240].

Making urban space in the Vaal

The process of producing the urban space of the Vaal after the war was messy, contradictory and violent.

Initially it was driven by the industrialists. Iscor and Sasol, because of their scale and location, each required a completely new town to service it. Built from scratch on farm land, these towns remade the area around Vereeniging into the Vaal Triangle. Vanderbijlpark, where building started in the 1940s, was named after Hendrik van der Bijl, the original hero of South African industrialisation, the first state scientist, Commissioner of War Supplies, chairman of Escom, Iscor and the IDC, a family friend of Prime Minister Jan Smuts and a friend and business partner to Ernest Oppenheimer. The second company town to be built was Sasolburg, named after the corporation that founded it.

Box 9: Spontaneous combustion

The 'fiery' nature of coal mining is evident in underground mines, open cast mines and coal discard dumps. Spontaneous combustion – fires that light themselves – results from methane released from coal when it is exposed. In 1973, the Petrick Commission highlighted spontaneous combustion of discard dumps as a pollution problem. Writing in 1995, Lang reported:

> On the coal mines themselves more than 50 old dumps burning have been a main cause of air pollution, contributing to acid rain. [194]

In 2004, Scorgie noted that such fires are estimated to burn as much coal as Eskom and are associated with "elevated sulphur dioxide concentrations … in the Witbank and Vaal Triangle areas" [2004: 3-64]. They burn without any pollution abatement whatsoever and under conditions that produce a high percentage of incompletely combusted VOCs, such as the carcinogenic benzene.

In the past five or six years, many of the discard dumps have been rehabilitated. But spontaneous combustion is still common – fires break out regularly at the New Vaal Colliery.[42] A new source has now been created as abandoned coal mines are rehabilitated and put back into production in response to high prices. Some burst into flames when the water that flooded them is pumped off.

[42] On a flight over the New Vaal Colliery in mid 2006, VEJA members saw a fire burning in the mine.

From the 1950s, politicians increasingly asserted control over the urban agenda. In 1954, the Mentz Commission was given the job of fitting the Vaal north of the river to the National Party's vision of apartheid – literally meaning 'separateness'. It decreed that all expansion of existing black areas should be suspended, and that a single black township should be developed. However, government attempted to implement this vision only in 1965.

White garden cities

Vanderbijlpark was to be a "planned industrial city" designed according to the latest planning principles embodied in the idea of the garden city. Iscor established Vesco as a wholly owned subsidiary to implement these plans and develop Vanderbijlpark and its two black townships. Sasolburg was similarly developed by Sasol's subsidiary Sasol Townships Ltd. starting in 1952. With advice from Vesco, it followed the same principles of garden city design. The plans for Vanderbijlpark were at once visionary and racist. They were marked by the unquestioned assumption that whites were superior and that blacks were there to serve them, as the 1922 Stallard Commission had ruled.

The towns were meticulously planned. In a promotional brochure, Van der Bijl said:

> I realised at once that here was the opportunity to establish a town on well-defined lines planned in advance and so avoiding haphazard growth and the many undesirable and even evil consequences arising therefrom. It is well-known that the residential environment of the worker has a far-reaching effect on his health, state of mind and consequently on his efficiency and productivity. Therefore I decided that the workers in Vanderbijlpark should live in environments which would be conducive to their greatest personal welfare and so to the welfare of the industries in which they are employed ... [Vesco 1948: 5]

The suburbs were insulated from heavy traffic by a system of broad outside avenues and curving inside roads and schools and playgrounds were located so that children would not cross main traffic routes. Thousands of trees were planted in both towns, lining the roads and shading numerous small and larger parks.

The street names of Vanderbijlpark reflect the aspirations of successive power holders. Before 1948, Van der Bijl's own imagination held sway. The names celebrated high Western science,

technology and culture: Marconi, Becquerel, Beethoven. In 1952, the town was proclaimed a municipality and Vesco was pushed into a process of handing municipal responsibility to a white local government. By 1954, the political triumph of Afrikaner nationalism was reflected in the names of Afrikaner generals and politicians. This was consolidated when the local council, with a National Party majority, took full control in 1959 and Vanderbijlpark's streets carried names of Afrikaans cultural figures like the writer Pannevis.

Industry's townships

Bophelong and Boipatong

Expressing cultural aspirations was, of course, a white affair. Black people were to be administered. In 1948, Vanderbijlpark's Health Committee, the forerunner of a full council, set up its own local department of Native Affairs. [43] It had two sections: administering and policing service contracts – thus regulating black South Africans' fragile right to work and live in the area – and township development and administration.

Black workers had been housed in a compound on the Iscor site since 1943 when construction started within the limits of war time constraints. By 1947, between 2,000 and 3,000 men were housed in 'temporary huts'. Van der Bijl himself saw a need for permanent residence for black workers and their families:

> Contiguous to the industrial areas space has been reserved for non-European townships where natives will be housed in ideal conditions. Industrialists will therefore have large non-European labour reserves in close vicinity to their undertakings, so that the minimum of time will be lost in getting to and from work. [This will] also obviate the traffic of non-Europeans through European townships and the centre of town while on their way to work. [Vesco 1948: 7]

Bophelong was thus located west of Iscor with Boipatong to the east, next to the new plant and a block of downstream industries and in the full blast of pollution carried on the prevailing wind.

Van der Bijl's metropolitan imagination indulged an ethnic fancy: the blocks of houses in Bophelong's residential areas were laid out "in the traditional 'kraal' formation" [Vesco, 27]. In 1947 Vesco started building experimental houses with 2 bedrooms, a lounge, a kitchen with a coal stove, and a bathroom with toilet. They were serviced with water, electricity and sewerage. The first

[43] Prinsloo [1994] records this history in great detail. This section draws on his work.

500 houses were available in 1948. Discrimination was obvious down to the sewerage – Vanderbijlpark's sewerage was treated while Bophelong's was simply pumped onto the surrounding fields. Nevertheless, this housing was as generous as it would get.

In 1948, Bophelong was proclaimed. The Vanderbijlpark Health Committee took over administration but had no intention of spending its own revenues. After some haggling, the new Department of Native Affairs allowed it to open a beer hall to raise revenue for development. Spending in black areas was to be limited to what could be squeezed out of residents, supplemented by a provincial housing subsidy. The development of Boipatong followed in 1953. In both settlements, a Native Advisory Board was 'elected' and a similar slate of amenities developed: crèches, schools, a community hall, administrative buildings, clinic, post office, sport grounds and business centre.

Zamdela

In the planning of Sasolburg, it was decided that the town should be near the works for easy access but a careful study was made of wind directions to minimise the impact of pollution. Zamdela was also to be close to the plant but separate from the town. The only place left for it was in the path of pollution. According to an early history commissioned by Sasol:

> The works single quarters were at first viewed with disfavour, the reasons now obscure, for the name Zamdela means 'they despise us'. By the time they had changed their minds, the name had become familiar and had clearly lost its original meaning, for it has not changed. [Meintjes 1975: 28]

That they changed their minds is the fantasy of this historian, a repetition of the apartheid fantasy that black people were grateful to know their place in its racial order. According to local people, the name in fact means the place of despair or the place from which people do not return. Zamdela included hostels for migrant mine and industrial workers as well as permanent residential housing for some industrial workers.

Dispossession, resistance and repression

From Top Location to Sharpeville

The removal of people from Vereeniging's old Top Location to Sharpeville, ostensibly to make place for industrial development that never happened, was a long and messy process finalised by an act of brutality.

Sharpeville was originally planned in 1935 as a 'model township' but was slow off the ground. People started moving in from 1943, many of them voluntarily according to political scientist Philip Frankel, as conditions in Top Location deteriorated. Local industry geared up for wartime production, drawing a mass of new immigrants into Top Location. At the end of war it contained 15,000 people. Tensions between landlords and tenants crowded into backyard shacks were acute and many people died from pneumonia, gastro-enteritis and tuberculosis.

At Sharpeville, the model plans were abandoned by the Vereeniging Town Council which was unwilling to spend the money. Instead, the council used the standard of the 'Brakpan house': four rooms with no internal doors, a concrete roof and outside bucket toilet. It provided one tap for every 14 houses and two communal shower facilities with 32 shower heads each for the whole township. There was a plan for stoves, but due to the war they were not available. The municipality rented the houses at a comparatively high rate but did not permit backyard shacks from which residents could draw a rent. It prioritised building a beer hall and used the profits for projects providing food and blankets to the elderly, cost price milk and sports fields. Plans for an old age home, a hotel and a recreation venue at the Vaal were never realised, while a secondary school was a long time coming.

The final removal from Top Location to Sharpeville, in 1959, was carried out with the brutality typical of an apartheid forced removal. Until then, Frankel notes, Sharpeville residents had shown little political fervour: they had not taken part in the 1950 May Day stay away, the 1955 Evaton bus boycott, or the Defiance Campaign and protests against the Bantu Education Act in 1958. The final removal created political dissent in Sharpeville:

> People in Topville were simply informed that they were being transferred to Sharpeville irrespective of their choices or dispositions, and, after impossibly short notice, were bundled at gunpoint into municipal police trucks along with the bare minimum of their portable

possessions. When people had possessions which did not fit the specifications of the trucks, they were simply left at the roadside. Thereafter, municipal bulldozers made short work of the crumbling shanties in order to clear the site for the speedy entry of the industrial developers…. (the) traumatised inhabitants arrived in Sharpeville Extension 1, known as Vuka section, to be confronted by little more than a collection of shacks and the most rudimentary of public health facilities – all on a bare piece of veld grandiosely labelled a 'site and service' settlement. This was particularly harsh on people who had previously been homeowners, who were sufficiently educated to comprehend the iniquitous workings of apartheid, and who had lost the accoutrements of a petit bourgeois township existence. [Frankel 2001:36]

Losing freehold in Evaton

Evaton was one of the very few black freehold areas in the country, and eventually developed into Sebokeng. The sad story of how Evaton slowly lost its freehold status is recounted in documents lodged in a failed land claim.[44] Evaton originated from the sale of portions of the farm Wildebeesfontein. Between 1904 and the mid 1930s, the owner Elizabeth Adams sold stands in private title to African people. Following the war, Evaton emerged as a centre of resistance. In 1955, residents joined the bus boycotts initiated by the people of Alexandra.

During the 1960s, a battery of legal but exploitative practices was used to deprive stand owners of their land: Under apartheid laws, stand owners were not allowed to sell land to other black South Africans, so the local authority became the buyer. When a stand owner died, attorneys handling the estate could alienate the land in lieu of compensation for their services. Heirs had to qualify in terms of section 10 of the Black (Urban Areas) Consolidation Act before they could receive title and, if they did not, the land was sold to the local authority. Stand owners were threatened with forced removals and pressurised into selling their land to the local authority. The local authority levied charges to put the owners in debt which then allowed the authority to alienate the land. Owners had to pay for residence permits as well as rentals to the local authority. Lodgers had to pay rentals to both the local authority and the owners. Services had to be paid, even though these consisted of night buckets and pit latrines only. Those who resisted suffered legal proceedings and their land was sold in execution. The local authority also carried out expropriations under false pretences, for example claiming that land was needed for roads and schools but then using that land for housing. Some owners never received compensation, others refused to accept the inadequate compensation on principle.

[44] The document TZ2, "Representations to the advisory commission on land allocation by the Wildebeesfontein Stand Owners Association concerning Evaton, Transvaal", dated 1998, is part of the file numbered LCC 58/04.

In 1961, Evaton was incorporated under the Sebokeng Management Council. In 1972, Evaton, Sebokeng and other areas were placed under the control of the Vaal Triangle Administration Board, later renamed the Orange Vaal Development Board. Following the 1979 Riekert Commission, the apartheid government grudgingly accepted that some black people would reside in 'white' South Africa and established black local authorities to manage this population. The Board was replaced by the Evaton Town Council in 1983, succeeded by the Evaton City Council in 1986, and this black local authority then became the title holder to much of the land that had originally been freehold.

The Sharpeville massacre

On the afternoon of 21 March 1960, police fired on a crowd of people protesting against the pass laws in Sharpeville. The protest was organised by the Pan African Congress but joined by many people loyal to other organisations. They refused to carry pass books and marched to the police station to be arrested. Officially, 69 people died including ten children. Many were shot in the back as they tried to run away. The real number of people killed was much higher but could not be established as government legitimated repression by declaring a State of Emergency. Police intimidated personnel at hospitals and cemeteries as far away as Boksburg and thousands of activists were detained. Many victims disappeared and some residents believed that the police dumped bodies in the Leeukuil Dam below Sharpeville.

The massacre changed Sharpeville for ever. Many talented people left the community, and Sharpeville's excellence "in soccer, boxing, art and criminality", which rivalled that of Soweto, evaporated [Frankel 2001: 201]. All development was halted. The apartheid authorities first considered changing the name of Sharpeville and later planned to erase the place itself through another round of forced removals, this time to Sebokeng. This was part of a wider plan to clear black people from the Vereeniging-Vanderbijlpark area but was never fully implemented.

For the apartheid state, the massacre was a spur to develop the mechanisms of a police state: bannings, arbitrary arrests, detention without trial, torture. For the forces of resistance, it signalled that the strategy of non-violent resistance must be supplemented by armed struggle and marked the beginning of the movement in exile. Internationally, "distaste for apartheid turned into horror" [Frankel 2001: 204], and the Anti-Apartheid Movement initiated a long running campaign for sanctions.

The grand plan

In 1965, government started to implement its grand apartheid plan to force people from the other townships into Sebokeng. The plan followed the principle laid down by Verwoerd in 1959 that black townships must be

> … an adequate distance from the white township … preferably separated by an area of industrial sites … (with) suitable open buffer spaces around … and a considerable distance from the main, and more particularly, national roads. [Quoted in Lipton 1986: 27]

Sebokeng and Evaton, separated from Vanderbijlpark by Iscor, fitted the bill. White people in Evaton were expropriated while further expansion was halted in all the other Vaal townships. Instead of moving out, however, the growing population was crowded in. Cyril Diwu, who arrived in Van der Bijl's model township of Bophelong in 1954, recounts that, "We allowed our children to build backyard shacks behind our houses, in the space where we had been growing mealies and vegetables."[45]

Boom time in the White Republic

Sharpeville signalled the start of apartheid South Africa's increasing international isolation and its growing obsession with energy security. Sanctions against weapons sales were imposed in the early 1960s and capital bled out of the country. The bleeding was staunched by a consortium of ten US Banks, led by Chase Manhattan, which provided the apartheid government with a $40 million revolving loan. Verwoerd, by now prime minister, led South Africa out of the British Commonwealth, declaring it a republic in 1961. South Africa thus distanced itself from the old imperial power while locating its legitimacy within the US Cold War order.

Despite Sharpeville, the economic boom continued. Between 1960 and 1970, the economy grew at 5.6% per annum and the average real per capita income increased at 3% per annum. Manufacturing growth grew at 5.3% from 1953-60 and at 8% between 1960 and 1970. Worldwide, this was the 'golden age of capitalism'. Real growth rates in advanced Western economies averaged more than 4% per year before reaching the limits of the post-war expansion around 1973, according to Terence Moll [1990].

[45] Interview June 2006

South African growth was largely driven by the minerals and energy complex. "For much of the decade of the 1960s, the iron and steel sector absorbed more than a quarter of all annual fixed investment in the manufacturing sector" [Fine and Rustomjee 1996: 164]. And while Sasol was not making a profit – indeed, soaking up state subsides – it was spending money in the area, buying steel and coal and creating job opportunities. Sasol gave a substantial boost to the chemical industry, whose main clients at the time were mining and agriculture. State agricultural subsidies promoted increased mechanisation, providing further opportunities for Afrikaner investment including Sanlam's investment in a Massey Ferguson tractor factory at Vereeniging. Mechanisation weakened the position of black share-croppers and increased the pressure for urbanisation.

South African oil consumption increased from 72,000 to 210,000 barrels per day, following the trend worldwide of moving from coal to oil in the post-war period. The weapons sanctions in the early 1960s gave government and industry notice of what international isolation might mean and South Africa was particularly anxious that it should not be vulnerable to oil sanctions. In 1966, the Natref refinery was established in Sasolburg, with Sasol as the majority shareholder in a partnership with the French oil company Total – reflecting that the old imperial powers were themselves now looking for advantage in each other's former territories – and the National Iranian Oil Company. This seemed to guarantee a source of crude oil from the Middle East, since the Shah of Iran was both a friend of apartheid South Africa and a client of the US. In 1971, its first year of full production, Natref "consumed the same amount of electricity as did a town the size of Vereeniging" [Meintjes 1975: 125].

The apartheid government was not entirely reassured and in 1969 requested Sasol to build a second synfuels plant. In a context of cheap oil prices, Sasol proposed the alternative plan of storing crude oil in old coal mine shafts at Ogies.

Prosperity in the Vaal

High growth supported the emergence of Afrikaner business. The outflow of international capital following Sharpeville presented an opportunity to national capital, both English and Afrikaans, to buy into assets. Afrikaner capital also "prospered under bureaucratic favours" [Terreblanche and Nattrass 1990: 14]. Volkskas bank, for example, grew phenomenally as it got to run the accounts of Escom, Iscor and Sasol.

The share of Afrikaner ownership of the mining sector increased significantly in the 1960s. Escom expanded rapidly to power the boom and created the opportunity for Afrikaner capital to break into coal mining via guaranteed contracts with new power stations. "Of the five power stations commissioned in the 1960s, four coal contracts were awarded to Sanlam's Federale Mynbou" [Fine and Rustomjee 1996: 160] which grew into the second largest coal company in the country after Anglo American. Afrikaner capital was invited into the Chamber of Mines.

Local historian Piet Prinsloo [1994] calls this the prosperous phase in the Vaal. Job opportunities expanded by 73% for white and 48% for black people. Escom, Iscor and Sasol instituted labour regimes that resembled those of the mines. It was dependent on the mass of disenfranchised, easily replaceable workers while skilled jobs were reserved for white workers. Yet all workers were, where possible, made dispensable through mechanisation and cheap energy. Escom itself led the way in mechanisation, reducing its dependence on cheap labour and on skilled technicians alike. More broadly, the regime was locking South Africa into its familiar constraints: low wages to black workers limited the growth of the domestic market while the local skills base was purposely constricted.

Making the ecological debt

The sometimes detailed knowledge about pollution in the Vaal was excluded from the discourse of industrial development. The apartheid government either did not make the necessary laws or did not enforce them. Thus, the Air Pollution Prevention Act (APPA) was introduced only in 1965 and operating permits to large industries were secret and effectively written by the industry. They were, in short, mere formalities and penalties for contravention were unheard of. South African industry consequently built up a massive ecological debt.

Ecological debt refers both to enclosure – or dispossession – and to externalisation through pollution or otherwise trashing the environment.[46] The pollution debt includes the damage done to people's health, in the workplace and in surrounding communities, and the damage to ecosystems – the ruined rivers, degraded land and bad air described in Chapter One. Industry has thus imposed a substantial proportion of the costs of production on others, making a debt that has accumulated throughout the history of industrialisation. This debt is set to escalate as ecological systems break down.

[46] Muradian and Martinez-Alier 2001 give a detailed exposition of ecological debt.

The inhuman workplace

The ecological debt is written into people's bodies. Researcher Irene Loebell interviewed black steel workers about working under apartheid and concluded that they experienced a "systematic … dispossession of the body" [2005: 14].

Lucky Maphutha told her, "You know, blacks were used like tools. Where there is hard work, blacks were always taken." Pasco Mzwabantu worked almost his whole life at Iscor. He said, "By that time, there were no machines at Iscor to help us … We were the first people to be the machines of Iscor, we were the people who were doing the work of the machines of today." He worked at a furnace where it was so hot that work teams had to be relieved every five minutes. Supervisors stood behind the workers to push them back in when they retreated from the heat. Compound food was used to reinforce the sense of alienation from the self. According to Thembelani Nyingwa, "When they cook … a cabbage, they use a spade to cut it off, not a knife." Maxin Mtambeki added, "The food was rotten … When the [meat] ration was cooking there were some worms walking on top of that ration."

All the workers complained about exposure to heavy dust, chemicals and fumes, and suffer from occupational diseases like high blood pressure, diabetes, respiratory problems and chronically infected eyes. Mzwabantu recalled, "The place where we were working was dirty, so the smelling of the chemicals and of the scrub, it goes into your chest. So when you sleep there is something like dizzy, so you cannot sleep well because it jeopardizes the soul inside. When I cough, things come out from the mouth, it is terrible." In the mornings he could barely get up. "You need somebody to push you and shout at you: 'Let's go to work!' You cannot wake up yourself, because your body has got something in the soul."

Racism in the workplace was institutionalised as 'baasskap', meaning that all whites were bosses to all black workers. Constant racial insults, repeated physical assaults and endless rituals of white supremacy and black subordination reproduced the racial hierarchy on a daily basis. Facilities such as washrooms and canteens were strictly segregated by law until 1983, and in practice well into the 1990s.

Any white worker, whether a supervisor or not, could issue instructions to any black worker. Instructions extended beyond work to personal service. Black workers were ordered to wash cars,

bring tea or go out to buy cigarettes. Blacks could not look whites in the eye without inviting abuse, as Karl von Holdt documents: "Hey, why are you looking at me? Seemingly you have become white now?" [2003: 33]. Blacks had to share their skills with new white workers who later lorded over them, as this bitter quote shows: "After you have guided a boer from the farms, a man who cannot even write his name, he becomes your boss and then you will see the white man coming after you, saying you are not working" [29].

Black workers had no rights and no recourse. Any objection or retaliation to assault risked the ultimate sanction of dismissal.

What Iscor knew

Industries often claim historical ignorance because, they say, environmental issues were not raised prior to the political transition. The implication is that they are not responsible, and certainly not liable, for their environmental debt. The argument is false. Environmental concerns were raised early on and corporations were quite aware of what they were doing. Ignorance was achieved as a purposeful evasion of responsibility. Iscor's Vanderbijlpark Steel Works provides a good example of knowing evasion over a long period of time.

The pollution potential of steel works was well known internationally at the time that the plant was built. Locally, Rand Water objected to the proposed siting of the Iscor steelworks on the Klip River in Meyerton in the 1940s. Department of Water Affairs and Forestry (DWAF) archive material shows that both Iscor and DWAF have known about the plant's water pollution at least since 1961. The material includes technical details: the unlined effluent dams were built on fractured rock formations very close to the water table and effluent was polluting the groundwater. The pollution could be traced to both the coke ovens and the steel making process. It had already reached the water supplies in Steel Valley and could affect both people's health and their farming operations.[47]

In subsequent years, Iscor repeatedly made empty promises to DWAF, disregarded successive reports from its own consultants, and carried on polluting. DWAF, the official regulator, occasionally pleaded with Iscor but never once penalised it. In contrast, Rand Water had no regulatory power but, in 1952, protested against water pollution by Union Steel in Vereeniging by cutting its water supply from five to two million litres a day. Union Steel was dumping "pickle liquor containing large quantities of ferrous iron, copper sulphate, mineral oils, animal fats and phenols"

[47] This material was produced as evidence when Steel Valley residents took Iscor to court in 2001.

into the Vaal [Tempelhoff 2003: 228]. Iscor effectively controlled Union Steel at the time and must have known what was happening. Commenting on DWAF's impotence, Neville Felix, Sedibeng councillor and former resident of Steel Valley, concludes that Iscor was untouchable.

Just as Iscor knew, so too does Mittal. Due diligence procedures are required during any corporate takeover and must investigate the liabilities of the target corporation.

Apartheid in decline

Despite their triumphs, the National Party and its chief ideologue, Verwoerd, were never free of the question of what would happen to white domination and the health of their economy in the longer term. As the 'winds of change' blew through Africa, Verwoerd invented 'separate development' as a new and improved version of apartheid and, as Merle Lipton [1986] notes, presented it as a version of 'decolonisation'.

South Africa, Verwoerd argued, was not a multiracial society but a collection of nations that each needed to become independent in a separate state. There were two impossibilities in this theory: First, 'European South Africa', as it was called without a hint of irony, had never been European or white. The majority of people were black. Second, the South African economy was dependent on black labour. By making such impossibilities the foundation of policy, apartheid constricted the growth of the market and of the skills base for capitalist development in South Africa and systematically produced violent social conflict.

This did not stop Verwoerd and his successors. They passed the first legislation to enable the creation of the 'homelands' in 1963. In 1976, the Transkei 'achieved independence'. Bophuthatswana, the Ciskei and Venda followed its lead while five other Bantustans opted for 'self-government'. When black South Africans could not be moved to the homelands, the homelands moved to them. Large urban areas, like KwaMashu and Umlazi near Durban, were simply transferred to the homelands. In the Vaal, the people of Evaton and Sebokeng were to be parcelled out to Basothoqwaqwa, Boputhatswana, Transkei, KwaZulu and Lebowa. By this time, however, the entire fantastical edifice was collapsing under the weight of its own absurdity.

The central tenet of Verwoerd's ideology, a 'white South Africa' with no permanent black residents, was never remotely likely even under the police state created by his Minister of Police and successor

John Vorster. PW Botha, next in line, attempted to reform apartheid while escalating repression and the regional wars that he had initiated as Vorster's Minister of Defence. The reforms compounded absurdity while repression ripped ever more deeply at the social fabric.

