## THREATS FROM – AND RESISTANCE TO – SOUTH AFRICA'S NEW CARBON MARKET

EDITED BY PATRICK BOND AND REHANA DADA

CONTRIBUTIONS BY HEIDI BACHRAM, MICHAEL K. DORSEY, GRAHAM ERION, GROUNDWORK, JUTTA KILL, MUNA LAKHANI, MEGAN LINDOW, LARRY LOHMANN, MPUMELELO MHLALISI, JUGGIE NARAN, CAROLINE NTAOPANE, TRUSHA REDDY, LAWRENCE SUMMERS, SHANKAR VEDANTAM, JANET WILHELM AND RICHARD WORTHINGTON

*'As representatives of people's movements and independent organisations, we reject the claim that carbon trading will halt the climate crisis. This crisis has been caused more than anything else by the mining of fossil fuels and the release of their carbon to the oceans, air, soil and living things. This excessive burning of fossil fuels is now jeopardising earth's ability to maintain a liveable climate.'*

**CLIMATE JUSTICE NOW!**

THE DURBAN DECLARATION ON CARBON TRADING (OCTOBER 2004)

*'We commit ourselves to mobilising against the farce of carbon trading. Real solutions are needed, and with our world-leading $CO_2$ emissions, South Africans must be at the cutting-edge of progressive climate activism, not partners in the privatisation of the atmosphere.'*

**SOUTH AFRICA NEEDS CLIMATE JUSTICE NOW!**

CARBON TRADING CONDEMNED - SUPPORT FOR THE DURBAN DECLARATION (OCTOBER 2005)

Left: Oliver Meth is 16, was in grade 10 in 2003 and belongs to the Wentworth Development Forum and South Durban Community Environmental Alliance.

*"I explore over our (Umbilo Secondary) school fence into IOP (Industrial Oleo-Chemicals Products, Durban Fibres)"* (OLIVER METH, DURBAN SOUTH PHOTOGRAPHY PROJECT)

Right: Jenny Gordon, a freelance photographer working with Durban South Photography Project.

*"Mr A. Velayadam and his son Stephen, sitting at their table with a nebulisor and all their asthma medication"* (JENNY GORDAN, DSPP)

*Cover: Rian Ruiters is 16 and was in grade 10 at the Umbilo secondary school in 2003.*
"Boys playing soccer in the park, across from the oil-refinery, in Bennie Geldenhuis (Wentworth)"
(RIAN RUITERS, DSPP)

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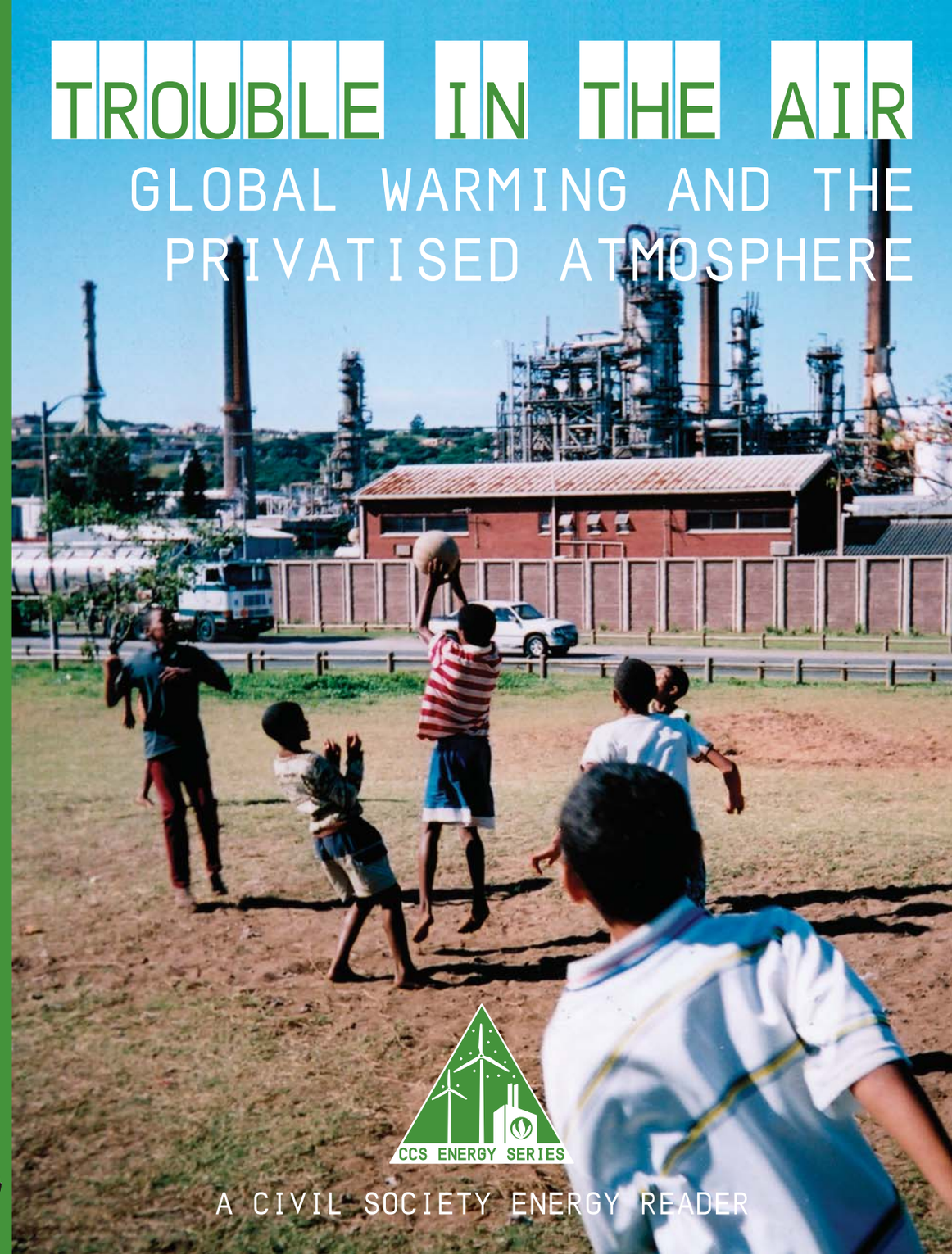
TROUBLE IN THE AIR

GLOBAL WARMING AND THE PRIVATISED ATMOSPHERE

T N I

# TROUBLE IN THE AIR

## GLOBAL WARMING AND THE PRIVATISED ATMOSPHERE



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A CIVIL SOCIETY ENERGY READER

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# TROUBLE IN THE AIR

## GLOBAL WARMING AND THE PRIVATISED ATMOSPHERE

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A CIVIL SOCIETY ENERGY READER

This book is dedicated to Sajida Khan, opponent of the Bisasar Road toxic landfill, who suffers cancer and who at the time of writing had lost part of her voice following lymph node surgery, in the midst of extremely painful chemotherapy. In a just world, the people responsible for her plight – especially eThekwini municipal officials - would pay the bills for her heroic efforts to raise our awareness about the threats of carbon trade. Until then, we salute her sacrifice and seek to follow her example of critique and advocacy.

Sajida Khan at Bisasar Road, Clare Estate

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# CONTRIBUTORS

**Heidi Bachram** is a member of the Amsterdam-based TransNational Institute's Carbon Trade Watch collective.

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# TROUBLE IN THE AIR
## GLOBAL WARMING AND THE PRIVATISED ATMOSPHERE

**Introduction**
By Patrick Bond and Rehana Dada

The international debate over climate change is heating up, the more irrefutable evidence of global warming we see emerging. The overarching problem is well known to South Africans who follow the news; less understood – if at all - is this country's responsibility for the world's overdose of greenhouse gases. Like filthy laundry, it sometimes seems like a national secret that the economy we inherited from apartheid is so addicted to fossil fuel, and moreover that the post-apartheid government has made the situation *much much worse*.

South Africa is classified as a developing country in the 1997 Kyoto Protocol, which came into effect in February 2005. We are not subject to emissions reduction targets at this stage. But we will be in future, and looking ahead, officials and corporations – and even a few NGOs which should know better - are promoting the Protocol's Clean Development Mechanism (CDM) as a way to continue South Africa's hedonistic output of greenhouse gases, and earn profits in the process.

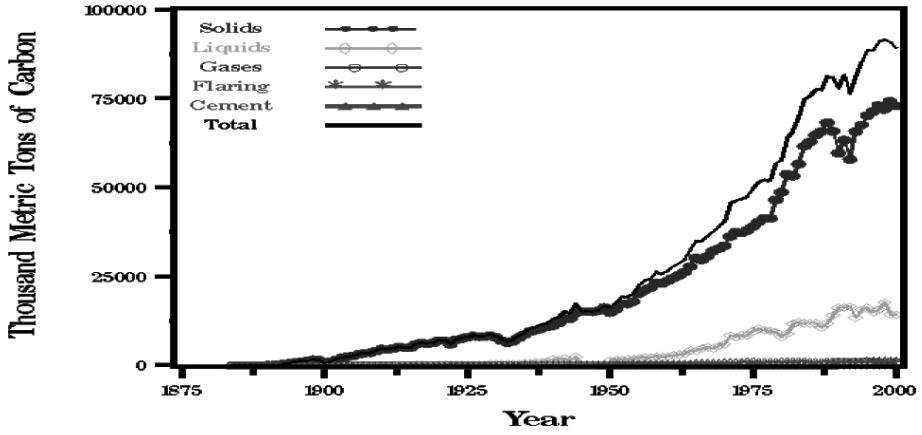
Do we deserve to earn 'foreign investment' from South African industry's indefensible contribution to global warming? From his base at the University of Zululand, professor Mark Jury has gathered the following damning facts about South Africa's debt to the planet:

- South Africa contributes 1,8% of total Greenhouse Gases, making it one of the top contributing countries in the world;
- the energy sector is responsible for 87% of carbon dioxide (CO2), 96% of sulpher dioxide (SO2) and 94% of nitrous oxide emissions;
- 90% of energy is generated from the combustion of coal that contains greater than 1% sulfur and greater than 30% ash;
- with a domestic economy powered by coal, South Africa has experienced a five-fold increase in CO2 emissions since 1950;
- SA is signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and Montreal Protocol, yet CO2 emissions increased 18% between 1990 and 2000;
- South Africa has only recently enacted legally binding air pollution regulations via the National Environmental Management Air Quality Act, but energy efficiency is low;

- in rural areas of South Africa, approximately three million households burn fuelwood for their energy needs, causing deforestation, reduction of CO2 sinks, and indoor health problems;
- the industrial sector consumes 2,6 quads of energy (57% of total primary energy consumption) and emits 66,8 M T of carbon (65% of total carbon emissions from fossil fuels), while industry's contribution to GDP is only 29%;
- since 1970, South Africa consistently has consumed the most energy and emitted the most carbon per dollar of GDP among major countries. South African energy intensity measured 33,5 K BTU per $unit (above), is nearly at China's level;
- South Africa's carbon intensity is far higher than in most other countries due to its dependence on coal; and
- household and industrial energy consumption across the continent is predicted to increase by over 300 % in the next fifty years with significant growth in sulphur and nitrogen emissions.[1]

Coal is by far the biggest single South African contributor to global warming, representing between 80 and 95% of CO2 emissions since the 1950s. But liquid CO2 emissions mainly from transport have risen to the level of more than 10 000 metric tonnes a year since the early 1990s. It is regrettable but true, just as in Eastern Europe (whose CO2 emissions are well below 1990 levels), that the long recession of the early 1990s was the only point in South Africa's history since the early 1930s' economic crisis, that CO2 emissions stabilised and dropped slightly.

**CO2 emissions in South Africa, 1875-2000 (000 metric tonnes)**

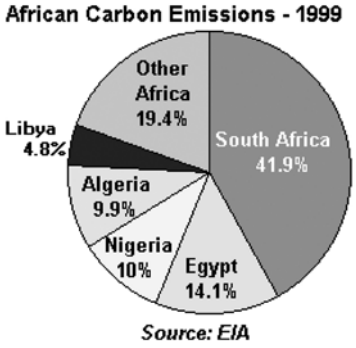



Source: Mark Jury

[1] Jury, M. (2004), 'Presentation to Durban Declaration Group', Richards Bay, 9 October.

Needless to say, South Africa is by far the primary global warming villain in Africa, responsible for 42% of the continent's CO2 emissions, more than Egypt, Nigeria, Algeria and Libya put together.

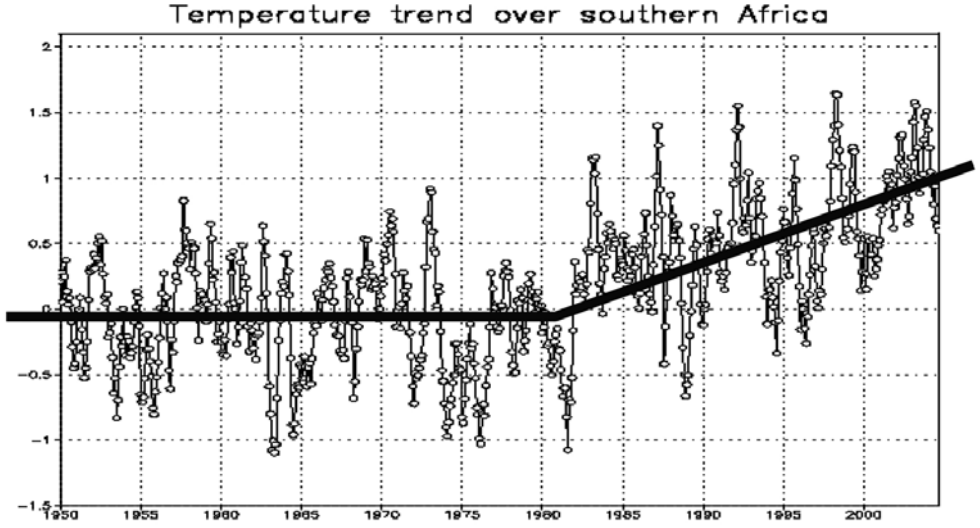
**South Africa's CO2 role in Africa**




Source: Mark Jury

Given the vast CO2 emissions increases by South Africa especially during the 1980s-90s, added to similar increases in global greenhouse gas emissions, it is only logical to find an average 1 degree C increase in our region's temperature, over historic norms.

**Rise/fall in Southern African temperatures over historic norms**




Source: Mark Jury

This is merely the surface-level statistical information about the climate change crisis, as it emerges. Much more could be said about the various other indicators, ranging from droughts/floods in South Africa and Africa, to the hurricanes that belted George W. Bush's oil producing and refining belt in Texas/Louisiana in September 2005.

But our purpose is to immediately dig deeper, in order to uncover an emerging form of environmental injustice, and to highlight cutting-edge attempts to mitigate that injustice through civil society activism and advocacy. This is not an entirely celebratory account, for one of the concerns our research has uncovered is the failure of the environmental justice critique to penetrate the realm of policy. In that sphere, Big Oil and the South African minerals-energy complex appear to have the upper hand.

What perhaps needs most attention, our contributors all agree, is finding consensus with what might be considered the 'reform' wing of the climate activist community who, through networks like the Climate Action Network and the SA Climate Action Network, have so far accepted carbon trading as a necessary evil. Although in at least one case, Durban's Bisasar Road, the more critical climate justice activists have halted the potential $15 million carbon trading project, it is also true that the reform-minded environmental NGOs have been far more effective in pointing out the problems in the strategy, even as they seek to improve it. An extremely good example of this level of detailed concern is the work of Richard Worthington, featured below. There are far too many 'environmentalists' in the large, corporate-funded international NGOs such as the IUCN, Sierra, World Wildlife Federation, Environmental Defense Fund and even Greenpeace who have bought into market solutions, and if the damning information about carbon trading is not convincing, it is hard to know how their minds might be changed.

But we must begin this volume by providing a sufficient amount of core argumentation and context, in Part One. The basic arguments against the carbon trading pilots in South Africa are initially presented by Graham Erion, in a short version of the long argument he makes in Part Four. Patrick Bond follows with a broader critique of the national energy system, and Muna Lakhani adds more detail about the government's dangerous nuclear fantasy, as well as its underfunding of vitally-needed renewable energy sources.

Speaking of fantasies, we thought it advisable to warn readers of destructive ideas that easily compete with those found in the White House, Pentagon and Osama Bin Laden's cave. The most famous words ever written by Harvard president Larry Summers are included in Part One. Even if it is 14 years old, his internal World Bank memo promoting trade in pollution was a seminal statement. It was even endorsed by *The Economist* magazine, which first revealed Summers' fetish for the toxic waste trade in February 1992. We consider his 'impeccable logic' a classical example of environmental racism. Though extreme, it's not unfair to allege that the

rationale for 'dumping a load of toxic waste in the lowest-wage country' is in part what informed the apartheid system's own landfill policies. Those policies are, indeed, potentially amplified by none other than Summers' old employer, the World Bank. Were it not for citizen activist Sajida Khan, the Bank would today be happily investing in a plan to keep the Bisasar Road dump open for more decades (even though the rather unreliable African National Congress government promised it would be closed in 1996).

In Part Two, South Africa's 2005 debate over climate change is revisited. A *Mail & Guardian* review of South African carbon trading techniques is provided by Janet Wilhelm, followed by our own rebuttal in the same newspaper. *The Washington Post*'s Shankar Vedantam soon picked up the story, using Bisasar Road as a handle to explain why the Kyoto Protocol has its genuine environmental critics. In contrast, a supportive position on behalf of carbon trading is articulated by Megan Lindow of the SA Institute of International Affairs, which regularly and eloquently brings to South Africa the thoughts of the Washington Consensus and White House. Somewhere in between, leaning left, Richard Worthington of the SA Climate Action Network addresses climate trading, and as usual his work is fine-grained and balanced. A more passionate critic of carbon trading, Lakhani, makes an alternative 'appeal for Zero Waste' to the SA Climate Action Network as they begin deliberations on climate trade.

Part Three provides yet more detail on the key pilots, with Trusha Reddy, Juggie Naran, the *Sunday Tribune Herald* editorial team and Rehana Dada exploring the Bisasar Road and Kennedy Road controversies. In the Western Cape, Mpumelelo Mhlalisi takes up the story, and is joined by Caroline Ntaopane of Sasolburg. Graham Erion puts all of this information into a coherent, rich and nuanced story, including shocking revalations about Sasol's bogus application for carbon credits and the 'crony' character of the CDM verification process.

In Part Four, the global critique is reviewed. We are fortunate that our colleagues at Amsterdam's TransNational Institute have a Carbon Trade Watch project. Heidi Bachram articulates their concerns about 'carbon colonialism'. Others associated with the Durban Declaration - Larry Lohmann, Jutta Kill, Graham Erion and Michael K. Dorsey – provide more detail about why emissions trading is fundamentally flawed based on the US model.