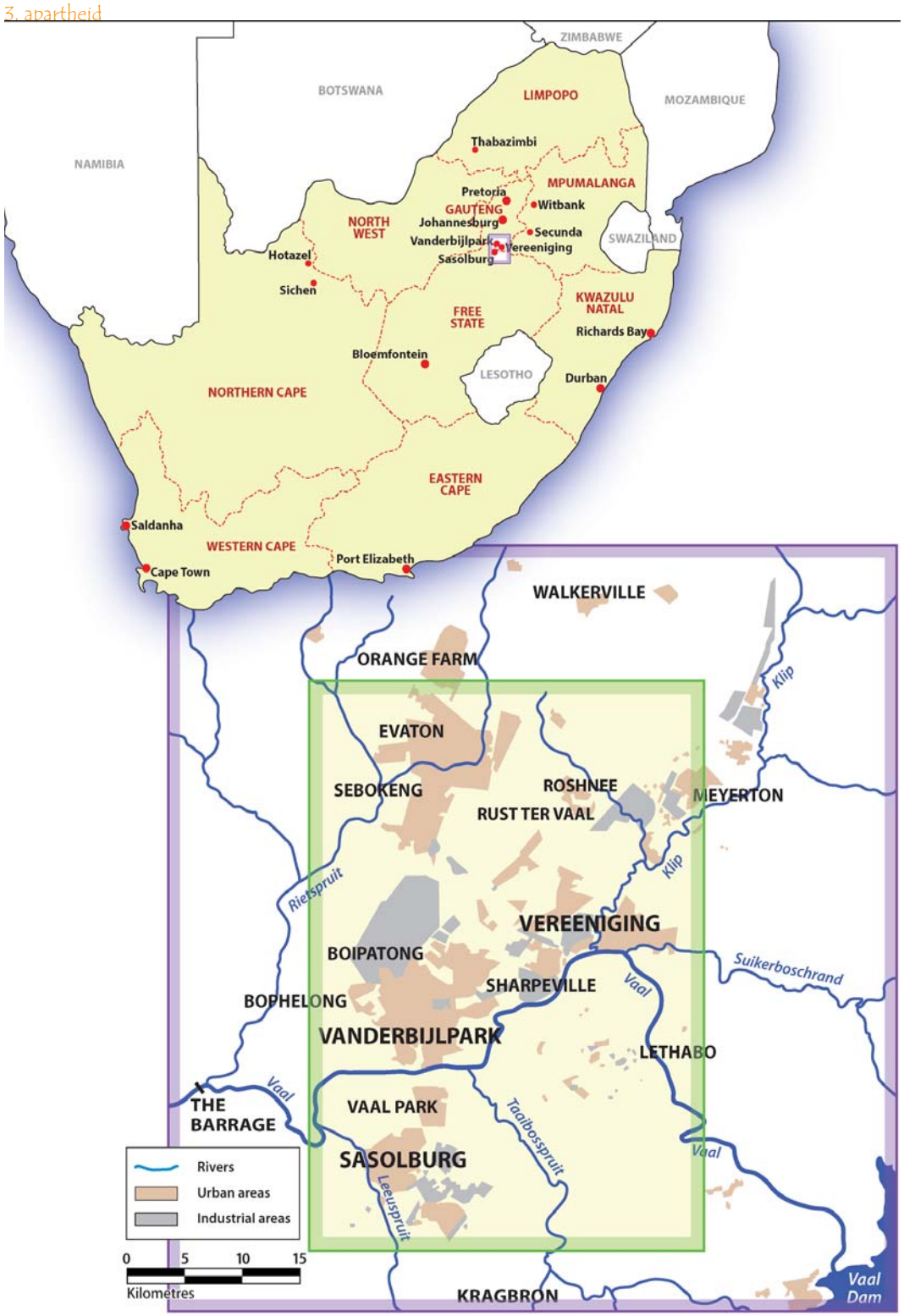
Despite the continued support of the US, notably in the proxy wars in Angola and Mozambique, popular pressure from the anti-apartheid movements was increasingly translated into international isolation. The initial arms boycott was followed by the OPEC oil embargo of 1973 and UN sanctions in the 1980s. Northern states and transnational corporations collaborated in circumventing sanctions both covertly or overtly. Corporates started to withdraw, however, as collaboration was punished by consumers in their home markets. Defending the white Republic, Botha's government gave priority to reducing South Africa's dependency on foreign suppliers of strategic goods and particularly to energy security. Corporate South Africa, meanwhile, was boxed into the domestic economy. It acquired more assets from departing transnationals and the concentration of economic power reached the point where six corporations controlled listed companies worth over 85% of the total capital on the Johannesburg Stock Exchange.

The migrant labour subsidy runs out

Since the earliest industrialisation in the late nineteenth century, mining and industry had profited from a subsidy from the poor homeland areas. Migrant labour meant that industrialists did not have to pay full wages because workers could be paid and housed as single men without families. The cost of looking after their families fell on the overcrowded, impoverished and eroded reserves or homelands. This was frankly acknowledged by the Chamber of Mines in evidence to the Witwatersrand Native Mine Wage Commission in 1944:

> It is clearly to the advantage of the mines that native labourers should be encouraged to return to their homes after the completion of the ordinary period of service. The maintenance of the system under which the mines are able to obtain unskilled labour at a rate less than ordinarily paid in industry depends upon this, for otherwise the subsidiary means of subsistence would disappear and the labourer would tend to become a permanent resident upon the Witwatersrand, with increased requirements. [Quoted in Wolpe 1972: 434]

Under the burden of mining profits, the reserves were in crisis well before the war. Extreme poverty and malnutrition were already reported in official government documents in the 1920s. Sociologist


ZIMBABWE
BOTSWANA
LIMPOPO
MOZAMBIQUE
NAMIBIA
Thabazimbi
MPUMALANGA
Pretoria
Witbank
GAUTENG
NORTH WEST
Johannesburg
Secunda
Vanderbijlpark
Vereeniging
SWAZILAND
Sasolburg
Hotazel
Sichen
KWAZULU NATAL
FREE STATE
Richards Bay
Bloemfontein
LESOTHO
Durban
NORTHERN CAPE
EASTERN CAPE
Saldanha
WESTERN CAPE
Port Elizabeth
Cape Town
WALKERVILLE
ORANGE FARM
Klip
EVATON
SEBOKENG
ROSHNEE
MEYERTON
RUST TER VAAL
Klip
Rietspruit
VEREENIGING
BOIPATONG
Suikerboschrand
SHARPEVILLE
Vaal
BOPHELONG
VANDERBIJLPARK
LETHABO
Vaal
THE BARRAGE
VAAL PARK
Taaibosspruit
Vaal
SASOLBURG
Leeuspruit
Rivers
Urban areas
Industrial areas
0 5 10 15
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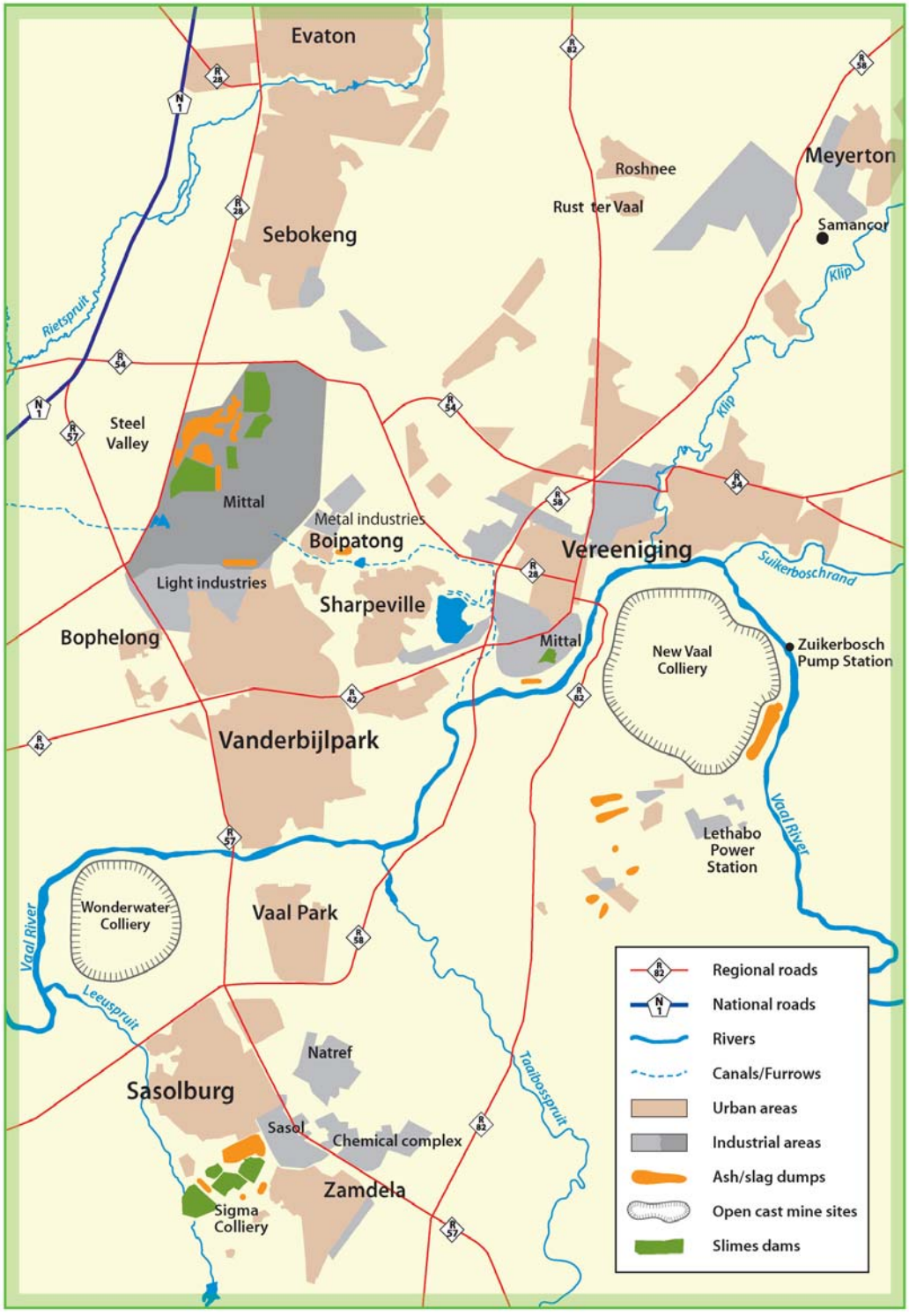
KRAGBRON
Vaal Dam


Evaton
Sebokeng
Roshnee
Rust ter Vaal
Meyerton
Samancor
Klip
Rietspruit
Steel Valley
Mittal
Metal industries
Boipatong
Vereeniging
Suikerboschrand
Light industries
Sharpeville
Bophelong
Mittal
New Vaal Colliery
Zuikerbosch Pump Station
Vanderbijlpark
Lethabo Power Station
Vaal River
Wonderwater Colliery
Vaal Park
Leeuspruit
Natref
Sasolburg
Sasol
Chemical complex
Toaibosspruit
Zamdela
Sigma Colliery
Regional roads
National roads
Rivers
Canals/Furrows
Urban areas
Industrial areas
Ash/slag dumps
Open cast mine sites
Slimes dams

Harold Wolpe describes the apartheid agenda since 1948 as an attempt to extend this system, after its exhaustion, through ever stricter repression of black mobility, labour and political organisation.

By the 1970s, even this strategy could squeeze no more out of the reserves while black miners' wages had remained roughly the same in real terms between 1911 and 1972. The pressure on the black working class intensified as the price of essential commodities rose sharply by 40% between 1971 and 1973. In 1973, a wave of strikes swept through the country, starting in Durban's docks but spreading rapidly to municipal and other workers. The strikes succeeded in raising wages, renewing trade union activity and forcing the state to open up legal space for trade unions.

The result, as economists Terreblanche and Nattrass note, was that, "By the mid-1970s, both government and employer organisations were publicly committed to moving towards a paying rate for the job, thus ending the official 'civilized labour policy' on wages" [1990: 15]. Industry and even mining now wanted a stabilised labour force to improve and retain workers' skills. Some even considered that paying better wages could create a bigger domestic market in place of the bipolar market of luxury goods for whites and cheap basic goods for blacks.

Economic growth, particularly in manufacturing, created a large class of urban black South Africans who had constituted the urban majority since 1946. Now, with the resurgence of trade union activity, employers and politicians were feeling the heat. The Metal and Allied Workers Union (later Numsa), was formed at this time and organised workers at Iscor. Employers responded by introducing tame, management controlled liaison committees to pre-empt trade union advances. By the end of 1974, nearly 1,700 liaison committees were in place. But the strategy didn't do the trick.

Two government commissions, Wiehahn and Riekert, investigated issues around black labour, trade unions and black urbanisation and reported in 1979. Wiehahn recommended that the growing independent black and non-racial trade union movements be legalised, but that migrant workers should be excluded from trade union membership. Riekert proposed that black urbanisation should be legalised, but that this should be limited by the availability of employment and housing. Wiehahn and Riekert wanted to accommodate urban black insiders with jobs and section 10 rights to be in urban areas while keeping rural black outsiders at a distance. The union movement organised resistance to this exclusion and forced the extension of union rights to all

workers. Turning these paper rights into a reality in the workplace proved a long and bloody struggle throughout the 1980s.

Expanding on coal

The Vaal coalfield lay outside the much bigger block of coal fields stretching from Springs-Witbank to Ladysmith in Natal. From 1955, Escom moved its focus from the Vaal to the eastern highveld coalfields where it built most of its major new power stations. By 1969, it completed the national grid and was able to link all its power stations, using the older ones to function more like relay stations. This also meant changes to the labour regime, as Nancy Clark argues:

> The grid system provided more than the rationalisation of power generation; it also allowed Escom to minimize and isolate its labour requirements. At the new stations established in remote areas, the commission brought in migrant contract workers, housed them in compounds, and faced few labour problems. Indeed, the new, highly technical stations with mechanized pulverized fuel-firing of the furnaces were very capital intensive and needed few workers to operate them. [1994: 157]

The old power stations in the Vaal were closed down, starting with the original Vereeniging station in 1974 and ending with the Kragbron stations in 1995. They were replaced by the massive Lethabo station built during the 1980s, the only one of the new stations not on the eastern highveld.

Sasol 2 and 3

The eastern highveld coalfields also attracted Sasol. The oil shocks of the 1970s made it look profitable while also stoking the government's anxiety for national energy security. In 1975, it agreed with government to build a second synfuels plant and in 1976 agreed to the third, the aim being to produce half South Africa's fuel. Construction on the third plant was 'fast-tracked' in 1979 when the Shah of Iran was overthrown. Both plants were operational by 1982 and producing ten times more than the Sasolburg plant which subsequently phased out synfuels to focus on chemicals. Sasol simultaneously constructed the world's largest underground coal mining complex to produce the 39 million tonnes that the new plants would devour each year.

Sasol 2 and Sasol 3 cost R7 billion, providing a major boost to the recession hit engineering sector. This was a staggeringly large sum so government privatised Sasol in 1979 to raise the capital. With

oil prices rocketing and a government guarantee of profits to Sasol, the offer was oversubscribed. Government nevertheless retained a substantial stake in the corporation through the IDC. At Sasolburg, meanwhile, all refurbishment was halted until 1980, leaving the complex more prone to accident.

The site chosen for the new plants was a town called Driefontein. The corporation renamed it Secunda after its second plant and, like Sasolburg, it was designed as a garden city complete with its own nature reserve. The black people of Driefontein were removed to eMbalenhle, downwind of the new plants.

Coal profits from oil crisis

South African coal was always cheap to mine. It occurs in thick layers close to the surface, while low wages were critical to maintaining profits, which were otherwise constrained by government control of prices as well as distribution and export from the Second World War to 1987. Until 1970, the industry was largely stagnant and subordinate to the big coal consumers: Escom, energy intensive industries and the railways. Between 1970 and 1983, in contrast, coal production more than tripled and exports rose more than 30 times "from only 1.3 million tonnes (mt) to 45 mt in 1986" [Leger 1991: 129]. Both internal and export demand was driven by the booming price of energy and other resources on the back of the oil shocks. Coal mine owners responded with substantial investments to mechanise mining, shift to open cast methods and improve the quality with coal washing facilities.

They also drove the expansion of exports centred on a contract to supply coking coal to Japanese steel makers. To their annoyance, government cut big oil – Shell, BP and Total – in on the export deal as a way of keeping them sweet. Government also provided the substantial subsidy of developing the infrastructure for exports. A small fishing village was bulldozed aside to make the deep water port of Richards Bay with bunkers and loading facilities to fill huge bulk coaling ships. Railways dedicated to coal were constructed between mines and the port and new power lines erected to supply the energy.

In the early 1970s, coal miners' wages were lower in real terms than in 1911. The modernisation of production was partly driven by the consequent difficulty of finding labour but in turn dramatically changed the labour regime. In 1970, "43% of coal was hand-loaded, in1978 as little as 10% …"

[Leger 1991: 134]. By 1987, 17 mines had moved to the open cast method which needs only a third of the workforce of underground mines but recovers 90% of the coal in the seam.

Pollute and go upstream for clean water

Water has attracted human settlement in all ages. Beside the river, the Vaal area was amply provided with streams, wetlands and a high water table, as the names of farms testify. The wetlands served to slow down and clean up the water before it flowed into the Vaal River. Today, more than half the wetlands are gone and the water of the Vaal is contaminated by heightened salinity, heavy metals and acid mine drainage from gold and coal mines on the highveld and industries in the catchment.

Mining and industry, having polluted or destroyed nearby sources of water, has driven a search for clean water ever further upstream. On the Vaal River itself, the search moved upstream from the Barrage to the Vaal Dam, it then reached across the Drakensberg watershed into the Natal catchments and finally to the sources of the Orange River in the Maluti mountains of neighbouring Lesotho.

Early mining on the Reef polluted the dolomitic aquifers that were the source of local springs and streams. The Rand Water Board, founded shortly after the Anglo-Boer War in 1903, consequently had to source most of its water from the Vaal 70 kilometres away. The plentiful water supply was a key factor in the industrialisation of Vereeniging itself with the establishment of the VFP power station, Union Steel and Stewart and Lloyds. In 1914 when the Vaal Barrage was built downstream of Vereeniging, both the Vaal and the Rietspruit which flows from the Rand were thought to be clean. By 1938, the Barrage water was polluted and the Vaal Dam was constructed upstream of the Vereeniging industries and of the tributaries flowing from the Rand. In the 1980s, Barrage water could only be used if diluted with two thirds water from the Vaal Dam.

In 1988, people complained about fish dying in the Leeuwspruit which flows past Sasol's effluent dams and into the Barrage. Sasol tested the water and found that ammonia levels in the Leeuwspruit were 20 times higher than would be allowed in Europe. It “maintained … that it was not necessarily responsible” even though one of its effluent dams had been repaired around that time [Tempelhoff 2003: 402].

Box 10: Costing pollution

Sometimes an ecological debt can be partially expressed in money terms. In 1980, at a conference called "Focus on the Vaal", South African water experts presented calculations of the costs of the increased salt load in the Vaal Barrage. They concluded that it would be very expensive to demineralise the Vaal Barrage water and even asked who was to carry the cost.

From 1935 to 1979, the average Total Dissolved Solids (TDS) in the Barrage had increased from 130 to 600 mg/l,[48] making it necessary for Rand Water to 'blend' this water with cleaner upstream water. This meant that investment in the Barrage was wasted but it also led to direct costs for people still using the water – about R100 million per year – which was born 50/50 by industrialists and householders:

> … the following economic effects of an increase in TDS have been identified: Increased desalination and softening requirements for the production of boiler and cooler water; increased corrosion and scaling of steel pipe networks; increased cooling water requirements; increased consumption of soap and detergents; and, reduced lifespan of plumbing and water installations. [Henzen et al 1980: 139]

Add to this that the salinity kills river life and takes productive and expensive irrigation fields out of production further downstream.

Ironically, mining and industry have polluted the water of the Vaal so much that they themselves have to move upstream for water clean enough for their processes. The Lethabo Weir was constructed next to the new power station in the mid-1980s. It is just downstream of the Vaal Dam and upstream of the polluted Klip, Suikerbosch and Rietspruit tributaries that flow into the Barrage.

Rand Water was responsible for water quality and developed an increasingly sophisticated monitoring system after the war with regular sampling backed by a sophisticated water testing laboratory built in Vereeniging during the 1970s. Tempelhoff [2003] notes that its staff also kept up with international information and debates. However, Rand Water downplayed pollution for the sake of promoting industrial growth and the expansion of its own market.

[48] Micrograms per litre, a measure of concentration.

Box 11: Thank you for your patience

Sasol had environmental problems from the start. It was using five tons of water for each ton of coal and the resulting effluent intensified the salts pollution of the Barrage. The Vaal coal is high in fluoride and Sasol regularly exceeded the legal limit for fluoride on its Department of Water Affairs permit. Finally, in 1979, Sasol made the limit. In his presentation to the 'Focus on the Vaal Conference', Sasol's Dr Brink thanked the DWAF for their patience …

Industry's voracious water appetite and the expansion of the Rand Water service area pushed dam builders into water augmentation schemes from other catchments. The Thukela water transfer scheme was approved in 1970 and delivered its first water into Vaal catchment in 1974. In 1987, an agreement between Lesotho, the European Union, World Bank and UN established the Lesotho Highlands Water Project. Apartheid South Africa was the absent party to this agreement but the main proponent of the scheme. Following the political transition, South African troops moved directly to protect its clean water source at the Katse Dam when the Lesotho government was threatened with a coup in 1998.

The project has enriched transnational dam building corporations, most of whom have been implicated in the rank corruption surrounding it. The Survivors of the Lesotho Dams (SOLD), meanwhile, have testified to the thousands of people dispossessed of their homes, their submerged fields and destroyed fisheries as well as to the failure of compensation that has left many destitute.[49]

Apartheid crashes

Like other third world economies dependent on resource commodities, South Africa was caught in the neo-liberal revolution used by the US to re-assert its political and economic dominance. The US drove up interest rates, escalating the costs of the debt taken on when the oil shocks made petrodollars cheap while simultaneously collapsing international commodity prices, including for oil, coal, steel and even gold. Countries that had banked on paying debt with high priced exports were driven into recession even as their debt multiplied itself.

The South African economy went into severe recession. In 1982 and 1983 it experienced negative growth rates of -1.2 and -3.1%. This was compounded as sanctions intensified. In 1985, Chase

[49] Press release by SOLD, the Transformation Resource Centre and International Rivers Network, September 21, 2005.

Manhattan Bank, which had provided the government with capital after the Sharpeville massacre, called for the immediate return of all loan funds falling due for repayment. This triggered a serious financial crisis.

These events put the industries at the centre of the minerals and energy complex up against the wall. The collapse of the steel price forced Iscor to put expansion plans for Vanderbijlpark on hold from 1980 to 1986. In 1986, Iscor lost its US market to sanctions. The coal industry was similarly exposed. Coal prices collapsed as the massive investments prompted by the energy shortages of the seventies had led to excess capacity and oversupply in the world coal market. The domestic market itself contracted as electricity demand slowed and Escom reduced its demand for coal. And Escom itself found that it had over-invested in new power stations and had to mothball a number of plants. Only military and mega-project financing still drove some sectors in the early 1980s, of which Sasol was an important part.

Politically, the apartheid government embarked on its piecemeal reform programme, which attempted to stitch up ethnic constituencies of black support for its leadership, even as it intensified repression. The internal resistance intensified too. The United Democratic Front was formed in 1983 and used the tactical space opened up by the reform process itself to organise country wide for a boycott of elections to the 'tricameral parliament'. In 1985 the Congress of South African Trade Unions (Cosatu) was launched, creating the most powerful worker's organisation in South African history and declaring its political affiliation with the Congress movement of the banned ANC. Its two strongest affiliates were the National Union of Mineworkers (NUM) and the National Union of Metalworkers (Numsa).[50]

As an adjunct to its internal repression, the apartheid government embarked on a WHAM – winning hearts and minds – campaign, to try and remove immediate causes for discontent like service delivery. At the same time, leading government thinkers had realised that the de facto white welfare state could not be extended to all South Africans and that privatised service delivery would be a better way of shielding privilege in a post-apartheid state.

The Vaal Uprising

The long established pattern of cheap and nasty local government – in which black South Africans had money squeezed out of them to pay to be 'administered' – finally provoked its own demise in 1984, and it did so in the Vaal Triangle.

[50] Numsa was created from a merger between the Metal and Allied Workers Union and other unions in 1987, see Baskin 1991.

Black Local Authorities had been installed in 1982 but were widely rejected as collaborationist structures. In the Vaal, the corrupt Lekoa Town Council announced a rent increase of R5.90, despite overwhelming evidence that residents could not afford even the existing rents, and provoked an insurrection that spread outwards from the Vaal. The Vaal Civic Association led the protests against the Town Council throughout August 1984. On September 2, it was decided that residents should refuse to pay their rents and a stay away call for the following day was supported by some 60% of the workforce. The police reacted viciously to the demonstrations in the townships that day. Scores were injured and 31 were killed. In Frankel's account, angry crowds

> … zeroed in on members of the Lekoa Town Council and other township officials whose ill-gotten gains were burnt in a purgative orgy of fire and destruction that eventually consumed the chairman of the Lekoa Town Council, the much-despised Esau Mohlatsi, and the Mayor of Sharpeville and two other councillors, all of whom were either hacked or stoned to death. [2001: 209]

The fires of resistance quickly engulfed other townships in the wider region centred on Johannesburg and then spread to the rest of the country. The government declared a State of Emergency in 1985. It was really a war on the people. More than 10,000 were detained while the security forces were given leave to act with unrestrained brutality. It failed to subdue resistance and produced only the stalemate of escalating violence.

Black unions struggle for space

While some employers grudgingly made space for black unions following the Wiehahn report, others sought to repress them and mobilised the backing of the police, white workers and vigilantes. According to its own history, the Chemical Workers Industrial Union started recruiting Sasol workers in Secunda in 1982 [CWIU 1994]. Sasol workers were faced with racism, unreported accidents, expensive transport to and from work, dismissals with no reason, physical and verbal attacks by supervisors, the compulsory use of Afrikaans in the workplace, low wages, and poor and dangerous working conditions. Sasol tried to prevent union organising but by February 1984 the union had over 4,000 members.

In October 1984, the Congress of South African Students (Cosas) called for a two day stay away. Although union officials were wary of taking on Sasol, shop stewards felt ready. Sasol dropped

Box 12: Greenwash kills

At the Hlobane colliery in Natal, an underground methane explosion killed 68 miners in 1983. An inexperienced white miner failed to test for methane in the area of the explosion even though dangerous levels of methane had just been reported. The events that followed showed how miners were gaining strength through organising.

The National Union of Mineworkers (NUM) had been established in 1982 and its first general secretary, Cyril Ramaphosa, used the opportunity to highlight the conditions in which black miners worked. NUM released a Bill of Rights for mineworkers' safety, including the rights to refuse unsafe work and to have their own safety representatives. It was a response to a longstanding feature of the apartheid workplace regime that endangered the lives of black mineworkers. They were not allowed to question the white miner, who alone made the judgement on whether the workplace was safe.

For the first time, black miners were able to break the monopoly on information held by mine owners. Ramaphosa released a constant stream of information to the media and black miners told the story from their perspective. But that victory was limited by the hold of an extensive safety greenwash system for mines.

The Hlobane mine had a four star rating on the International Safety Rating System (ISRS). This meant that the mine "was only marginally less safe than the safest mine in the world". The ISRS was devised by Frank Bird, an American with no experience of mining, who ran the International Loss Control Institute in the US. And it was not in fact 'international', being used only in South Africa. It was based on a detailed list of accident prevention measures which had to be filled in by mine managers. The results of this 'system' were displayed at mine entrances and applauded by an uncritical business press. Following another disaster at the Kinross gold mine,[51] NUM's view of the safety situation was summed up in a poster showing mineworkers' coffins with the words: "In 88 years the mines have killed 50,000 workers – organise or die."

Based on Allen 2003.

[51] The disaster was caused by the use of highly flammable polyurethane to strengthen tunnel walls. When burning, polyurethane gives off lethal fumes containing carbon monoxide and cyanide. Kinross mine owner Gencor first said it did not know about the dangers of polyurethane, but was forced to retract when the Chamber of Mines revealed that it had sent out circulars about the dangers of polyurethane as early as 1968.

pamphlets from helicopters threatening to dismiss the workers and called in the police and the army. Armoured cars drove into the hostels as 6,000 workers met to discuss the threat. The next day, workers marched to the plant but were stopped by security and police. Management announced their dismissal and the workers were forced onto buses at gunpoint. The CWIU spent the next three months organising the Sasol coal mine workers in the area and enlisting international pressure on Sasol to reinstate the workers. Finally 70% of the workers were reinstated and the union was recognised.

The NUM, Cosatu's biggest union, declared 1987 "the year mineworkers take control", echoing the ANC slogan "1987: Year of Advance to People's Power". Several local strikes and a two day stay away to protest the white-only election in 1986 generated momentum towards a national strike in 1987. As the strikes intensified, government responded with raids on union offices, the detention of workers, assassinations and vigilante violence.

"The Great Miners' Strike – 21 days that shook the Chamber," as NUM described it, brought out 340,000 miners on strike against low wages.[52] Battles raged for control of the hostels and the supply of food. In August 1987, police invaded hostels at the Matla and Optimum coal mines. Workers were teargassed and forced underground, where they struck again and were teargassed again. The Reserve Bank cut off NUM's overseas funding and TEBA bank, owned by the mines, froze miners' accounts. Anglo American dismissed more than 10,000 workers. Finally, Anglo threatened to dismiss all miners, forcing NUM to abandon the strike or risk its own destruction since most of its members worked in Anglo mines. The cost to the workers was heavy: 11 were killed, 600 injured, over 500 arrested, over 50,000 dismissed and they did not get the wage increase they went on strike for. South Africa's leading 'liberal' corporation had demonstrated its ruthless commitment to its 'core value' – profit.

In October 1987, the South African Chemical Workers Union (SACWU), which had organised in Sasolburg, came out on a legal strike for higher wages. Sasol and Natref tried to prevent workers' meetings, calling out the police to baton charge a meeting in the Boiketlong hostel and warning that it would dismiss all strikers. A group of vigilantes attacked striking workers with pangas and knobkerries. Accounts of these times were censored,[53] but the strike was defeated and over 3,000 workers dismissed according to Mabuti Mlangeni of Ceppwawu.[54]

[52] See Baskin 1991 and Allen 2003.
[53] The description of this strike is marked by the note "censored in terms of Emergency Regulations" in the source, the South African Labour Bulletin Vol 13 no 1, p. 26
[54] The Chemical, Energy, Paper, Printing, Wood and Allied Workers Union the successor to the CWIU, interview 3 May 2006.

In the next year, the corporations and government tightened up labour legislation and in 1988 the state banned 17 organisations, including the UDF, and placed far reaching restrictions on the unions. In the longer term, the defeat of the unions in 1987 paved the way for a fundamental reorganisation of the labour regime driven by the corporations. Sasol's strategy, as Mlangeni remarks, was to avoid having permanent workers beyond the core group. This was achieved in two ways. First, jobs were casualised, creating permanently temporary workers. Second, whole departments were split off from Sasol to form their own companies and Sasol then outsourced the work to them. In both cases, workers were hired on contracts which could be terminated at any time creating an insecure and 'flexible' workforce and enabling Sasol to evade responsibility for labour standards. Organising these workers is also made more difficult as those who join a union are easily excluded and the unions have yet to recover their organisational strength.

Apartheid's legacy

By the end of the 1980s, a group of senior National Party politicians recognised that apartheid had reached its limits. In 1989, FW de Klerk[55] snatched the leadership of the National Party from Botha, released political prisoners and, in 1990, unbanned the liberation movements. These actions heralded the negotiated transition to democratic rule.

As it reached its overdue demise, the costs of apartheid industrialisation were increasingly evident. It had created a dysfunctional urban form. Many black South Africans lived in the way of pollution in poorly serviced housing, with bad or non-existent infrastructure, and on the peripheries of South Africa's sprawling cities far from work opportunities and with heavy transport costs. Migrant labour produced a heavy human cost, damaging black family life over decades as well as destroying people's livelihoods and environments. The cost in lost opportunities in education and skills is beyond calculation. Meanwhile, cheap but dirty energy was replacing cheap labour, leaving unemployed many thousands of people who had been driven to work in the Vaal and had no alternatives once apartheid had eventually outlived its usefulness.

The legacy of political conflict and violence ran deep through the transition period. The security forces were still stoking violence: between those who made an accommodation with apartheid and those who refused, between different ethnic groups and between the urban insiders and outsiders created by apartheid. In the Vaal, acute tensions developed between hostel and township dwellers reinforced by politically instigated ethnic antagonism, particularly, but not exclusively, between

[55] De Klerk started his political life as parliamentary representative of the white constituency of Vereeniging and an exhibition at the Vaal Teknorama Museum, where Top Location once stood, is devoted to him.

people of Zulu origin and others. These antagonisms were manipulated through covert operations involving the security forces, Iscor's security and the Zulu nationalist Inkatha movement, and resulted in the Boipatong massacre of 1992.

Apartheid industries left an enormous environmental toll: ash heaps, air pollution, acid rain, groundwater pollution and pollution of the Vaal River. More insidiously, weak and fragmented environmental governance allowed for glib denial of the problems and allowed industry to proclaim the virtues of self-regulation.

Eskom's externalities logic

Eskom is a major source of environmental externalities imposed on South Africans. By 1990, The Star's environmental writer James Clarke regularly ridiculed Eskom and the government's approach to air pollution:

> The department of health's policy … was to allow industry to use high stacks, some reaching 300 metres, the idea being to disperse the gases and particulates as widely as possible. In other words, to use fresh air to dilute bad air. The tall stacks tended not to solve the problem so much as spread it across the sky … Dispersal of gases and solids, even at 300 metres, is no permanent answer, especially on the Highveld with the stagnant air. One sees demonstrations of this quite frequently when fly ash from Eskom power stations meets up against an inversion 'roof' 500 metres above the ground and spreads out like a giant umbrella from which it filters down, day and night. One occasionally sees, when precipitators break down, huge quantities of thick smoke and dust literally tumbling out of the stacks and dropping directly to earth. The average fly ash fallout is at least 1,400 tons a day, going by official figures, which tend to be optimistic. [1991: 34]

This view was subsequently confirmed by Harold Annegarn who found, in 1995, that most of Eskom's pollutants were deposited within a 10km radius.[56] To this day, Eskom resists installing scrubbers for sulphur dioxide – a priority pollutant of which Eskom is the largest source – because it would double the cost of building new or retrofitting old power stations. This implies that the externality costs of its power production, measured only by abatement technologies, are so high that the polluter cannot pay for them and stay in business.

[56] Cited in Van Horen 1996: 48.

Eskom also produces mountains of ash: some 33 million tons of ash in 1994. Its ash heaps are damped down with water to prevent it blowing in the wind. The water is taken from Eskom's 'zero effluent cycles' when it is too contaminated to be used in the power station and adds to the pollutants that leach from the ash.

4. New South Africa

Previous groundWork Reports have analysed the transition from apartheid to liberal democracy from the perspective of environmental justice. In this chapter, we will pick up some of the key points from those earlier reports before going on to look at more recent developments in the evolution of government policy and practice. In particular, government has, as Padayachee and Valodia [2001] put it, 'changed Gear' – the macro-economic policy introduced in 1996. In doing so, it has attempted to retrieve the language of the developmental state.

The 2004 groundWork Report showed that South Africa's Constitution implies two different and contradictory visions of development. The one is based on the Property Right which goes well beyond the question of land to imply, without saying so, capitalist development. The second is based on the Environment Right, the only right that explicitly mandates development. In the view of The groundWork Report, this right requires sustainable development based on environmental, social and economic justice.

Thus far, government has preferred the Property Right. All major policies and strategies that shape development overall, from the Growth, Employment and Redistribution (Gear) policy to the Industrial Manufacturing Strategy to the Accelerated and Shared Growth Initiative – South Africa (Asgisa), completely ignore the Environment Right. Energy policy takes account of the right but subordinates it to 'the market', to economic growth and to providing cheap energy to industry. Environmental policy, which flows directly from this right, is clearly subordinated to the development agenda and will, at best, only mitigate environmental, social and economic injustice.

Chapter One of this report shows how the developmental process has shaped people's lives and reproduced environmental injustice on the ground in the Vaal Triangle. The enclave development described there has been actively produced through the 'post-Fordist' strategies of corporations

enabled by the neo-liberal policies of government. The logic of the enclave has been patched into the spatial orders produced in previous rounds of development – the colonial free market ruled over by the British empire, described in Chapter Two, and the racial Fordism of the apartheid era tied into the Cold War US hegemony, described in Chapter Three.

Negotiating the future

South Africa's democratic constitutional order was won at considerable cost through a struggle that mobilised people across the full spectrum of social relations: through labour and civic organisations, religious bodies, women's organisations, human rights groups, and in struggles for land. It terminated the brutal repression and authoritarian racism of apartheid and so represents a victory for the majority of people. The institution of democracy framed by a liberal and 'rights rich' constitution marked a significant step towards greater political freedom.

As is so often the case in struggles against oppression, what has been won is very far from what many South Africans imagined they were fighting for. For the majority, apartheid was not just about political exclusion from decision making: exclusion was the means by which they were dispossessed and impoverished to secure cheap labour for capital. Similarly, democracy was not an end in itself but the means by which the majority would gain freedom from want through their control of production. Thus, the Freedom Charter called for the return of the land to those who worked it and the people's control of the 'commanding heights' of the economy. These demands picked up strands of egalitarian and socialist thinking within the liberation movement.

The environment was not central to the imagination of liberation. Indeed, the association of environment with conservation, and of conservation with the dispossession of land, provoked some hostility. Nevertheless, many of the demands articulated during the 1980s responded to environmental injustice: unions demanded health and safety at work; civics demanded water, energy and waste services; and everyone demanded the total transformation of South Africa's spatial regime – an end to pass laws and urban influx controls and comprehensive redistribution of land. So in many ways, the struggle against apartheid was implicitly a struggle for environmental justice.

Saving capital

A negotiated political transition came about because, as Govan Mbeki said, "the two major political forces in South Africa had fought to a draw" [quoted in Marais 2001: 85]. While the resistance was not able to overthrow the apartheid state, the state was unable to contain the resistance. Further, the apartheid economy, based on racial capitalism, was in crisis. The costs of war were escalating, international isolation was driving up the cost of trade and access to technology, the racially restricted skills base was too narrow and the racially defined domestic market too small to enable growth. For capital, this meant that the state was no longer able to secure a basis for future accumulation. A radical restructuring of the economy was needed and the apartheid regime did not have the legitimacy to carry it out.

In the late 1980s, meetings between business delegations and the exiled ANC leadership signalled that capital was looking for alternatives. The problem with the ANC, however, was its perceived attachment to socialism. As it prepared for government between 1990 and 1994, and as political violence escalated, it was subject to intense pressure to adopt business friendly policies. Being a 'broad church' movement, elements within the ANC responded positively to this pressure. Those who thought apartheid was primarily about racial exclusion favoured a 'national democratic revolution' that would enable an aspirant black "bourgeoisie to emerge as the prime beneficiaries of the new state" [Maré 2003: 33].

Those who emphasised class and argued for socialism – including the ANC's alliance partners, the South African Communist Party (SACP) and the Congress of South African Trade Unions (Cosatu) – found themselves on the defensive. They had, moreover, already conceded the primacy of race. Thus the SACP argued that there would be a 'two-stage revolution': first the national democratic revolution which would pave the way for a later transition to socialism led by the working class. This line "would immediately dilute ... radical demands within the transitional negotiations" [Maré 2003: 34]. Voices representing the interests of the poor, of the black working class both urban and rural, were increasingly marginalised.

South Africa's negotiated transition was not just a compromise with apartheid's ruling elite or even with the representatives of racial capitalism. Negotiations took place in the context of change in the global order of power. The collapse of the Soviet Union marked the end of the Cold War and left the US as the only 'super power'. The victors proclaimed the triumph of capitalism and aggressively

redefined 'development' in line with neo-liberal ideology. Behind the scenes at the South African negotiations, the institutions of global capital profoundly influenced the terms of the economic debate.

During the early 1990s a range of experts, including the World Bank, business leaders and economists of various political leanings, said that South Africa's economy would need to grow by at least 6% a year to create enough jobs to reverse poverty. There were intense arguments about how this was to be achieved and what the role of the state should be. The trade unions called for 'growth with redistribution' and an interventionist state. Their thinking was strongly represented in the Reconstruction and Development Programme (RDP) published as the ANC's manifesto for the first democratic elections in 1994.

Capital on the other hand argued that the economic failure of apartheid was precisely the consequence of state intervention and that the 'market' should regulate itself. This view was endorsed by the international players. They emphasised that 'there is no alternative' to an export oriented economy integrated into global relations of production and marketing, and this message was strongly supported by those sectors of South African industry that saw profits in the world market.

Geared

Two years into the life of the ANC-led Government of National Unity,[57] international finance capital demonstrated the material force behind these arguments. Trevor Manuel, just appointed as the first ANC (and black) Finance Minister, made a mildly sardonic comment about 'the market' and foreign capital was instantly withdrawn from the economy, putting the value of the Rand on the skids. According to economic policy insider Alan Hirsch [2005], "restoring credibility" with international capital was then made government's top priority. Gear, the macro-economic policy, was put together in a matter of months and adopted in 1996. It was the culmination of the process that began with the business delegation visits to the ANC in exile. In that process, "the working class [was] forsaken as the agent of the National Democratic Revolution in favour of the state and a black bourgeoisie" [Chipkin 2003: 35]. Government's agenda for transformation thus came to centre on Black Economic Empowerment (BEE) aimed at creating a black capitalist class and, in Moeletsi Mbeki's view, represented the deal done between the new black political elite and the old white business elite.[58]

[57] The ANC won the first democratic elections handsomely but invited other parties to join it in the Government of National Unity which included the former ruling National Party.
[58] Who is the dominant class in South Africa? Mail and Guardian, 28 July 3 August 2006

With some variations on the theme, Gear replicated the development model prescribed by the neo-liberal 'Washington consensus'. Leslie Sklair has given it the tag 'ELIFFIT' – 'export-led industrialisation fuelled by foreign investment and technology'. This is "the way globalising TNCs [transnational corporations] relate to the Third World as the main 'development' strategy of the capitalist global system" [Sklair 1994: 167]. Alongside this development package is a related package of governmental reforms – 'structural adjustment' – which require reduced government expenditure, tight fiscal control, cost recovery on public government services and deregulation to open the economy to international competition.

What remained consistent was the vision of a modern industrial economy aiming for the magic number of 6% growth. Yet the neo-liberal strategy accepted global, rather than national, capital as the agent of modernising development. The state's own strategies were then geared to attracting private capital, and particularly transnational corporations, through privatisation or through state infrastructure investments in Spatial Development Initiatives (SDIs) and Industrial Development Zones (IDZs). It was claimed that benefits to workers, to women and to the poor would then flow from economic growth. The actual effects, however, were to expose these supposed beneficiaries to the full blast of globalisation and it met with resistance from the start.

Government defended Gear on two grounds. First, South Africa had to deal in the real world. The political transition had coincided with globalisation, the world economy was expanding rapidly and, in contrast to the economically isolated apartheid regime, democratic South Africa would ride it. Higher rates of investment into South Africa and access to global markets would provide for growth and growth would provide the jobs. The domestic market would then grow to create a virtuous cycle. Foreign investments would usher in new skills and clean and green technologies to replace South Africa's dirty old industrial plant. Second, government argued that the RDP remains the development programme but Gear provides the economic means through which the necessary resources can be mobilised. Fiscal conservatism and the proceeds from privatisation would reduce South Africa's debt, the country would avoid the debt trap and the consequent dictation of policy by the IMF and World Bank, and the money saved on interest repayment would be freed up for redistributive development.

Contrary to the words of its title, and as its critics predicted, Gear produced little growth, formal sector employment shrank with the loss of 2 million full-time jobs in the first decade of democracy,

and inequality grew as wealth was indeed redistributed but from the poor to the rich. Resistance also grew as the effects of Gear were trickled down through cost recovery on services, inadequate housing provision, the collapse of already pitiful environmental regulation and the lacklustre performance of land reform. The value of pensions, on which many poor households depended for survival, was eroded and the very principle of welfare grants came under sustained assault.

Resistance was deeply resented, particularly when it threatened the ANC government's claim to the mantle of emancipation. The groundWork Report 2004 documents a growing intolerance and suppression of dissent, the resurrection of security legislation and the Key Points Act in particular, and a whittling away at the right of access to information – not least in the text of the Promotion of Access to Information Act itself.

Government also increased its rhetorical emphasis on 'poverty alleviation' in response to resistance. The volume was turned up to legitimate a priority for 'development' over 'environment' at the 2002 World Summit on Sustainable Development (WSSD) and reached a crescendo in the run up to the 2004 elections. Under the slogan of 'the people's contract', the ANC repeated the 1999 promise of 'delivery'. This time round the promise was given greater credit by Cosatu because the union federation believed there had been a real shift towards greater state intervention to grow the economy. In particular, Cosatu lauded the Expanded Public Works Programme and claimed victory as government announced that the privatisation of three key parastatals would be put on indefinite hold.

Not yet the promised land

The new South Africa seemed to hold great promise for the people of Steel Valley. There was an expectation that the ANC government would listen to the people, especially as Neville Felix, a member of the SACP and ANC underground and a new resident of Steel Valley, was spearheading the effort to finally deal with the pollution. Felix and three other Steel Valley leaders were elected onto the 1994 transitional Western District Council[59] and they decided to use the local govt machinery to deal with the problem.

In December 1995, the councillors called a public meeting to tell residents about the pollution and, in February 1996, the district council's legal department set up a discussion with Iscor. This became the Iscor Environmental Forum. According to Felix:

[59] Transitional local authorities bridged the gap between apartheid's crazy patchwork of local and tribal authorities and the restructured system which created elected local authorities throughout the country for the first time in 2000.

> Iscor said they were sorry to hear there was a problem, and they would like to be part of the solution. The Forum had weekly meetings. We had to argue our case technically for which we gathered scientific and legal support.[60] But when we reached September 1996, the council walked out. We saw that Iscor was a protected species. We had just gotten a new constitution. We had been active in writing the environmental clause in that constitution, and getting the National Environmental Management Act (NEMA) on the books. But it didn't apply to Iscor.

Why was Iscor a protected species? In 1996, the ANC announced Gear and President Nelson Mandela declared that it was not negotiable. It should have been a clear sign to the Steel Valley activists that their attempts at disciplining a corporate polluter through the formal mechanisms of government were doomed.

Following the walkout, the council met with Water Affairs Minister Kader Asmal who instructed them to return to negotiations. In early 1998, the council returned to the Iscor Forum with a new proposal: Steel Valley should be declared a disaster area and the people relocated to available land at Mooi Water,[61] 20 kilometres away on the Vaal River. Farm workers and share-croppers should also be accommodated with their own land, to be acquired through the land reform programme. With the people gone, Iscor should clean up Steel Valley at an estimated cost of R100 million as compared to the daily operating cost of R66 million for the Vanderbijlpark steel works. Finally, a health trust with a research arm specialising in the health effects of industrial pollution should be established.

The Council envisioned that Steel Valley and other areas around Iscor would be cleaned up in time for the WSSD in 2002 and the project would be made a showcase of sustainable development. It would also have embodied something of the vision of liberation that animated the anti-apartheid struggle.

Iscor rejected the proposal and the Forum broke down again. Asmal then ordered that a report on the pollution, what Iscor could do about it and on options for Steel Valley residents should be done through the Forum and paid for by Iscor. Most Forum members welcomed the report but Iscor simply rejected it. The Gauteng MEC for environment, Mary Metcalfe, then closed down the

[60] They met with WISA (the Water Institute of South Africa, an organisation of the country's water professionals) and the Water Research Commission, to get access to their expertise. WISA set up the Vaal River Catchment Association which included Iscor and other industries, DWAF and Gauteng's Department of Agriculture, Conservation, Environment and Land (DACEL).

[61] "Beautiful water" in Afrikaans

Forum, saying that Asmal had decided that he would manage the issue with Iscor directly.

The frustration of trying to use the democratic machinery of the new government to address industrial pollution was shared by a number of other communities at this time. They accepted that government define the rules of engagement in stakeholder fora but then found that industry was given a veto. The fora were used, in effect, to bring legitimacy to the negotiation of non-compliance that defined government's relations with industry. Reflecting Gear's approach to development, they enabled de facto self-regulation by industry while allowing state regulation, such as it was, to collapse.

In contrast, south Durban communities refused to enter a similar forum set up by Asmal in 1996 to discuss the future of the Umlazi waste dump until it was agreed that the issue to be addressed was its closure. And they made that the defining issue through sustaining protest action on the streets rather than in negotiating chambers. They also formed SDCEA at this time on the resolve that the voice of civil society remain autonomous of government and that communities would not be divided through tactical negotiation. They thus refused participation in an open ended process of negotiation while defining the terms on which they would participate.

In Steel Valley, resistance fragmented with the closure of the forum. In 1998, Johnny Horne, one of the Steel Valley councillors, and 167 other residents of Steel Valley took Iscor to court to stop it polluting and make it clean up. They used the evidence built up by the local government which included an archive of DWAF complaints about Iscor's pollution, letters from Iscor that seemed to acknowledge this pollution, and reports from consultants hired by Iscor that clearly described the pollution problem. The case was heard in 2000 and the judge made it clear that he was prepared to make a ruling to shut Iscor down. Iscor then settled out of court for R34 million, thus avoiding a court ruling on its liability, and started buying out the Steel Valley smallholdings.