Part Five unveils the main beneficiaries of carbon trading: Big Oil. In September 2005, an exceptionally powerful analysis was presented to the World Petroleum Congress in September by groundWork: *Whose energy future? Big oil against the people of Africa.* We are grateful for this world-renowned NGO's research and permission to excerpt from that book. Finally, Patrick Bond shows how the search for Africa's oil has generated serious geopolitical and economic crises for the continent's citizens. This leads to the conclusion that perhaps Africans should consider keeping oil within the ground, since it so clearly underdevelops countries and also so clearly

threatens the world's climate. To achieve that logical outcome will require a far stronger international push to limit Big Oil's power, not to mention the Bush imperial agenda. It will require us all to work overtime for reparations - $75 billion per year merely for serving as a carbon sink, trusted experts argue – that the South is owed by the North. That project continues, not only within the global justice movements (especially groups like Jubilee South Africa), but in other CCS work yet to be published.

In Part Six, we provide the three key documents issued during the past year: Pretoria's September 2004 Clean Development Mechanism Policy, the October 2004 'Durban Declaration on Carbon Trading' and the follow-up 'South Africa needs Climate Justice Now!' statement issued by activists and allied intellectuals in October 2005.

For assistance in gathering information at colloquia in June and October 2005, funding our TNI colleagues' travel, and publishing this *Civil Society Reader*, we are most grateful to our financial sponsors, the SA-Netherlands Research Programme on Alternatives in Development. SANPAD pursues the following objectives, with which we agree entirely: 'To stimulate and promote quality research; to produce research outputs intended and useful for development purposes; to promote co-operation between Dutch and South African researchers, and between institutions within South Africa; and to develop research capacity and a culture conducive to research, aimed particularly at researchers from historically disadvantaged communities.' This is the first of several outputs financed by a SANPAD grant on energy alternatives, and we will follow this report with a study of retail electricity controversies in 2006. SANPAD director Anshu Padayachee is especially thanked for her support, as are the director of the TransNational Institute – Fiona Dove – and TNI public services/energy specialist Daniel Chavez, who assisted us in February 2004 with project design. All three have gone far beyond the call of duty. We also appreciate the support of the Netherlands Institute for Southern Africa in facilitating contact with the Amsterdam team.

Although the vast majority of material in this volume is brand new, we are very grateful to various journals and periodicals for permission to republish some of the articles below. We have also used graphics originally assembled by Mark Jury of the University of Zululand and Anton Eberhardt of the University of Cape Town, as well as by the environmental economics staff at the World Bank (an institution whose policies have been profoundly damaging in this and so many other areas). We're very grateful for the hard work that went into these.

To those who participated in the Colloquium on Energy at the University of KwaZulu-Natal Centre for Civil Society on 5 October 2005, special thanks: Amanda Alexander, CCS; Heidi Bachram, TransNational Institute CarbonTrade Watch; Vanessa Black, Earthlife Africa; Desmond D'Sa, South Durban Community Environmental Alliance; David Hallowes, groundWork; Graham Erion,

CCS/TransNational Institute CarbonTradeWatch; Gill Hart, UKZN Sociology & University of California/Berkeley Geography; Siziwe Khanyile, groundWork; Muna Lakhani, Earthlife Africa/Institute for Zero Waste in Africa; Llewellyn Leonard, groundWork; Wally Menne, Timberwatch; Mpumelelo Mhlalisi, Environmental Justice Networking Forum and Earthlife Africa; Setjele Mofokeng, Vaal Economic Justice Alliance; Alan Murphy, Ecopeace; Prishani Naidoo, Anti-Privatisation Forum; Melumzi Nontangaga, Strategic Environmental Associates; Caroline Ntaopane, Sasolburg Air Quality Monitoring Committee; Basil Palan, Center for Research and Communication; Virginia Setshedi, CCS/Freedom of Expression Institute.

All of you, your predecessors at the Durban meeting in October 2004, and the many thousands of other radical climate justice activists in South Africa and across the world, are the reason we still have hope for our descendants.

Patrick Bond and Rehana Dada
Centre for Civil Society, Durban, 10 October 2005

# PART ONE:
# CORE ARGUMENTS AND CONTEXT

## WHAT'S WRONG WITH CARBON TRADING?
## BY GRAHAM ERION

### The global carbon market

The idea of a global market trading in carbon was conceived of in 1997 as part of the Kyoto Protocol's Clean Development Mechanism. The CDM allows Northern countries (Annex 1) to purchase emissions 'credits' against their own reductions targets by investing in projects that reduce or sequester emissions in Southern countries. The CDM was originally opposed by environmental organisations and Europeans countries for fear that it wouldn't contribute to sustainable development or the struggle against climate change. Nearly eight years later, these fears have clearly materialised.

Empirical proof of the tragic shortcomings of the CDM can be seen in terms of the types of projects that have been funded: 75% of all carbon credits certified to date are for projects capturing landfill gas (methane) or hydroflourocarbons (HFC13), which were banned in OECD countries in 1987 for depleting the ozone layer. Neither of these projects contribute to sustainable development or help local communities, but they do offer enormous amounts of carbon credits as their gases are much more potent than carbon dioxide. In contrast, renewable energy projects – which the CDM was intended to promote – account for a mere 5% of the carbon market. The carbon market is also following typical patterns of foreign direct investment (FDI) by concentrating in middle-income countries like India, Brazil, and China.

With emissions in Northern countries continuing to rise, the demand for CDM credits will only continue to grow in the coming years. Without action now, this will result in more of the dangerous 'low-hanging fruit' projects in middle-income countries, which provide lots of credits but few benefits for local communities or the global climate. Although South Africa is yet to become a major player in the global carbon market, it has a number of projects in development, and through just a cursory review of four of them, the problems that plague the CDM become quite obvious.

**Durban's Bisasar Road landfill**

With $15 million in start-up capital from the World Bank's Prototype Carbon Fund in 2002, the idea to capture methane at three landfills in Durban became the first proposed CDM project in Africa. Although two of the landfills are already in the process of approval (La Mercy and Mariannhill), the third one, Bisasar Road, has been stalled following a sustainable campaign against it by the local community.

Bisasar is a case study in environmental injustice: it is Africa's largest dump and is situated right in the middle of an Indian community (Clare Estate) and an informal Black settlement. The dump was originally proposed to close in 1987 and again in 1996, but in the project documents for the CDM state that no closure is planned and the project may continue for up to 21 years. The local community, led by activist Sajida Khan, has demanded that a clear commitment and date for closing the dump be made prior to any discussion of the CDM project, which they do not believe will provide much benefits for them anyway.

**Sasol's pipeline**

Aside from Durban's CDM, perhaps the most controversial project in South Africa is the one proposed by Sasol. In the last few years Sasol has run out of coal in Sasolburg to use as a fuel source in its chemical processes. In response to this problem, Sasol constructed an 865 kilometre pipeline to natural gas fields in Mozambique, at a cost of $1,2 billion. With the pipeline now on-line, Sasol is attempting to gain CDM credits.

To be sure, there has been a reduction in greenhouse gas emissions because of this source of energy. But for a project to be verified as a genuine CDM project, it must also be shown to be 'additional' to what the developer – Sasol - would have done normally (without carbon finance). Otherwise, there is no real 'offsetting' of continued emissions in Northern countries.

Sasol has argued to the World Bank that this project is additional since they would normally just have built another coal mine somewhere near Sasolburg. However, in a public meeting in August 2005, Sasol's own manager admitted, 'the biggest issue is additionality: we would have done this project anyway.' In other words, they are lying simply to gain additional profits, in the process unveiling the bankruptcy of the carbon market.

Although Sasol's project clearly fails the test for verification under the CDM, there is a strong reason to believe the project might still be verified. This is because the consultancy firm KPMG was contracted by Sasol to write their project documents.

Because of the 'crony' character of the emerging carbon market, there is a good chance that KPMG will also be the verifier of these documents (it is the Designated Operational Entity, i.e., the private consultancy that ensures a project meets the additionality requirement.) This is probably the most obvious candidate for a project that deserves to be immediately rejected.

**Bellville landfill gas capture**

Much like Bisasar Road in Durban, the South Bellville Waste Disposal site is located in an urban Indian and Black neighborhood. Although the site was originally closed due to its proximity to the residential areas and the Cape Flats Aquifer, the City of Cape Town re-opened it in 1997. Now, in addition to the planned CDM project, they are also in the process of extending the operational life of the landfill past its planned closure in 2006. However, unlike Durban, Bellville has been certified as a 'Gold Standard' project meaning it meets the highest international benchmarks for social, environmental, and economic sustainability.

Amidst widespread local opposition and plans to use the carbon finance to fund other projects outside the local community, there is little evidence of how Bellville can possibly contribute to social or economic sustainability. Although any effort to reduce greenhouse gas emissions is environmentally beneficial, one must question whether this project is even environmentally sustainable. Absent progressive waste management in Cape Town, there is no sorting of wastes or waste-reduction schemes in the city.

Were organic and non-organic wastes to be separated, much more methane could be captured (close to 100% rather than 70% as conceived in this project), and there would be less particulate emissions from the electricity generation. The community would also have more employment opportunities, thus increasing social and economic development. This is the type of project that should be 'Gold Standard,' not low-hanging fruit that just creates lots of credits while entrenching unsustainable waste management practices.

**Kuyasa low-cost housing energy upgrade**

This project was the first African project to receive certified emissions reductions credits from the CDM Executive Board. The first phase of this project installed solar water heaters, insulated ceilings, and compact florescent lighting in ten RDP homes in Kuyasa (a neighborhood of Khayelitsha, outside Cape Town). Kuyasa was also the first project certified under the Gold Standard, and unlike Bellville, there is little disagreement over its social, economic, and environmental benefits. However, the major problem with this project is that it is not financially sustainable, especially its second phase where the plan is to replicate the project in 2089 homes around Kuyasa.

Due to the low price of carbon credits caused by all of the 'low-hanging fruit' projects, the Kuyasa was only able to use carbon finance for 15-20% of its total budget. The rest of the money came from various government departments and Electricity France via their Corporate Social Responsibility initiative. While generous, this funding is not guaranteed in the future. Therefore the project developers are looking at other options, including debt-financing from project beneficiaries via controversial – and

possibly unconstitutional - pre-paid electricity meters, or funding through the 'offset' market.

Neither of these solutions are desirable from a social justice or environmental perspective. The fact that they are being considered reveals that the carbon market as presently conceived simply cannot support the type of quality project that Kuyasa could be. Thus this project is not an example of the wonderful potential of the CDM, but rather of its obvious inability to finance the very projects it was designed for.

**Institutional shortcomings**

A major reason that the CDM market in South Africa has been able to develop in such perverse ways is the failure of institutional structures to provide the necessary oversight and policy environment. The central verifier of Clean Development Mechanism projects within the government is the Designated National Authority (DNA), which is responsible for ensuring projects meet their very loosely defined sustainable development criteria. These criteria are already in the process of being relaxed to ensure more projects are verified.

The DNA also has very weak mechanisms for public comment on projects, and has yet to receive a single comment on any of the projects it has approved. The DNA is located within the Department of Minerals and Energy, who have offered little enthusiasm for renewable energy in the past, and seem content to have employees from Eskom write their policy papers on the subject, even though they admit that Eskom is using their monopoly over the electricity grid to deny access to renewable energy producers.

**Conclusion**

The carbon market in South Africa is highly problematic and fraught with contradictions. But more positively, activists have been able to make a difference in this market, as witnessed by the intervention of activists to stall the Bisasar Road landfill scheme. Outside of Durban, though, activists have been much less engaged in this issue.

More civil society activism and policy engagement must raise the problems onto the national agenda. Because the threat of global climate change is the most severe future generations of humans and the environment face, there is every reason to have confidence that awareness of and anger at the crony character of South Africa's carbon market will lead to stronger direct action. Alternatives that combine radically new industrial policies, tough state regulation of emissions, massive investment in renewables, waste reduction and grassroots carbon reduction initiatives are long overdue.

# WHAT'S WRONG WITH OUR ENERGY SYSTEM?

BY PATRICK BOND[1]

There is perhaps no better way to interpret power relations in contemporary South Africa than by examining who has had access to energy in the past, who is getting it now and at what cost, and who will have it in the future. The argument below is that the larger players in the energy 'market' – i.e. , transnational capital, accommodating neoliberal multilateral agencies and national governments, and the rich – are having a disproportionate effect on public policy, even in liberated South Africa.

Contradictions abound, of course. For Anton Eberhardt of the National Electricity Regulator, there is 'no simple transition from a state centred electricity supply industry to an idealised World Bank electricity supply industry model'.[2] The 'idealised World Bank model' has failed nearly everywhere, not just in electricity and energy and especially electricity, but across the board. Hence it is no surprise that, during the transition to energy neoliberalism, the core components of South Africa's energy system are beset by anti-social, anti-ecological practices. These include climate change caused by what has been termed the 'Minerals-Energy Complex'; the crisis of electricity access in view of disconnections associated with energy sector liberalisation; and the government's failure to promote renewable energy sources and instead waste scarce funds on a nuclear energy fantasy.

We can consider each in turn. The most important to flag at the outset, however, is the extraordinarily cheap supply of electricity that corporate users enjoy.

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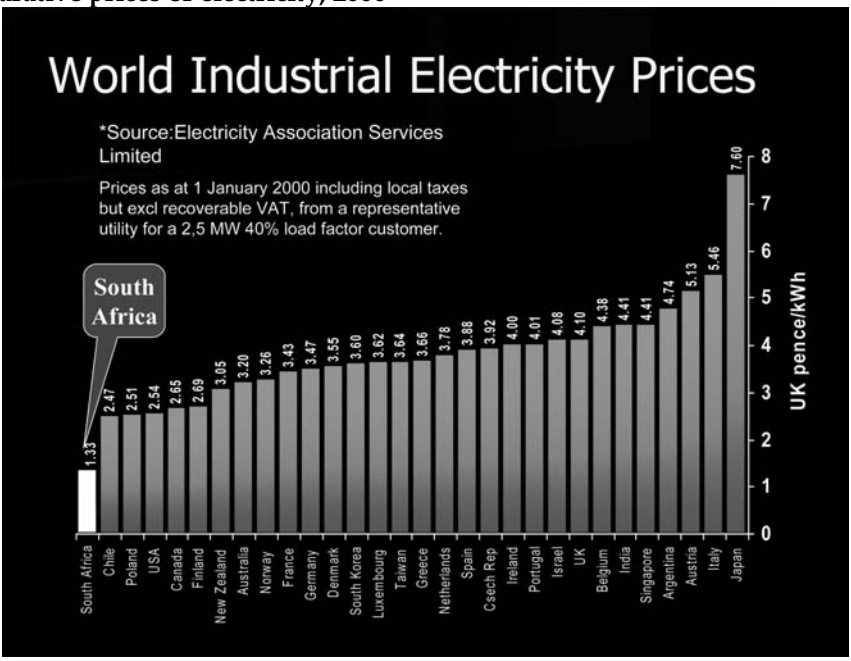
1. Some of the material below is revised and updated from a chapter coauthored with Stephen Greenberg and Maj Fiil-Flynn in *Unsustainable South Africa,* Pietermaritzburg, University of KwaZulu-Natal Press and London, Merlin Press, 2002.

2. Eberhard, A. (n.d.), 'The Political, Economic, Institutional, and Legal Dimensions of Power Sector and Legal Dimensions of Power Sector Reform in South Africa', Presentation, Graduate School of Business, University of Cape Town and National Electricity Regulator. The illustrations below come from this presentation, available on the internet.

**Comparative prices of electricity, 2000**




Source: Anton Eberhardt

**Durable minerals/energy dependency**

The centrality of cheap electricity in South Africa's economy stems from the needs of mines and heavy industry, and in recent times especially in beneficiating metallic and mineral products through smelting. *The Political Economy of South Africa* by Ben Fine and Zav Rustomjee puts the parastatal into economic perspective.[3] Here we locate electricity at the heart of the economy's Minerals-Energy Complex, a 'system of accumulation' unique to this country. Throughout the twentieth century, mining, petro-chemicals, metals and related activities which historically accounted for around a quarter of GDP typically consumed 40% of all electricity.

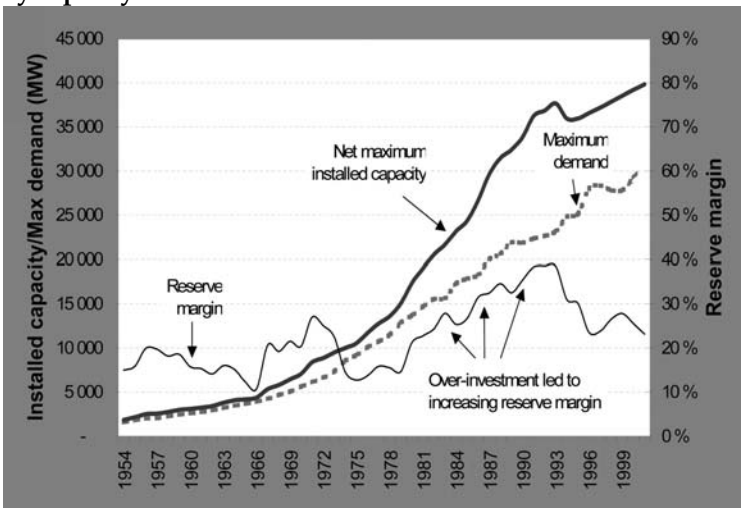
South Africa's largest parastatal firm, the Electricity Supply Commission, still known by its Afrikaans acronym, Eskom, plays a triple role, as a) generator of virtually all of the country's electricity; b) sole transmitter; and c) distributor to many large corporations, municipalities, commercial farms, and to half South Africa's households, from sections of the largest municipalities to most rural villages. Eskom was crucial to South Africa's rapid capital accumulation during the past century. At

[3] Fine, B. and Z.Rustomjee (1996), *The Political Economy of South Africa: From Minerals-Energy Complex to Industrialisation*, London, Christopher Hirst and Johannesburg, Wits Press.

the same time, Fine and Rustomjee show, the company fostered a debilitating dependence on the (declining) mining industry. Economists refer to this as a 'Dutch disease', in memory of the damage done to Holland's economic balance by its cheap North Sea oil. Moreover, Eskom as the monopoly electricity supplier played a role in strengthening private mining capital by purchasing low-grade coal from mines that were tied to particular power stations on the basis of a guaranteed profit.

But the damage and skews went far deeper, into the social and environmental realms. After World War Two, growing demand from new mines and manufacturing caused supply shortages, and resulted in a programme for the construction of new power stations. In the process, the apartheid state promoted Afrikaner-owned coal mines, with Eskom contracting these for a portion of its coal supply. The national grid – which linked previously fragmented power station supplies via transmission lines - was initially formed in 1964, and extended supply into the Southern African region.[4] Until 1985, when sanctions made international borrowing more difficult, foreign loans were used to build Eskom's massive excess capacity through environmentally damaging coal-fired power stations. At peak in 1990, Eskom produced three-quarters of the African continent's electricity, and its capacity was being extended to more than 37 000 MW at a time that the highest demand was less than 25 000 MW.[5]

**SA electricity capacity and demand**




Source: Anton Eberhardt

4. Wellmer, G. (2001), 'The Foreign Financing of the Parastatal Eskom during the Apartheid Years', mimeo for Jubilee South Africa, Johannesburg, August.

5. Clarke, J. (1991), *Back to Earth: South Africa's Environmental Challenges*, Johannesburg, Southern Book Publishers, p. 33.