Following this limited success, another 16 litigants sued Iscor in 2001 to obtain compensation and stop the pollution. The court proceedings were limited to documentary evidence and legal argument. Iscor now disputed the conclusion, in each successive document in the archive, that it was responsible for the pollution of Steel Valley. In the absence of witnesses, the court decided in 2003 that it could not make a conclusive ruling and dismissed the case. Two of the litigants have taken further legal action which may yet lead to a class action.

During the case, Iscor also obtained an order gagging all of the 16 court applicants. Their children then formed the Steel Valley Crisis Committee to speak on behalf of the applicants and adopted new tactics. SVCC organised a protest march in July 2001, demanding that Iscor should stop polluting, provide clean safe water to the remaining Steel Valley residents and buy out polluted properties at replacement cost. They also started networking more broadly. At the WSSD in 2002, SVCC joined other activists from around the world at a conference on corporate accountability organised by groundWork and participated in a 'toxic tour' of the Vaal for WSSD delegates. It is now a founding member of VEJA, which gives the Steel Valley struggle a wider organisational base.

Iscor has continued its strategy of buying up properties. In 2006, Mittal Steel CEO Davinder Chugh declared that Mittal had "created a buffer area" where Steel Valley used to be. The pollution has not been cleaned up, most of the people are gone and the few that remain are surrounded by high electric fences. Mittal has graphically demonstrated that the externalisation of costs through pollution cannot finally be separated from enclosure. A vibrant community that was taking its first steps towards racial integration was effectively dispossessed.

The developmental state

Even though government resented being challenged, it was concerned that Gear was also failing in certain areas. On its own terms, Gear was successful in imposing spending constraints and reducing inflation and the national debt but it completely missed its own goals on economic growth and job creation. In government's view, the key problem was that Gear failed to attract private sector investment – and particularly foreign direct investment. Finance Minister Trevor Manuel expressed his frustration at an international Financing for Development Summit in March 2002: "You can subject South Africa's policies to the tests of salt water and fresh water economists, and we will pass those tests. But that has not translated into a great flow of investment." In other words, the 'economic fundamentals' required by the neo-liberal 'Washington consensus' were in place but the development story did not go according to the script.

The script itself was beginning to change, however. The World Bank backed off some of its more extreme free market positions and allowed an economic role for the state beyond macro-economic rectitude. In 2000, World Bank president James Wolfensohn made "a strong plea" to President Thabo Mbeki for South Africa to get its 'micro-fundamentals' right [SALB 2002 a: 8]. This was a green light for more active state intervention in the economy but for the purpose of extending the

logic of the market into the day to day working of the state and into the fabric of social life.

The Micro-Economic Reform Strategy (MERS) and the Industrial Manufacturing Strategy (IMS) followed in 2002. They were welcomed by labour as signals of a more interventionist approach to economic growth but were in fact cast in the mould of Gear: they were premised on an open, export-oriented economy tied into the world economy through global production chains; and they were formed from an imagination of development as produced through market competition based in high tech, high capital and high energy enterprises. The groundWork Report 2003 argued that this excluded the majority of South Africans from the core of the economy and that this economic core would itself be subordinated to the needs and profits of global capital.

Government now seems to agree that such development policies exclude the poor. In 2003, President Mbeki introduced the metaphor of the two economies: the 'first world' market economy and the second economy, a 'third world' survivalist economy. Wealth, he said, would not 'trickle down' from the first to the second economy so we should "not assume that the interventions we make with regard to the 'first world economy' are necessarily relevant to the ['third world economy']." A distinct development strategy was needed "to transform this economy … so that the 'third world economy' becomes part of the 'first world economy'" [quoted in Hirsh 2005: 233].

The metaphor oddly echoes the apartheid description of South Africa as two worlds – first and third – in one country. The problem of the second economy is held to be that it lacks development rather than that it is the product of development. The process that produces wealth is thus made to appear as if it is separate from the process that reproduces poverty. It then follows that a dual development strategy is justified: core development is concerned with capital accumulation while development-as-delivery contains the fall out from the enclosure of common and public resources and the costs of externalisation at the 'back of the shop'.

By 2004, government was preparing a more aggressive strategy of intervention, since summarised as the Accelerated and Shared Growth Initiative (Asgisa), to drive towards the magical 6% growth target.

First economy

The core macroeconomic challenge rehearsed in Asgisa is the volatility and overvaluation of the Rand. Cosatu has long argued that the high value of the Rand increases the costs of South African exports and that this retards economic growth and job creation. Government appears to agree. Alan Hirsh, chief economic adviser in the Presidency, blames the Reserve Bank's singular focus on managing inflation to the neglect of managing the Rand exchange rate to support the Finance Ministry's growth strategies. What remains off limits is any questioning of the opening of South Africa's capital markets to the 'hot money' of international finance capital. It can therefore be expected that the next major shock to global capital will be instantly transmitted to the South African economy.

The core development strategy centres on a massive programme of state investment amounting to some R370 billion. Such investment is a hallmark of the developmental state and government argued that it would crowd in private sector investment and so create a virtuous cycle of economic growth. It also put a hold on privatising key corporations – Eskom, Transnet and arms manufacturer Denel. These 'state owned enterprises' would enable direct government influence in strategic economic sectors and provide the channel for a large part of state investments.

Thus, in February 2005, Public Enterprises Minister Alec Erwin announced that investments of "R107 billion will be needed between 2005 and 2009 to meet the country's growing energy needs. Eskom will invest R84 billion over the next five years. The balance of R23 billion is reserved for independent power producers (IPP) entrants."[62] Eskom's investments exclude the costs of developing the Pebble Bed Modular Reactor, a new and untried nuclear energy technology, now estimated at R16 billion for just the demonstration model.

Alongside this, are initiatives to secure skills, particularly high level skills, and develop sector specific industrial strategies that will "focus the energy of government and its partners" [SAG 2006: 7]. The partners in question are, of course, business. Top priority sectors are those claimed to be labour intensive and open to small business development: 'business process outsourcing'– mainly call centres – and tourism. Other priority sectors include 'biofuels', chemicals and metals. The common aim of all sector strategies is to improve global competitiveness, enhance exports, attract local and foreign investments, promote downstream higher value production, create jobs and encourage BEE. That is, they take their logic directly from the IMS and hence from Gear.

[62] Minister Alec Erwin, Parliamentary media briefing, February 2005, Economic Cluster: Higher growth, sustained growth, and shared growth. IPP's are private sector investors who will be invited to tender for power plant projects specified by government.

Second economy

Government's Ten Year Review [SAG 2003] showed that welfare – such as pensions and child care grants – had the single biggest impact on 'poverty alleviation' in the first decade of democracy. Welfare spending has increased significantly because more people are claiming grants, although individuals receive less in real terms. This finding put a stop to arguments for dismantling welfare. Nevertheless, government remains grudging, claiming that grants create a culture of 'entitlement', and it refused demands for a Basic Income Grant (BIG) that would give everyone a right to some income. Many, like the workers who were made redundant by Iscor but who are not yet old enough to get pensions, have no income whatever. Government also claimed that housing and services delivery had reduced poverty. As shown in Chapter One, the benefit to the poor is compromised by the terms of delivery as they are taught to know their place at the 'back of the shop'.

Asgisa does not consider social grants as part of its growth strategy. If service delivery proposes the heroic figure of the frugal consumer, Asgisa proposes the heroic figure of the small entrepreneur. Government initiatives are to bridge the gap between first and second economies and ultimately 'eliminate' the second. The bridge, presumably, is expected to get rather crowded. It is to be created by leveraging first economy investment spending "to develop *small businesses and broad based empowerment*" [SAG 2006: 8, their emphasis]. One effect of this is to endorse outsourcing as a way of creating small businesses.

The Expanded Public Works Programme is supposed to work in a similar way. It is a five year programme advertised as creating jobs by using labour intensive methods for building local infrastructure.[63] It is to develop several thousand small black contractors while each year about 200,000 people will get temporary work of about six months. This work is paid at below minimum wages so as not to influence the first economy 'labour market'. In other words, people in low paid work should not be tempted to take work in the EPWP and their employers should not be put under pressure to increase wages. During their six months stint of employment, the workers are also to get training in entrepreneurial skills. This will supposedly increase their ability to make their own living thereafter.

In its design, the programme assumes – or pretends – that unemployment is a passing problem in South Africa. Anna McCord argues to the contrary that the real problem is structural unemployment and addressing it would require a large scale programme offering sustained

[63] Funding for EPWP is about R20 billion over 5 years. This is substantial but only an eighth of the investments in the first development strategy and it includes several existing programmes such as working for water.

employment. Instead, the EPWP "offers an acute [short term] response to a chronic [long term] problem." It makes sense only if it can be believed that growth in the first economy will create "a rising tide of employment" [2004: 9].

Asgisa also promises to help the poor realise "the value of dead assets" [10]. The idea, promoted internationally by the World Bank, is that they will be able to raise credit from commercial lenders if they have private title to their houses or land. The unmentioned side of the bargain is that they will lose these assets if they can't make their repayments. In a withering response, Mike Davis comments:

> The pundits of bootstrap capitalism … may see this enormous population of marginalized labourers … as actually a frenzied beehive of ambitious entrepreneurs yearning for formal property rights and unregulated competitive space, but it makes more obvious sense to consider most informal workers as the 'active' unemployed, who have no choice but to subsist by some means or starve. [2004: 25]

These second economy initiatives follow the World Bank prognosis that, throughout the 'developing' world, the informal sector will now provide the jobs that the formal sector no longer offers. It also provides the most flexible of 'labour markets'. Nevertheless, it is commonly recognised that the informal sector relies on formal sector wages for its market. As the number of jobs shrinks, so too will the opportunities for making a living. Further, informal trading is increasingly saturated. There are only so many shebeens that can survive competing for the same shrinking market.

In 2003, UN Habitat concluded that the rise of the informal sector, together with the slums that now house close to one sixth of the world's population,[64] was itself "a direct result of liberalisation" dating from the 1980s and enforced by the IMF and World Bank [quoted in Davis 2004: 23].

Critical notes on Asgisa

Government argues that Gear was always intended to create the basis for a more expansionary programme of intervention.[65] Yet the programme outlined in Asgisa clearly marks a radical shift from Gear in respect of the role of the state in development. Gear explicitly relied on the market to drive growth and create jobs once the economic 'fundamentals' were put in place and it assumed that state investments would 'crowd out' private sector investments. If the story had gone according

[64] Davis notes that Habitat was conservative in its definition of slums and so also in numbering the people who live in them.
[65] See Trevor Manuel in The Sunday Times, 13 August 2006. Given the failure of economic growth, it is arguable that it is the success of the South African Revenue Service in expanding the tax base that has really provided the means for the return of the 'developmental state'.

to script, Asgisa would be superfluous. Instead, Asgisa now makes the opposite assumption, that public investment will crowd in private investment, and the state is identified as leading the drive for growth. In short, it is an expansionary programme where Gear was not. The shift is perhaps most obvious in energy policy described below.

Nevertheless, government has considerable justification in claiming that Gear still lives. If the role of the state has changed, government's imagination of development has not: modernising development – catching up with the industrialised nations – is founded on accelerating economic growth. It will be achieved through an export oriented economy driven by 'international competitiveness' and by investments intended to create a competitive advantage for South African industry. These investments are, in consequence, capital intensive and will create significant numbers of jobs only during construction. The creation of a black capitalist class through Black Economic Empowerment remains at the centre of government's project for transformation and is promoted with increasing vigour through BEE charters for most economic and industrial sectors. The charters are intended to ensure that business does not renege on the transitional deal, but also have the effect of intensifying the networking between the new political elite and the old economic elite.

Indeed, these interventions give greater depth to that imagination, taking it into the details of economic life and attempting to recreate people's subjectivities – their sense of themselves in the world – in its own image. The first economy interventions work by addressing the constraints to international competitiveness and accept that competitiveness is defined by global capital and the major powers. Development is to be based on 'knowledge intensity' and high tech, high capital and high energy industries that can find a place in the global production networks presided over by the leading transnational corporations who determine the terms of production and access to markets. By this means, government aims to move South Africa up the value chain, to higher 'value added' production and therefore higher GDP growth, but it is also signalling that South Africa 'knows its place' in the global order, just as it expects the denizens of the second economy to know their place.

Competitive regulation

The constraints on international competitiveness are not just about technologies of production. Asgisa mandates "a system of regulatory impact analysis [which] will add well-designed procedures (first developed in the United Kingdom) to reduce or eliminate the negative unintended consequences of laws and regulations, especially on job creation" [12].

It expresses particular concern about local and provincial planning and zoning and the Environmental Impact Assessment (EIA) system. EIAs have already been 'streamlined', with revised regulations introduced in 2005, but a succession of ministers, including the President, have since indicated that they are holding up development. Delays are attributed to the constraints of bureaucratic capacity and to 'special interest' groups – read local activist groups concerned about the impact of proposed development on their communities. What is not acknowledged is that business itself contributes significantly to delays. Brent Johnson observes that environmental and social impacts are peripheral to the concerns of most project developers who "often fail to plan or provide adequate resources" to address them.[66] The EIA is then regarded simply as a regulatory hurdle.

That government ignores this aspect of the 'EIA problem' indicates that it effectively shares the view of business. While ministers have reiterated their commitment to environmental integrity, the discourse of development – the habits of thought that frame the issue – makes the environment, not to mention environmental justice, a point of resistance in the heroic narrative of competitive development and accelerated growth.

Asgisa also calls for "a review of labour laws, including their impact on small businesses" [10]. The phrasing suggests that the legal endorsement of a dual labour market, long opposed by the unions, is once more being considered. This no doubt seems logical in the context of a dual development strategy. It also suggests that 'labour market rigidities' in the first economy will be subject to hostile scrutiny.

French legal scholar, Alain Supiot, remarks the influence of the World Bank's annual Doing Business reports which "provide a systematic evaluation of every feature of national legal systems that have a bearing on economic efficiency" [2006: 115]. They provide a supposedly objective benchmark against which international investors and governments can measure competitiveness – or profitability. In respect of labour regulations, "a 'rigidity of employment' index penalizes countries that recognise too many workers' rights: social insurance for part time employees; excessive minimum wages ($20 a month is deemed too high for an African worker); a working week limited to under 66 hours; the requirement to give third parties (e.g. a union) notice of dismissal; programmes to fight racial or sexual discrimination" [116]. Doing Business is both a symptom and an instrument of a global economic system in which "it is no longer products that are in competition

[66] Brent Johnson, The idiom's guide to EIAs, Mail & Guardian, August 18 to 24, 2006.

but the normative [regulatory] systems." The obvious "consequence is a race to the bottom in fiscal, social and environmental deregulation" [119].

As if to confirm this point, the 2007 edition, just out, is criticised by the International Confederation of Free Trade Unions for recommending "that governments should … emulate those countries that have almost no worker protection rules of any kind and are not members of the International Labour Organisation".[67]

Corporates in the transition

The corporations that dominate the Vaal have done well out of the political transition. They are now also the beneficiaries of the escalation in energy and resource prices initiated by the US invasion of Iraq. All of them rapidly broke out of the confinement imposed by anti-apartheid sanctions. Eskom is the largest African power utility and its continental ambitions were evident from the early 1990s. Sasol has become a transnational corporation in its own right and, although it is a 'minor' in the world of oil 'super-majors', its technologies provide it with a strategic niche. The privatised Iscor floundered and was taken over by global giant Mittal at a fire sale price in a 'rescue' deal brokered by government. Table 6 shows gross corporate revenues for 2005.

Corporate executives have also done well as Table 7 shows. Mittal's chief executive, Davinder Chugh, does very nicely but well short of the extravagant payments to Thulani Gcabashe at Eskom

Table 6: Corporate money in SAR billions in 2005

	Eskom (i)	Sasol (global)	Mittal SA
Turnover	34.7	69.5	24.8
Input costs	- 15.3	- 42.0	- 14.1
Total income	19.4	27.5	10.7
From which			
Capital gets (ii)	9.9	14.5	5.6
Employees get (iii)	7.7	8.6	2.1
Government tax	1.8	4.3	3.0

Adapted from the corporate 2005 annual reports' 'value added statements'.
i. Eskom's 2005 report covers 15 months. The figures here are averaged to 12 months.
ii. Capital's take includes interest + dividends + retained earnings.
iii. Includes directors take (see Table 7 below)

[67] International Confederation of Free Trade Unions, Media Release, 6 September 2006.

and Pieter Cox at Sasol. This no doubt reflects Lakshmi Mittal's tight grip on the money in a corporation that retains the character of a family business. It also marks a difference between Western and Asian corporate cultures. South Africa followed the Western norm of ever more inflated executive pay. Gcabashe and Cox themselves seem modest in comparison to the global mining giants with interests in the Vaal. Anglo American CEO Tony Trahar took R55 million while BHP Billiton boss Chip Goodyear took R30 million.[68]

Table 7: Directors' cut in SAR millions in 2005

	Eskom (i)	Sasol			Mittal SA		
		Pay	Shares (iii)	Total benefit	Pay	Shares (iii)	Total benefit
Board (non-exec)	4.0	7.6	21.0	28.6	1.2	(iv)	1.2
Chief Executive	10.4	9.2	6.4	15.6	3.5	0.9	4.4
Other Exec directors	2.2	9.7	5.2	14.9	3.3	0	3.3
Divisional directors	45.4	-			-		
Total directors	**62.0**	**26.5**	**32.6**	**59.1**	**8.0**	**0.9**	**8.9**
Previous year (ii)	52.3	22.4	6.5	28.9	25.2	-	

Compiled from the corporate 2005 annual reports' remuneration statements.

i. Eskom's 2005 report covers 15 months. The figures here are averaged to 12 months.

ii. Previous year for Eskom is 2003, for Sasol and Mittal it is 2004.

iii. 'Shares' represent profits from share options during the year.

iv. Lakshmi Mittal owns 52% of Mittal SA, worth R14.7 billion, and sits on the board.

While CEO incomes have inflated, workers have been retrenched in droves. Indeed, the reduction in overall wage bills is made a criterion for judging executive performance. And even if workers in the 'core zone' are better paid than previously, the gap between executive and worker incomes has widened dramatically. On average, South African CEOs get 51 times more than their workers. By contrast, Korean CEOs earn 11 times more while even in low wage China CEOs get 21 times more than workers.[69]

Eskom

In 1991, Eskom started a programme to electrify black areas. It did so firstly to reposition itself politically. Having excluded black people throughout its history, providing access to energy became a political imperative during the transition period. Eskom funded the electrification programme until 2000 when government ended its free ride on paying tax. It then announced that it would no longer 'subsidise' the programme. This implied that the programme was exchanged for

[68] The Rich List, Sunday Times, August 6, 2006.
[69] Jocelyn Newmarch and Percy Zvomuya, Fat cat execs 'need to look East, not West', Mail and Guardian September 1 to 7, 2006.

its tax exempt status and allowed Eskom to escape what was arguably a miscalculated investment rather than a public interest initiative. Subsequently, the DME has funded the programme through subsidies to Eskom and municipalities.

Its second reason was to use up some of the excess generating capacity created by over investing in power stations during the 1980s. It had to mothball several stations and was looking for new and expanded markets. The anticipated economic returns from electrification did not materialise, however, as newly electrified households consumed less than expected. Energy intensive industries proved a more reliable, and much larger, market than black households. Eskom has been at the centre of mega-project deals since the 1990s, offering the cheapest electricity in the world to new aluminium and steel plants.

Eskom has retained its centralised and secretive character. Throughout the transition period it defended its monopoly on strategic information and planning capacity in the power sector and dominated the Department of Minerals and Energy. This strangle-hold has been weakened, but not broken, with the establishment of the National Energy Regulator of South Africa (NERSA), which has developed some independent capacity, but the utility is still able to exercise disproportionate power in policy.

Officially, the 1998 White Paper on Energy Policy still provides the overall framework for energy development. Taking its cue from Gear, the White Paper is determinedly market orientated. It locates energy policy in relation to international trends – largely described in the terms of the neo-liberal 'Washington consensus' – and to Gear from which it quotes "two core strategies: promoting growth through exports and investment; and promoting redistribution by creating jobs and reallocating resources through the budget."

It envisaged the break up of Eskom into a number of power utilities which would then be privatised and the creation of a competitive energy market. Eskom was happy to privatise but not to break up or lose its dominant position. It "lobbied at the very highest levels of government" against a recommendation that it should be left with only 35% of its generating capacity and, in 2001, cabinet approved a reform package which gave Eskom 70% of the generation market [Eberhard 2005: 16].

Developmental Eskom

Following the 2004 election, government reversed this aspect of policy. Privatisation was 'put on hold' because, government argued, state control of this strategic industry was necessary to ensure that infrastructure investment would contribute to national economic growth. The decision leaves Eskom with its virtual monopoly on generation,[70] control of the national grid and a substantial share of distribution to final users accounting for 40% of customers and 60% of sales by value.

In other respects the White Paper remains the reference point for policy. The 'developmental state' does not reverse the intention of facilitating capital accumulation. To the contrary, the core intention of the massive energy investments announced by government is to maintain 'an abundant supply of cheap energy' as a primary source of competitive advantage for South Africa's energy intensive industry.

Energy pricing is to be 'cost reflective'. Environmental activists understood this to mean that the real cost of electricity – including the costs of pollution, decent wages for coal miners and cross-subsidies to make energy affordable for the poor – would be included in the price. They have been disappointed. The real implication, according to the Electricity Distribution Industry Blueprint Report of 2001, is a price hike of between 22% and 50% to households, with newly electrified households expected to cover the costs of new infrastructure, and a price reduction of between 5% and 16% to big industry consumers supposed to benefit from economies of scale.

Energy security was also cited as a reason for not privatising Eskom. Pro-market energy analyst Anton Eberhard sees this as an echo of the priority of the apartheid state [2005: 19]. It is, however, the security of supply to potential investors that is now the central concern. Eskom's capacity to deliver on this was dramatically called into question when one of its two nuclear generators at Koeberg went down in late 2005 and a series of major power black outs hit the Western Cape, resulting in losses to local business estimated at R6 billion. NERSA has subsequently found that Eskom's management of the plant was negligent. This clearly raises troubling questions about the corporation's capacity to maintain safety at nuclear plants where mistakes can escalate into disasters.

Eskom's expansion plans nevertheless include new conventional nuclear power plants apart from the PBMR. But the bulk of the new plant is coal based. Eskom's present total capacity is 37,000

[70] Government has called for some private investments by Independent Power Producers. It says IPPs will get 30% of new generating capacity, rather than 30% of the total capacity. IPP investments announced so far are more like 20% of new capacity.

MegaWatts (MW). 8,391 MW is now under construction. This includes expansions at present plants and the recommissioning of three of its old mothballed plants. Two oil fired 'peaking' plants – designed to supply additional power when demand peaks in the morning and evening – are also being built at Cape Town and Mossel Bay. Planning for a further 20,850 MW is advanced. This includes three new 'six pack' 4,000 MW plants planned for Limpopo, Mpumalanga and the Free State side of the Vaal Triangle. Longer term plans for a further 25,175 MW are in development. These include the PBMR which, Eskom notes, "still has to be proved".[71] In total, Eskom is building, planning and investigating 54,416 MW of new generating capacity.

Initial plans for the 4,200 MW Vaal Triangle plant (500 MW bigger than Lethabo) were introduced to a meeting with stakeholders in July 2006 at Sasolburg. Civil society concerns that the air is already full of pollution were shared by industry representatives, particularly from Sasol and Natref.[72] Their interests, however, are different. Concentrations of sulphur dioxide and particulates are already at or beyond the rather generous limits that will be allowed by the ambient standards now proposed by the DEAT in terms of the Air Quality Act.[73] A new power station would therefore infringe on their pollution rights and force reductions all round – providing that the AQA is enforced.

This frenetic expansion is, say both government and Eskom, driven by demand. Public Enterprise Minister Erwin says "we were caught napping by our own economic success".[74] Eskom, however, says its new planning is now based on Asgisa's 6% GDP growth target instead of on 4% growth projections. This planning assumption brings the moment when the limits of capacity are reached closer. It adds urgency to the investment – although it also raises the spectre of another round of over investment. The urgency was driven home by the Cape Town black outs. The Sasolburg meeting was told that Eskom did not have time to wait two years for cleaner technology options because the limits to capacity are here now. It thus seems that these urgencies are being used to stampede consent for technologies that Eskom seems most comfortable with – big and dirty plants that require big and centralised corporate management.

Renewable energies are absent from Eskom's immediate expansion plans and very modestly represented in its long term investigation of options. In the case of wind, its approach appears to be

[71] Details of Eskom's expansion plans are given Creamer's Engineering News, Power Shift, May 19-25, 2006.
[72] Ninham Shand consultants: Notes from the Key Stakeholder meeting, 25 July 2006.
[73] groundWork has detailed just how generous the standards are, for example allowing a 24 hour maximum for sulphur dioxide concentrations at over six times the WHO standard. Letter to DEAT 8 September 2006. It may be questioned if the standards are not calculated to accommodate industry rather than ensure health.
[74] Alec Erwin, Minister of Public Enterprise: Generating electricity, 31 May 2006 at www.dpe.gov.za

positively obstructionist.[75] Its energy efficiency programme was also invisible prior to the Cape Town black outs.