Eskom's power plants continued providing artificially cheap electricity to large, energy-intensive corporations and white households, including a new wave of subsidised white commercial farmers during the 1980s. Since the loans were guaranteed by the state it meant that all taxpayers, regardless of whether they benefited from the expansion of infrastructure or not, paid the bill. The World Bank's $100 million in Eskom loans from 1951-67, and subsequent bond purchases by international banks, are coming under more scrutiny as victims of apartheid seek reparations in US and European courts for the Eskom interest and profits the banks earned, while black South Africans suffered.

Even though industrial users do provide a small cross-subsidy to household consumers, Eskom supplies the large firms with the cheapest industrial electricity in the world. While in other countries, domestic consumers are charged twice as much as large industry, Eskom charges industry prices that are as little as one seventh the domestic price.[6] As a result, the University of Cape Town's Energy for Development Research Centre confirms that generation of cheap electricity in South Africa still relies on the extremely wasteful burning of low-grade coal, which has a worsening impact on the environment not just through emissions but also in requiring vast amounts of coolant water. Indeed, Eskom is the single largest consumer of raw water in South Africa. While industry benefits from cheap electricity as a competitive advantage, the negative social and environmental effects of electricity production have never been internalised into the cost. One UCT study concedes that South Africa:

- is 'the most vulnerable fossil fuel exporting country in the world' if the Kyoto Protocol is adopted, according to an International Energy Agency report;
- scores extremely poorly 'on the indicators for carbon emissions per capita and energy intensity';
- has a 'heavy reliance' on energy-intensive industries;
- suffers a 'high dependence on coal for primary energy',
- offers 'low energy prices' which in part is responsible for 'poor energy efficiency of individual sectors'; and
- risks developing a 'competitive disadvantage' by virtue of 'continued high energy intensity' which in the event of energy price rises 'can increase the cost of production'. [7]

In short, the existing levels of environmental degradation caused by coal mining, electricity generation, lack of access by the majority of low-income people, hydropower and nuclear energy are formidable. Not including net exports of

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6. Leslie, 'Social Pricing of Electricity in Johannesburg'.

7. Spalding-Fecher, A. (2000), 'The Sustainable Energy Watch Indicators 2001', Energy for Development Research Centre, University of Cape Town, Cape Town, November. www.edrc.uct.ac.za.

greenhouse gas pollutants - since South Africa is the world's second largest exporter of coal after Australia - the energy sector contributed 78% to South Africa's share of global warming and more than 90% of all carbon dioxide emissions in 1994. By 1998, South Africa emitted 354 million metric tonnes of carbon dioxide, equivalent to 2 291 kilograms of carbon per person (a 4% increase from 1990 levels). South Africa is amongst the worst emitters of CO2 in the world when corrected for both income and population size, worse than even the United States, *by a factor of 20*. South Africa took no action to reduce emissions over the period 1990-98, and indeed allowed them to increase from 2 205 to 2 291 kilograms of carbon per person.[8]

**Energy sector carbon emissions, 1999**[9]

| Area | Population (mns) | $CO_2$/ person | GDP ($bns) | $CO_2$/GDP (kg/$bn) | $CO_2$(kg)/ GDP*pop |
|---|---|---|---|---|---|
| S.Africa | 42 | 8.22 | $164 | 2.11 | 0.0501 |
| Africa | 775 | 1.49 | $569 | 1.28 | 0.0016 |
| USA | 273 | 20.46 | $8,588 | 0.65 | 0.0023 |
| OECD | 1116 | 10.96 | $26,446 | 0.46 | 0.0004 |
| World | 5921 | 3.88 | $32,445 | 0.71 | 0.0001 |

NOTE: The tonnes of carbon dioxide ($CO_2$) emissions are those measureable through fuel combustion.

**Liberalisation and price sweeteners for corporations**

The 1986 *White Paper on Energy Policy* set the framework for the marketisation of the electricity sector. It called for the 'highest measure of freedom for the operation of market forces', the involvement of the private sector, a shift to a market-oriented system with a minimum of state control and involvement, and a rational deregulation in energy pricing, marketing and production.[10] As electricity provision became

8. International Energy Agency (2000), 'CO2 Emissions from Fuel Combustion, 1971-1998', Paris; International Energy Agency (2000), 'Key World Energy Statistics from the IEA,' Paris.

9. Source: International Energy Agency data, with final column calculated by Bond. Because Purchasing Power Parity estimates by the IEA are dubious (e.g., Zimbabwe's GDP is $32,7 billion), the actual GDP figures are used. However, South Africa's is far less than $164 billion, so the ratios indicating South Africa's high carbon/GDP emissions are actually quite conservative.

10. Charles Anderson Associates (1994), *National Electricity Policy Synthesis Study, Vol 1*. Report submitted to the Dept of Mineral and Energy Affairs, 12 August, pp. 12-13.

increasingly politicised during the 1980s, in part because of township payment boycotts, a joint National Energy Council/Eskom workshop held in 1990 called for deregulation of the supply industry. The workshop also put forward proposals to adopt a market-oriented approach to distribution, including large, restructured distributors that would purchase power from a broker. The introduction of specific tariffs would separate generation and transmission, and transmission and distribution functions (the seeds of ring-fencing). Notably, the workshop called for supply to be run on business lines.[11]

By the time of South Africa's liberation, because of heavy mining and industrial usage, per capita electricity consumption soared to a level similar to Britain, even though black - African - South Africans were denied domestic electricity for decades. Today, most poor South Africans still rely for a large part of their lighting, cooking and heating energy needs upon paraffin (with its burn-related health risks), coal (with high levels of domestic and township-wide air pollution) and wood (with dire consequences for deforestation). Women, traditionally responsible for managing the home, are more affected by the high cost of electricity and spend greater time and energy searching for alternative energy. Ecologically-sensitive energy sources, such as solar, wind and tidal, have barely begun to be explored, while the main hydropower plant that supplies South Africa from neighbouring Mozambique is based on a controversial large dam.

Nevertheless, Eskom claims to be one of the New South Africa's success stories, having provided electricity to more than 300 000 households each year during the 1990s. Black residents were denied Eskom's services until the early 1980s due to apartheid, and the townships were, as a result, perpetually filthy because of coal and wood soot. From 1990 to the end of 2001, Eskom and the municipalities had together made nearly four million household connections, including farmworkers, at a cost to Eskom of R7,72 billion.[12] The percentage of households with access to electricity infrastructure increased to 70% at the end of 2000. In urban areas, the percentage of households with electricity infrastructure was 84%, with rural areas lagging behind at 50%.[13]

Critics argue that regulation of Eskom and the municipal distributors has not been successful, from the standpoint of mass electricity needs.[14] This is not only because of an extremely weak performance by the initial National Electricity Regulator – Xolani Mkhwanazi, who subsequently became, tellingly, chief operating officer for BHP Billiton Aluminium Southern Africa – but also because government policy has

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11. Charles Anderson Associates, *National Electricity Policy Synthesis Study*, pp. 15-17.
12. Department of Minerals and Energy (1997), 'Re-appraisal of the National Electrification Programme and the Formulation of a National Electrification Strategy', www.dme.gov.za/energy/RE-APPRAISAL.htm.
13. National Electricity Regulator (2001), *Annual Report 2000/01*, Johannesburg, p. 14.
14. Winkler, H. and J.Mavhungu (2001), 'Green Power, Public Benefits and Electricity Industry Restructuring', Report prepared for the Sustainable Energy and Climate Change Partnership, EDRC, Cape Town, p. 6.

increasingly imposed 'cost-reflective tariffs', as a 1995 document insisted. The 1998 *White Paper* was an improvement on previous versions, allowing for 'moderately subsidised tariffs' for poor domestic consumers. But it too made the counterproductive argument that 'Cross-subsidies should have minimal impact on the price of electricity to consumers in the productive sectors of the economy'.[15] That philosophy remained intact during Phumzile Mlambo-Ngcuka's reign as energy minister until 2005.

This raises for us the crucial question of the price charged to these 'productive sectors', namely a tariff regime inherited from the apartheid era extremely generous to minerals/metals smelters and other large electricity consumers. The man responsible for Eskom's late-apartheid pricing – Mick Davis – left the parastatal's treasury to become the London-based operating head of Billiton, once former finance minister Derek Keys gave permission for Gencor to expatriate vast assets to buy the firm from Shell (after apartheid ended, Keys tellingly became chief executive of Billiton).

Ten years later, the deals which gave Billiton, Anglo American and other huge corporations the world's lowest electricity prices came under attack by Alec Erwin, minister of public enterprises. It seemed like progress finally, because the package Davis had given Billiton for the Alusaf smelters at Richards Bay Hillside and Mozal in Maputo during the period of Eskom's worse overcapacity, had resulted in ridiculously cheap electricity – often below R0,06/kiloWatt hour (kWh) – when world aluminium prices fell. Creamer's Engineering News reported in June 2005 that, 'following the introduction of new global accounting standards, which insist on "fair value" adjustments for all so-called embedded derivatives… Eskom admits that the sensitivities are substantial and that the volatility it could create is cause for concern.' Public enterprises minister Alec Erwin reportedly insisted on lower 'financial-reporting volatility' – every time the Rand changes value by 10%, Eskom's wins or loses R2 billion - and he gave 'guidance that the utility should no longer enter into commodity-linked contracts and that management should attempt to extricate the business from the existing contracts'. Mkhwanazi replied that any change to the current contracts could be 'a bit tricky for us… We would adopt a pragmatic approach and, who knows, perhaps there will even be some sweeteners in it for us.'[16]

How did that new approach play out in terms of the vast subsidies promised at Coega, where Erwin as trade and industry minister from 1996-2004 had led negotiations for a new aluminium or zinc smelter? The answer was clear within two weeks, as a long-awaited $2,5 billion (R16,3 billion) deal with Canada's Alcan came

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15. Department of Minerals and Energy (1998), *White Paper on the Energy Policy of the Republic of South Africa*, Pretoria, Part Three.

16. Creamer's Engineering News (2005), 'Eskom will seek to Cancel Commodity-Linked Tariff Deals', 29 June.

closer to completion. According to the chief executive of the parastatal Industrial Development Corporation (IDC), Geoffrey Qhena, 'The main issue was the electricity price and that has been resolved. Alcan has put a lot of resources into this, which is why we are confident it will go ahead.' Meanwhile, however, to operate a new smelter at Coega, lubricated by at least 15% IDC financing, Alcan and other large aluminium firms were in the process of shutting European plants that produce 600 000 metric tonnes between 2006-09, simply 'in search of cheaper power', according to industry analysts. A Coega plant would generate an estimated 660 000 tonnes a year. For the purpose of complying with Kyoto Protocol obligations, Europe will be able to show reductions in CO2 associated with the vast energy intake needed – representing a third of a typical smelter's production costs – while South Africa's CO2 will increase proportionally. Indeed, as a result of the sweeteners offered to Alcan, Eskom will more rapidly run out of its excess electricity capacity, resulting in raised prices to poor people, more coal generation, and a more rapid turn to objectionable power sources such as nuclear reactors and two proposed Zambezi River megadams.[17]

**Price hikes and disconnections for the poor**

The contrast with the government's treatment of low-income people is stark. While Eskom was offering billions of rands worth of 'sweeteners' to the aluminium industry, the Department of Provincial and Local Government's *Municipal Infrastructure Investment Framework* supported only the installation of 5-8 Amp connections for households with less than R800 per month income, which does not offer enough power to turn on a hotplate or a single-element heater. (In turn, without a higher Ampage, the health and environmental benefits that would flow from clean electricity instead go up in smoke.) The 1995 energy policy also argued that 'Fuelwood is likely to remain the primary source of energy in the rural areas'. Eskom did not even envisage electrifying the nation's far-flung schools, because 'It is not clear that having electricity in all schools is a first priority.'[18]

Moreover, Eskom economists had badly miscalculated rural affordability during the late 1990s, so revenues were far lower than were considered financially sustainable. Because of high prices, consumption of even those with five years of access was less than 10 kWh per month, resulting in enormous losses for Eskom. Paying as much as R0,40 per hour (compared to a corporate average of R0,06 and bigger discounts for the Alusaf), rural women used up their prepaid meter cards within a week and can't afford to buy another until the next pension payout. This was

17. Bailey, S. (2005), 'Alcan Will Probably Build $2,5 Bln Smelter, IDC Says', Bloomberg News, 13 July. For a full critique of Coega, especially Erwin's role, see Bond, *Unsustainable South Africa,* Chapter Two.
18. Department of Minerals and Energy (1995), 'South African Energy Policy Document', Pretoria, pp. 96,66.

the main reason demand levels are so low that Eskom's rate of new rural electrification connections ground to a standstill.[19]

The state's electricity subsidy was insufficient to make up the difference, even when the ANC government introduced its free basic services policy in mid-2001. Eskom refused to participate for several years, waited until a new national subsidy grant became available, and still today has not fully rolled out the promised 50 kWh per household per month lifeline supply. With merely an hour's use of a standard hotplate consuming 25 kWh, the amount Eskom and the municipalities offer is pathetically inadequate.

Politicians and municipal managers defend the system not withstanding these many problems. The leading official of eThekwini (Durban), Mike Sutcliffe, justifies the inadequate 50 kWh/household/month allocation:

> The amount of 50 kWh was developed at national level in consultation with Eskom where 56% of their residential customer base currently use less than 50 kWh a month and this includes many customers in colder climates than Durban. The average consumption of all our prepayment customers (160 000) is 150 kWh a month and not all of them are indigent.
>
> South Africa does not have sufficient experience in the provision of free energy services to conclude whether 50 kWh a month is adequate or not. The amount of 50 kWh would appear to be a reasonable level to start with on a nationwide basis using the self targeted approach. If the self targeting works and the country can afford to increase the free service it could be reviewed in the future. There are more than 7 million electrified households in SA and for every 1 million indigent households receiving 50 kWh free the loss in revenue is R17,5 million a month.
>
> The proposal of a flat rate has proven to result in considerable wasted energy as users are unaware of their usage and consume far more than that which could be purchased for R50. Even if a current limit of only 10A is imposed these flat rate users could consume well over 1 000 kWh a month. South Africa can ill afford to waste energy, the generation of which not only depletes our fossil fuel reserves but has a considerable impact on water resources used in the generation process and air pollution as 80% of SA's generation is from coal.[20]

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19. Another reason for low consumption is that people may not be able to afford the cost of appliances required to increase electricity use. A suggestion that has some support from electricity suppliers is the provision of a 'starter pack' when households are connected, providing the household with a hot plate or a kettle for free. Leslie, G. (2000), 'Social Pricing of Electricity in Johannesburg', Masters research report submitted to the Faculty of Management, University of the Witswatersrand, Johannesburg, p. 69.

20. Sutcliffe, M. (2003), 'South Africa Cannot afford to Waste Energy', *The Mercury,* 27 February.

It is not at all unusual for wealthy South Africans – perhaps suffering from a 'culture of privilege' - to advocate that poor people should consume less electricity or water because they 'waste' these state services (it may be irrelevant, but Sutcliffe earns a far greater income than president Mbeki). Uniquely, though, Sutcliffe here also implies the poor are responsible for depleting the vast South African coal reserves, even though household electricity consumption by low-income families in South Africa is still less than 5% of the national total.

Misleading or wildly inaccurate information from state officials – relating to, for example, AIDS, arms deals, crime, adult education and municipal services - is an epidemic in South Africa, a country also overpopulated by gullible journalists. Witness South African Press Association coverage (reprinted in the *Mail&Guardian)* of a Statistics South Africa services survey in March 2005: 'The best-performing municipalities on average were in the Free State, where 91,5% of households had free water and 90,3% had free electricity' [*sic*]. (The explosive municipal riots in the Free State must indeed have been a right-wing plot, as alleged by some in the ANC, since denial of services was obviously not a factor.) Conveniently, it would apparently be impossible to verify these amazing claims, because 'Stats SA said although it is able to release provincial data, it cannot in terms of the Statistics Act release unit information - that of individual municipalities in this case - without their express permission. "Municipalities do need to be protected by the Act because they may want to apply to certain organisations for grants, and poor performance figures could harm them, or there may arise situations where they face punitive measures from the ruling party in their areas"' according to Stats SA head Paddy Lehohla.[21]

For very different reasons, some in national government periodically concede that low-income South Africans do not, in fact, receive sufficient free electricity. In November 2004, prior to taking over as deputy president from Jacob Zuma, energy minister Mlambo-Ngcuka alleged, according to SABC, that 'municipalities are botching up government's free basic electricity initiative to the poor… However, there is another bureaucratic dimension to the problem. Eskom, a state owned enterprise, is struggling to recoup its money from the Treasury for the free electricity it provides and Mlambo-Ngcuka says even when Eskom does get the money from them, it is always insufficient.' Indeed, the Treasury's 2004 grant of just R200 million to cover free basic electrification subsidisisation is grossly inadequate. But Mlambo-Ngcuka's own ministry was mainly to blame, because its staff had obviously overruled the 2000 ANC election promise of free basic services through a rising block tariff. It apparently remained committed, instead, to 'cost-reflective' pricing of

[21] Mahlangu, L. (2005), 'Most South Africans Receive Free Water, Electricity', SAPA, 17 March.

electricity, except insofar as it had no objection to the sweetener deals with the aluminium industry.[22]

Relatedly, when the World Bank came under pressure in 2004 for its sweet financing of extractive industries, Mlambo-Ngcuka again revealed her loyalties, making it clear to senior Bank staff in February 2004 that they should oppose 'green lobbyists', as reported by the UN news agency IRIN. Instead of the Extractive Industries Review provisions for a phase-out of Bank fossil-fuel investments, Mlambo-Ngcuka promoted the African Mining Partnership within the neoliberal New Partnership for Africa's Development. According to her spokesperson, 'We are already implementing sustainable development programmes.'[23]

The energy system Mlambo-Ngcukca oversaw was anything but sustainable for its many victims. By pricing electricity out of reach of the poor, the state officials, economists and consultants who design tariffs together refuse to recognise 'multiplier effects' that would benefit broader society, were people granted a sufficient free lifeline electricity supply. One indication of the health implications of electricity supply disconnections that resulted from overpriced power was the recent upsurge in TB rates. Even in communities with electricity, the cost of electricity for cooking is so high that, for example, only a small proportion of Sowetans with access to electricity use it, favouring cheaper fuels. [24] The gender and environmental implications are obvious.

The result of unaffordable electricity and inadequate state subsidies was an epidemic of disconnections. Electricity cutoffs were widespread by 2001. At that point, the Department of Provincial and Local Government's Project Viability reports and Eskom press statements together indicate an electricity disconnection rate of around 120 000 households per month. These are likely to be higher since not all municipalities responded to the DPLG survey, and the Eskom statements focus on Soweto, where resistance was toughest. But even using this base, and making a conservative estimate of six people affected by every disconnection (since connections

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22. SABC News, 1 November 2004. Mlambo-Ngcuka partly blamed the 'universal' entitlement which meant that in some cases, all municipal residents received their first block free. Yet this was not only good public policy in view of the consistent failure of means tests, but conforms to her own party's 2000 campaign promise: 'ANC-led local government will provide all residents with a free basic amount of water, electricity and other municipal services, so as to help the poor. Those who use more than the basic amounts will pay for the extra they use.' Her ministry's commitment to neoliberal market-based pricing was apparently strong enough to veto the rising bock tariff system that would be required to implement the ANC campaign promise.