Sasol

Although privatised in 1979, Sasol remained intimately linked with the state both before and after the political transition. With sanctions lifted, Sasol repositioned itself as a transnational corporation in its own right. It has listed on the New York Stock Exchange and has major investments in Europe, the US, China, the Middle East and Africa. This expansion has been made possible by a massive accumulation of subsidies at public expense, not to mention the additional subsidy of being allowed to pollute.

The state still retains a major share in the corporation through the Industrial Development Corporation and the Public Investment Commission and the link between Sasol and state strategies remains tight. Thus, the Industrial Development Corporation invested heavily in Sasol's Mozambique gas pipeline, an investment justified in terms of regional policy, and Sasol presents itself as a key partner in Nepad. The confluence of geo-strategic interests extends also to China. While government is anxious to build a 'strategic partnership' with the emerging Asian giant, Sasol is investing in two coal-to-liquid plants there. This will substantially enlarge its global carbon emissions despite its stated commitment to reducing them. The state also portrays Sasol as a paragon of technology innovation and hence as a key national asset for industrial development.

Subsidised profit

In contrast with electricity, petroleum is dominated by transnational corporations. The major transnationals – Shell, BP, Caltex and Total – were also complicit with apartheid and sanctions busting. In return for this cooperation, the state guaranteed corporate profits by regulating the price of fuel in relation to the supposed costs of importing oil.[76] As part of the deal, the transnationals were required to buy Sasol's synfuel to blend with their refined crude oil products while Sasol was restricted to a few symbolic pumps and could not develop a significant retail market. Industry regulation has thus centred on pricing and the use of Sasol's synfuels. The pricing mechanism is still in place.

When the price of crude oil is low, as it was for most of the 1980s and 90s, Sasol's synfuel is hopelessly uncompetitive. From 1989 to 2000, it enjoyed nearly R8 billion in subsidies paid out of

[75] Eskom's pilot wind farm is poorly located according to Banks and Schaffler 2005: 22.
[76] The calculation of the 'landed price' is obscure and contains a number of fictional costs which turn into guaranteed profits for the oil refineries.

the 'fuel equalisation fund': Sasol was paid from the fund when the oil price fell below a benchmark figure (US$23 a barrel in 1995), and was supposed to pay back into the fund if it rose above a second benchmark (US$28 in 1995). In 1996, government announced that this subsidy mechanism would be phased out. The last subsidy payment was made in 1999. Since then, crude prices have risen steeply, ranging between $60 and $80 a barrel in 2006. In this context, the competitive relationship between synfuels and oil products is reversed because Sasol controls its own supply of cheap coal and is insulated from rising global energy prices.[77] It is thus enjoying windfall profits guaranteed by the oil based pricing mechanism. According to Sasol, however, the equalisation mechanism has lapsed so it does not have to repay the subsidy.

Government does not necessarily share this view. It initiated a review of the equalisation mechanism in 2000. It has not been made public but apparently recommends that the mechanism be retained – in other words, Sasol should pay back the subsidy. This was revealed in the report of a second investigation, announced by Finance Minister Trevor Manuel in March 2006, into whether Sasol should be slapped with an additional tax on windfall profits. According to this report, the equalisation mechanism was in fact based on a gentleman's agreement. "When in 2003 Sasol believed that it no longer required tariff protection it refused to reintroduce such a 'gentleman's agreement'."[78]

The report also makes clear that Sasol Synfuels and Natref, in particular, and the oil refineries more generally, secured numerous other hidden subsidies besides the equalisation and pricing mechanisms: Natref did not pay for piping crude oil from Durban for 17 years; Natref also got oil from the strategic reserve at Ogies at cut rates; Mossgas got about R1.5 billion from the equalisation fund; the benefits to the oil majors from the deal cutting them into coal exports are not known; the state over invested in pipelines in the 1960s and 70s and the costs have not been recovered.

Sasol's response suggested that more subsidies might be appropriate. It argued that the international trend was to provide incentives for 'alternative fuels' and that its subsidy paled besides those given to defence industries – R200 billion, mostly paid before 1994 – and the motor industry – R90 billion paid out through the Motor Industry Development Programme.[79] In all, the state had paid out some R334 billion to industry between 1989 and 2000.

[77] The oil super-majors are, of course, making super profits from crude oil but their refineries in South Africa still have to pay the going rate.
[78] Quoted by Kevin Davie, The clawback, which wasn't, Mail and Guardian, August 4 to 10, 2006. The information on subsidies is mostly based on a number of articles by Davie in the Mail and Guardian: Govt's R6bn gift to Sasol, September 23 to 29, 2005; From Ogies with love, August 4 to 10, 2006; No windfalls here, August 18 to 24, 2006. See also Hallowes 2005.
[79] The MIDP is described in The groundWork Report [2003: 71ff].

' Deregulation'

Deregulation[80] of liquid fuels under the 1998 policy banner of competition and industrial restructuring envisaged a three phase 'managed transition' to "allowing market forces to set prices" in phase 2, with government monitoring and measures to correct market failures in phase 3.

Phase 1 has centred on terminating the requirement that the oil majors purchase Sasol's product and allowing Sasol independent access to the market. The most immediate effect was a merger deal between Sasol and Petronas, owner of Engen, together with their respective BEE partners, to form a new company called Uhambo. Uhambo would include the Engen refinery, Sasol's share of the Natref refinery, the liquid fuels produced by Sasol Synfuel, and the combined retail network in Africa. It would give Sasol access to petrol stations and secure Engen's supply of product.

The other oil majors – BP, Shell and Caltex – opposed the deal at the Competition Tribunal and, in February 2006, the Tribunal refused to allow it. It found that Uhambo would:

- dominate the market with about one third of all petrol stations;
- control most inland refining capacity and also the existing pipe-lines from Durban. It could therefore cut off the product supply to its competitors' petrol stations in the 'inland market' – including Gauteng.
- entrench a system of import parity pricing – albeit it one sanctioned by government through the pricing mechanism – that enables Sasol to reap the windfall profits from the difference between its costs and high priced oil imports.

When, and whether, phases 2 and 3 of the restructuring will take place is not known. At the Uhambo hearings, DME officials indicated that the pricing mechanism would be maintained well beyond 2010 to guarantee petroleum profits so that Black Economic Empowerment (BEE) partners would be able to pay for their shares. Business Report's Ann Crotty calculates that this implies that "consumers are paying about R594 million a year towards the cost of empowerment … a cost that is generally carried by the shareholders of companies." [81]

Government, meanwhile is building up another state owned petroleum enterprise within the Central Energy Fund (CEF) group of companies. PetroSA was established in 2002 from a merger of the state's exploration and refining businesses. It owns the Mossel Bay gas-to-liquid refinery and has relatively small gas and oil fields off South Africa itself and is the CEF's flagship subsidiary.

[80] Deregulation is the word used in the policy. Reregulation would perhaps be more accurate since government would effectively empower a limited number of very powerful corporations. Government regulation in phase 3 would then mediate between these corporations.
[81] Ann Crotty, Fierce rivalries keep powerful oil players in check, Business Report, November 2, 2005

Other subsidiaries are the Strategic Fuel Fund, responsible for securing supplies and ensuring reserves of oil, the Petroleum Agency SA and IGas which respectively promote oil and gas exploration, and the Energy Development Corporation, tasked with facilitating the development of "commercially viable" renewable energy projects.

From Iscor to Mittal

Iscor was privatised for R3 billion in 1989 as part of the late apartheid strategy of liberalising the economy. The big buyers were finance capital, with Standard Bank Nominees and Mutual Life holding 26% and 10% respectively in 1996. Government also retained a large share through the IDC's 15%.

South Africa provides a low cost base for steel production. Apart from scrap metal, all the inputs are cheap: energy is as cheap as it gets; labour costs are less than half the world average; high quality iron ore was available from Iscor's own mines and is now bought cheaply through long term deals that shield the producer from fluctuations in the ore price. Despite this, the privatised Iscor was in trouble and government bailed it out. Between 1992 and 1996, it received over R1.2 billion from various subsidies and was also protected by a 30% tariff and duties designed to ensure that imported steel cost more than local steel. [82]

Part of its problem originated in the apartheid state's concern for security of supplies in the face of growing isolation. Iscor was "producing a wide variety of grades and types of steel to satisfy the range of local requirements" [Roberts forthcoming: 5]. Given South Africa's limited market, this meant short high cost production runs which could not achieve economies of scale. Iscor was also grossly inefficient. More than 60% of deliveries were late and 15% were rejected because of bad quality.

The corporation started rationalising from 1994. It shut down 2.5 million tonnes of capacity, halved the number of grades produced, slashed thousands of jobs and reorganised its marketing to support exports at the cost of the domestic market [see import parity pricing below]. In 1996, government reduced the tariff protection to 5%. This followed the logic of cutting costs to downstream manufacturers to promote export oriented production.

[82] Interview with Zav Rustomjee in May 2006. See also documents on the Competition Tribunal's website www.comptrib.co.za.

Boom, bust and panic

In 1995, Iscor and the IDC embarked on a joint project to build a new steel mill at Saldanha Bay. This mega-project was made the 'anchor' of government's spatial development initiative (SDI) supposed to kick start economic growth and job creation in the area. In fact, it produced a boom and bust cycle. High labour demand during construction attracted workers from outside the area but, once complete, the plant provided relatively few jobs. The overall effect was to increase the local unemployment rate.[83]

Saldanha Steel was planned as a "lean mill" with cutting edge technology aimed at the export market. It started producing in 1998 but the timing was exquisitely wrong. Large steel surpluses came onto the market as the result of the IMF induced 'Asian crisis' and new production in China, South Korea and Brazil added to the surplus. The international price of steel collapsed and domestic demand, at around 4,000 tons compared with nearly 5,000 tonnes of the early 1980s, did not compensate.

Iscor and IDC each held 50% of the shares in Saldanha Steel. By 2000, the venture was bleeding cash from both corporations. It accounted for 65% of the IDC's portfolio and threatened its very existence. In panic, the IDC came up with two strategies. First, it drove a process of 'unbundling' Iscor by splitting off its iron ore and coal mining operations to form Kumba Resources. Iscor opposed this move and then tried to saddle the Kumba with its massive debts. It failed on both counts. It was, however, allowed to acquire a 100% stake in Saldanha Steel.

Next, IDC looked for an international investor to bail it out. It found Lakshmi Mittal, a tycoon with a reputation for buying up unprofitable state-owned steel producers with low cost production bases, like Iscor, and turning them around through cutting labour and product lines and upgrading technology. His atrocious environmental record did not register as an issue with the IDC.

Fire sale

Mittal was offered very attractive terms to 'rescue' Iscor. He was rewarded with R1.3 billion for a three year 'business assistance agreement' to provide business, technical, purchasing and marketing assistance to Iscor. Trade union Solidarity's Dirk Hermann described this as "possibly the largest consultation fee in history".[84] As part of the deal, Mittal bought a 35% share in Iscor in 2001 and then built his holding up to 47%. In October 2004, he applied to the Competition Tribunal for permission to become majority shareholder.

[83] See The groundWork Report 2003 [68ff] for a critique of spatial development initiatives.
[84] Quoted by Ann Crotty, Business Report 25 August 2004

This was sharply opposed by the trade unions Numsa and Solidarity. They argued that Iscor had reduced its workforce from 44,000 in 1980 to 12,200 in 2004 and that further cuts were likely. The tribunal dismissed their concerns, arguing that most of the jobs had been cut before Mittal's involvement. In contrast, investors welcomed the takeover. As the Financial Mail[85] put it: "From a pure investment point of view, the takeover of Iscor by steel magnate Mittal has been a good thing… Headline earnings went up by 183% to R4.5 billion, on the back of 25% improved revenue of R23 billion. Operating profit of R7.3 billion means the group commands an operating margin of 32% ..."

Business journalist Ann Crotty was unconvinced. Those on the "Iscor unemployment scrapheap" would witness a dividend pay-out that turned the previous Iscor managers into multimillionaires and gave Mittal R3 billion – which would more than cover the cost of his buying Iscor shares for R2 billion in 2001.

> It is difficult to imagine that what is happening at Ispat Iscor is part of a well-considered government plan to create a global steel player that could support the needs of a growing economy. It is easier to imagine that the ANC government is using Iscor to prove to us how destructive unrestrained capitalism can be …[86]

She warned that Mittal could simply be leaching as much money as possible out of the South African steel industry before the Chinese started exporting steel, which they did in the first half of 2006. Mittal maintains that he is investing in South Africa for the long term, with R8 billion for expansion and R1 billion for 'environmental improvements'. Some of the environmental investments are merely upgrades of productive capacity, while activists suspect that the overall expansion will result in increased pollution.

Government has also expressed reservations about Mittal's contribution to the national economy. In 2004, both Mbeki and Trade and Industry Minister Mandisi Mphalwa objected to import parity pricing because it raises costs for downstream industry. But it was left to lightweight gold miner Harmony to directly confront Mittal through complaints to the Competition Tribunal that Mittal was charging excessive prices.
In the meantime, Mittal achieved his ambition of building his family corporation into the biggest steel producer in the world through a take over of Arcelor, Europe's largest steel maker, in 2006.

[85] 18 February 2005.
[86] Business Report, 25 August 2004. Iscor's name changed first to Ispat Iscor and then to Mittal Steel.

Import parity pricing

Import parity pricing is achieved through state regulation, as with the petrol price, or through monopoly power as with steel. Mittal makes domestic costumers pay for steel as if it had been imported, adding in the imaginary costs of transport to South Africa, handling costs at the ports, the 5% import duties, and transport inland. In reality, the steel is simply loaded on a truck and delivered. This fiction has allowed Mittal to add around 30% to the price of domestic steel and, between 2002 and 2005, it charged domestic customers between 50% and 83% more than it charged for export steel. To prevent anyone buying Iscor's cheaper export steel and then selling it locally, only Mittal's partner MacSteel can sell its steel into the local market.

Economist Simon Roberts [2004] concludes that the advantages of cheap iron and years of government subsidies to Iscor are not passed on to downstream producers making products from steel. These producers are thus unable to compete with overseas producers and the country's economy is locked into exporting primary resources rather than 'value added' manufactured goods, while local jobs and industries are sacrificed.

The effect is that the domestic market is being used to subsidise the export market and Mittal told the Competition Commission that this was necessary to secure its survival in South Africa. It also suggested it was not making as much money as its published reports showed because those figures had been prepared to make it look good to investors. In reality, the future was bleak. The Commission is still to make a ruling. Government meanwhile has scrapped the remaining 5% import tariff, which "disappointed" Mittal. Mittal claims it no longer uses import parity but instead calculates the price on an international basket of prices. This seems merely to recalculate the local subsidy to exports.

Competitive energy in the age of climate change

Competitive energy was put in a somewhat curious light in South Africa's 2004 Climate Change Response Strategy. This document focuses more on the dangers of climate change diplomacy than on climate change as such. It argues that the country's economy, particularly the mining and energy sectors, is vulnerable to climate change mitigation measures. However,

> … it can be argued that the relocation of energy intensive industries from annex 1 [developed] to non-annex 1 [developing] countries should be promoted, but that such relocations should

> be accompanied by the transfer of best available technologies. However, it can also be argued that this is undesirable as it could lead to increased exploitation of limited natural resources and may give rise to negative environmental impacts … Further, such actions may do little to alleviate the problem of unemployment through labour-intensive development. However, the development of new fossil fuel export markets amongst non-annex 1 countries could be encouraged. Annex I parties should commit themselves to reduce emissions from fossil fuels in terms of the convention and the protocol and should initially concentrate on domestic actions that will not negatively impact on the market for fossil fuels from developing countries [DEAT 2004: 7].

Government is in fact doing everything suggested here on the negative side of the climate change equation. As energy intensive aluminium smelters are closed down in Europe, government is still angling to land Alcan at its Coega IDZ near Port Elizabeth. The smelter would require energy equivalent to the output of a large power plant, the environmental impacts would indeed be severe and, after the construction boom, very few core jobs will remain. Renova, a Russian corporation, is also being courted. It is looking at developing a mine and sinter plant in the Northern Cape linked to a manganese-alloy smelter at Coega together with bulk manganese ore exports. A consortium headed by German corporation MAN Ferrostaal, and including Columbus Steel, will start construction on a stainless steel strip mill at Coega in 2007.

These projects are just a sampling of proposed energy intensive projects that account for a large part of the rising demand for electricity, and hence Eskom's urgency to build new plant. Major expansions are either planned or in progress in the Mpumalanga platinum mines, at the Hillside and Mozal aluminium smelters, at Columbus Steel and Mittal, and at Sasol, while Indian conglomerate Tata has started construction on a high-carbon ferrochrome plant at Richards Bay. In each case, the corporations will be haggling over the electricity price and seeking to ensure that increases following from the costs of building new generating capacity are laid at someone else's door.

Coal exports are also being boosted. Transnet's investment budget is half of Eskom's but still a very large R47 billion. Its first priority is to expand its railways and ports to handle a major increase in coal exports. The price of coal has risen sharply on the back of rising oil prices and "may overtake oil as the best performing energy investment," according to Creamer's Mining Weekly.[87] A number

[87] Emerging energy heavyweight, Creamer's Mining Weekly, August 11-17, 2006

of mining expansions are now being timed to coincide with Transnet's infrastructure programme. It seems unlikely that climate change diplomacy will penalise South Africa's coal exports in the near future.

Struggles on the knowledge front

Struggles over knowledge, information and policy are closely entwined and take place across the local, national and international scales. The major corporations are linked into global production and are members of industry associations such as the Chemical and Allied Industries Association (CAIA), the International Iron and Steel Institute and Business for Sustainable Development. So too, the organisations participating in VEJA have networked with organisations within the broad environmental justice movement to access information and knowledge resources, publicise local conditions and advocate for more progressive policy. National organisations, including groundWork, Earthlife Africa and the Group for Environmental Monitoring (GEM), have played a critical role in international networking, linking VEJA organisations to other communities and broader debates, and coordinating policy responses.

The political transition to democracy put information and knowledge at the centre of environmental struggles. The Key Points Act was symptomatic of the apartheid regime's use of secrecy in the name of national security. Most large-scale industries were designated key points and were protected from scrutiny by local communities, the public at large and even from local regulators. Similarly, the operating permits granted by national regulators, covering occupational health and air and water pollution, were secret – and still are in most of the country including the Vaal.

With the democratic opening, the walls of secrecy started to crumble under a sustained assault from environmental justice activists. They found support in the Constitutional provision for access to information and in the framework National Environmental Management Act (NEMA) of 1998. Industry, on the other hand, defended secrecy in the name of 'commercial confidentiality' and found support in Gear.

By 2000, the official regulation of both air and water pollution had collapsed. Air pollution was still governed by the dated and dysfunctional Air Pollution Protection Act (APPA) of 1965 managed by the Department of Environmental Affairs and Tourism (DEAT). Under intense pressure from environmental justice groups, government promised new air quality legislation. It took them four

more years to write an Air Quality Bill which the DEAT then tried to rush through parliament in February 2004. Civil society blocked this, preferring a further delay to badly flawed legislation. An amended Bill, containing significant changes looked for by civil society, was passed later in the year and the National Environmental Management: Air Quality Act (AQA) was finally promulgated in 2005.

The National Water Act of 1998 made the government the trustee of all water resources, and the sole referee of which water uses are permissible. The theoretical change was greater than the real change. Industries continue to use water extravagantly and to pollute within the generous allowance of their permits or, when they exceed that, to negotiate non-compliance with the DWAF. Around 2000, some industrialists doubted that their water quality reports were read, much less acted upon.

The DWAF has since shown some resolve, particularly on the potentially catastrophic problem of 'acid mine drainage' caused by water being contaminated by coming into contact with old mine workings. In 2005 it took mine corporations to court to force them to maintain mines where they had stopped operations to prevent further contamination of groundwater. The seriousness of this problem, which affects the Vaal tributaries, is even recognised by the Chamber of Mines, although predictably they argue that public money should be used to address this 'legacy problem'.[88]

River catchments now define the geographic units of governance for water resources. While in theory bringing decision making closer to people, catchment fora are dominated by the more powerful interests including water utilities, commercial farmers, industries and mines. Sub-catchment fora for the Upper Vaal provide occasions for 'naming and shaming' polluters, and a measure of accountability of DWAF's regulators to the public. They are open fora but have not facilitated effective participation by the poor.

Regulatory reform has not been a simple one way improvement. The Key Points Act was largely ignored but never repealed. When the US announced the supposed 'war on terror', the Ministry of Defence dusted it off in the name of security. It attempted to block community access to a risk assessment at the Engen Refinery and told local industry that environmental information must be regarded as 'extremely sensitive'. Until this act is repealed, it may be arbitrarily invoked at any time and any place.

[88] Creamer's Mining Weekly, August 11, 2006.

In the name of economic development, Environmental Impact Assessments (EIAs) have been 'streamlined'.[89] Civil society experience of EIAs has been mixed. They are a valuable source of information and a last line of defence against damaging projects. But communities neighbouring industrial areas have been flooded with EIAs and engaging with them requires a distinct set of technical expertise for each one. Very few EIAs have resulted in a refusal to allow a project. A notable exception was SAQMC's successful opposition to a project to build an incinerator for hazardous waste in Sasolburg. More broadly, EIAs are produced at the end of a planning pipeline that begins with the Property Right. They would have a radically different character if the pipeline had its origins in the Environment Right.

Strategic Environmental Assessments (SEA) have also been used in some areas. They are supposed to look at the accumulated social and environmental impacts in an area and, in theory, to enable a democratic vision of the future that will guide planning. In practice, more powerful 'stakeholders' have determined the outcomes. In the Vaal, a SEA initiated in 2002 was abandoned in 2004. That process was funded by industry and 'facilitated' by government. VEJA activists remark that this facilitation allowed industry to set the agenda while community proposals were ignored. Representation on the SEA forum was also manipulated as the National Air Quality Association, an industry lobby group, was allowed to occupy a civil society seat. Plans to restart the process have again been put on hold in anticipation of a new initiative to address air pollution under the AQA.

Responsibility for implementing the regulatory regimes for air and water is being devolved to municipal level. Regulatory capacity has been developed in some areas, notably Durban which was nominated to pilot the new air quality regime. Most municipalities, including those in the Vaal Triangle, have next to no capacity. Actual regulation is therefore liable to be highly uneven between different local areas and intensely contested between corporations aiming at self-regulation and local civil society demanding effective official regulation. As The groundWork Report 2002 remarked, "civil society, and particularly local organisations, now carry the critical responsibility for monitoring both the regulator and the polluter" [63].

The Vaal Triangle has now been declared a 'priority area' – or air pollution hot spot – in terms of the AQA. This means that a plan to improve air quality must be developed with the involvement of all stakeholders. Six priority pollutants – sulphur dioxide, nitrogen oxides, particulates (PM10), ozone, benzene and lead – must be properly monitored. Activists point out that pollution levels must first be

[89] An EIA is required for any new project, such as building a new plant or expanding an existing one, that has potential environmental impacts.

reduced before new emissions can be considered. According to them "the air is already full", a point on which local industry appears to agree.

These processes are not designed to fundamentally transform the way development happens in the Vaal. Rather, they are intended to mitigate the impacts of industrial development and so get local 'buy-in' or legitimacy for it. Nevertheless, they create an opening for civil society to challenge the dominant power of corporations in the area. How these processes are managed and what issues and understandings, what imaginations of the future, are included or excluded from the agenda will have long term consequences. Struggles over the production and circulation of knowledge and information – of what knowledge is held to be credible by whom – will be central to the outcome. Such struggles are already going on and the sections below look at some skirmishes in the battle.

Mittal's secret plan

From 1994, Iscor has faced mounting pressure to clean up its pollution of water at Vanderbijlpark. The poisoning of Steel Valley was increasingly evident and could no longer be concealed from the public. The DWAF was also feeling the pressure as the media carried stories that revealed not only a heartless polluter but also a careless regulator.

Between 2000 and 2003, Iscor and the DWAF came to a negotiated agreement. The DWAF accepted what it called a comprehensive environmental management plan for the plant and gave Iscor to 2010 to implement it. But Iscor insisted that the plan should be secret and presumably made this a condition of providing it to the DWAF.[90] DWAF agreed but has not given any reasons for why it agreed. Nor has it given reasons for negotiating with Iscor rather than ordering it to produce a plan. Negotiation, however, enabled secrecy and it must be surmised that that was DWAF's intention.

The usual excuse for corporate secrecy is that information may benefit a competitor and is therefore subject to 'commercial confidentiality'. There is no procedure for testing such a claim so it is also a claim that corporations should have sole power to decide what information they will and won't release. In this case, the claim would imply that the management plan contained information on production processes that give Mittal a competitive advantage. In a very mature industry such as iron and steel, this is highly unlikely.

[90] A 'consultation committee' included DWAF, DEAT and Gauteng's environmental department, but the role of this committee is not publicly known.