23. http://www.irinnews.org/report.asp?ReportID=39413&SelectRegion=Southern_Africa&SelectCountry=south%20africa.

24. Reaching the same conclusion, various mid- and late-1990s studies are reviewed in Beall, J. O.Crankshaw and S.Parnell (2002), *Uniting a Divided City: Governance and Social Exclusion in Johannesburg*, Chapter Nine; and White, C., O.Crankshaw, T.Mafokoane and H.Meintjes (1998), 'Social Determinants of Energy Use in Low Income Households in Gauteng', Department of Minerals and Energy Affairs, Pretoria.

are made to households which often have tenants and backyard dwellings), upwards of 720 000 people a month were being disconnected from their access to electricity due to non-payment, meaning *that there were several times as many households losing access to electricity every month as were gaining access*. A survey of Soweto residents found that 61% of households had experienced electricity disconnections, of whom 45% had been cut off for more than one month. A random, stratified national survey conducted by the Municipal Services Project and Human Sciences Research Council (HSRC) found that 10 million people across South Africa had experienced electricity cutoffs.[25]

Even higher numbers could be derived using municipal disconnection statistics available through Project Viability, a national accounting of municipal finances whose last data set was analysed by the Department of Provincial and Local Government in December 2001. After that date, the embarrassing statistics have not been publicly available, in spite of numerous requests by Centre for Civil Society students. The latest report showed that 174 municipalities out of 284 total implemented credit control procedures that included service disconnections. During the last quarter of 2001, those 174 municipalities disconnected electricity to 296 325 households due to non-payment. Of those, 152 291 households were able to pay a sufficient amount to assure reconnection during the quarter, leaving 144 034 families – 4,3% of the total population connected - without electricity at Christmas in 2001. If, very conservatively, half a million people were adversely affected during this quarter – a time when December bonuses should have permitted bill arrears payments – then, multiplying by four quarters, roughly two million people would, cumulatively, have had their power disconnected for substantial periods (on average 45 days) throughout 2001. Moreover, since Eskom supplies more than half the low-income township population directly, and since self-disconnecting pre-paid metered accounts are not included in these statistics, the numbers of people who lost power would logically be far higher. Hence the electricity attrition rate – i. e. , the percentage of those who were once supplied with electricity but who could not afford the high prices and lost access due to disconnections – must be, using these indicative statistics, scandalously high for South Africa as a whole. Indeed, the ongoing lack of electricity supply to low-income people is invariably blamed, in part, for the upsurge in municipal protests since the early 2000s.

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[25] McDonald, D. (2002), 'The Bell Tolls for Thee: Cost Recovery, Cutoffs and the Affordability of Municipal Services in South Africa', Municipal Services Project Special Report (http://qsilver.queensu.ca/~mspadmin/pages/Project_Publications/Reports/bell.htm).
Government initially contested these figures as wild exaggerations, but by mid-2004 lead water official Mike Muller admitted in the *Mail & Guardian* (24 June) that in fact, according to a new government survey, 275 000 households were disconnected during 2003, which equates to 1,5 million people – so the MSP estimates were 50% 'wrong' - but too generous to government.

**Latest available Project Viability statistics (October-December 2001)**[26]

| Total Number of: | Total |
|---|---|
| Total Number of Councils that | |
| have formally approved credit control and procedures | 174 |
| do credit checks before opening a account | 34 |
| Read the meters for water – monthly | 185 |
| - every 2 to 3 months | 2 |
| - irregularly | 2 |
| - never | 93 |
| Read the meters for electricity – monthly | 154 |
| - every 2 to 3 months | 2 |
| - irregularly | 2 |
| - never | 93 |
| render consumer accounts to all areas in the jurisdiction | 159 |
| Percentage of debtors that are paying regularly | |
| The number of | |
| electricity disconnections done over the past three months | 296 325 |
| electricity reconnections done over the past three months | 152 291 |
| water disconnections done over the past three months | 133 456 |
| water reconnections done over the past three months | 50 703 |
| summons issued over past three months | 58 498 |
| The number of households | |
| receiving water | 4 084 009 |
| receiving electricity | 3 366 226 |

Rising electricity prices across South African townships already had a negative impact during the late 1990s, evident in declining use of electricity despite an increase in the number of connections. According to Statistics South Africa, the government's official statistical service, households using electricity for lighting increased from 63,5% in 1995 to 69,8% in 1999. However, households using electricity for cooking declined from 55,4% to 53,0% from 1995 to 1999, and households using electricity for heating dropped from 53,8% in 1995 to just 48,0% in 1999. Although comparable data are not available for the subsequent five years, in 2001 Stats SA conceded a significant link between decreasing usage and the increasing price of electricity and there is no reason to believe that this trend was subsequently reversed.[27] The implications for women and children are most adverse, given the inhalation of particulates that they in particular suffer during internal cooking and heating with coal, wood or paraffin.

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[26.] Department of Provincial and Local Government (2002), 'Quarterly Monitoring of Municipal Finances and Related Activities: Summary of Questionnaires for Quarter Ended 31 December 2001' (Project Viability), Pretoria, pp.30-31.

[27.] Statistics South Africa (2001), *South Africa in Transition: Selected Findings from the October Household Survey of 1999 and Changes that have Occurred between 1995 and 1999*, Pretoria, pp. 78-90.

**Renewable down, nuclear up**

In contrast to the vast amounts of energy generated through dirty coal-fired methods, South Africa's renewable sources with enormous potential include solar and wind, but these are surprisingly underdeveloped, as Muna Lakhani notes below. Capital costs are expensive, as are repairs.

Resource allocation by the South African government remains skewed away from renewable energy, towards nuclear. In 1995/96, energy spending through the Department of Minerals and Energy was R515 million, of which R489 million went to the Atomic Energy Commission (mainly for debt servicing), even though the AEC produced no new electricity since nuclear power generation had been purchased by Eskom. In addition, that year, the Central Energy Fund wrote down loans to Soekor by more than R110 million and included additional provisions for non-payment of loans to state companies by R7,3 billion. Another R1,5 billion was spent on subsidising synthetic fuels. Eskom's capital investments that year amounted to R5,4 billion and there were many other unaccounted investments in energy, through local electricity distributors, transport/pipeline companies, state oil companies, Eskom and National Research Foundation research and development in energy, and upgrading of port infrastructure for coal handling. The problem of resource allocation appears to be getting worse. Expenditure on renewable energy was less than 0,5% of the Department of Minerals and Energy (DME) budget in 2002/03.

Ironically, this was the moment that Pretoria released its *White Paper on Renewable Energy* which claims that electricity generation from renewables will reach 4% by 2013. As Graham Erion shows elsewhere in this volume, however, the statistic is misleading: 'For starters, the 4% target is *cumulative,* meaning that it will be satisfied if the annual percentage of electricity coming from renewables every year adds up to 4% by 2013. Therefore if new renewable capacity goes online next year totally just 0,5% of the market and no other new supply goes online, this target will be satisfied.'[28]

At the same time, DME continued to fund the Nuclear Energy Corporation of South Africa (successor to the AEC) to the tune of R135 million, and provided strategic loans of R266 million.[29] Opposition to nuclear energy on grounds of safety and long-term waste storage has come from sections of civil society, notably most of the environmental movement and the trade unions. By the end of 2001, Cosatu and four dozen other civil society organisations and networks were joined by another 23

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[28] Erion, G. (2005), 'Low Hanging Fruit Rots First', in Bond, P. and R.Dada (Eds), *Trouble in the Air,* Durban, University of KwaZulu-Natal Centre for Civil Society.

[29] Department of Finance (2001), '2002 Estimates of National Expenditure: Vote 30, Minerals and Energy', Pretoria, pp. 706-709.

regional and international organisations in opposition to a nuclear development path in South Africa.[30]

By November 2004, Earthlife Africa had won a court battle against Chippy Olver, former director-general of the Department of Environmental Affairs and Tourism, for his failure to take into account their views during nuclear energy environmental impact hearings. In January 2005, Olver was forced to turn over files he had refused to give Earthlife regarding the nuclear programme's safety, as he simultaneously complained of 'a seemingly endless round of consultations and judicial reviews'.[31] (A related controversy emerged in October 2005, where the president of the World Conservation Union, former environment minister Valli Moosa, had to defend his mid-2005 acceptance of the chairmanship of Eskom against board members in Geneva aghast at the corporation's environmental record. Moosa oversaw Olver's decisions related to the Earthlife critique, not to mention other crimes against the environment including his personal profiting from carbon trading.)[32]

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30. Earthlife Africa (2002), 'Information Pack for Activists Training in Energy Issues', Johannesburg; (2001), 'Nuclear Energy Costs the Earth', Johannesburg; Congress of South African Trade Unions (2001), 'Cosatu Submission on the Eskom Conversion Bill', presented to Public Enterprises Portfolio Committee, 9 May.

31. I-Net Bridge (2005), 'Manuel Gives the Green Light to PBMR', 23 February.

32. According to the Greenfly 'Cynics Corner' column in the groundWork Newsletter (December 2004), 'Former comrade, one time parliamentarian, and now turned fatcat businessesman, Valli Moosa is also the new head of the IUCN… Moosa's presidency of the IUCN signals a consolidation of the neo-liberal camp in a decidely mainstream establishment organisation. The journey from flag-burning militant to IUCN boss is a sorry tale of compromise, connivance and cooption. As ordinary South Africans start to pay the costs for the ways in which the dream of transformation was sold down the river during our "miracle" transition, Moosa's name should not be forgotten as a key figure in the ANC negotiating team that snatched defeat from the jaws of victory. As social movements mount heroic struggles for basic resources and services to the poor, Moosa's name should be remembered since, as minister for provincial and local government, he facilitated the privatisation of municipal services. As activists and movements continue to face the combined onslaught of state repression and government's duplicitous divide and rule strategies, we will all no doubt recall Moosa's name as the environmental minister who hosted the World Summit on Sustainable Development (W$$D) in Sandton, South Africa. Here, according to groundWork's 2004 Report "a candle-light march of South African social movement activists and global allies was 'violently disrupted by police recklessly throwing eight percussion grenades into the crowd and injuring at least three international visitors'... At the same time, the South African government was threatening to ban a major protest march aimed at exposing weaknesses and hypocrisy in the WSSD and highly critical of the ANC government. As it happens, public revulsion at the action against the smaller 'candle-light' march made it politically too expensive to ban the big march. The government backed down and allowed the march – but organised its own counter march on the same route on the same day under the banner of the ANC! This strategy simply reinforced the humiliation as the ANC sponsored march was notably smaller, drawing between 1 500 and 4 500 compared to the estimated 20-25 000 who marched under the banner of 'Social Movements United'". But it turns out that attacking the independent left and implementing neoliberal policies was not enough for this man's revolution. He's now left government and walked, straight through the revolving door, into business. In a flagrant abuse of his political connections and the spadework he's put in as environment minister, Moosa now heads up a company set to make millions trading carbon (dis)credits on the stock exchange!'

From an economic point of view, the cost of production of the preferred nuclear option – the Pebble Bed Modular Reactor (PBMR), which is 50% owned by Eskom – became unviable during the early 2000s, given currency fluctuations and severe problems experienced by Eskom's partners in Britain and the US. On a simple (non-environmental) financial basis, electricity generated from nuclear power in other countries costs up to 25% more than conventional fuels.[33] The PBMR technology was already rejected by German firms who sold it to Eskom, yet is presently being marketed as 'homegrown' South African knowledge.

In spite of the vast waste of resources, the nuclear programme has been expanded during the post-apartheid era, as pointed out by Muna Lakhani in this volume. Against all evidence to the contrary, such as the departure of US investor Exelon, public enterprises minister Alec Erwin claimed to parliament in October 2004: 'There are constant requests for information from different governments, utilities and research institutions on the PBMR technology.' Asked about the costs to taxpayers, Erwin replied in manner that has become familiar: 'Given that there are other shareholders involved, and the project is in a fund-raising exercise, this information is confidential and cannot be divulged.'[34] The fund-raising failure became obvious a few months later, when Trevor Manuel authorised dropping another R500 million from the fiscus into the PBMR sinkhole. According to Earthlife campaigner Sibusiso Mimi,

> The project is moving backwards. The projection by Phumzile Mlambo-Ngcuka in her budget speech, saying nuclear energy is inevitable for South Africa, and that by 2010 the PBMR will be economically viable, is a lie. Eskom has just anounced another verdict: that the PBMR will be economically viable by 2013. In essence, the project has moved three more years backward in few months after the budget speech despite a generous R500 million, which really means that South Africa is being used as a testing ground for this white elephant alienated by the global investing community, while its proponents are praising it like some kind of a god.[35]

Earthlife's protest was joined by the South African Council of Churches, South African Non-Governmental Coalition and Congress of South African Trade Unions:

> Government intends allocating R500-million to the PBMR. At the same time, government has allocated slightly more than a billion rand in the 2004/05 financial year for the national electrification programme. The spending on the

33. Earthlife Africa (2001), 'Other Energy-Related Developments', Johannesburg, p. 2.
34. SAPA (2004), 'Hot Interest in SA Nuclear Reactor', 4 October.
35. Email, 23 February 2005.

PBMR is almost half of the projected spending to achieve universal access. The project involves high risks and unpredictably high costs with the prospect of limited returns.[36]

The most recent critique of PBMR, from Greenwich University researchers, was covered by the press in August 2005:

South Africa will have to spend a massive R25-billion on the proposed pebble bed nuclear power project before it will be economically viable. This has emerged from an international report on the economic impact of the proposed pebble bed modular reactor which says that if the project goes ahead South African consumers could end up paying for 'a series of expensive white elephants'.

The cost of a PBMR demonstration plant to be built at Koeberg has risen from R2-billion in 1999 to R14-billion today. This excludes the decommissioning costs, which would be at least another R5-billion. The economic forecasts by PBMR are 'implausibly optimistic'.

The economic report was written by Steve Thomas, of the Public Service International Research Unit at the University of Greenwich and commissioned by the Legal Resources Centre. It is to form part of a submission by Earthlife Africa to the department of environment affairs.

The department was ordered by the Cape High Court six months ago to reopen the environmental impact process for the pebble bed, but has not yet done so. The National Environmental Management Act requires that the state ensure development is economically sustainable. Thomas writes that South Africa plans to build several of the nukes for export but, after years of negotiations, has no overseas orders.

The developer, PBMR, is pressuring Eskom to commit, unconditionally, to buying 24 of the units at a cost of R25-billion. This would allow 'economies of scale' to kick in and only then could the company produce a commercially competitive product.

Thomas says the PBMR's huge escalating costs and the long time delays show that the developers have failed to understand the nature or scale of their task. Their poor track record gives little confidence that they would be able to control costs and time schedules in the next, more expensive, phase.

The pebble bed's economic forecasts by the PBMR company have not been updated since 1998 and are 'implausibly optimistic'. Thomas points out that, as the demonstration plant itself would only incur costs, not create profits, building

[36] I-Net Bridge (2005), 'Manuel Gives the Green Light to PBMR', 23 February.

it would make sense only if there were a high probability of a 'stream of orders' from overseas.

Beijing has made no commitment to buy PBMRs. The company had been 'very vague' about its target markets. Its analysis of the world nuclear market was simplistic and its assumptions about who would buy the exported PBMRs had no basis. There was 'nothing remotely close to a firm order' from overseas for a pebble bed nuke reactor. The main expected export market was China but, despite several years of discussions, Beijing had made no commitment.

South Africa has not been able to find another international partner for the nuke project since the US company, Exelon, pulled out in 2002. John Rowe, chief executive officer of Exelon, said the reason for the withdrawal was that 'the project was three years behind schedule and was too speculative'.

The French nuclear company Areva has also indicated it is not prepared to fund the demo plant. Britain's BNFL, the only foreign partner, is in financial difficulties.

Thomas says the PBMR project has always been high-risk and the risks were likely to fall squarely on the shoulders of the South African public. As South Africans would have to be the major underwriters for the pebble bed project, it was 'reprehensible' that most of the economic information needed to evaluate it had been withheld from the public.'It is particularly regrettable that a report by an international panel of experts, commissioned by the department of minerals and energy to review the overall project, has not been made public,' Thomas wrote.

Thomas, a member of the panel, said the panel had been 'required to promise not to disclose any information' about the report. The Legal Resources Centre has tried, under the Access to Information Act, to get the department of minerals and energy to release the report, but it has refused to do so.

Peter Bradford, former commissioner of the US Nuclear Regulatory Commission, peer-reviewed Thomas's report this month and his only criticism was that Thomas had been 'conservative' in his concerns about the pebble bed. Bradford said Thomas had not considered the negative impact on the South African economy that would flow from electricity bill increases or tax increases to fund the pebble bed project. He also had not considered that the Chinese pebble bed design or the Areva prismatic nuclear design were likely to be effective competitors for whatever market developed for the pebble beds.[37]

So the multiple environmental, social and economic dangers posed by Pretoria's new nuclear fetish are substantial. Sensitivities at the highest levels of government are one indication that Earthlife is on the right track. After the organisation - of which I confess

[37] *Cape Times* (2005), 'Pebble Bed Needs Billions to be Viable', 15 August.

to be an ordinary Durban branch member - revealed high levels of radioactivity near the Pelindaba plant, politicians went ballistic. Energy minister (later deputy president) Mlambo-Ngcuka warned: 'We are considering strengthening the law so that if people make such allegations there is a sanction.' President Mbeki, who was that weekend awarded the ludicrous United Nations 'Champion of the Earth' award, accused Earthlife of making 'reckless statements' which were

> in my view, totally impermissible… We cannot go on scaring people about something that does not exist… These statements have been made by an NGO in order to promote its own interests, which is regrettable.[38]

Earthlife's agenda was a bit broader than that, though, as two journalists from the hometown paper learned to their surprise:

> When the *Pretoria News* visited the site yesterday radioactive warning signs were, at first, nowhere to be seen. A chicken-wire fence had been erected around the site. Less than 30 minutes after arriving there, Nuclear Energy Corporation of South Africa (NECSA) officials 'escorted' reporters off the site before erecting 'private property' signs as well as signs warning of radioactivity.
>
> Officials from the National Nuclear Regulator (NNR) and NECSA also spent the day conducting radiation level readings. NECSA spokesman Nomsa Sithole said the signs 'are part of the organisation's security measures and are used to warn people to keep off the land.'
>
> 'I categorically deny that the site is a nuclear waste dump. All our waste is dumped within the nuclear facility itself,' she said.
>
> Sithole said the site, a former calibration facility established in 1979, was used to calibrate the instruments used by Pelindaba staff.'While I admit that the fence around the area is not up to scratch, there is no need for fear of radiation leaking from the site,' she said.
>
> Sithole said the radiation warning signs had been posted to warn people about enhanced levels of 'naturally-occurring' radioactive materials mixed into the concrete calibration pads. She could not say why they were erected only yesterday.
>
> NNR communication manager Phil Nkhwashu confirmed they were investigating the site, but declined to comment further.
>
> Dr Stefan Cramer, a geologist who conducted tests at the site on Saturday on behalf of Earthlife, said there had been a grave lack of security and an oversight by Necsa concerning the nuclear facility. He said he had not seen such high

[38] SAPA (2005), 'State Dismisses Nuclear Threat', 28 April.

> levels of radiation in such an open area before. He claimed that the radiation in the immediate vicinity of the site was 200 times higher than natural radiation…
> Government spokesman Joel Netshitenzhe said that given the undue panic generated by the scare, South Africans, including the media, needed to be cautious when handling information from organisations 'with their own narrow agendas'.[39]

Earthlife's lead anti-nuclear campaigner Mashile Phalane explained that agenda: 'We want government to regulate the industry properly and punish anyone who transgresses the law.'[40] Fortunately, Earthlife will continue raising concerns about nuclear safety and other narrow agendas, while battling Mbeki, Mlambo-Ngcuka, Erwin and Netshitenzhe. In addition, thankfully, the Kyoto Protocol still prohibits the use of nuclear energy as justification for reducing greenhouse gases, and rejected the nuclear option within the Clean Development Mechanism, but that stance is under attack from the US and other pro-nuclear governments.[41] It remains to be seen whether under president Valli Moosa, the World Conservation Union advances Eskom's pro-nuclear agenda in the carbon markets, where Moosa's interests are potentially lucrative in the event the PBMR is ever built and authorised as a CDM.

Finally, it should also be recognised that there are enormous environmental and social problems associated with hydro-electricity across Southern Africa, not least of which is global warming gasses that are released in tropical dams due to vegetation decay.[42] Favouring hydropower and the privatisation of Africa's existing energy agencies, Eskom had ventured into the following countries by 2000: Angola, Botswana, Cameroon, the DRC, Ghana, Mali, Mozambique, Swaziland, Tanzania and Zambia. In the early 2000s, major EE projects included

- a R100 million agreement to supply water and electricity in Gambia;
- a 15-year operation and maintenance contract for the new Manantali hydro station in Mali and its associated high voltage transmission system;
- the formation of a consortium with the French firms EDF and Saur International to bid for 51% of Cameroon's Sonel;
- an alliance agreement with the Libyan power utility, Gecol;
- an agreement with Nigeria's National Electricity Power Authority covering generation and operations, electro-mechanical repairs, transmission, and rehabilitate, operate and transfer (ROT) schemes;
- consulting and management contracts in Malawi; and even

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39. Hosken, G. and S. Adams (2005), 'What is the Matter at Pelindaba?', *Pretoria News,* 29 April.
40. *Business Day,* 29 April.
41. Earthlife Africa, 'Other Energy-Related Developments', p. 4.
42. The World Commission on Dams found that in many cases, the greenhouse gas emissions from large dams exceeds those of conventional energy generation. See http://www.irn.org for more information.

- a bid for power stations operated by the Zimbabwean Electricity Supply Authority as repayment for outstanding debt owed to Eskom.[43]

There have been many other feelers in Africa recently, including major contracts in Nigeria and at Uganda's extremely controversial Bujagali Dam. As John Daniel and Jessica Lutchman of the Human Sciences Research Council explain,

> Hydro-electric power is regarded as a more viable option for South Africa at present and it is in this context that South Africa's developing trade and other ties to Africa loom large. Mozambique possesses substantial hydro-electric capacity (sourced from Cahora Bassa), some of which it sells to South Africa. SA's largest initiative is the Grand Inga project in the DRC. Grand Inga is expected to generate 40 000 Megawatts of electricity, sufficient to meet the needs of the entire continent as well as generate revenue for its members by exporting its surplus power to Europe. Grand Inga is the vital element in South Africa's long-term objective of ensuring its self-sufficiency in electricity. It is little wonder then that the South African government has committed so much in the way of time and effort, as well as military peacekeepers, to the task of bringing political stability to the DRC.[44]

The danger of this sort of hydropower hype is obvious, however, and was recognised in 1998-2001 World Commission on Dams studies of large energy and irrigation facilities associated with megadams, which nearly invariably failed to meet economic expectations. As International Rivers Network campaigner Terri Hathaway put it in a useful corrective, reliance upon Inga may not be advisable given

> Africa's vulnerability to climate change and political instability. Climate change will bring risks to hydro-dependent economies through increases in the severity and frequency of both droughts and floods. Worsening droughts will reduce hydropower production, while increased floods threaten dam safety and may also increase sedimentation (thus shortening the useful life of dams). Climate change will add to existing environmental stresses on riverine ecosystems and watersheds. Economic feasibility, environmental impact studies and engineering

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43. Greenberg, S. (2002), 'Eskom, Electricity Sector Restructuring and Service Delivery in South Africa', Alternative Information and Development Centre, Cape Town, June. Documentation available in *Business Day* editions: 9 March 2000, 26 April 2000, 10 August 2000, 12 September 2000, 17 October 2000, 10 November 2000, 29 November 2000, 25 January 2001, 27 March 2001, 8 November 2001, 12 March 2002, 16 July 2002.

44 Daniel, J. and J. Lutchman (2005), 'South Africa in Africa: Scrambling for Energy', Presentation to the SA Association of Political Science Colluquium, University of KwaZulu-Natal/Pietermaritzburg, 22 September.

plans for Inga should take into account the hydrological uncertainties of a warming world.

Political instability is a very real concern across the region where the transmission grid would be built. The ongoing violence in DRC was recently rated the world's most forgotten crisis by Reuters. Over three million people have died since 1998 as a result of the civil war and ongoing strife in DRC. The Inga mega-project would centralize much of Africa's electricity source and require a grid of transmission lines through many of Africa's most politically unstable regions. Dams, power plants, and transmission lines are often made targets in political conflicts. The dependence of more countries' economies on Inga would increase its attractiveness as a target for sabotage by rebel groups. Less than 10 years ago (in 1998), rebels seized Inga II and cut its power to Kinshasa, the capital of the DRC.[45]

**Conclusion**

In sum, several important factors converge when we consider the nature of South African energy:

- South Africa, already amongst the most unequal countries in the world in 1994, became more unequal during the late 1990s, as a million jobs were lost due largely to the stagnant economy, the flood of imports and capital/energy-intensive investment—and these trends had enormously negative implications for the ability of low-income citizens to afford electricity;
- billions of rands in state subsidies are spent on capital-intensive energy-related investments such as new smelters, where profit and dividend outflows continue to adversely affect the currency;
- the price of electricity charged to mining and smelter operations is the lowest in the world;
- a pittance is being spent on renewable energy research and development, especially compared to a dubious nuclear programme;
- greenhouse gas emissions per person, corrected for income, are amongst the most damaging anywhere, and have grown worse since liberation;
- electricity coverage is uneven, and notwithstanding a significant expansion of coverage, millions of people have had their electricity supplies cut as the state provider moves towards commercialisation and privatisation;
- the possibilities of improving gender equity through access to free lifeline electricity are vast;

[45] Hathaway, T. (2005), 'Grand Inga, Grand Illusions?', *World Rivers Review,* 20, 2, April, http://www.irn.org/pubs/wrr/issues/WRR.V20.N2.pdf

- for people suffering from the recent upsurge in TB, and indeed for 6,4 million HIV-positive South Africans, the public and personal health benefits of replacing coal, wood or paraffin with electricity are vast; and
- there are other important environmental, segregation-related and economic benefits that flow from clean electricity as a replacement for traditional fuels, which are at present not incorporated into social and financial decision-making, especially when it comes to pricing electricity.

All of these problems can be countered by critiques from civil society. However, most challenging is the lack of synthesis between the three major citizens' networks that have challenged government policy and corporate practices: environmentalists, community groups and trade unions. Our work at CCS aims to identify the numerous contradictions within both South African and global energy sector policies/practices, and help to synthesise the emerging critiques and modes of resistance within progressive civil society. Only from that process of 'praxis' can durable knowledge be generated.

# WHAT'S WRONG WITH NUKES, WHAT'S RIGHT WITH RENEWABLE ENERGY

BY MUNA LAKHANI

The way we use energy throughout the world is causing a lot of harm. We are poisoning our children with the petrol that we use. In countries like Lesotho, Namibia and Mozambique, we are moving thousands of people to build big dams so that we can create electricity from the flow of water over the dam wall. When we burn dirty coal in our electricity plants, factories and homes, we warm up our planet and cause floods and drought somewhere else. Burning coal also causes many health problems for people using coal at home, or living near coal fired power stations, especially problems with their lungs and throats. Their houses are also difficult to keep clean, and even their washing gets made dirty again. Our coal fired power stations are amongst the dirtiest in the world.

The way we are currently using energy means that we will pay more and more for that energy, as the fixed resources (coal, oil and wood) run out. This will mean no energy for our grandchildren and those that follow after them. This also impacts badly on our health, our studies, our enjoyment of life. It also makes it more difficult for us to afford safe and clean energy.

We have to ask ourselves: 'What are the social, environmental and financial costs of our use of energy?' 'What can we do with energy supply, and use sources that are better?' 'What are the challenges facing the government and the people in finding a better energy mix?' At the same time, we must improve living conditions in informal settlements, hostels and townships. We must find solutions that also allow future generations to live a better life. The quality of life, a healthy environment and sound development are all closely linked. Bringing energy and environmental concerns into all stages of housing delivery and the upgrading process, can save money and improve the quality of life not just for us today, but for the generations that are yet to come.

**The new nuclear threat**

Given the growing concern about the inevitable impact of climate change, the nuclear industry is trying to revitalise nuclear power by claiming that it does not release carbon dioxide. While CO2 is not emitted at the power plant, large amounts of CO2 are generated through mining, transport and especially uranium enrichment.

Nuclear power generation thus creates over 8 tons/GWh of power that is delivered – much more than renewable energy sources.

Nuclear energy is the energy stored in the smallest piece of matter: the nucleus, or centre, of an atom. When the nucleus of one atom, Uranium, is broken (called 'fission'), it forms two new atoms and lets out a large amount of energy in the form of heat. This heat is used to drive a turbine, which then generates electricity. We have one nuclear power station in South Africa at Koeberg, 28 km from the Cape Town city centre.

Nuclear power is not safe. When the nucleus of the Uranium atom splits it also creates new atoms (such as Strontium and Cesium) that are very dangerous because they are radioactive. This means that these new atoms are always giving off little amounts of radiation. When they go in through the mouth and nose and find their way into the bones and organs of people, they can break down cells in those organs and bones. This causes cancer and birth defects.[1] The National Union of Mineworkers say that many people have died from illnesses related to working in nuclear power plants and Uranium mines. Some doctors around the world say that communities living near nuclear power stations also die more from cancer and give birth to damaged children. Nuclear power stations can also have major accidents, such as the Chernobyl accident in the former Soviet Union.

Certain types of radiation can also travel through a person, just like X rays do, which also cause much harm. Radiation cannot be seen, heard, touched, smelt, tasted or destroyed. Nuclear power also produce dangerous radioactive waste at every stage of the nuclear fuel cycle: from uranium mining, to reactors, to the re-processing of irradiated nuclear fuel. No one has found a proper solution to the long-term storage of this used fuel and other high radioactivity waste. There is also a strong link to the international nuclear weapons programme, including depleted uranium ammunition. When Koeberg comes to the end of its life, it will also be contaminated and the whole building will have to be treated as radioactive waste, that will remain dangerous for thousands of years.

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1. Although enriched uranium is only mildly radioactive, ingestion through the mouth and nose is extremely harmful because of its chemical toxicity, which is comparable to lead, according to the World Nuclear Association. The main chemical health effect ascribed to uranium in humans has been damage to the kidneys. Recent research shows that ingested particles can enter the bloodstream from the lungs or stomach where they may exert systemic toxic effects. Acute pulmonary effects relating to chemical toxicity have been observed in rabbits. Insoluble uranium particles can remain in the lungs for many years causing chronic radiotoxicity to be expressed in the alveoli, potentially leading to cancer. The National Radiological Protection Board in Britain conceded in 1995 that 'there is in fact no threshold radiation dose under which one wouldn't risk growing a cancerous tumor – in other words even small doses can make one ill.' 452 used fuel pebbles will be released from the reactor core every day and become waste - translating into a daily amount of 226 000 Curies of radioactivity generated daily at one reactor, which will remain dangerous for thousands of years. These are enormous quantities. A single curie of iodine 131 – one of many isotopes created through nuclear fission - could make 10 billion quarts of milk unfit for continuous consumption (USA guidelines). The PBMR EIR Final Report clearly shows Strontium-90 as a byproduct of the fission process in a PBMR reactor. This isotope has been directly related to incidences of leukemia among children aged 0-14.

All over the world, people are saying 'No nukes!' The nuclear industry in the developed world, particularly Western Europe and the United States, is on its last legs. Germany has put an end to its programme; there are no new orders coming from the United States, France has stopped its new reactor programme, the World Bank has made a decision not to finance any new nuclear power plants. Nuclear reactors can also not be used to minimise greenhouse gasses under the Kyoto Protocol.

So why are we still investing in with nuclear power? Government's White Paper on Energy Policy says that no decision on nuclear power stations will be taken before all energy issues have been discussed with everyone. But Eskom is carrying on with a new nuclear power programme: the Pebble-Bed Modular Reactor (PBMR) programme, to be sited at Koeberg or Pelindaba. They chose Koeberg and Pelindaba is because these are already nuclear sites, making it cheaper for Eskom.

The Nuclear Energy Corporation of South Africa (NECSA) want to make the radioactive fuel at a new factory at Pelindaba, which will also release radiation during the manufacture of fuel. There will be up to 9 trucks every day on our roads carrying radioactive products for the next 40 years if they are able to achieve full production. Even just one accident will cost many billions of Rands to clean up, and the radiation will remain harmful for thousands of years. NECSA has not proven that they can even make the fuel, nor if they can make it safely. A nuclear container they designed recently was rejected by the USA, and they have also used casual labour to work on radioactive material with no protective equipment.

There is no debate whether radiation kills, maims, causes mutations, is cumulative; causes leukemia (mainly in children), cancers, respiratory illnesses and attacks the immune system (with children, pregnant women and the elderly the most vulnerable). The only disagreement is about what is considered an allowable dose. The only people who say that radiation is safe are those who make money from radioactive processes, and cannot be trusted, as they have proven so far, here and overseas. There is no such thing as a 'safe' dose of radiation.

Earthlife Africa is alarmed at the potential for dangerous nuclear accidents should Eskom continue with its plans for the Pebble Bed Nuclear Reactor (PBMR) Programme. The fuel for the new PBMR is a graphite wrapped pebble, the size of a tennis ball, containing enriched uranium kernels. The plant to manufacture these fuel balls will be built at Pelindaba near to Tshwane/Pretoria, but the raw material - enriched uranium - will need be imported via a harbour in KZN, probably Durban.

Eskom officials plan to build approximately 256 Pebble Bed Modular Nuclear Reactors (PBMRs). Of these, about 24 reactors are earmarked for local energy generation, and Eskom hope to sell the remainder on the international market. This means that in addition to transporting enriched uranium, the manufactured fuel pebbles will need to be transported from Pelindaba to various locations as far as Cape Town, as well as to Durban for export.

At the height of proposed PBMR production, this could mean that nine trucks would drive through Durban every week carrying enriched uranium to Pelindaba and another 31 trucks would return carrying fuel pebbles for export. A total of 231 012 000 kilograms of radioactive materials would be travelling on our roads during the 40 year lifetime of the reactors – an average of 9 trucks a day. (These figures are based on information provided by Eskom in their EIA process.) eThekwini residents should be concerned about the enriched uranium transported through the harbour up to Pelindaba. Even if only the first demonstration PBMR is built, 1000 kg of enriched uranium will be transported annually.

Eskom claims it will be transported in specially constructed canisters, but the information provided by Eskom as part of the Environmental Impact Assessment process says that the canisters are only designed to withstand a drop of 9 metres. So if a truck had an accident on a bridge and the canisters fell, they could easily be split open and expel the enriched uranium, described by Eskom as a fine powder. At windspeeds of only 3 metres per second, this can blow 10 kilometres within an hour. And Durban mean daily wind speeds are at least 4 metres per second. In this instance it is very likely that it will not only contaminate land and water sources, but will be breathed in by many people.

Although enriched uranium is only mildly radioactive, ingestion through the mouth and nose is extremely harmful because of it's chemical toxicity, which is comparable to lead (World Nuclear Association). The main chemical health effect ascribed to uranium to date in humans has been damage to the kidneys. Recent research shows that ingested particles can enter the bloodstream from the lungs or stomach where they may exert systemic toxic effects. Acute pulmonary effects relating to chemical toxicity have been observed in rabbits. Insoluble uranium particles can remain in the lungs for many years causing chronic radiotoxicity to be expressed in the alveoli, potentially leading to cancer.

Earthlife Africa is concerned that emergency services in Durban and other municipalities would provide an inadequate response in the event of a nuclear transport accident, given recent statements made by emergency personnel and the response to transport accidents such as the recent asbestos spill on the M7 in May 2005. Furthermore it would be difficult to evacuate a wide area in an emergency. Hence over the last few years, insurance companies have been amending household insurance policies to specifically exclude any damage or loss caused by nuclear fuel, waste and its associated radiation from their cover.[2] The following are a small sample of nuclear transport accidents reported in the USA:

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[2.] The following are a small sample of nuclear transport accidents reported in the USA: v The Critical Mass Energy Project (part of Ralph Nader's Public Citizen) tabulated 122 accidents involving the transport of

The Critical Mass Energy Project (part of Ralph Nader's Public Citizen) tabulated 122 accidents involving the transport of nuclear material in 1979, including 17 involving radioactive contamination. For example, two canisters containing radioactive materials fell off a truck on New Jersey's Route 17 in September 1980. The driver did not notice the missing cargo until he reached Albany, New York. In 1986, a truck carrying low-level radioactive material swerved to avoid a farm vehicle, went off a bridge on Route 84 in Idaho, and dumped part of its cargo in the Snake River. Officials reported the release of radioactivity.

Used fuel poses the greatest risk in the nuclear chain. Used fuel will need to be transported from the reactors at some point and this waste then needs to be safely stored. There is the possibility that other countries that buy reactors and fuel from us, will demand that the highly radioactive used fuel be returned to us as the country of origin.

Transport accidents involving used fuel could be a calamity. Graphite, the casing of the fuel pebbles, burns readily in air if exposed to temperatures of greater than 800 degrees. Diesel burns at 1010 degrees centigrade and magnesium alloy wheels burn at far higher temperatures. Thus in an accident where there is a fire we can expect the graphite balls to combust. Water cannot be used to put out a graphite fire. (Used pebbles are also prone to mechanical damage such as chipping, cracking and the separation between the outer graphite, and silicon dioxide layers exposing the uranium/graphite to fires, etc.)

In short, South Africa has no policy on how to 'manage' radioactive waste.'Medium' and 'low' level waste is transported to Vaalputs in Namaqualand for long term disposal. Highly radioactive used fuel from the existing Koeberg reactors has not been moved here because of the great danger. Instead government spent R80 million on new high-density storage racks.

**The National Radiological Protection Board in Britain conceded in 1995 that 'there is in fact no threshold radiation dose under which one wouldn't risk growing a cancerous tumor – in other words even small doses can make one ill.'** 452 used fuel pebbles will be released from the reactor core every day and become waste - translating into a daily amount of 226 000 Curies of radioactivity generated daily at one reactor, which will remain dangerous for thousands of years. These are enormous quantities! A single curie of iodine 131 – one of many isotopes created through nuclear fission - could make 10 billion quarts of milk unfit for continuous consumption (USA guidelines).