It seems more likely that the information would confirm Iscor's responsibility and potential liability for environmental damage. If this is the case, the DWAF is simply colluding with Iscor/Mittal's evasion of liability. It is also possible that the information contained in the plan exposes the DWAF's own culpability. If so, collusion with Iscor is based on a common interest to conceal information, not from Iscor's competitors, but from the public. Secrecy would then be in the service of denying people their rights.

The plan is also presumed to describe Mittal's future expansion both because this would be critical to an environmental plan and because corporations commonly claim that expanded production and revenues are necessary to justify investment in pollution control technologies. Again, commercial confidentiality is hardly convincing since Mittal has advertised loudly its ambition to be the world's dominant steel producer, now achieved through a merger with Arcelor, and its intention to expand production at Vanderbijlpark.

Rather, secrecy conceals an overall view of expansion plans at Vanderbijlpark from local organisations and so works to disable public scrutiny and potential opposition. It confines local participation to a succession of EIAs. Like the pieces of a jigsaw puzzle, each EIA is a fragment of the larger picture described by the secret plan. Local organisations can only understand how they fit together to make the larger picture in retrospect. They must react to each EIA as it comes out at the end of the planning pipeline while Mittal retains control over how and when it will be presented. Further, Mittal can be trusted to take advantage of new rules streamlining EIAs to restrict the time afforded for scrutiny of each EIA. The effect of these strategies, actively enabled by the state, is to secure corporate control over the future application and direction of technology.

What seems evident from EIAs presented thus far is that fewer permanent workers will be employed at the plant while overall air emissions will increase with the expansion of production even if emissions per tonne of product are reduced. In a submission to the DEAT, the Legal Resource Centre (LRC) notes that the Vanderbijlpark plant is a "second class facility" and would need to reduce emissions of particulates and sulphur dioxide by between 80% and 96% to come up to standard. Authorisation of individual EIAs "will be done piecemeal and in isolation of the total impact that [the plant] will have on air quality." It calls for a public review of Mittal's operating permits, which are at present secret, to be "done on the basis of an overall emission reduction plan …"[91]

[91] Submission on Vaal Triangle air-shed priority area, 24 August 2006.

In a further challenge to the corporation's culture of secrecy, researcher Mondli Hlatswayo took legal action to access records of Iscor meetings discussing workers' issues in the 1970s for his research on black workers' resistance to the apartheid workplace regime. The court found in his favour in September 2006, on the grounds that Iscor was a public company at the time and its records should therefore be open to the public. Important as it is, the ruling does not open the privatised corporation to scrutiny.

Sasol corners strategic knowledge

Sasol's control of ambient air quality monitoring is touched on in Chapter One. It provides an instance of self-regulation and is presented by Sasol itself as part of its programme of corporate social responsibility (CSR). It is further justified by the failure of the state to develop effective capacity for monitoring or even for supervising Sasol's self-monitoring.

That Sasol has an interest in under reporting pollution is patently obvious. Community suspicions that it will do so are also supported by the global record of corporate under reporting. The effects, however, do not stop at the credibility of air quality reports. Control over knowledge production allows Sasol to frame issues for public policy and more particularly the technical parameters that will determine implementation and interpretation.

This monopoly of knowledge production was challenged when the SAQMC made use of low tech 'bucket' sampling for VOCs noted in Chapter One. Sasol initially disputed these findings but, because the compounds revealed by the buckets were previously ignored both by Sasol and the regulator, had no evidence to refute them. It was thus forced to abandon a position of wilful ignorance and contracted the South African Regional Science Initiative (SAFARI 2000) and Leeds University to take air samples in Sasolburg. The results confirmed the bucket samples.

Under the APPA regulatory regime, the state colluded in the wilful ignorance of corporations regarding their environmental impacts. Only sulphur dioxide was regulated and the system was founded on negotiation between corporations and the regulator. The corporation's view of practical emission limits was then written into its operating permit and the permit itself was secret.

The AQA of 2004 substantially reforms the regulatory regime. It responds to demands by civil society, sustained in campaigns stretching over ten years, for national standards for air pollution,

for regulation of a wider range of dangerous pollutants, and for compulsory compliance in the place of corporate self-regulation and 'negotiated non-compliance' enabled by the APPA regime. The importance of these changes is reflected in Sasol's Sustainable Development Report which repeatedly refers to the new legislation as the reason for taking action to reduce pollution. It also lets slip the underlying rationale of voluntary corporate initiatives: "We are committed to managing sustainable development as a strategic issue, going beyond legal compliance *when this creates competitive advantage or makes business sense*" [2005a: 14. Our emphasis].

In anticipation of the implementation of the AQA in Sasolburg, Sasol now monitors sulphur dioxide, hydrogen sulphide, ozone, nitrogen oxides, particulates, carbon monoxide and three VOCs benzene, toluene and xylene. This selection is, it says, "aligned with the requirements set in the proposed ambient standards for South Africa" [2005b: 5].

More ambiguously, the AQA devolves responsibility for monitoring ambient air quality and for licensing 'controlled emitters' to district municipalities or, if they lack capacity, to provinces. The district municipalities of Sedibeng in Gauteng and Fezile Dabi in the Free State will thus be responsible for air quality in the Vaal Triangle. Each has only two air quality officers and neither has the technical capacity to implement the Act. The capacity of the respective provincial governments, particularly the Free State, is also questionable. For the present, the DEAT remains responsible for licensing polluting industries.

The local regulator in Durban, the eThekwini Environmental Health Department, was similarly under-resourced in 2002. It has since developed more credible capacity. It did so in terms of the 'Multi-Point Plan' initiated in 2000 by three government ministers acting under intense pressure from civil society. They declared that Durban would be the pilot for local monitoring and regulation. The process of developing capacity as well as the system of regulation in Durban therefore serves as the official model for what should happen elsewhere. This is particularly relevant to the Vaal Triangle because it has been declared a 'priority area' in terms of the AQA. Box 13 summarises the key characteristics of the system and discusses some of the struggles around who controls the production of knowledge and information.

Box 13: The eThekwini precedent

The Multi-Point Plan presented to Durban stakeholders in 2000 committed government to: setting national sulphur dioxide standards aligned to World Health Organisation standards; strengthening enforcement by introducing new legislation (the AQA) replacing the APPA; banning the use of dirty fuel by industry in south Durban; improving air pollution monitoring; identifying and minimising fugitive emissions; and assessing community health impacts.

Government has not made good on all these promises. Dirty fuels, for example, have not been banned in south Durban. In contrast, a functional system of air pollution monitoring and regulation has replaced the entirely dysfunctional APPA system. The key changes are:

- Monitoring and regulation is now controlled and managed by the official regulator rather than by industry through self-regulation.
- Staff training improved skills and staff posts built up from next to nothing to 20.[92] The option of outsourcing to consultants was rejected because it was shown to be more expensive and less effective. Permanent staffing, by contrast, allows for knowledge to be internalised and for the retention of institutional memory within the regulatory authority.
- The regulatory regime links information from ambient air monitoring with the licensing of 'controlled emitters'.
- On-line continuous monitoring shows both exceedances and wind directions and so enables the identification of probable sources. Public access to this data enables community groups to see whether or not regulation is working. The belated installation of sulphur dioxide scrubbers at Mondi's south Durban pulp plant was immediately visible in the reduced readings at monitoring stations.
- Community now participate in the process of licensing 'controlled emitters', so ending the secrecy of the old permitting system.
- Enforcement includes penalties for non-compliance.

The result is that industries no longer control the production and distribution of knowledge on air pollution. SDCEA has nevertheless had to fight every inch of the way on this highly technical terrain. It fought for open public access to data in the face of industry claims that

[92] The fragmentary nature of the APPA regime, as well as subsequent local authority restructuring, makes it difficult to give a precise original figure. At present the eThekwini regulator is short of four staff. Manager Siva Chetty says this due to turnover in a context where skills are highly mobile and government recruitment processes are cumbersome [personal communication].

data would be misinterpreted. Like the SAQMC, it identified pollutants that were previously ignored and argued that they must be monitored. It contested the siting of monitoring stations to ensure that they do in fact pick up industrial pollution. And it insisted that monitoring is not an end in itself but must be used to identify which industries are responsible for each exceedance. This enabled effective regulatory action and put the brakes on the corporate game of passing the pollution buck: of claiming endless uncertainty as to the sources of pollution and blaming something or someone else for ambient exceedances. The usual scapegoats are traffic, which has the peculiar virtue of never answering back, and domestic use of coal or wood.

Participation in licensing has also enabled SDCEA to contest industry's definition of flaring. A flaring incident is now defined in relation to 'nuisance'. The criteria include that it lights up the interior of people's houses or emits smoke or is visibly enlarged. Public complaints are verified by on-line video cameras pointed at the flares and monitored by the regulator. More than 32 verified complaints during the year constitutes a violation. Under pressure from SDCEA and the media, the local regulator took action against Engen in August 2005 for violating this condition. Engen paid an admission of guilt fine of R10,000 in January 2006. Although the fine was modest, SDCEA claimed this as a significant victory because corporations were virtually immune to penalties under the APPA regime.

The people of south Durban do not believe that their right to an environment that is not harmful to their health has been realised, but they do now have greater faith in the basic information on what is in their air. And they can at least see how far they have to go to realise the right. They also know that the gains they have made will be lost if they do not maintain constant vigilance.

Health impacts

The Air Quality Bill presented to parliament in February 2004 did not recognise the protection of people's health as an objective. For communities on the fenceline, the relationship between health and pollution is central and civil society representatives vigorously objected to the omission, pointing out that the Environment Right in the Constitution emphasises health. The final version of the Bill draws its objectives directly from the Environment Right.

The original omission, whether intentionally or not, appeared to play to a corporate agenda that works to dissociate health and industrial pollution on the grounds of 'scientific uncertainty'. 'Scientific certainty' is in fact the twin of wilful ignorance. As industry uses it, certainty must be absolute: the link between pollution and ill-health must be demonstrated in each case. Medical studies on the causes of ill-health, however, work on the basis of statistical probabilities and are not compatible with absolute certainty. Industry thus demands a standard of proof that it knows is impossible. The strategy is to invalidate statements linking pollution and ill-health and so exclude them from public debate and make the relationship invisible. It puts the onus of proving harm onto those who suffer it and simultaneously raises the costs of doing so.

The relationship is also made invisible because the Department of Health does not collect relevant health statistics. Nevertheless, groundWork was able to access clinic records for its 2003 report on air pollution and to draw its own conclusions:

> Health statistics recorded at clinics in and around Sasolburg show a high rate of asthma and other lung conditions. An analysis of clinic reports reveals that, during some months, respiratory illnesses can account for up to 40% of all illnesses treated at the clinics. There does not appear to be any correlation between respiratory illnesses and [seasonal] changes. If such a correlation existed it would indicate that the burning of coal in homes during winter was a primary cause of respiratory illnesses. But this is not the case. [2003: 27]

Subsequent to this, clinic records have been withdrawn from local scrutiny as "the Ministry of Health has decided that one cannot access information on health without pre-approval from the provincial offices" [Fiil-Flynn and Naidoo 2004: 20].

Fenceline activists see the impact on people's health every day and VEJA participants note that independent doctors frequently tell patients that they will not get better unless they leave the area.

Their struggle is really against official silence and the wilful ignorance that serves to frustrate their core demands that industry must clean up and compensate those it has harmed. It is a struggle to have what they know substantiated by medical science so that it can no longer be excluded from public debate and ignored.

Their belief that the health impacts are pervasive is in fact supported by a massive international literature which shows that exposure to specific pollutants results in specific health effects. It is also widely acknowledged that the cumulative effect of exposure to many pollutants is probably greater than the sum of impacts from individual pollutants but this is not well studied due to the limitations of scientific procedure. Other studies have looked at the actual health status of people living with pollution at various specific locations around the world.

Faced with denial of health effects from industry and government, SDCEA campaigned over several years for a health study to corroborate what they knew to be a heavy toll of death and disease from pollution. In 2000, government finally agreed. An initial study focused on respiratory effects at a local school situated between the two Durban refineries. After numerous delays in getting started, a larger study compared south Durban with other neighbourhoods. The report of this study was finally published in July 2006 and does indeed corroborate local people's perceptions. It found that the risk of cancer and the incidence of respiratory ailments are significantly higher for south Durban people [see Box 14].

For the Vaal Triangle, Scorgie modelled the likely exposure of people to three pollutants – sulphur dioxide, nitrogen oxides and particulates (PM10) – to estimate how many people were likely to suffer health impacts. On the information available, she found that about 24,000 people would suffer chronic bronchitis, 11,600 people would be hospitalised for respiratory ailments and 90 for heart diseases, and about 25 people would die prematurely. On her account, "domestic fuels … are predicted to be responsible for 60% to 65% of health effects" but industrial emissions will account for "65% of chronic bronchitis cases …" and 30% of all respiratory health effects [2004: 5-11].

This finding is for the Vaal Triangle as a whole. Industry would, however, account for a far higher proportion of health effects in settlements downwind of the big plants. Thus, domestic fuel accounts for "84% of PM_{10} concentrations at Sebokeng" upwind of Mittal but only 45% at Sharpeville where

Box 14: The Durban findings

The South Durban Health Study comes in two sections: a health risk assessment based on monitoring people's exposure to air pollutants; and an epidemiological study which looked at the actual status of people's respiratory health by examining children at selected schools and their parents. The study compared sites in south Durban with other sites in eThekwini, including Warwick next to the major city traffic intersection, and sites which are remote from industry and traffic.

The risk assessment concludes that the number of cancers caused by pollution will be very high in south Durban compared with the other sites and with figures from studies in other places in the world. It estimates 25 cancer cases for every 100,000 people, which is 250 times the accepted norm, but notes that this figure is conservative for three reasons: air monitors were not necessarily located at hot-spots; estimates of people's exposure were based on averages for pollutant concentrations and actual exposure may have been much higher; the amount that people actually breathe in was also conservatively estimated. Real cancer rates in south Durban are thus likely to be higher than the study estimates and may be much higher.

The study identifies benzene, naphthalene and dioxins and furans as the pollutants responsible for most of the cancers, but ethyl benzene, PCBs and styrene and the metal particulates of nickel and chromium also contributed to cancers.

The epidemiological study also finds that respiratory ailments in south Durban were high by comparison with other sites. In particular, it notes that previous exposure increased people's vulnerability. Further, "relatively modest" increases in pollution affected vulnerable children. The key pollutants linked to respiratory ailments were sulphur dioxide, nitrogen dioxide, nitrogen oxide and particulates.

The study recommends tighter regulation with further improvements to the air quality monitoring system and of emission controls. For the 'conventional pollutants', it notes that sulphur dioxide emissions have been reduced from historically very high levels but further reductions are needed, particularly if there is going to be more development. As it is, daily and 10-minute limits are frequently exceeded by pollution peaks although the annual limit

is met.[93] Particulates (PM_{10}) and nitrogen dioxide exceeded the annual limit and very frequently exceeded short term limits. Limits for fine particulates ($PM_{2.5}$) have not been set but limited monitoring specifically for the study showed that concentrations exceeded World Health Organisation (WHO) annual guideline and regularly exceeded its daily guideline.[94] It recommends that a "strategy and timeframe for attaining compliance with standards, guidelines and targets should be developed for each pollutant" [202].
The report recommends better monitoring for VOCs, covering a wider range of compounds, [95] and for metals, dioxins and furans, and TRS compounds. The sources of all these pollutants should be tracked down and rigorous emission controls introduced.

Apart from reducing pollution, the report recommends that an early warning system for major pollution releases should be set up. This recommendation is partly anticipated in the refinery license condition requiring 24 hour notice of flaring. It also calls for a programme of asthma education in Durban communities and for better health information, including long-term monitoring of respiratory diseases and setting up a cancer registry.

In their response to the report, SDCEA and groundWork called for:

- The production of health information to create a systematic understanding of what cancers affect people living in the south Durban area.
- Urgent action to find sources emitting metals, such as cadmium, chrome and manganese, in order to better regulate and stop these emissions.
- More stringent standards than those proposed by the Department of Environmental Affairs and Tourism, taking account of the finding that "relatively modest" increases in pollution affect people's respiratory health.
- A review of all industry licenses, linked with increased enforcement and monitoring, to start a process of reducing pollution at source.

[93] Ambient limits are set for different timeframes and the concentration of each pollutant is averaged out over that duration. Short-term limits are much higher than long-term limits. Thus, for sulphur dioxide, the annual limit is 19 parts per billion, the daily limit is 48 and the 10 minute limit is 191. The standards system thus allows pollution peaks up to the relevant short-term limit. The assumption is that higher levels of exposure can be tolerated for shorter time periods.
[94] PM10 is generally visible as smoke or dust. PM2.5 is not visible and is produced from higher temperature combustion such as in industrial processes or motor engines.
[95] At present, benzene, toluene, ethyl benzene and xylene (BTEX) are monitored in Durban.

industry accounts for 50% [5-5]. Figures for Boipatong and Zamdela are not given but the industrial contribution is likely to be higher still.[96]

Scorgie's findings are likely to underestimate health effects from industrial pollution for several reasons:

- Information on emissions is partial. Many industries in the Vaal report some emissions but not others, it is likely that many under-report, and overall emissions are likely to have increased since the data was produced.
- Only three pollutants are considered. In particular, Scorgie notes that benzene is not included in the model. Several other VOCs and total reduced sulphur (TRS) compounds are also highly toxic.
- The findings cannot take account of the cumulative impact from the combination of pollutants in the Vaal Triangle's air.
- Only a limited range of health effects are considered. Cancers and disorders affecting the nervous system, the reproductive system or the immune system are not included.
- The findings do not appear to take account of workplace pollution or of industrial incidents.
- The findings are based on annual and daily averages which conceal pollution 'peaks' – short periods of more intensive exposure. Even short term exposure to high levels of some pollutants can result in serious long term damage.
- People with a history of exposure are more vulnerable to further exposure. People living in the Vaal are therefore more likely to suffer health effects than the average population in the country as a whole.

Scorgie estimates hospital costs associated with air pollution at R289 million a year. This does not include the costs of caring within households or of income lost as a result of illness. Nor does it include the long term costs in the life chances of children who grow up with chronic conditions. Putting a monetary value on the costs of pollution can be misleading, however, because it invariably results in the lives of poor people being given a lower value than those of the rich. The real costs to poor people are in fact much higher because they do not have insurance or other reserves. Illness often precipitates an economic 'shock', tipping poor households into utter destitution from which many never recover.

[96] Industry contributions are over 80% in the formerly white areas where there is little domestic fuel burning, even though the intensity of industrial pollution is less extreme in these areas.

Privatising information

In Emfuleni, the failures of municipal accountability have stoked conflict between people and the local government that is supposed to represent them. With the privatisation of water services, Johannesburg Water[97] put the principle that public services should be publicly accounted in doubt. As reported in The groundWork Report 2004, it refused information requested by researcher Ebrahim Harvey on its 'public-private-partnership' deal with Suez subsidiary Johannesburg Water Management (Jowam). It said the documents requested contained the 'confidential methodology' of the private corporation.

Harvey challenged this decision in court with the support of the Freedom of Expression Institute (FXI). In October 2005, the court ordered that the water authority must review its documents and decide which must be released in terms of the Promotion of Access to Information Act. It also had to list the documents that it would not release and give reasons for holding them secret. Harvey and FXI would be entitled to challenge this decision in a further court case.

According to FXI, more than half the documents have now been disclosed. Outstanding documents relate to Jowam's original bid for the contract, its subsequent reporting to the water authority and the water authority's evaluations of these reports. The reason given for refusing these documents is that they contain trade secrets and information received in confidence.[98] The issue will now go back to court.

It is notable that the reason for refusing information remains the same: commercial confidentiality. So those documents which have been released are presumably not really as confidential as originally claimed. This implies that the original decision to withhold them was arbitrary. Yet the decision as to what is really confidential remains with Johannesburg Water and Suez and there is, in principle, no way for public judgement of the legitimacy of the decision. The conclusion must be that privatisation is not compatible with accountability.

Secrecy is made possible by unequal power relations and has the intention of maintaining inequality. The terms of participation at Orange Farm similarly reflect a profound inequality of power. As one respondent to the APF survey put it, “They consulted us – yes, but they didn't listen to us” [Fiil-Flynn and Naidoo 2004: 14]. In short, the terms of water delivery were already decided in the contract between Johannesburg Water and Jowam and 'participation' was merely to facilitate

[97] Johannesburg's corporatised water authority
[98] Personal communication with Simon Delaney of FXI.

implementation of that agreement. And the 'customers' may well suspect that the 'confidential methodology' has to do with keeping them in their place to the profit of Suez.

5. Change coming

Agriculture is often represented as a backward sector of the economy. In the post-war period it was progressively industrialised, with state support, throughout the world and this process has been accompanied by a depopulation of the rural landscape as machinery and chemicals increasingly replaced labour. Investments and growth in local economies were associated both with job shedding and with a concentration of land ownership as smaller commercial farmers fell behind in the technology race. In most countries, the better part of the value of state support was captured by large corporations. Now, with the withdrawal of state support in southern countries, the market is capitalising on those earlier investments and the process of depopulation is intensified.

What has happened on the farms is now happening in the factories. The industrial landscape is being depopulated. As described in Chapter One, workers are being swept out of both farms and factories and they and their families are forced to find shelter where they can in increasingly impoverished urban settlements. The service sector – particularly tourism and call centres – is now looked to for jobs. Services are, however, very diverse and people are already being replaced by computerisation in many areas like financial services. Indeed, call centres themselves exemplify this. As they centralise functions such as bookings and information in one place, they destroy local jobs in other places both within South Africa and across the English speaking world. Globally, they destroy more jobs than they create and they pay less per job. In the name of productivity, that is precisely what they are meant to do.

The post-war promise of full employment within the Fordist regime of production, backed by the safety net of the welfare state, held good only for the first world. It was the outcome of struggles between northern social movements and the managers of capital but it was underpinned by the transfer of resources from the third world. Since the 1980s, under the neo-liberal regime, employment and welfare in the industrialised countries have been leached away. As financier

Warren Buffet is reputed to have said, "If there is such a thing as class war, my side is winning." In the third world, full employment was the political privilege afforded only to certain categories of people – whites in South Africa. For most of the rest, labour was coerced into the factories at pitiful wages and only as it was needed.

Across the third world now, the workers abandoned to poverty are being joined by people whose subsistence economies subsidised industrialisation to much the same effect as the 'reserves' and 'homelands' did in South Africa.[99] These economies staggered under the burden and the environmental resources of land, water and biodiversity that maintained them, and was previously maintained by them, eroded away. This erosion has undermined the resilience of local environments, making them ever more vulnerable to the stress of drought and flood. On the other side of the fence, industrial agriculture has also undermined environmental resilience, destroying forests and wetlands, compacting soils under the weight of machinery and substituting chemicals for organic fertility. Thus it was, in the drought of the early 1990s, that thousands of people abandoned what remained of production in the homelands and thousands of farm workers lost their jobs, creating a 'pulse' of migration to towns and cities.

These disasters are still called 'natural'. They get less natural all the time. It is no longer just that environmental resilience is destroyed on the ground, but the climate itself is made more erratic and extreme under the impact of industrial emissions. The people who flee these unnatural disasters mostly join those already crowded in urban shack settlements located on land that is not valued by the urban real estate market. This land is often in flood zones, on steep slopes or in polluted areas, and the shack settlements are inadequately served, if at all, with water, energy, sanitation and waste removal. Here, people face a new round of environmental disaster from contaminated floodwater and mud-slides, from periodic outbreaks of disease, and from the fires that repeatedly burn through them.

A third of the world's urban people now live in the slums, mostly in the third world, in old working class areas drained of income as well as shack settlements. Almost all the growth in the world's population is being absorbed into the ranks of the urban poor while the population in rural and richer urban areas is, or soon will be, declining. Both the absolute number of people and the proportion of the world's population living in slums are therefore rising fast. UN-Habitat's Global Report on Human Settlements 2003, concluded that, "instead of being a focus for growth and

[99] Gill Hart argues that this was not a necessary condition of industrialisation as both Korea and Taiwan redistributed land to peasants while industrialising. These countries, however, benefited from a major transfer of resources from the US because of their location on the Cold War frontier.

prosperity, the cities have become a dumping ground for a surplus population working in unskilled, unprotected and low-wage informal service industries and trade" [quoted in Davis 2004: 23].

At the same time, rising global inequality, between rich and poor countries and between rich and poor people everywhere, reached 0.67 on the Gini scale.[100] Mike Davis comments, "This was mathematically equivalent to a situation where the poorest two-thirds of the world receive zero income; and the top third, everything" [23]. This is worse inequality than in any individual country. South Africa and Brazil, the two most unequal countries in the world, have a Gini of around 0.6. Individual third world cities, however, have far worse Gini figures if the South African example is anything to go by. According to the State of the Cities Report 2004, Cape Town does best at an atrocious 0.69, while Johannesburg at 0.78 and Buffalo City at 0.79 are worst [185].

UN-Habitat attributed this catastrophic dispossession directly to the neo-liberal policies initiated in the 1980s. These policies were the means by which the US reasserted global dominance following its defeat in Vietnam and the 'oil shocks' of the 1970s. They were enforced by the IMF and World Bank, acting more or less directly on the instructions of the US Treasury, through 'structural adjustment programmes' (SAPs), through the instigation or manipulation of economic crises in recalcitrant countries, and through rigging the rules of multilateral, regional and bilateral trading agreements. By these means, massive resources have been transferred from the poor to the rich and the shocks produced by the political and economic crises afflicting the imperial powers have been displaced onto the third world.[101] Thus has the plight of the wretched of the earth come full circle. Those dispossessed in the countryside to force them into, or to subsidise, the work of urban industrialism are now also dispossessed in the cities to which they were and are being driven.

Contrary to the spurious arguments of the World Bank and major powers, the environmental impacts associated with poverty are not caused by poverty. Poverty is as much a sign of unsustainable development as environmental degradation and for the same reason: both are produced by the working of the economy that concentrates wealth in the hands of the few – and particularly in the hands of fewer and fewer corporations who are then able to decide where and how to reinvest it and so determine the future of development. Under the rule of neo-liberalism, in the analysis of geographer David Harvey [2005], the dominant means of accumulation has become accumulation by dispossession.[102] The practices of capital at the periphery have thus returned to its centre and the system as a whole now feeds on its own entrails.

[100] A Gini coefficient of 0.0 means absolute equality – everyone has the same income – while a coefficient of 1.0 means absolute inequality – 1% of people get everything.
[101] These arguments are made in detail in earlier groundWork Reports [2003: 22ff and 2005: 16ff].
[102] Harvey's use of the term includes all three of the mechanisms of environmental injustice described in the Introduction: externalities, enclosures and exclusion.

This plunder is part of the response of the dominant powers to the crises outlined in the Introduction. Despite the appearance of an overwhelming force, it is as much a sign of weakness as of strength. The next section traces the cracks primarily through the relationship between Venezuela and the US. There are three reasons for choosing Venezuela. First, it has made itself the flag-bearer of anti-imperialism and of the hope that another world is possible. Second, the energy intensity of its economy is comparable to South Africa's and there are some striking similarities in the way these two countries are trying to leverage competitive and international advantage from their energy endowments. Third, it illustrates a tension that Harvey sees in contemporary struggles for justice between demands for 'expanded reproduction' – more and better paid jobs based on higher levels of growth – and demands for an end to dispossession – pollution and the theft of resources.

Venezuela in the crisis

In April 2006, Venezuela's President Hugo Chavez said he would propose a new OPEC (the Organisation of Petroleum Exporting Countries) price peg of $50 a barrel for crude oil. This was the average price of oil in 2005 and compares with prices ranging between $10 and $20 a barrel during the 1990s. In 2006 market prices have generally been above $60. At the same time, Venezuela has requested OPEC to recognise an upgrading of its reserves to 312 billion barrels which would put it in top place above Saudi Arabia's 262 billion barrel reserve. OPEC rules link production quotas to the size of a country's reserves. So if Venezuela's request is granted, it will get the largest production quota.

These two moves are related. Venezuela has the world's largest reserves of very heavy oils which are something like bitumen. At a price below $40 a barrel, these reserves are not economically viable and are therefore not counted. If they are counted, Venezuela moves up from fifth place in the OPEC rankings. Its total potential reserves of heavy oil are claimed to be larger than the combined conventional (liquid) crude oil reserves of all the Middle Eastern countries.[103] Chavez claims that it has heavy oils for the next 200 hundred years. This compares with Saudi claims that it can maintain high level production for at least 50 years.

Peaking out

These claims, like all claims made by oil industry actors, need to be treated with caution. The link between OPEC quotas and 'proven reserves' creates an incentive to exaggerate and the data on which reserve figures are based is secret and therefore not subject to external verification. How long

[103] How much of what is in the ground can be extracted depends on technology and cost. 'Proven reserves' are calculated on the basis of how much can be lifted. Existing projects in Orinoco manage between 5 and 10% according to Pierre-René Bauquis of Total, What future for extra heavy oil and bitumen: the Orinoco case, undated, posted at World Energy Council site.

oil producers can keep pumping depends on demand. The International Energy Agency (IEA) puts world demand for 2006 at 84.7 million barrels a day (30,660 million barrels a year). Annual demand has been increasing by about 2 million barrels a day in recent years although high prices in 2005 constricted the increase to just over 1 million. The IEA puts the 2006 increase at 1.5 million as US and Chinese demand recovers despite the price.[104] At the same time, production from older wells around the world is declining. This means that producers must compensate for about 4 million barrels a day in declining production as well as producing more to meet the increased demand. That makes over 2,000 million barrels a year of new production.

The IEA predicts that demand will increase to 120 million barrels a day by 2030. Oil giant Total believes this demand cannot be met.[105] It argues that this is not because the oil is not there but because the human and technical resources cannot be developed to keep up with the increase in demand. This applies to refining as well as extraction. The world as a whole is not producing enough petrochemical engineers or artisans and all sorts of equipment, from deep sea drilling rigs to the tyres for extra large earth moving machines, is in short supply. In short, the production system as a whole is stretched to its limits and revealing vulnerabilities all the way down the production chain.

The same can be said for the energy sector as a whole. The blackouts in Cape Town are not just about a bolt in a rotor, they are about a system of production stretched to its limits. Government has announced over SAR 100 billion in energy investments over the next five years but it will have to compete on a global market for skills and materiel that are in short supply. South Africa is not alone. The price of gas in Britain, following the price of oil, has risen by 48% in the last two years. Cold weather in March pushed up demand and a fire at a major gas storage facility led to a supply alert being issued. [106]

Total also points out that geo-political factors will constrain supplies. Thus, increased supplies from occupied Iraq have been partially off-set as insurgency in the Niger delta has interrupted Nigerian supplies. Meanwhile, the US is threatening aggression against Iran, claiming that it plans to build nuclear weapons and asserting that the US will hold it to its commitments under the Non-Proliferation Treaty (NPT). Iran certainly does have nuclear ambitions but claims it merely wants to build power plants. The threat of a US strike, however, builds Iranian support for nuclear weapons development. In April this year it declared that it has successfully enriched uranium to produce

[104] IEA Monthly Oil Market Report, 14 March 2006.
[105] The Times (London), World 'cannot meet oil demand', 8 April 2006.
[106] Guardian 14 March 2006.

nuclear fuel. This is interpreted as indicating that it is indeed capable of making a bomb within the next few years but the International Atomic Energy Agency has found no evidence that it is violating the NPT by diverting material to a weapons programme. [107]

The US meanwhile blew its credibility when it cooked up the information used to justify its invasion of Iraq. And it has itself abrogated its own NPT commitments under the Comprehensive Test Ban Treaty while also supporting Israel's nuclear capacity in defiance of the treaty. The real threat of Iran is to the US's strategic control of the Middle East and of the flow of oil. Iran is excluded from the US market but has done major deals with China and India. It is thus located on the frontier of global competition for a resource that will become more critical as it becomes scarcer. With nuclear weapons capability, it might consider itself immune to US pressure. The European powers, however, including even the UK, are increasingly alarmed at the bellicosity of the US approach to Iran, while China and Russia are likely to oppose it outright – so preventing UN security council endorsement of any military action. The US agenda is further damaged by Israel's assault on Lebanon which, despite its high tech brutality, failed in its main objective of crushing Hizbollah, the guerrilla group that both the US and Israel claim to be an Iranian proxy.

OPEC countries are producing as much as they can to meet the growing demand so the question of who has the biggest production quota is, for the moment, symbolic. Saudi Arabia is investing $55 billion to increase production from about 12.5 to 15 million barrels a day. Oil wells, however, are drilled into complex geological formations and there are technical limits to how fast the reserve can be pumped. There are fears that 15 mb/d is above the limit and will trigger the early collapse of Saudi Arabian wells leaving 'trapped oil' in the ground.

The idea of 'peak oil' is that global production of conventional crude oil will soon reach a peak and then begin to decline. If demand keeps rising, the price will rocket. This makes for windfall profits for the oil producing countries and for the big oil corporations. In January 2006, ExxonMobil's profit was up 42% to $36 billion – the biggest profit ever by any corporation. And it came on top of buying back $18 billion worth of its own shares.[108] The other 'super-majors' also posted record profits: Shell $25 billion; BP $19.3 billion; Total $15.7 billion; ChevronTexaco $14 billion; ConocoPhillips $13.5 billion.

[107] For a detailed discussion of US war planning and intentions, see Seymour Hersh, The Iran Plans, The New Yorker, April 8, 2006. Also Doug Lorimer, Iran: Oil, not nukes, Washington's concern, Green Left Weekly, April 26, 2006, at www.greenleft.org.au. How long it would take for Iran to produce weapons is disputed with estimates ranging from five to 10 years or more. See also Ewan MacAskill, Tehran has won, The Guardian UK, April 12, 2006.
[108] Terry Macalister, ExxonMobil make world's biggest profit, The Guardian, January 31, 2006.

With all this money swilling around the oil trough, big oil is investing massively in exploration but is finding less and less conventional oil. They are also beginning to exploit unconventional sources – heavy oils, tar sands and liquid fuels from gas and coal. Just as Chavez is making a power play on Venezuela's heavy oil deposits, South Africa's Sasol is exploiting its technology lead in manufacturing synthetic fuels or 'synfuels'.

Oil remains by far the largest source of energy for industrial economies world wide. Coal prices are therefore following oil prices upwards as energy users look for alternatives. South Africa has huge coal deposits and minimal oil reserves and is, unusually, more dependent on coal than oil. It is also a major coal exporter and is intent on expanding the infrastructure to export more. Venezuela also has substantial coal deposits and is following a similar strategy. It is opening new coal fields and building major rail and port infrastructure to export coal

Bolivar against empire

Chavez's move to reposition Venezuela in the oil rankings is part of a larger strategy to redefine global power relations and specifically Latin America's position as the US's back yard. Within Venezuela, he has reinforced 'resource sovereignty' by nationalising oil and gas resources in the ground and charging higher rents to the corporations who pump it out. At the same time, he has also expanded the Venezuelan national oil corporation's operations in the field. In the Latin American region, he has promoted three oil-based alliances with the ultimate objective of creating Petroamerica as a force to challenge the dominance of the big oil corporations both regionally and globally.[109] He has also led the 'Bolivarian Alternative for the Americas' (ALBA), an explicitly anti-imperialist initiative positioned in opposition to US plans for an all American free trade area. Like Venezuela's own 'Bolivarian revolution', it is named after Simon Bolivar who led Latin America's struggle for independence from imperial Spain in the 18th Century. ALBA specifically invokes Bolivar's vision of continental unity.

In November 2005, Venezuela announced that it would trade its oil in Euros. Iran has expressed similar intentions and even proposed establishing a global oil trading floor independent of New York. Iraq announced that it would trade its oil in Euros in 2000 and several analysts believe the real reason behind the US invasion was to stop other oil producers even thinking about it. Trading in Euros is effectively an attack on the status of the dollar. Most oil, as well as other strategic

[109] In the Caribbean region, Petrocaribe delivers oil to a majority of the island states at preferential rates, thus cushioning the effects of the oil price explosion. And in Latin America, Chavez has promoted Petrosur, an alliance of state owned oil companies including those of Venezuela, Brazil, Argentina and Uruguay, while Petroandina includes Venezuela, Colombia, Bolivia and Ecuador. The ultimate goal is to create Petroamerica, a coalition of state-owned oil companies that would cover all of South America.

commodities, is traded in dollars which means that all countries must keep reserves of money that is made in America. This greatly expands the scope of the US economy – supporting its ability to rack up debts beyond what would be allowed to any other country – and its leverage over strategic resources. It is, in short, an essential feature of US global dominance.

The US is by no means a spent force. Nevertheless, its power now seems to rest more on its capacity for destruction and coercion than for creation and leadership. This is most evident in its overwhelming global military supremacy and simultaneous failure on the ground in Iraq and in the repetition of this pattern in Israel's failure on the ground in Lebanon. The prospects for Iran, where the US has left itself without any options other than force, look even grimmer.

The global economic system over which the US presides also looks remarkably resilient. Although the oil price has tripled in just three years, "the global economy … sails on" as David Smith of the London Sunday Times puts it. Far from provoking a global recession, global economic growth ran at 4.5% in 2005, well above the 3% growth in the years preceding the supposed price shock. [110]

Global economic warning signs are, however, flashing insistently. US economic dominance is reflected in the extent to which the global economy as a whole has come to rely on high levels of US consumption. This is overtly supported by the rest of the world through the purchase of US debt.

In 2003, this transfer of wealth to the US was running at $1 billion every day. In 2004, it had risen to $1.5 billion and in 2005, to over $2 billion. In February 2006, Kairos Canada put this figure at $ 2.6 billion a day – amounting to 70% of the world's savings. US net debt was about $3 trillion at the end of 2005 and, at current rates, would reach $7 trillion by 2009. The rising rate of US borrowing is partly caused by the costs of war, now running at $6 billion a month. At the same time, the transfer of foreign wealth enables ordinary Americans to spend above their income at $1.22 for every $1 earned and the scale of household debt parallels the national debt.[111] Already in 2003, Arrighi questioned "how this situation can be reproduced for any length of time without transforming into an outright tribute, or 'protection payment'" [2003: 70].

The Far Eastern countries which are most heavily reliant on exports buy about half the US debt. However, IMF insistence on export oriented economic development has made the entire developing world dependent on the purchasing power of the rich countries and the US in particular.

[110] The Sunday Times, March 5, 2006: The myths and legends about high oil prices.
[111] Kairos Briefing # 1, Will US debt lead to a financial crisis? February 2006. Market analysts Comstock Partners Inc., gave their opinion on 14 September 2006 that a US housing crash is now in progress.

Even Venezuela, insulated from IMF pressure by the oil windfall, relies on the US to import most of its product.

If the global economy 'sails on', rising levels of global inequality have made poor nations and poor people (even in rich nations) vulnerable to rising prices. Eritrea, for example, has reserved all oil imports for 'essential' uses – effectively the military – and cars are off the streets. In Zimbabwe some municipalities have resorted to draught animals to haul ambulances and for rubbish collection. There are, of course, other reasons for the plight of Eritreans and Zimbabweans – Eritrea's military expenditures and Zimbabwe's gross mismanagement. The oil price, however, exacerbates existing vulnerabilities just as US bellicosity in the Middle East pushes up the price irrespective of theoretical reserves.

Chavez – in the face of stiff opposition from the Venezuelan national elite, the oil corporations and the US – has substantially redistributed the profits from the oil industry, using the flood of petrodollars to fund massive social welfare programmes providing housing, education, medical services and food to the poor. Within a very short time, the country has achieved the lowest rate of infant mortality and one of the highest rates of literacy in all of Latin America. He has afforded legal recognition to the rights of indigenous people in Venezuela and responded to civil society actions demanding meaningful democratic participation with the establishment of community councils. Under the banner of 'social production', he has announced the intention to promote use-value in the place of profit and link production to social need through the partnership of workers and state in state owned corporations. This transformation in governance in Venezuela is still partial. It is at once vulnerable to a conservative and corrupt bureaucracy allied to local elites and the means for removing their power. For the present, it relies heavily on Chavez's determination to push it through.[112]

While Chavez has massive popular support, the 'Bolivarian revolution' remains dependent on the solitary figure of a charismatic leader. Nor is everything quite what the rhetoric suggests. The Bolivarian Constitution retains private property rights to promote economic growth and job creation. James Petras observes that Venezuela's share of oil revenues was "far below global levels" and the tax on big oil merely brings it in line with international norms. Arab nationalisations in the 1970s were far more radical. Most of the major corporations have stayed right where they are and earned record profits in Venezuela. He also disputes that there has been any real change in the

[112] Lebowitz [2006] gives a sympathetic account of the Bolivarian revolution.

relationship between workers and employers in either the state owned or foreign oil corporations [2006].

Anti-imperialist injustice?

Nevertheless, Venezuela is pressing ahead with plans to expand the production of conventional oil, of heavy oil in the Orinoco valley and of coal mining in the province of Zulia. These projects cannot be carried out without dispossessing local indigenous people by enclosing their land to the benefit of the corporations – both state owned and transnational. Indigenous and environmental groups protested these plans at the 'Alternative Social Forum' in Caracas, Venezuela, in February 2006. In April they followed up with an open letter to Chavez.[113] In Zulia, the plan is to lift coal production from 8 to 36 million tons a year and to build a massive transport infrastructure terminating at a new port – Puerto Bolivar – to export it. The letter points out that existing mines have already resulted in deforestation and the severe contamination of land and rivers with sulphuric acid and heavy metals and it calls on Chavez to annul coal concessions in the area.

Zulia lies in just one of nine 'axes of integration' which make up a grandiose Initiative for Regional Integration of Infrastructures in South America (IIRSA) originally conceived by the World Bank. The plans include massive pipelines south across the Amazon basin 8,000 kilometres to Buenos Aires as well as a branch to Peru's Pacific coast and north to Mexico and ultimately the US. The political alignment of these projects, to the imperialist US Free Trade Agreement or the anti-imperialist ALBA, is now being contested between the Latin American countries. Nevertheless, Oilwatch comments that the ALBA group "want national capital articulated with the transnational interests" and the consolidation of this relationship through energy intensive industrial projects producing for export. Whether carried out in the name of imperialism or anti-imperialism, these projects will "destroy the environment and generate a systematic violation of people's rights".[114]

Lifting Orinoco's heavy oil can only intensify the impact. It is an energy and capital intensive business requiring very heavy machinery and infrastructure. The oil must be either fully or partially processed on the spot to make it liquid enough to be piped out and it is very dirty – with high sulphur and heavy metal content. Even by the wretched standards of the oil industry, the expansion of the present heavy oil industry in Orinoco will devastate people and their environments.

Beyond the local, 2005 yielded startling evidence of an accelerating rate of climate change. The groundWork Report 2005 noted that just using the oil already on tap will be catastrophic. And the

[113] Open Letter to President Hugo Chavez, Sociedad Homo et Natura, posted at http://www.nadir.org/nadir/initiativ/agp/free/imf/venezuela/2006/ in April 2006.
[114] Oilwatch against the southern gas pipeline project at www.oilwatch.org.

poor will be hit first and worst by climate induced disasters as was the case when Hurricane Katrina hit New Orleans in August 2005. At the World Social Forum in Caracas, Chavez expressed concern about climate change but the request that OPEC recognise heavy oil reserves clearly indicates a priority for capitalising on peak oil while abdicating responsibility for acting on climate change.

Latin America's IIRSA has its African equivalent in the New Partnership for Africa's Development (Nepad). This too emphasises infrastructure projects advertised as promoting regional integration, many of which were conceived or supported by the World Bank: The Chad Cameroon Pipeline, the West African Gas Pipeline, Sasol's Mozambique gas pipeline, Eskom's Western Power Corridor from Congo's Inga Falls via Angola, Namibia and Botswana to South Africa. And it too promises to push people aside from the enclaves of wealth connected by 'development corridors'. There is, however, no struggle between governments of the region over the identity of Nepad. The partnership of the title is explicitly between African leaders and the northern powers. Anti-imperialism is heard only as the nostalgic echo of the heroism of past liberation struggles used to claim legitimacy.

The open letter to Chavez poses a question: "Will the left-wing governments of Latin America conceive of a new model of development? Or will they simply inherit the neo-liberal model based on long-distance transport and unbridled energy development, thus sacrificing local communities, the environment and the future?" This question resonates with the conclusion of The groundWork Report 2005 – Big oil against people in Africa – that another energy future is necessary, one brought into being by and for people rather than by and for corporations and the global and local elites.

The corporate agenda was articulated at the 2005 World Petroleum Congress in Johannesburg under the banner of 'Shaping the Energy Future: Partners in Sustainable Solutions'. Lifting Orinoco's heavy oil depends on this agenda. The partnership is between corporate oil and the state. The Venezuelan state under Chavez has proved a tough negotiating partner insisting on a larger slice of the rising oil revenues but leaving enough to keep the corporations on board. The 'sustainable solutions' are based on heavy investments in new technologies necessary to bring the heavy oil to market.

Growing for bust

The environmental justice implications of oil clearly confront Chavez with a double contradiction. First, if Venezuela does not expand production, how will it fund social benefits for those who are excluded from the enclave development created by the oil industry – and indeed, by the process of economic globalisation as a whole? Yet the reproduction of environmental injustice (including climate change) will not only impose massive costs on the poor but will entrench the underlying trend of exclusion that makes them dependent on redistribution by the state. Second, if Venezuela does not leverage the power derived from oil revenues, how will it challenge US imperialism? Yet Venezuela, like everyone else including China, ultimately relies on US consumption which in turn is made possible only through the power of US imperialism. A successful challenge to US imperialism must result in global economic recession and the collapse of commodity prices including the price of oil. Conversely, a US attack on Venezuela would put oil prices through the roof. For the present, the US is funding opposition groups and expanding CIA operations in Venezuela.

There are two ironies in the threat of global recession. First, it will dramatically reduce demand for oil and thus delay the consequences of peak oil. Second, it is the most likely way that the world will achieve a big enough reduction in greenhouse gas emissions to slow the pace of climate change. This is a striking indicator of just how unsustainable the present economic model is.

The central value of this economic model is growth and it is tied to productivity. Within the international system of nation states, each country's ranking is measured by gross domestic product (GDP). The annual growth – or contraction – of GDP measures their performance against other countries. GDP itself is measured by the sum of 'value added' from all economic activity and represents the productivity of the economy. Growing productivity creates wealth and this, finally, is what development is about. Even if some benefit more than others, it is held to be in everyone's best interest. Indeed, growth is most often justified in the name of the poor because it is claimed to be the basis for eradicating poverty.

Productivity, however, has a rather more problematic history than this would suggest. Throughout the colonial period it was used to justify the dispossession of indigenous people. Their occupation of the land gave them no right of property because they did not use it productively for profit. Ellen Meiksins Wood summarises the view of 17th Century English philosopher John Locke: "America was the model state of nature, in which all land was available for appropriation, because, although it was certainly inhabited and even sometimes cultivated, there was no proper commerce, hence no

'improvement', no productive and profitable use of land, and therefore no real property" [Meiksins Wood 2003: 96]. Improvement then meant much the same as development means today.
The representation of GDP[115] as a technical tool of economic management thus conceals that it is, at base, about relations of power. Growth is based on two linked processes: the exploitation of waged labour which enables corporations to accumulate profits; and the process of enclosure or what Harvey calls 'accumulation by dispossession'. The exploitation of labour is about the difference between what labour is paid and what the product of labour is sold for – that is, it is about the profit that is returned to the owners of capital. At present, the biggest profits from production are being made in China where the cost of labour in industry is just 3% of what it is in the US.[116] This is the foundation of China's spectacular economic growth and its rising power within the global market.

Dispossession is also essential to profits and it takes many forms starting with the appropriation of land and other natural resources but now also including the privatisation of energy, water and other services that were previously provided by the state as public goods, as well as rank corruption and a host of other legal and illegal rip-offs. On the global scale, it is about rich countries plundering the wealth of poor countries and adding this income to their GDP. When the Venezuelans speak of 'national sovereignty' it is this level of dispossession that they seek to reverse. However, so long as national sovereignty is founded on growth it remains trapped within the logic of an economic model which puts nation states in competition with each other for the rights of plunder. For China, moving up in the ranking of nations is based on pitifully low wages as well as rural dispossession and foul pollution. For Venezuela, it is based on oil.

What gets left out of the calculation of growth is the value subtracted: the people dispossessed, the land spoiled and much of the cost of reproducing labour. These costs are imposed on the non-monetised economy – of unpaid work in homes and fields, caring for the sick and disabled including those disabled by occupational disease or environmental pollution, mutual aid within communities and families, bartering, 'sweat equity' etc. as well as the environment itself – where there is no 'proper commerce' and hence no need to account. The burden of these costs falls on the poor and most heavily on women – that is, on those who do not see the benefits of value added but must nevertheless subsidise it. What Venezuela has achieved through the oil windfall is the mitigation of the costs of reproducing labour but at the expense of further enclosure and massive externalities. Ultimately, this strategy will accelerate climate change with devastating consequences and wholesale dispossession.

[115] GDP literally only measures what goes through markets, and thus does not represent any aspect of the non-monetised economy and excludes it from economic discourse and planning.
[116] Andrew Glyn, Marx's reserve army of labour is about to go global, The Guardian, April 5, 2006.

Responding to crisis

The impacts of climate change, peak oil and economic instability resulting from the collapse of US imperial authority, will force a wholesale transformation of the global regime of production. Whether another country, or combination of countries, comes to replace the US and renew global capitalism is a moot question made more debateable by climate change. Economist Jeremy Wakeford [2005] has itemised the more immediate consequences for South Africa.

First, escalating transport costs will force the contraction of international trade, including tourism, and threaten the entire structure of the global production networks presided over by the major transnational corporations. This will expose South Africa's export oriented development strategy together with its industrial strategy of promoting the insertion of South African firms within the global production networks. Second, currency shocks, particularly the prospects of a dollar crash, will further jeopardise exports and play havoc with economic stability, threatening escalating inflation and recession. South Africa's exposure is heightened by policies which allow the free flow of speculative capital. Third, South Africa's coal reserves and Sasol's synfuels production may provide a partial energy security shield but 80% of transport remains dependent on crude oil imports. Fourth, food security will be threatened by climate change, made worse by South Africa's reliance on coal, and by biofuel production. Finally, social stability will be threatened by the increasing desperation of people both in South Africa and in neighbouring countries.