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nuclear material in 1979, including 17 involving radioactive contamination. For example, two canisters containing radioactive materials fell off a truck on New Jersey's Route 17 in September 1980. The driver did not notice the missing cargo until he reached Albany, New York. In 1986, a truck carrying low-level radioactive material swerved to avoid a farm vehicle, went off a bridge on Route 84 in Idaho, and dumped part of its cargo in the Snake River. Officials reported the release of radioactivity.

The PBMR EIR Final Report clearly shows Strontium-90 as a byproduct of the fission process in a PBMR reactor. This isotope has been directly related to incidences of leukemia among children aged 0-14.

We have no nuclear waste policy South Africa has no policy on how to 'manage' radioactive waste. 'Medium' and 'low' level waste is transported to Vaalputs in Namaqualand for long term disposal. Highly radioactive used fuel from the existing Koeberg reactors has not been moved here because of the great danger.

Instead government spent R80 million on new high-density storage racks.

**A bad financial deal**

Nuclear energy is not cheap. But Eskom continue to spread false promises of delivering cheap power to the poor. The economic viability of the PBMR is based on spreading the start-up costs across 216+ reactors, which need to be sold on the international market. However, government and Eskom continue to withhold crucial information on the financial feasibility of the PBMR from public scrutiny.

Ten years ago Eskom was claiming that the first 'demonstration' reactor would cost about R1 billion and would create thousands of jobs. But Eskom now concedes that R1,5 billion has been spent on the design and feasibility process to date. An additional R500 million was authorised by government in November 2004. Another R10 billion is needed to build the first pilot reactor and the fuel plant. These costs exclude decommissioning of the facilities – estimated at a minimum of R100 million, fuel costs for 40 years, ongoing (high) cost of maintenance, and storage of the radioactive waste for at least 240 000 years. The existing Koeberg reactors were built at a cost three times more than originally planned.

Nuclear energy generation costs in the U.K. turned out to be double what the UK government had originally claimed. The last reactor built in the UK in 1995 cost $3000 per kilowatt of capacity – nearly ten times more than it costs to build a gas-fired power plant. British taxpayers are presently faced with a £48 billion bill for cleaning up historical nuclear contamination. Even the World Bank is sceptical: 'Nuclear plants are thus uneconomic because at present and projected costs they are unlikely to be the least-cost alternative. There is also evidence that the cost figures usually cited by suppliers are substantially underestimated and often fail to take adequately into account waste disposal, decommissioning and other environmental costs.'

There is a limited export market for PBMRs. Eskom has been trying to sell their reactor internationally for at least eight years, with expensive international trips and marketing campaigns, but have not been able to show us written evidence of any international interest in purchasing PBMR units. Most countries in Europe are phasing out nuclear power, with the exception of France, which has its own nuclear

industry. French nuclear company, Areva declared that the PBMR was 'not competitive to generate large-scale electricity…' The USA also has its own nuclear industry, which withdrew support for the PBMR in 2002. The South African Industrial Development Corporation (IDC) has diluted its shareholding from 25% to 12.5%. Eskom CEO Thulani Gcabashe, is on record as wishing to move from developer to potential client, and also wants to dilute their shareholding. The most likely market is East Asia, but China is developing its own reactor models (including a pebble bed).

### *Not* 'Proudly South African'

While Eskom claim PBMR as a Proudly SA product, this design was actually purchased from Siemens after Germany abandoned the programme. The German programme was shut down because malfunctioning fuel balls became stuck, because of dislocated graphite tiles on the inside of the reactor, and because of a large accident at Hamm-Uentropp in May of 1986, which the regional authorities tried to pass off as 'fallout from Chernobyl'. Not only are we trying to tweak unproven, hand-me-down technology but we will also be importing many of the key parts.

The PBMR also creates few jobs. Most components of the demonstration unit will be imported from foreign companies because we do not have the capability to produce these highly specialised items. During 2005 the following contracts have been awarded: Mitsubishi Heavy Industries – contract to build the turbine machinery at a cost of $12 million; and Uhde, a division of Germany's Thyssenkrupp Engineering – contract to build the fuel plant and infrastructure at a cost of $20 million. This might explain why the thousands of jobs promised by the PBMR programme won't be delivered: only 80 full-time jobs will be provided, mostly for highly skilled people. At present, the PBMR company staff (about 50 full time) earn an average of R480 000 per year, or R40 000 per month.

As another example of *not* proudly South African values, the PBMR appears rife with vested interests. Cabinet appointed Maurice Magugumela as the CEO of the National Nuclear Regulator (NNR), the government body tasked with safeguarding the public from nuclear harm. The NNR also gives the final go ahead to a reactor by issuing the operating license. Maqugumela is also the Safety and licensing Manager of the PBMR Company for five years.

Reuel Khoza, the CEO of Eskom had a 28% interest in IST Holdings through his own BEE companies when IST were awarded a contract of R260 million for development of the PBMR by Eskom. And Louisa Zondo, the previous CEO of the NNR, was on the board of a company that owns a 25% stake in IST.

**Safe, clean and simple energy options exist**

We all agree that fossil fuels cause environmental and health problems, and we need to move away from these unsustainable fuels. The question is through what means? Energy conservation is the first step. South Africans (mostly at household level) reduced energy consumption in 2004 by 198 MW ( = 1,2 PBMRs), 30% more than government's annual target.

Secondly, public funds should be used to ensure safe, clean and reliable energy delivery to all South Africans. We should invest in those technologies that are at the cutting edge of energy provision: technologies that are sustainable, proven, decentralise power generation to where it is needed and that optimise job creation.

Twelve billion Rands can buy:

- one 165 MW Pebble Bed Modular nuclear reactor = 80 full time jobs + 1400 construction jobs of one year; or
- 1700 MW of wind power = 850 full-time jobs + 3000 construction jobs which can be supplied locally; or
- 5700 MW of solar PV = 680 full-time jobs + 8800 construction jobs which can be supplied locally; or
- 795 MW of generating power saved by providing solar water heating for 1,2 million houses, thereby improving the quality of life of six million people.

Well-proven and commercially viable renewable technologies exist but haven't been tried at scale in South Africa. For example, wind is a tried and tested technology that one can set up really quickly with relatively unskilled labour and it is easy to build turbines locally. There are numerous sites across the country where the wind resources are sufficient for wind energy generation. Wave, tidal and solar thermal power will deliver bulk industrial supplies safely and reliably – waves and tidal currents never stop.

Our wind and solar resources are amongst the best in the world. If the EU can develop solar thermal technologies why don't we with our more reliable supply of sunlight? Even if we disregard the dangers associated with nuclear power, renewable energies are better for the economy. The international markets for these safe technologies is growing by up to 40% per year, with the nuclear market growing (at best) a few percent a year.

**What can be done, instead?**

Because of global warming and pollution at the local level, we need to use less oil for transport, and less coal for electricity and industry. Research and development money must be spent on alternative, environmentally friendly energy sources such as wind, solar, wave and biomass. There are a number of ways we can better use energy, and make energy safely and cleanly:

- *Energy efficiency.* If we use less electricity to do the same jobs we are being energy efficient. Some fridges and stoves, for example, use less electricity than those that we used in the past. Compact Flourescent Lights (CFLs), which use less electricity for the same amount of light are now advertised on TV under Bonesa. If we put in ceilings and insulation, and make sure that our buildings and windows face North, we can also reduce the energy we use for heating our homes and factories. Eskom was able to reduce their electricity consumption at the head office by 34%, by implementing energy efficiency.
- *Solar water heating.* If we were to use energy directly from the sun to heat water in our homes and factories, we would save half of the electricity that we normally use from the national grid. In some countries, governments pass laws that compel people to use solar heating. If everyone were to use solar water heaters in South Africa, we could do away with one 2000 Megawatt coal-fired power station, or 20 pebble-bed reactors. Solar cooling can also be used instead of normal airconditioners.
- *Solar thermal*. Solar power can also be used to generate large amounts of electricity, by concentrating the power of the sun with mirrors or lenses, like a giant magnifying glass. Large mirrors reflect the heat of the sun to one spot on the tower, making that spot very hot – this heats water to make steam, which then turns a turbine to make electricity. There are different kinds of mirrors that can be used – those that are quite flat, or they can be curved (like half a pipe) and a pipe for water can run through the middle. This very hot process easily and quickly turns water into steam, which can then drive a turbine – it is exactly the same generating process as coal fired power stations, except that the source of heat is the sun. If we used the world's deserts for electricity generation, we could supply the whole world with only 2% of the land covered by deserts. We can also use low temperature Solar Thermal for the drying of food, for example.
- *Solar Thermal Chimneys.* These can generate up to 200MW, by allowing a large greenhouse to be built, which will heat up air, that then travels up a

chimney, creating its own wind to drive turbines. These generate power day and night, as the earth stores heat which is released at night.

- *Solar panels.* PV – Photovoltaic – panels turn sunlight into electricity. The sun can also be changed to electricity through solar panels, which are normally linked to batteries. Because lights, radios and TV sets do not use a lot of electricity, they make the best uses for solar panels. Solar panels are also great for people who live far away from grid electricity. Since the demand for solar energy is growing all the time, the cost of manufacturing solar panels is coming down every year.
- *Wave energy.* The waves at the edge of the ocean can also generate electricity. Throughout the world, governments and businesses are conducting more research on wave energy. This is the energy held in rising and falling waves at sea, which makes a wave generator go up and down, and so make electricity. This is already happening commercially. As the recent storms in Cape Town have shown, South Africa's coastline has excellent potential for wave power generation, and Stellenbosch University has already produced working models. For example, it is estimated that 0,2% of the ocean's wave energy could supply the current worldwide demand for electricity. Every metre of coastline in Northern California provides enough energy to power 20 average American households, who use more electricity than South Africans. Rough calculations show that 40m of wavefront could produce enough power to run the Point Hotel in Cape Town (200 kw per 40m of wave), and with only 1 km of wave, we could generate enough power for Cape Town. Wave energy is captured in a very easy way – the waves (which never stop) go into the pipe at the bottom – this pushes the air in the tube out – while it is doing this, it can turn a fan (turbine) which generates electricity. When the wave drops, air comes rushing back in, which can turn the turbine again, to make more electricity. South Africa has the Agulhas Current that runs past Durban, and can easily generate 50MW of power from each energy appliance, from the ocean current which never stops. Bringing seawater onto shore, and in the process desalinating it, is an additional bonus in newer technology than traditional ocean current turbines. As water is much more dense than air, much smaller turbines are needed compared to wind turbines.
- *Wind energy.* Wind energy is one of the fastest growing industries in the world, and the cost of wind power has been coming down every year. It is also competitive with coal and gas. If you take into account the health costs of coal, wind has already been found to be cheaper than coal in the USA. Wind energy is captured simply by letting the wind turn the blades of the rotor, like a fan, which then makes electricity. In some countries wind

already produces over 10% of people's energy needs and by 2010, wind energy will supply over 10% of Europe's power needs. Some analysts predict that wind could supply up to half of all global energy needs by 2100. Wind is better than coal and nuclear power because it can often create electricity close to where it is used; there are very few impacts on the environment; it creates local jobs; and South Africa has great wind resources along our coastline and the escarpment. We need to use this energy source more in the future.

- *Hydro-energy.* For centuries, people have been using the energy from small amounts of moving water ('hydroenergy') to grind grain - like the Josephine Mill, next to the Newlands sports ground in Cape Town. In the last hundred years, however, engineers have built massive dams to hold back large amounts of water, and then let it out to run through big turbines, to generate hydro-electricity. But these big dams have equally huge environmental problems (like the Narmada Dam in India) and governments are moving back to small hydro-electric generation (or 'micro-hydro'), as this has little impact on the environment. We can build micro-hydro schemes on small rivers and equally small dams. If we use local technology and skills, we can also create local jobs. In some countries such as Sri Lanka, micro-hydro can supply up to 90% of people's energy needs.
- *Bio-energy.*'Bio' means 'life', so 'Bio-mass' is the raw material of living things.'Bio-fuels' are the kind of fuels we can get from 'bio-mass', and the outcome is 'bio-energy'. So we can burn bio-fuels directly, such as wood, but we can also change bio-mass, such as sugar-cane or beet, into gas or fuels that can replace paraffin, such as ethanol. We can also change bio-mass chemically into liquid fuels, such as ethanol, which we can then use to generate electricity, or burn as transport fuel. The left-over mush (or 'slurry') can then be used as compost. We can call wood and other bio-fuels sustainable and renewable, if we harvest them in a way that does not destroy the environment. In many countries, small bio-gas 'digesters' are used to produce gas for homes or communities, but in Denmark 20 large bio-gas plants currently digest wastes from animal and food-processing wastes. We can also capture usable gas from sewage, which will recover water, biogas and compost, instead of pumping it into the sea or rivers along with toxic waste from industry.
- *Geo-thermal energy.* When the heat from the centre of the earth ('geo-thermal' energy) is close enough to the surface, we can use it to heat water, and so generate electricity. Global usage is growing very fast and now stands above 8000 MW. Geo-thermal energy is not dependent on the weather and can be utilised 24 hours a day.

- *Tidal energy.* A good answer to those who say that 'all renewable energy is intermittent' (comes and goes) is to suggest that - besides wave, wind, geo-thermal, and micro-hydro (which are generally very predictable) - we use Tidal or Ocean Energy. Water in the oceans is constantly moving, at different levels underwater, and never stop. These tidal and ocean currents are very strong, and are responsible for some of our plastic bags being found in Australia. Similar technology for wind, microhydro and wave energy can be used here, and is already being tested commercially.
- *Storing energy.* Fuel cells are devices that combine the basic elements of hydrogen and oxygen to produce energy and water. Many people see them as a good way to store energy from natural sources, such as solar and wind. This is because fuel cells need some energy first to produce hydrogen, which can then be made into electricity. Fuel cell technology is growing fast: some of the big motor companies want to have products on the market by 2003. Many cities around the world are already testing fuel cell engines and these engines could soon replace the noisy, polluting car engine we know so well. Fuel cells produce energy 'on tap' and can also be used as small, portable power plants (much better than pebble-bed reactors). Another advantage of hydrogen fuel cells, is that we can use intermittent (as well as other) renewable technologies to produce the hydrogen.
- *Pumped storage*. This is already being used in South Africa, but not using renewable technologies. Pumped storage this is where (usually) water is pumped up to a higher level, using energy when there is little or low demand, and then releasing it to make more energy when required - for example, at times of high demand, like winter mornings and evenings. Renewable energy is very good for this application, as it can be used whenever the resource is available, and then released when needed.
- *Gas.* Because natural gas gives off less carbon dioxide when it burns, scientists see it as a fuel which can bridge the gap between the old days of dirty coal and oil to the coming clean-energy world, based on Renewable Energy (RE) and hydrogen power. In this period of the early 2000s we are using gas for over one fifth of our global energy needs. Although gas is also a fossil fuel, it produces much less carbon dioxide than coal or oil. Southern Africa has abundant supplies of gas.

# WHAT'S RIGHT WITH POLLUTION TRADING

BY LAWRENCE H. SUMMERS, CHIEF ECONOMIST, WORLD BANK

DATE: DECEMBER 12, 1991
TO: DISTRIBUTION

'Dirty' Industries: Just between you and me, shouldn't the World Bank be encouraging MORE migration of the dirty industries to the Lesser Developed Countries (LDCs)? I can think of three reasons:

1) The measurements of the costs of health impairing pollution depends on the foregone earnings from increased morbidity and mortality. From this point of view a given amount of health impairing pollution should be done in the country with the lowest cost, which will be the country with the lowest wages. I think the economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable and we should face up to that.

2) The costs of pollution are likely to be non-linear as the initial increments of pollution probably have very low cost. I've always thought that under-populated countries in Africa are vastly UNDER-polluted, their air quality is probably vastly inefficiently low compared to Los Angeles or Mexico City. Only the lamentable facts that so much pollution is generated by non-tradable industries (transport, electrical generation) and that the unit transport costs of solid waste are so high prevent world welfare enhancing trade in air pollution and waste.

3) The demand for a clean environment for aesthetic and health reasons is likely to have very high income elasticity. The concern over an agent that causes a one in a million change in the odds of prostrate cancer is obviously going to be much higher in a country where people survive to get prostrate cancer than in a country where under 5 mortality is is 200 per thousand. Also, much of the concern over industrial atmosphere discharge is about visibility impairing particulates. These discharges may have very little direct health impact. Clearly trade in goods that embody aesthetic pollution concerns could be welfare enhancing. While production is mobile the consumption of pretty air is a non-tradable.

The problem with the arguments against all of these proposals for more pollution in LDCs (intrinsic rights to certain goods, moral reasons, social concerns, lack of adequate markets, etc.) could be turned around and used more or less effectively against every Bank proposal for liberalisation.

# PART TWO:
# SOUTH AFRICA'S CARBON TRADE DEBATE

## PROFITS FROM FRESH AIR

BY JANET WILHELM, *MAIL & GUARDIAN*, 10 DECEMBER 2004

Walter Brooke's career advice in The Graduate, 'Ben, I have just one word for you - plastics', was spot on. In the years after the film's 1967 release, plastic manufacturing boomed. But if Brooke had to counsel a confused university graduate today, the word would be 'emissions'.

The green movement has shifted from activism to careerism, with the trading of 'carbon credits' promising profits from pollution and desirable jobs in one of the fastest-growing industries - carbon management. As a major polluting nation, South Africa is well placed to benefit from the trend.

Carbon management aims to combat global warming through the reduction of greenhouse gas emissions. It embraces greater energy efficiency as well as renewable energy sources such as wind, hydro, solar and 'biomass' - fuel from waste.

When these are not possible, the aim is to offset emissions with other carbon-reducing activities, usually far from the polluting problem. Planting trees is one such activity - the theory is that the carbon dioxide soaked up by the trees will compensate for noxious gases spewed out elsewhere.

Carbon credits are a triumph of capitalism, creating a commodity from nothing - clean pockets of air that gain value through being certified. They have created a market that will be worth between $10- and $30-billion by 2008, according to London-based advisory group EcoSecurities.

The new commodity is the by-product of the 1997 Kyoto Protocol on Climate Change, which entrenches the offsetting of emissions as one way to save the planet. The protocol commits most of the industrialised world to the reduction of carbon dioxide emissions by 2012. However, to meet overall quotas, the Clean Development Mechanism (CDM) of the protocol allows countries to trade carbon credits.

**What is a credit?**

Any effort to mitigate emissions beyond the norm or to use renewable energy sources instead of fossil fuels - in short, carbon not used that would have been emitted - can be converted into a credit.

Industry in the developed world -Annex 1 nations - is set to become the main buyer of credits, mainly from developing nations, which are exempt from targets under the protocol. The argument for setting up projects in the Third World is that reducing emissions is cheaper than in the First World, and creates development opportunities for the host country.

South Africa is well placed for carbon credit projects. It is not on the Annex 1 list of countries that must reduce emissions, but is ranked among the top 15 polluting countries, making reductions here possible and profitable.

Parties to the protocol must designate a national authority for the CDM. Cabinet approved the setting up of the South African Designated National Authority (DNA) in the Department of Minerals and Energy two weeks ago. The authority's staff moved into their offices in Pretoria this week.

'Only a few legal details are now outstanding,' says Kevin Nassiep, chief director energy planning.

The financial sector is also going for the gap. Standard Bank has teamed up with EcoSecurities to provide carbon credit services. Financial services firm Sterling Waterford Securities, which has Valli Moosa, recently elected president of the World Conservation Union, as one of its directors, is releasing carbon credit notes - a promise to deliver a CER (certified emission reduction) to a purchaser at a future date.

This is in line with global trends. Trade has begun, even though Kyoto will only come into force next year. Selling is taking place on projects that have received credits but have still to be implemented.

**In the pipeline**

No local project has received a credit yet, but a number are in the pipeline. They include landfill gas to energy projects in eThekwini and Cape Town, with similar ones being considered in Johannesburg and Msunduzi (Pietermaritzburg). Mondi Kraft in Richard's Bay has a fuel-switching project that replaces a coal boiler with a biomass boiler. Another company is involved in a mini hydro-project, and one in Khayelitsha involves giving houses energy-saving upgrades through solar heating, insulation and fluorescent lights.

Eskom is also looking at possible projects, says corporate sustainability manager Wendy Poulton.

With the DNA's doors open, many more ideas are expected to leave the drawing board. But it is no quick fix. Acquiring a certificate is a complicated, costly procedure (see box).

The eThekwini landfill project is furthest advanced and is at the environmental impact assessment stage - although an agreement has already been signed with the World Bank over the sale of the credits.

Foreign government aid and private investment is set to flow in. And the sale of credits will plough back more funds. The DNA can veto any project it believes will not benefit the country or is unfairly weighted in favour of the funder. Development is a concern, and requirements for project approval cover environmental, economic and social criteria, such as job creation.

There will be plenty of work for environmentalists but, to repeat the age-old question: 'What about the poor?'

Nassiep says the hope is that jobs and money will flow into the broader community.'There are not many jobs for urban projects, but rural projects such as biomass fuel production promise lots of employment.'

As to the question of whether all this toiling will save the planet, he is more sanguine.'It's a modest step forward. But it's a start.'

**From PIN to CER**

Carbon credits are controlled by the Clean Development Mechanism (CDM) executive board, which sets the rules for trading. Projects also need approval by governments and new organisations set up to verify the trade. The following are the acronym-ridden steps that must be followed to gain a saleable credit:

Step one is a project idea note (PIN). This needs a letter of approval from the Designated National Authority (DNA). A project design document (PDD) is then drafted.

Certain projects must have environmental impact approval.

Project participants must submit the PDD to a designated operational entity (DOE) for validation. Projects pay for validation. DOEs are private sector bodies, accredited by the board. There are no accredited DOEs in South Africa at present and validation is being carried out outside the country.

The validation and PDD then go back to the DNA for a final letter of approval. This is submitted to the CDM board, which will register the project. Credits, called CERs (certified emission reductions), that will be generated in the future from the project, are saleable even before the project begins.It does not stop there. Credits are issued over a number of years, and the project is monitored throughout its life to ensure the promised emission savings happen. Regular monitoring and verification need to be undertaken by consultants accredited by the CDM executive board.

# PUTTING A PRICE ON FRESH AIR

BY PATRICK BOND AND REHANA DADA, *MAIL & GUARDIAN*, 14 JANUARY 2005

Is undue influence being exerted over government by what former Trade and Industry director-general Zav Rustomjee termed, in his PhD thesis, the 'minerals-energy complex' (big mining houses, minerals smelters, petrochemical firms, and Eskom)?

The case of global warming is instructive, particularly in the wake of Pretoria's October 2004 climate change policy, which promotes World Bank-designed 'carbon trading'.That approach endorses the idea of the right to pollute as a property right granted free to big business, and then to trade in pollution rather than reducing industrialised country emissions.

There are two troubling consequences. Instead of reducing their carbon emissions, local mining and minerals firms will continue to be recipients of vast state subsidies, especially low-priced Eskom electricity, along with public infrastructure investments like those envisaged for the proposed Coega aluminum smelter.

In addition, the carbon-trading strategy to address global warming could well exacerbate other environmental problems in centres like Durban.

This is diabolical, because energy-intensive megaprojects create very few jobs, and the bulk of their profits flow to beneficiary firms' financial headquarters in London and Sydney. They also churn out carbon dioxide at one of the highest rates in the world, making South Africa today 20 times more CO2-intensive per unit of per capita gross domestic product than even the U.S.

If the toothless Kyoto Protocol is ever strengthened, countries like China, India and especially South Africa will have to play rapid catch-up on emissions reductions. Yet subsidised megaprojects are making Pretoria's transition into a responsible world energy consumer all the harder.

In fact, an international carbon trading system is simply not feasible, in spite of government and business arguments reported by Janet Wilhelm ('Profits from fresh air', M&G, 10 December 2004). Emissions trading equates two processes which are scientifically untenable, permitting CO2 emissions to be mitigated by credits for carbon 'sequestration' (i. e. , absorbing carbon through 'sinks' such as timber plantations), 'avoided emissions' or 'emissions reductions'.

This means not only giving big minerals-energy firms an allocation of free emissions rights. In turn, the same firms will gain greater access over - and with it, the capacity to commodify - air, land, water, timber and other goods.

To illustrate - one high-profile pilot carbon trading project in Brazil involves planting eucalyptus plantations as a carbon sink. Aside from the fact that

plantations are not permanent carbon stores, there is huge uncertainty about how the biotic cycles can stabilise carbon released from fossil fuels.

In any case, about 25% of the increase in atmospheric CO2 over the past 250 years or so is a result of the destruction of forests. If anything, indigenous forests - not alien timber plantations - should be re-established and protected as part of climate change mitigation.

The 'green deserts' of eucalyptus trees favoured by carbon traders cause destruction of soil structure and release of soil carbon, displacement of people, loss of biodiversity and serious disruption of water systems.

When these trees are old enough, they are felled and turned into charcoal for the steel smelting industry, and the firm then receives additional carbon credits for substituting mineral coal. Ironically, this process leads to the production of Brazilian cars, which worsens global warming.

In South Africa, the World Bank's primary emissions trading pilot is the controversial Bisaser Road dump in Durban's (Indian/African) Clare Estate neighbourhood.

That dump emits methane which can be captured and turned into a minor amount of electricity to augment the eThekwini metro's supply. But the electricity produced costs more than double the rate that Eskom charges, so the project is not economically feasible without World Bank subsidies.

According to Carl Albrecht, research director at the Cancer Association of SA, 'Clare Estate residents are like animals involved in a biological experiment.' Cancer victim Sajida Khan documents 70% of neighbouring households with tumor cases, not to mention severe respiratory problems.

However, eThekwini intends making money off the dump when a $25 million World Bank investment begins this year. By not factoring in Khan and her community's health crisis, the Bank termed the dump 'environmentally friendly' in 2002. Because of past broken promises, Khan doesn't believe the metro council's vaguely-worded November 2004 decision to close the facility: 'They treat us like fools, but we will keep fighting.'

The Bank's Prototype Carbon Fund manages monies from 17 corporations and several carbon-intensive Western governments. Because of investments such as Bisaser Road, these polluters will face reduced pressure to cut emissions. South Africa is thus a willing co-conspirator in a farcical non-solution to the worst environmental disaster our descendants are likely to face.

Numerous alternatives exist, were governments and international agencies serious about global warming: regulation, taxation, support for existing low-fossil-carbon economies, energy efficiencies, development of renewables and non-fossil-fuelled technologies, responsible tree planting, and other strategies that do not involve commerce and do not presuppose that big business already owns the world's carbon-cycling capacity.

These alternatives should be supported by officials like minerals and energy minister Phumzile Mlambo-Ngcuka. In addition to a rethink on carbon trading, Pretoria should end subsidies for continued exploration, extraction, exploitation and burning of fossil fuels, and urgently begin to make deep cuts in carbon emissions. It should respect, not attack - as Mlambo-Ngcuka did last February - the World Bank's 2004 Extractive Industries Review, which advised the Bank to cease its fossil fuel investments. The Bank rejected the advice last August.

However, because minerals-energy-complex corporations and the World Bank have set the agenda, South Africa will probably become a leading guinea pig for what can only be described as the privatisation of the air.

# KYOTO CREDITS SYSTEM AIDS THE RICH, SOME SAY

BY SHANKAR VEDANTAM, *WASHINGTON POST*, 12 MARCH 2005

Sajida Khan, who has fought for years to close an apartheid-era dumpsite that she says has sickened many people in her predominantly brown and black community outside Durban, South Africa, was dismayed to learn recently that she faces a surprising new obstacle: the Kyoto global warming treaty.

Under the protocol's highly touted plan to encourage rich countries to invest in eco-friendly projects in poor nations, the site now stands to become a cash cow that generates income for South Africa while helping a wealthy European nation meet its obligations under the pact.

The project's sponsors at the World Bank call it a win-win situation; Khan calls it a disaster. She said her community's suffering is being prolonged so that a rich country will not have to make difficult cuts in greenhouse gas emissions at home.

'It is another form of colonialism,' she said.

Such complaints are being increasingly heard from environmentalists and even some business leaders around the world, said Ben Pearson, director of Clean Development Mechanism Watch, an Australia-based environmental group that monitors Kyoto's impact - and the criticism could be the unkindest cut of all for the treaty, which took effect on Feb 16.

In what advocates call an innovative market-based strategy, the treaty allows rich nations to avoid making some of their mandated reductions in greenhouse gas emissions by buying 'credits' from nations that pollute less, or by investing in sustainable development projects, which is how the Durban dumpsite is classified. The theory is that such investments will allow rich countries to lower the global burden of emissions and simultaneously spur transfer of clean technology to poorer nations.

But activists such as Khan and Winfried Overbeek, who is fighting a Kyoto-inspired project in Brazil, say that the world cannot barter its way out of global warming, and that there is no way to achieve a stable climate unless people in wealthy countries use fewer resources and energy - in other words, lower consumption.

The problem, said Pearson, is that the market system gravitates to such projects as the Durban dumpsite, which will generate electricity by burning methane, over environmentally superior projects such as wind farms: 'The people buying credits want to know how reliable the stream [of credits] is and how much it costs - whether it exploits local people or improves air quality doesn't make a difference to them.'

Although such criticism seemingly places these activists in the same corner as the Bush administration and oil companies such as Exxon Mobil - which have long fought Kyoto for very different reasons - these environmentalists say they want to mend the treaty, not end it.

'There is a fear that if you are criticising Kyoto, you want it to fail like the U.S. does, and that is not our goal,' said Daphne Wysham, director of the sustainable energy and economy network at the Institute for Policy Studies, an advocacy group that is critical of the trading system.'But we are concerned that the poor are being asked to pay the highest price.'

The United States strongly backed the concept of emissions trading under the Clinton administration, and environmental groups threw in their lot with the market-based approach partly because it was the only way to get the treaty approved. But the idea remained even after President Bush pulled out of the treaty, saying it would hurt the U.S. economy.

Europe 'didn't want the emissions trading,' said Robert Donkers, an environment counselor for the European Union.'We were quite cynical about it, but we have implemented it.'

The treaty establishes a barter system where the currency is carbon - global warming is linked to the buildup of carbon dioxide generated by burning coal, oil and other fossil fuels. Every developing-country project that reduces greenhouse emissions or taps a clean source of energy earns 'carbon credits' that can be sold to European countries, Canada and Japan.

Those rich countries promised to reduce their greenhouse gas emissions below 1990 levels, targets they are unlikely to meet through domestic controls. Leaders have promised to make at least half the reductions at home, and the treaty allows them to make up the difference in two ways. The simplest involves buying credits from Eastern Europe and Russia, where an economic meltdown in the 1990s shut down many old industries, reducing emissions well below those nations' limits under the treaty and giving them a large 'headroom' of carbon credits.

The Bush administration has ridiculed such trading because it will not result in any emissions reductions. Under pressure from their own environmental groups, Europe, Japan and Canada are therefore opting for the more difficult alternative: investing in clean-energy projects in poor countries. Developing countries have eagerly welcomed such investments, and some environmental advocates say the real concern is that Kyoto will have too few emissions trading projects.

'The supreme irony is that as Kyoto opens, the window of opportunity is closing,' said Ken Newcombe, who manages the World Bank's carbon finance business. Sustainable development projects need to generate credits between 2008 and 2012, when the treaty calls for Europe, Canada and Japan to make emissions cuts, he said. There are no incentives for rich countries to buy credits after that, although environmentalists expect a new round of pledges after 2012.

Among the World Bank's projects are the Poechos hydropower facility in Peru, whose credits will be purchased by the Netherlands, and a $35 million wind turbine plant in the Philippines. Private brokers such as CO2e.com are also cutting deals - one contract linked Japanese and Canadian electric utilities with a pork producer in Chile. The project captures methane, a greenhouse gas, produced by 100 000 pigs.

Jose Contardo, who helps manage a World Bank-supported Chacabuquito hydroelectricity project in Chile, said it generates 26 megawatts of clean power.'Anybody in the world will find it a good project,' he said in a phone interview.

The Durban dumpsite was an attractive target under Kyoto because, like most dumps, it emits methane, one of six greenhouse gases the treaty seeks to limit. Methane is 21 times worse than carbon dioxide in trapping heat, Newcombe said, adding that the project was supported by South African authorities and had met safety protocols. He dismissed Wysham's charges as 'technically naive,' saying the project would generate clean power, and also collect toxic gases and filter them away.

But Sajida Khan said the World Bank and the treaty do not recognise the realities on the ground where she lives. The Bisasar landfill was established by the apartheid regime in 1980 to get rid of waste from predominantly white neighborhoods in a community largely populated by Indians and blacks. No buffer zone protects the community, she said in a phone interview, adding that hazardous chemicals at the dump have given her cancer and caused numerous health problems in the area. The African National Congress once promised to close the dump, she said, but has not, and now South Africa will gain by keeping it open.

'You are talking about gaining credits and making money, but the people on the ground will continue to suffer,' she said.'My goal is to protect the community and close the site down and compensate people for their losses.'

Steven Sawyer, a climate policy adviser at the environmental group Greenpeace, defended many Kyoto-inspired projects and said they would make poor countries more economically resilient and help them leapfrog over the dirty stage of industrial development. But he criticised one emerging source of carbon credits - deals that have rich countries financing large plantations in poor countries to trap carbon biologically.

In Brazil, tracts of land are being converted to eucalyptus plantations to earn emissions credits under Kyoto, said Overbeek, a community activist at the social justice group FASE.

Overbeek said the plantations are depleting the water table and displacing poor people who depended on agriculture. Biodiversity, he added, is being replaced by 'monocultures' of eucalyptus forests that he called 'green deserts.'

'In Germany, they use five to six times more tissue paper than in Brazil,' he said.'Is it necessary? Is it sustainable? And because of that you are taking land away from people here who have to go to cities and can't find jobs.'

# DOUBLE-EDGED SWORD OF THE KYOTO PROTOCOL

BY RICHARD WORTHINGTON, *GLOBAL DIALOGUE*, AUGUST 2005

'Carbon Trade' is a generic term that covers a wide range of activities, from modest intra-national transactions in countries where absolute caps on greenhouse gas emissions have been translated into caps[1] for economic sectors and individual plants, to the massive package deal initiatives between institutions such as the World Bank (through their Prototype Carbon Fund – PCF) and governments of developing countries. Carbon trading has been incorporated into the Kyoto Protocol (KP) of the United Nations Framework Convention on Climate Change (UNFCCC), through inclusion of three flexible mechanisms, but there are also initiatives that seek to operate outside of this multi-lateral agreement, generally to its detriment.

In keeping with the principle of common but differentiated responsibilities established in Rio in 1992, the KP stipulates emissions reductions only for the most industrialised countries, as listed in Annex 1 of the Convention, during its first commitment period of 2008-2012. The first two mechanisms (Emissions Trading & Joint Implementation) apply to activities between Annex 1 countries. This article will focus on the Clean Development Mechanism (CDM), which provides for trade in 'carbon' – shorthand for avoided or reduced greenhouse gas emissions – between the industrialised Annex 1 countries and developing countries, which do not have emissions caps.[2]

The twin objectives of the CDM are to support sustainable development in non-Annex 1 countries - the South – while assisting northern countries to comply with their caps. It is important to note that the KP puts in place a legally binding international system, with a compliance system to monitor and ensure that countries fulfil their commitments. Politically, it has succeeded in making climate change a priority issue within the international agenda for co-operation, development and trade, with an emphasis on equity in dealing with the problems linked to climate change. It has also stimulated national policies and measures requiring accounting of greenhouse gas emissions and promoting energy efficiency and renewable energy technologies.

However, there are significant weaknesses to the 1997 Kyoto agreement as well as loopholes in the rules covering the CDM. First is the low level of initial reduction commitments by Annex 1countries: only 5,2% over-all, from the benchmark year of

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[1] Caps are quantified emission limitation and reduction commitments.

[2] There is not space here to discuss the perversities of current emissions allocation systems within industrialised countries, whereby polluting corporations are freely granted 'rights' to pollute, which may then be sold to other companies should the recipient not need these allocations – e.g. if a power company generates less electricity than anticipated in the allocation.

1990. This assumes 7% reduction by the USA and a limited increase of 8% for Australia, both of which have since reneged on the agreement, reducing the over-all cap. The protocol is just an initial step towards climatic stabilisation, requiring that reductions will be progressively stepped up over succeeding 5 year cycles - the Intergovernmental Panel on Climate Change (IPCC) has recommended global reductions of 60-80% against 1990 levels. Negotiations concerning the second period are due to start this year.

Second is that trading is allowed to meet up to half of northern commitments, a compromise on the meaning of "supplementary" action that was negotiated 4 years after Kyoto, along with the inclusion of 'sinks' projects, whereby sequestration (take-up of carbon dioxide) through land use, land-use change and forestry activities is counted as emissions reduction (more below). The KP provisions emphasise the need for the transfer of new and additional resources from North to South, specifying transfer of ecologically sound technologies and funding in their own right, and a Special Climate Change Fund was established. However, with no additions to the €uro420 million pledged to the fund when it was established in 2001, it seems increasingly clear that carbon trade is now seen as the main vehicle both for mobilising finance and introducing more advanced technology in developing countries.

This is not only a failure to honour the spirit (or at least the rhetoric) of negotiations in 1997, when the compromise of including trading was sweetened with talk of other pathways for technology transfer and direct funding, including for adaptation activities (rather than the current arrangement where the Adaptation Fund is reliant on a levy on the CDM). It is also an abdication of responsibility by governments – another example of power being transferred to corporations in the name of 'market forces' – whereby the task of driving a change from business as usual is left to vested interest groups that are profiting handsomely under current practices. Thus provisions for trading, particularly through the CDM, undermine the efficacy of the KP as a global response to climate change.

Nevertheless, most developing countries have embraced the prospect of foreign direct investment offered by the CDM, particularly rapidly industrialising countries such as South Africa (with a high emissions profile that provides plenty of scope for reductions). Earning CDM finance for a project requires that Certified Emissions Reduction units (CERs) – the 'credits' that can be sold – are certified by the international Executive Board through one of its Operational Entities (essentially the auditors of CERs), which must be satisfied that the CDM component is additional to what would have happened under business as usual, i.e. that the reductions would not have taken place without the revenue generated through the CERs.