One way or another, the unfolding global crisis will force deep changes in South Africa's present development policies. People too, particularly workers and the social justice movements, will have to respond to the growing crisis. How they do will in turn influence the response of the state. Box 15 gives a brief account of Cuba's response to an energy crisis in the early 1990s. Box 16 describes the response of workers to economic meltdown and factory closures in Argentina in the early 2000s.

Reproducing urban space

The South African government is investing some R15 billion through its Municipal Infrastructure Grant programme. This is big money although dwarfed by Eskom's R84 billion. According to Mark Swilling [2006], the spending will be directed by the National Spatial Development Perspective put out by the President's Office. This document argues that spending should focus on places where there is both great social need and the potential for economic growth. In its view, rural areas do not have the potential for growth while big city centres do not have sufficiently desperate need.

Box 15: Cuba's energy and food crisis

Just as Taiwan and Korea were subsidised by the US on one side of the Cold War frontier, Cuba was subsidised by the Soviet Union on the other. It bought Cuban sugar at high prices and sold it oil and fertiliser cheap. Cuban agriculture was dominated by state owned estates expropriated from capitalist plantation producers during the 1959 revolution. Ownership aside, the management and technology regimes were similar to corporate agriculture in California or South Africa. The estates were water and energy intensive – irrigated, mechanised and chemicalised – to produce monocrop sugar. A small peasant sector – cooperatives and individual farmers – produced 40% of food on 20% of the land.

Following the collapse of the Soviet Union, Cuba's petroleum imports were more than halved and fertiliser and pesticide imports dropped by 77% and 63% respectively. For people, food is the most basic form of energy and Cuba's food imports, on which it relied heavily, were also halved. So its most immediate problem was how to feed its people with minimal agricultural inputs.

Cuba's response was to go for organic and low input farming using animal draft and supported by massive household, animal and human waste recycling. It supported farmer's markets which allowed for a decent return and also promoted urban agriculture by giving people access to garden plots. Peasant and urban agriculture flourished under this regime and restored food security for most of the population by 1995. The estates floundered because the management regime required for large scale monocropping precluded the relationship to the ecology of the land required by organic production. Under a 'linking to the land' programme, the estates were consequently broken up and later turned over to the workers. The transformation of the sector has been uneven and it still battles with the skills deficit created by high input agriculture. Meanwhile, access to Venezuelan oil at low prices presents an opportunity for those who wish to restore the high energy estate agriculture of earlier years. Whether they will succeed appears to depend more on the will of the state than on that of the people.

Three key points can be drawn from this. First, technologies are not neutral but embody relationships of power. Second, the cheap energy, cheap food, cheap goods regime of production does not provide food or energy security to the poor but creates dependence

on global chains of production managed for profit. Third, the supposed productivity of energy intensive production is more about power in the market and the benefits of subsidies – both from the state and from the unpaid ecological debt to the poor – than with actual productivity on the ground.

Source: Hallowes 2005: 74 ff

Spending should therefore focus on 'non-core' metropolitan areas and core areas in the smaller cities. The Vaal, presumably, qualifies.

Looking at urban infrastructure planning in Cape Town, Swilling presents detailed evidence that a sustainable development strategy would have more equitable social outcomes, create more local jobs and do more for local economic development than the conventional growth strategy that underpins the developmental state. It would also enhance South Africa's prospects for surviving peak oil, climate change and global economic turbulence.

There is, however, "no evidence that … the underlying sustainability of the ecosystem services that urban infrastructures depend on" have been taken into account [2]. This is pretty much par for the course. The environment, let alone environmental justice, is largely absent from most government development policy documents.

South Africa's substantial urban infrastructure investments are being directed by conventional planning and technology assumptions. These technologies embody power relations. They assume a model of urban development designed to service 'consumption neighbourhoods' which favour the rich who consume most. They ignore resource constraints and will not only incur escalating costs as energy and water supplies hit the limits but they will bring those limits closer. In short, this infrastructure will reproduce environmental injustice. These are, moreover, long term investments and will lock in the bias to the rich for decades to come. Rather than wasting money in this way, Swilling argues that the infrastructure investments should support a 'sustainable neighbourhoods' model.

Swilling puts forward a 'sustainable neighbourhood manifesto' while Wakeford, cited above, recommends precautionary policies in anticipation of climate change, peak oil and global

Box 16: Worker self-management

Argentina's economy was plunged into a crisis, manipulated by the IMF, in 2001. Many businesses were abandoned by their owners and managers but, at some 190 firms, workers responded with occupations, setting up worker councils and taking over the organisation of work, financial management and marketing. They paid equal wages, irrespective of whether workers took on management responsibilities or not, and improved working conditions. Having experienced the freedom of self-management, workers told researcher Michael Albert that "you would need to shoot us, literally, to get us to leave our self managed glass plant to work at a capitalist plant of any kind, at any pay rate." Yet they were also clear that they resorted to self-management only because the alternative was unemployment and that workers in firms that had not been abandoned would not follow their example:

> They explained that workers in successful plants would fear that to occupy and run their workplaces would diminish rather than improve their conditions, in addition to fearing being fired or repressed if their uprising failed. They said that prior to actually fighting for and winning control over their work lives they didn't realise what a difference it would make to their fulfilment to not have profit-seeking bosses. They were quite adamant that their current commitment to the new way of operating depended for its origin and its power on their having had to fight for the plant and then to run it in order to survive, but that their commitment didn't exist before that.

At self-managed plants, workers did not redesign production technologies to create "less repetitive and debilitating" work although they did provide relief in the form of more regular breaks. And although everyone is paid the same, those performing management functions have the information necessary to setting workplace agendas and strategies. Maintaining the egalitarian spirit of self-management over time thus depends largely on good will. The necessity of surviving in the broader context of market competition was the most significant restraint on further transforming the nature of work.

Source: Albert 2005.

economic turbulence. Taken together, their proposals would shift the basis of development from the Property Right to the Environment Right, but without challenging property relations as such. Indeed, Swilling invokes the limits to "using the state to realise genuine pro-poor objectives without alienating powerful global economic interests and institutions" although he adds that "pathways that are independent of US interests are becoming increasingly viable" [27].

The elements of a combined programme would be:

- The use of a Tobin tax[117] or of exchange controls to moderate exposure to global economic volatility;
- Fair trade and exchange, including increased protection for vulnerable industries, such as textiles and clothing, that will be difficult to re-establish following a contraction of global trade;
- A transition to renewable energy alternatives and energy efficiency with petroleum subsidies, which will become unaffordable following peak oil, transferred to renewable energies;
- Zero waste, including the return of organic wastes and sewerage to local energy systems and to soil fertility and the re-use of wastes from one industry as inputs in others;
- A major expansion of public transport systems and use of renewable fuels to dramatically reduce the use of petroleum and prevent the economy being drained by rising oil prices;
- The reconfiguration of urban space to shift away from consumption neighbourhoods defined by class by reintegrating the poor into central areas while also putting amenities and jobs within walking distance for most people;
- Sustainable building with housing and workplaces that do not impose high costs for people to be comfortably warm or cool;
- Support to local economic development – which may in any case be stimulated by escalating transport costs – with expanding local demand through increased employment and grants;
- Local organic food production linked to people's markets as part of a broader turn to organic and permaculture production technologies coupled with accelerated land reform;
- Sustainable water management with neighbourhood sewage systems providing energy, manure for urban agriculture and recycled water;
- Securing people's health and well-being, requiring both a radical reduction in pollution and provision of housing and services designed to meet people's needs rather than being designed for cost recovery;
- Conservation of local ecologies and biodiversity to ensure both the sustainability of 'ecological services' and as accessible local amenities;

[117] A Tobin tax is imposed on international financial transactions. So foreign investors in the stock exchange would pay a small percentage of the amount that they invest in tax, both when they put the money in and when they take it out. The effect is to discourage purely speculative investments.

- Ensuring inclusiveness and people's participation while interrogating the exclusive implications within the consumption economy.

Similar concerns and recommendations are also reflected in the draft National Strategy for Sustainable Development (NSSD). It is important to note that this is a draft for discussion and not yet adopted. It contains moments of inspiration, as David Fig observes, but its more radical impulses are contained by the need for "conformity with other parts of government policy like Asgisa" [2006: 13] and it endorses government's nuclear fantasies. Nevertheless, if it is adopted it will signal the beginning of a substantial policy reform – unless, of course, it is used as a shop window policy to display South Africa's green virtues while the real business proceeds as usual.

There are, however, signs that the Cape blackouts have confronted some metropolitan authorities with the vulnerability of energy supplies and their exposure to rising costs. Thus, Nelson Mandela Bay Municipality (Port Elizabeth) recently accepted bids for renewable energy investments including solar water heating, wind, biogas digesters and methane capture from waste. The municipality emphasises the potential for local job creation. These bids, from private companies, are apparently still subject to financial feasibility studies.[118]

New infrastructure will dictate options for decades to come so this is an important departure. The deal between the municipality and private companies is not yet clear, however, except that the latter will put up the estimated R9 billion capital investments. The groundWork Reports have argued that technologies compatible with 'ecologically sustainable development' mandated by the Environment Right are compatible with a people's economy in a way that centralised high energy technologies are not. But this does not mean that renewable technologies cannot be enclosed within the logic of contemporary capital.

Thus, despite commitments to 'technology transfer' in the climate change agreements, wind turbines are likely to be imported. If a local industry does develop, it will likely be saddled with heavy royalty costs. Under the current trade regime, even solar water heaters could well end up being imported although their installation is intrinsically local. Further, the investors will want a profit. How that is financed is likely to have major implications for poor people or it will fall to the public account. As these markets develop in the longer term, the private producers will increasingly be subject to the logic of corporate and market concentration.

[118] Undated press release, Major renewable energy investment in Nelson Mandela Bay, Issued by Nelson Mandela Bay Municipality Communications Office.

Another Vaal is necessary

In the Vaal Triangle, VEJA's first concerns are that corporations should clean up and compensate. VEJA is, however, more broadly confronted with the nature of corporate production and the crisis in the lives of the poor. While the organisations that make up VEJA do not necessarily share a single analysis of their situation, a strong common language, critical of neoliberal capitalism or of capitalism as such, is evolving. At groundWork's air quality workshop in Sasolburg (4 May 2006) participants observed that the power of corporations is founded on their relationship with the state both because the state creates the basis of corporate legitimacy and because corporations create the revenue basis for the state.

Discussions of the purpose of struggle, at various VEJA meetings, are increasingly located within this critical perspective. The immediate demands – clean up and compensate – are themselves ambitious in the current context. Beyond this, the desire for 'another Vaal' is very much part of the discussion with people raising the need to change the capitalist system for a new model of development, to socialise the economy and to create a new paradigm where communities and workers are central to the power system.

VEJA participants observed that "the corporations are like a brick wall while government is a wet blanket on people's action." Criticism of government, and criticism of the ANC as the party of government and as a centre of power in the Vaal Triangle itself, does not necessarily affect people's allegiance to the party. This is confirmed in a recent survey of worker opinion by the Cosatu research organisation Naledi [2006]. More than half the respondents said the ANC had not delivered on its promises but 60% said they would vote for it. The most common reason given for ANC loyalty was that workers' families had always supported it. Cosatu members are most likely to vote ANC but less than a fifth of them choose to vote for it because they think it has the best policies for workers and the poor. In this context, civil society organisations such as VEJA provide a space for mobilisation across the lines of party allegiance. This is perhaps most important precisely for those who are loyal to the ANC but critical of its policies.

Participants in VEJA see it as important to assert the freedoms and rights won through the anti-apartheid struggle and written into the Constitution. "If we can't protect the achievements of the past, we cannot protect the future." The tactics of struggle proposed by participants therefore include formal representations to parliament and other official bodies and engagement with

formal processes of participation such as will be on offer through the 'hot spot' process. And they are acutely aware of the potential for exclusion. "Participation is not a favour from government but a right for us. When government did the EIA revisions, it consulted industry, not us." They also show a readiness to go to court to challenge government as and when necessary – and it is clear that many in VEJA believe that it is increasingly necessary.

Finally, however, there is a strong sense that popular mobilisation is the heart of struggle and it must accompany whatever actions are taken through formal engagement. Action must thus always have its roots outside the bureaucratic wet blanket of state sanctioned process. This mobilisation needs to link apparently disparate struggles that the organisations participating in VEJA are engaged in. This linking is at once an expression of solidarity and a recognition that these fronts of struggle are formed in resistance to the same processes of capitalist development. Thus, a key weakness of the original Steel Valley struggle was not just that it became divided but also its isolation from the broader community of the Vaal townships.

Asinamali: Vaal on the march

Drawing on their long history of activism and a sharp reading of the politics of the present, the people of the Vaal massed on the streets of Vereeniging to march on the Sedibeng District Council offices on 30 August 2006. Hundreds of people responded to the call of the Anti-Privatisation Forum which reads:

NTWA YA DITSHEBELETSO TSA BATHO
KE
NTWA YA DITOKELO TSA BOTHO
LE
PUSO YA BOJAMMOHO [119]

> Reminiscent of the rent boycott and the "Asinamali" Campaign of the 1980s, the Vaal Region of the Anti-Privatisation Forum is marching to the offices of the Sedibeng District Council in support of its demand for pension surpluses, compensation for industrial pollution, job creation/ labour rights and the provision of basic services such as water, electricity, education and housing. The march will take place on Thursday 31 August 2006 and is part of the APF campaign for the government to deal with basic services, unemployment and poverty within working class communities.

[119] "The struggle for people's services is a struggle for human rights and a government of solidarity"

An end to privatisation of water and electricity

Just like other areas, communities in the Vaal have been faced with electricity cut-offs. In a context where many people are unemployed and retrenched it becomes unreasonable for the local government to expect a full payment for services like electricity. The APF Vaal Region is demanding that the local government provides electricity to working class communities in a manner that takes into account the fact that the overwhelming majority of our people are unemployed and poor. A system that ensures that the rich and big companies subsidize the unemployed and the poor has to be implemented. We are aware of the fact that the water service provider in the Vaal – Metsi a Lekoa – has plans that seek to further privatise the provision of water in the Vaal. Metsi a Lekoa intends installing prepaid water meters which will further undermine access to water. People in Phiri (Soweto) and Orange Farm have rightly opposed the installation of these meters. We also urge the community of the Vaal to follow suit. We demand that the Council disclose, fully, all policies and decisions taken in relation to provision of water and electricity.

Pollution is killing us!!

Environmental studies have shown that the Vaal area is one of the most polluted areas in the country. Companies such as SAMANCOR, ISCOR (MITTAL), SASOL and ESKOM are the polluters of our environment. The pollution has led to an increase in respiratory problems among working class people in the communities. Our demand is that these companies should be compelled by the local government and the state to compensate all communities that have been affected and that government force these companies to stop polluting our communities.

Where are the pension surpluses?

In 2001, the South African Parliament passed Pension Fund 2nd Amendment Act 39, which required companies to pay out relevant pension surplus monies to former and existing members. However, to date, most companies continue to ignore this while the many retrenched workers in the Vaal live in poverty and have no money to live. We demand Council intervention on the pension funds so as to enforce the law. In order to lessen the impact on unemployment and poverty, the state must force companies to audit pensions funds so that surpluses can be paid to retrenched workers.

What has happened to the 'indigency' policy?

In 1998, our Municipality indigency policy exempted all registered 'indigents' from paying rates & taxes. Then, in 2002 the Municipality introduced a new policy which required 'indigents' to pay R500 to cancel their services debts. Many people did so, but the debts were not cancelled and instead the monies disappeared into the pockets of corrupt officials and councillors. Today the same 'indigents' are called on by the Municipality to sign declarations based on false promises of subsidies and cancellation of debts. Where does this debt come from? Who owes who? We demand full disclosure of the indigency registration process through release of Council minutes and resolutions as well as full disclosure of all councillors and officials facing corruption charges. Further, we demand that the Municipality takes full control of all graveyards and makes provision of full subsidies/exemption for all poor people.

Decent housing and education for all!

Our communities are not adequately housed and education continues to be hostage to one's ability to pay. We demand that the Council immediately stop the SA Police Services from harassing innocent people on behalf of the Council, banks & other mortgage holders. Further, there must be full disclosure by the Council of all Housing infrastructural development and land acquisition plans/programmes especially in the following communities: SONDERWATER, KANANA, BOIKETLONG, ANGOLA, AVIVA-VILLE (BOIPATONG), NEW-VILLAGE & ZONE 19.

Where have all the jobs gone?

ASGISA (the offspring of Gear) has promised 1,000,000 quality jobs but 60% of Vaal residents are jobless and earn no income at all. In a context of such unemployment and poverty, the demand from the people is that government has to ensure that it provides basic services and education for the working class and the poor. The state must intervene in the economy in a manner that creates sustainable work for the unemployed and saves existing jobs. We demand full disclosure of all the Extended Public Works Programmes in the Vaal Region.

The unconditional support of the Shoprite Checkers Striking Workers and enforcement of labour legislation

One of the principles of workers' struggles and the Asinamali campaign of the 1980s was a principle of solidarity. The working class used to say, "An injury to one is an injury to all". We are in full support of the striking workers at Shoprite Checkers. We are urging members of the communities not to purchase from Shoprite and Checkers until the workers demands have been met fully. We demand that the Council ensure that all businesses in the Vaal adhere to the Labour Relations Act, the Employment Equity Act as well as the Basic Conditions of Employment Act.

Imaginations of another Vaal

Just as people's imagination of struggle draws on their history, so too does their imagination of a different development. This imagination is not necessarily articulated in formal documents but is visible in what people do. In some cases this reflects a long held dream. In others, it is a creative response to the crisis of the poor and the need to secure survival.

Return to the land

Strike Matsepo was born in Clocholan in the Free State in about 1930. His father and his grandfather were farmers. That, he says, was the way of the family. His father was a farm worker but had his own stock, ploughing teams and land that he worked for himself. The ploughing teams were also rented out to neighbouring farmers. His father died rich and he wanted to follow in his footsteps. He too had started off as a farm worker with his own ploughing teams and land that he could plant. The family only had to buy meat but produced everything else including eggs and milk. So things were better in those earlier times even though the farm worker's wage was little: just R1 when a cow cost R30.

In subsequent years, the autonomy that Matsepo remembers was gradually eroded. He remembers the first tractors and says there was so much land to plough that there was still a need for his team. In time, however, tractors changed the balance of power on the farms. They made white farmers independent of the peasant's ploughing teams and family labour and they greatly extended the land under the plough, reducing the grazing available for the peasant's stock. At the same time, the apartheid government's racist land policy was enforced with increasing vigour and peasants were either made wholly dependent on farm worker wages or they were driven into the reserves or into urban work.

Matsepo himself went to work for Coca Cola at Vanderbijlpark. With the political transition, "when people could buy where they liked" he invested his pension in the farm at Steel Valley. He was inspired by his memory of an autonomous life and this time it would not be tied to working for a white farmer. It was also a chance to restore the family of his memory. He brought his sister and brother and their families as well as his own children to the farm.

He had heard that there were pollution problems in Steel Valley but thought that the stories were a ploy to keep the land in white hands. After good beginnings, stock began to die as the polluted water of Steel Valley affected them. "In all 30 cows, 9 calves, 5 sheep, 6 goats, 3 tortoises, 7 dogs, 2 cats, 1 pig and 20 chickens have died" [quoted in Cock and Munnik 2005: 4]. Members of his family also sickened and three have died. Strike himself has had lengthy stays in hospital being treated for kidney failure associated with pollutants known to be in the groundwater.

Matsepo's vision of another life no doubt has its own bias. In particular, it is an imagination of family within a patriarchal relationship. Nevertheless, it is also a vision of healing, of uniting families divided by the history of apartheid, of restoring people to the land and restoring the land itself. It is not so much an imagination of development as of the making of a shared life. It recalls the desire of the original share-croppers on Sammy Marks' Vereeniging Estate to make their lives free from the demands for mine labour and the landlord's take of their crop. And it contributed to the vision of liberation embodied in the Mooi Water proposal.

Box 17: Message to Mandela

Strike Matsepo has a message for Mandela "as the one who wrote the Constitution".

> Mandela said that the purpose of the Constitution was to work for the people and correct what was wrong. President Mbeki is not implementing it. I feel betrayed. I can't breathe properly when I wake in the morning. There is black dust over everything. Even closing the windows does not keep it out. I must wash my cattle every fortnight. I can't graze them on my own land but must take them every day to another's land.
>
> I brought my family and my sister and her children to the farm to give them a life. But I have buried my wife and sister and a child. I have raised 21 children but they are all gone now. Those who came to the farm left when they saw the problems. I am in prison behind Iscor's electric fencing.

Commoning

In Sebokeng Zone 15, women who have come from rural areas to live with their husbands are cultivating the land in the courtyards created in the design of the converted Iscor single story hostels. They are also cultivating fields on open land outside the hostels. If enclosure is about dispossession, this is a form of repossession. In their joint activity, the women of Zone 15 are reversing enclosure and making another commons. In doing so, they are also remaking a set of social relations, creating the norms and values that lie outside the logic of capitalist development and creating rights in land that lie outside the real estate market but which are recognised within the community.

These activities would no doubt be referred to as 'second economy' activities. The rights that they create are not protected by the state and there is always the danger that they will succumb to another round of enclosure brought on by 'development'. That this activity is possible in the Vaal is perhaps because Sebokeng lies upwind of the Mittal plant, but there is also the danger that, like Steel Valley, these lands will be enclosed by pollution.

This is hard work. It is about survival in a time of crisis. In this, there are echoes of Cuba's turn to organic agriculture: choosing a strategy based on sustainability provides better security than one based on growth. Yet these activities go beyond mere survival. They are also about creating ways of living.

Commoning,[120] or the creation by ordinary people of common property, is not restricted to agriculture. People create commons of all sorts – including in urban spaces such as people's markets. Many of these spaces have an ambiguous quality to them – half in and half out of the logic of the capitalist market and often at the wrong end of unequal exchange with that market. As the crisis of the global system unfolds over the coming decades, however, it is possible to envisage the expansion of the commons. It is possible to begin thinking about this not only in terms of urban agriculture but also in the sustainable production and supply of services.

The potential here is considerable because the Municipal Workers Union (Samwu) has promoted the idea of 'public-public-public partnerships' of workers, communities and local government. These initiatives have the flavour of the Venezuelan idea of 'co-production' – a form of social production in the place of either state or privatised production. Thus far, Samwu has been rebuffed

[120] For more on the commons and commoning, see The Commoner at www.thecommoner.org.

as the state has determinedly pushed cost recovery and the privatisation or corporatisation of services. Yet such ideas make it possible to think the commons in the relationship of communities, workers and local government – and perhaps to think of the commoning of local government.

The future made in struggle

There is a deep recognition in the Vaal that there is no blueprint for the future. What will be will come out of the process of engagement and struggle between people, corporate capital and government. This engagement takes place on many fronts and in many dimensions – on the streets, in the formal fora of participation, in battles for information, in the contestation of corporate control of knowledge and science, in the media and in struggles around the identity and purpose of the state.

This report has shown that these contending forces do not begin and end in the Vaal. The Vaal as an industrial and urban space has been produced within the old imperial economy of London and the new world economy of Washington as well as within the brutal politics and corporate rivalries specific to South Africa. It is the product of the racist divisions of labour that took particular forms in South Africa but were also part of the structuring of a global division of labour.

This story opened with the dispossession of people to force them into mining and industrial work. It has arrived now at the dispossession even of that labour. It opened with an industrial regime indifferent to its environmental destruction. It has arrived at the prospect of the wholesale junking of the basis of life. The story does not close here.

Harvey argues that the mainstream left of the 20th Century was formed in the struggle around the distribution of the wealth produced by formal waged labour. Hence it centred on the labour movement and privileged the role of workers' unions to the neglect of processes of dispossession. The shift to dispossession as the primary mode of accumulation destabilises this role and the unions have become increasingly marginal to the larger defence of society from the depredations of capital and even to the organisation of actual workers. This is reflected in South Africa in the incapacity of unions to represent those made redundant, in their failure to contest environmental abuse even at the level of worker health and safety, and in their inability to organise informal workers.

In most southern countries, dispossession has in fact been a continuous and ongoing process. Yet, as Harvey notes, the new left that is being formed in opposition to the myriad forms of accumulation by dispossession should not repeat the mistake of the old left by now neglecting the exploitation of workers within classic workplace relationships. And indeed, the call to solidarity with the striking workers at Shopright Checkers indicates that the people of the Vaal are determined that these struggles will not be divided.

The crises into which the world is now led will send successive shocks through South Africa and the Vaal. Those who direct the processes of accumulation that produce the crisis will seek to save themselves by managing the displacement of its violent effects onto those made poor by those processes. Yet crisis is also opportunity. Resistance to the orders of accumulation is gathering in all corners of the world and resistance itself becomes part of the crisis of the ruling powers. And just as these struggles shake the Vaal, so too will the struggles of the Vaal people reverberate around the world – as they have done in the past.

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notes

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