Strict additionality tests for CDM projects should serve to exclude projects that do not involve substantial improvements in technology or practices (e.g. energy efficiency) in developing countries, which will also put upward pressure on the

price of credits and thus the over-all potential revenue for developing countries. However, many countries and carbon brokers (including the PCF) are more interested in quantity of credits than the quality of projects (consistent with the current low price of credits being traded) and are seeking to weaken, rather than strengthen the mandate of the Executive Board.

Chemical process projects provide an example of the dilemma: nitrous oxide is a more potent greenhouse gas than carbon dioxide and is therefore incinerated at most facilities, but at a South Korean plant where this is not the case, many millions of credits might be generated by incinerating current nitrous oxide emissions, thus undermining the global market. Developing country governments are showing no sign of collective action to increase the price of carbon (the concept of a sellers cartel has attracted little interest), but are rather competing to sell their 'low-hanging fruit' – i.e. to generate CERs through cheap and easy emissions reduction opportunities.[3]

It is up to individual countries to determine whether a proposed project will contribute to sustainable development, through a designated national authority to approve CDM projects. International competition for shares of the CDM market will not encourage a rigorous national process. This raises the possibility that negative environmental and social impacts at the local level may be justified or ignored in the name of reducing atmospheric (global) impacts, to which a monetary value has been attached, particularly where there are no standards or effective enforcement regarding local impacts.

If CDM is to benefit local communities in addition to the project developers, it is crucial that strict criteria are applied to national approval, taking account of the full range of impacts as well as the distribution of benefits. An example of the complexity of this problem is a landfill project where methane will be collected (rather than simply vented – as a greenhouse gas methane is about 23 times as potent as carbon dioxide) and used for electricity generation, thus also displacing coal-fired generation emissions and extending the operational life of the landfill. A local community expecting closure of the landfill, from which toxic fumes are (allegedly) damaging health and childhood development, do not feel that revenue for the landfill operator and cheap carbon credits for atmosphere polluters in the North justify prolonging their misery.

The inclusion of 'sinks' projects in the CDM is perhaps the most contentious element of the CDM. There is still a high degree of scientific uncertainty in calculating the amount of carbon that is sequestered through such activities, the definition of forestry includes single species plantations that have detrimental

[3] There is thus little prospect of the CDM supporting a significant increase in renewable energy use, or even energy efficiency, under current market conditions – the price of carbon would need to be many times its current value to make a substantial contribution to sustainable energy. However, agreements regarding the second KP commitment period could change this dramatically.

impacts on ecosystems and the time-span of projects is 3 to 10 times shorter than "off-set" greenhouse gas emissions will remain in the atmosphere. It also encourages a land use, with accompanying water use (which is greatest for fast-growing trees that sequester carbon rapidly), that often conflicts with local needs and projects include a contractual obligation to maintain the carbon 'sink' that effectively passes control of vast tracts of land to the northern buyer of the credits.

Another perverse impact of the CDM is that some developing countries are more reluctant to introduce policies and measures that directly mitigate climate change while delivering local benefits, such as mandatory energy efficiency standards for low-cost housing or preferential finance for solar water heating, for fear that potential CDM projects would then fail the additionality test. This is really a matter of perception, since the Executive Board, which will hear appeals against Operational Entity decisions, has repeatedly noted that mitigation measures introduced since 2000 may not be used to disqualify projects.

Despite the flaws of carbon trading provisions under the Kyoto Protocol, it is schemes for carbon trade not bound by the rules of the multilateral system that pose the greatest threat to potential benefits of the system. Parties to the Protocol should renounce alternative trading schemes proposed by rouge nations such as the USA or opportunistic brokers such as the PCF and independent speculators. There are certainly alternatives to carbon trade, including a proposal for an international emissions-based currency, that offer more equitable ways to allow markets a role in reducing emissions, but non-Kyoto compliant trading would reduce the already meager gains of the Protocol.

If carbon trade is to contribute to, more than it compromises, efforts to reduce net greenhouse gas emissions, more rather than less rigorous additionality criteria are needed. If it is to benefit developing as well as industrialised countries, co-operative measures are needed to drive up the price of carbon, bringing it closer to the costs of emissions reductions in the Annex 1 countries. If it is to benefit local communities as well as polluting industries, national project approval should require inherent and guaranteed social and environmental benefits.

# A NEW SOURCE OF AFRICAN FINANCE

BY MEGAN LINDOW, E-AFRICA, SEPTEMBER 2005

Innovative countries are starting to finance new projects through the Kyoto treaty, which allows industrialised nations to cut emissions by paying for pollution reduction in the South.

By all accounts, the Bisasar Road Landfill in Durban is an unsavoury place. Plunked in the middle of an Indian suburb more than 20 years ago, the site spreads the odour of rotting garbage over the surrounding community and emits thousands of tonnes of harmful methane gas into the atmosphere each year.

Strange as it may seem, though, the stench may turn out to be the smell of money - if a controversial carbon financing deal signed last year between the city and the World Bank gets off the ground. At the inaugural Carbon Expo held in Cologne last June, Durban's Landfill Gas to Energy project became the first in Africa to be financed through an emerging global market in carbon credits.

The 1997 Kyoto Protocol on Climate Change entered into force on 16 February this year and is giving rise to a new market for trading the kind of 'hot air' spewing from Bisasar landfill - specifically so-called greenhouse gases, such as carbon and methane, which trap solar heat in the atmosphere and slowly raise the earth's temperature.

**Free-market mechanisms**

In its earliest phases, the treaty commits industrialised signatory countries to cut their greenhouse gas emissions in 2012 to an average of 5,2% below 1990 levels. Heavy penalties await those who fail to comply. While industrialised countries can do much within their own borders, the treaty's Clean Development Mechanism (CDM) - one of three carbon-trading provisions outlined in Kyoto - allows industrialised countries to meet part of their obligations by financing projects in developing countries that achieve reductions in greenhouse gas emissions, and then claiming the certified emissions reduction credits (CERs) generated by these projects as their own.

The Durban project is made possible by an agreement to sell 3,8 million tonnes worth of certified emissions reduction credits (CERs) for $15 million to the Prototype Carbon Facility, a World Bank project funded by industrialised country industries and governments to promote the CDM.

The Durban Landfill Gas to Energy project would lead to emission reductions in two ways: first it would capture the methane gas that is produced by rotting garbage

in three city landfills, including the Bisasar Road facility; and then by feeding the gas into a generator to produce electricity, the landfill project lessens demand on the city's dirty coal-generated power, according to Lindsay Strachan, who is project manager for the Department of Cleansing and Solid Waste.

To Strachan, the deal promises not only to generate much-needed revenue for the city, but has also sparked new interest in alternative and renewable forms of energy around the country and on the continent. In a country like South Africa that is struggling to reduce poverty, fight AIDS and boost economic growth, he says, government has no money to spend on simple methane capture technologies that have become standard in Europe.

'What's happened is that suddenly this project could stand up on its own two legs, but without the CDM it never would have happened,' he said.'CDM has really paved the way for sustainable development to happen in this country.'

Consequently, as industrialised countries scramble to find the easiest and most cost-effective ways of reaching their targets, experts say, industries and governments alike in the developing world are seizing the opportunity to transform their dirty emissions into bankable assets.

In South Africa, major industrial polluters and small-scale social development organisations alike are looking to attract carbon financing. Strachan has been advising cities such as Maputo and Kampala on the potential of landfill gas recovery projects. Mining and fuel companies are hoping to obtain financing by switching their operations from coal to cleaner-burning natural gas. Even the South African government's Working for Water programme - which pays the unemployed to rehabilitate denuded land - is looking into obtaining carbon credits by planting eroded farmland with a native shrub species, the spekboom, that absorbs unusually large amounts of carbon.

The logic of the CDM is two-fold: Firstly, it allows developed countries to spend less on achieving their targets, by investing in developing countries where environmental standards are typically less advanced, and therefore cheaper to improve upon. Secondly, it provides an impetus for developed countries to transfer cleaner, but costlier, technologies to developing world industries that otherwise couldn't afford them - thus enabling countries to pursue their development more sustainably.

'The developed world essentially pays for the developing world to get sustainable technology at a much sooner stage,' says Johan van den Berg, who is CEO of the carbon-trading consultancy CDM Africa Solutions, based in Cape Town.'Essentially, you get more emissions reductions for the same money.'

But if this emerging system of carbon finance offers the potential for development in poor countries, critics also insist that the CDM has equal scope for inflicting harm on the poor - and even to the treaty's broader aims of curbing climate change - if it is not implemented properly. Kyoto is described by some critics as a

complicated experiment in harnessing the free market system to curb global climate change - the product of lengthy and painstaking compromise between politicians, big business and environmentalists, all with widely diverging agendas.

The protocol hinges on the use of carbon-trading as a mechanism designed to allow countries to meet their targets with maximal efficiency, proponents say. This inherent free market structure ensures that while national governments bear ultimate responsibility for meeting their targets, virtually anyone - industries, governments, or multilateral institutions like the World Bank - can take part in emissions trading. Most countries are passing their requirements on to the private sector by issuing emissions quotas, called Assigned Amount Units (AAUs) to each specific industry - which in turn distributes them among individual companies.

Under this system, an energy company in Europe, for example, can in theory choose to earn its own CERs by cutting emissions at home, or it can buy them from another First World company that has a surplus of CERs to sell, or it can enter into an agreement to purchase them from, say, a South African power plant that is switching from dirty coal to cleaner natural gas. No matter which route it chooses, each tonne of greenhouse emissions to be saved earns one CER.

In theory, CERs are just another financial instrument. Not only can they be used to satisfy emissions reduction requirements under Kyoto, but they can be bought, sold or kept for the future. The beginning of this year saw the launch of the EU Emissions Trading Scheme, which allows European countries to trade allocations with one another, while carbon exchanges are being planned and opened around the world in countries such as Brazil, Japan, Singapore and Canada, which experts say could soon be linked in a global system of exchange.

As the reality of Kyoto hits home, fuelling demand for cheap sources of carbon credits around the globe, the carbon economy is growing more robustly than anyone expected, says Van den Berg.

The volume of greenhouse gas emissions credits traded globally rose from 78 million tonnes in 2003 to 107 million tonnes in 2004 - a 38% increase, according to the World Bank's *State and Trends of the Carbon Market 2005* report. And the price of carbon - which had fluctuated between $6 and $13 per tonne - has soared to new highs of $30 per tonne in recent months.

All told, the CDM can only be expected to claim a small share of all this market activity, experts say, as the treaty makes clear that all carbon-trading must be supplementary to cutbacks achieved at home. Nevertheless, it could have big impacts in countries like South Africa that face increasing pressure to achieve their economic growth needs in an environmentally-sustainable manner.

According to the Norwegian consultancy group PointCarbon, the CDM is expected to attract between $24 billion and $37 billion in environmentally sustainable investment to the developing world by 2012. Given the hot market so far, Van den Berg says, that figure will probably grow even higher.

But if the theory of CDM seems relatively simple, the practicalities are infinitely more complex. The system is governed by an international body called the Kyoto Executive Board, which sets the rules for participating in the scheme, maintains a registry of all approved CDM projects, and accredits firms that independently measure and monitor these projects at every stage.

Each CDM project must first be approved by a government-run Designated National Authority in its home country; then it must line up financing, be validated by independent auditors, register with the Executive Board, and then undergo a verification and certification process in order to receive CERs. Since most CDM projects by definition require up-front financing to begin, investors usually fix a price for CERs long before they are earned or issued.

Only one project so far is actually registered with the Executive Board - a landfill methane recovery project in Brazil - which is an indicator of the intricacy of CDM. The Protocol allows CERs generated from the year 2000 onwards. Even now, says Van den Berg, CDM deals tend to be highly speculative and involve a lot of risk for investors. There are no guarantees that a project will actually generate the CERs agreed to, or that these will ultimately be admitted to the investor country's CER registry. And even the CERs themselves only exist in theory, as none have been issued yet.

In most cases, the project host and investor agree up front on a price for the carbon credits, with the purchasing institution paying up front for, perhaps, 10 years worth of carbon credits at a fixed price, often assuming the risk of the project in exchange for a reduced price for the credits.

**Dirty industry**

In spite of such uncertainties, South African officials have hinged their plans of achieving future sustainable development on attracting CDM investment. A National Climate Change Response Strategy released last year by government, for example, identifies the CDM as an important lever for shifting the economy away from dependence on cheap but dirty coal. As soon as 2012, the country will face mandatory targets under Kyoto, government officials have warned, which will render coal far too costly an alternative.

Ironically, the country's wealth of dirty industry is precisely what makes it such a potentially attractive destination for CDM investors, Van den Berg says. While there may be limited potential for CDM investment in other African countries like Kenya and Namibia, which already have large clean energy sources like hydropower, South Africa desperately needs to find alternatives to coal, which supplies 90% of the country's electricity.

'South Africa has a very dirty electricity grid,' says Van den Berg.'Our per capita emissions are much more like a developed country than a developing country. Working from this relatively poor position, it's quite easy to improve on that.'

With foreign investors being drawn to the kinds of projects that achieve the largest emissions cutbacks for the lowest prices - the 'low-hanging fruit,' as the experts say - South Africa has much to offer.

Even so, it is a relative late-comer to the carbon-trading party, government officials acknowledge. While China, India and Brazil - all abundant potential sources of cheap carbon credits - have aggressively pursued CDM investment, and collectively account for 58% of all global transactions so far, the Durban project remains one of only about a dozen in South Africa that are in various stages of the approval process by the Department of Minerals and Energy (DME).

Richard Worthington, who is coordinator of the South African Climate Change Action Network, says this abundance of easily exploitable projects on the carbon market threatens to undermine the integrity of the treaty, by creating perverse incentives for countries and companies to keep polluting in order to attract investment, as well as by keeping carbon prices so low that only the cheapest and easiest projects that deliver large volumes of carbon credits remain viable.

Ironically, the CDM can also effectively transfer the impacts of dirty industry from developed to developing countries, he says.

US author Daphne Wysham writes, on the website for the organisation CorpWatch, that all too often CDM projects serve to undermine, rather than help, sustainable development: 'Critics charge that carbon trading is a smokescreen. At best, it is designed to attain "carbon neutrality" - representing no net growth in emissions for a country or industry, but doing so cheaply. At worst, it may make the warming climate even less stable, while robbing the poor of their rights.'

Other critics say the system will be open to abuse in developing countries which lack the monitoring and enforcement capacity to ensure that projects are carried out in a sound and sustainable manner.

According to Worthington, the bar was not set high enough in the 2002 Marrakesh Accords to the treaty, where the rules of CDM and the project categories to be allowed were set. As a result, the kinds of projects that are viable under current market conditions often offer dubious environmental benefits at best, he says.

According to the 2005 World Bank carbon-trading study, for example, the types of alternative energy and efficiency projects favoured by environmentalists account for less than 5% of all CDM projects. The most common categories, on the other hand - hydroflourocarbon emissions, methane capture and landfill gas recovery, biomass energy production and hydropower - often do little to further genuinely sustainable development, he argues.

The inclusion of carbon sinks - forested or agricultural areas that absorb carbon dioxide from the atmosphere - under CDM has been particularly contentious. Many

scientists say that not enough is known about carbon sequestration to determine sound methods of accounting for and verifying how much carbon the sinks would actually absorb. Nor can they predict the extent to which carbon absorbed into the soil would actually remain there.

The Durban Landfill Gas to Energy project exemplifies the debate over whether CDM serves the needs of the global poor, or forces them to bear the brunt of reducing greenhouse emissions for the greater good - while the west carries on with business as usual.

To Sajida Khan, who lives across the street from the Bisasa Road Landfill, the dump once symbolised apartheid-era discrimination that lumped non-white communities with all the landfills and heavy industries that whites wouldn't have in their own backyards. The community has fought for years to have the dump closed, also claiming that they have been exposed to toxic chemicals that have caused cancer clusters in the neighbourhood. Instead, Khan says, the city has ignored locals' complaints and forged ahead with the project.

Now, the scheme faces an uncertain future. Khan has appealed against it, arguing that it will prolong the life of the dump and expose the community to increased pollution locally from the generators, while failing to make a difference globally.'This will cause harm to people at an international level too,' she says.'Selling these credits to northern industries is going to give them license to increase their emissions there, and so people in the north who live around these industries will suffer too.'

**What is carbon trading?**

Under the Kyoto Protocol, each industrialised country is assigned a legally-binding greenhouse emissions quota, which it must meet or face penalties. To make the process efficient, the treaty allows polluters who fail to curb their pollution sufficiently to purchase CERs from another company that produces a surplus - or from a project in the developing world that earns CERs under the Clean Development Mechanism of the treaty. Carbon trading has been conducted on an experimental basis over the past few years, but the treaty's entry into force on 16 February 2005 is quickly ensuring that a brisk trade in hot air becomes inherent to the process of curbing emissions globally.

**How are quotas distributed?**

Each industrialised country has been assigned an emissions quota (the EU was assigned quotas as a block), and has compiled a registry of polluting companies. These companies must effectively apply for permission to pollute from the government, and are allocated specific individual emissions quotas from year to

year. A country's targets were determined roughly by calculating the volume of fossil fuels it consumes; however it determines each company's individual quotas based on its current levels of emissions, and the scope for improvement. The quotas are designed to collectively curb a country's emissions to below 1990 levels, but each company or industry's specific allocation is a matter of complex negotiations with government.

**What is the time frame?**

Sue Lund, Senior Transaction Advisor at the South African National Treasury's PPP Unit, said the South African government learned from the experience of the prisons contracts about how to improve its ability to leverage private finance for infrastructure projects.

The Kyoto Protocol has three commitment periods, which will introduce progressively stricter limitations on greenhouse gas emissions. The first, from 2005 to 2008, is effectively a test period in which industries are expected to make the first strides in curbing their emissions. The second, from 2008 to 2012, sets targets for signatory countries of reducing their emissions by about 5,2% below 1990 levels. The third, which begins in 2012 and is still under negotiation, will involve even stricter emissions caps, and may introduce mandatory targets for developing countries such as South Africa.

**How does a free-market system for carbon trading achieve the aims of the treaty?**

Kyoto is the world's first legally binding treaty on the environment. The treaty structure holds governments accountable for meeting their emissions reduction targets, but also encourages them to harness the free market to do so through their industries. The result is a system where the EU and individual countries bear ultimate responsibility for meeting the targets, but the actual cutbacks are largely achieved by industry - whether through carbon-trading or employing cleaner technologies at home. Carbon-trading is governed by strict rules under the treaty, but the flexible mechanisms such as the Clean Development Mechanism are turning the 'hot air' trade into a big business as well. Independent carbon brokers are cropping up and earning hefty commissions through structuring these deals, and even the World Bank has emerged as a leading carbon financier in the developing world, through its Prototype Carbon Fund.

**How are the quotas enforceable?**

Countries are required to have registries, in which they account for how their targets are met under the treaty. Each tonne of greenhouse emissions to be saved earns an

Certified Emissions Reduction (CER) credit, and is admitted into a country's registry only after it has been certified by an independent auditor. The treaty introduces fines for not meeting emissions reduction targets of 40 Euros a tonne during the first commitment period, and 100 Euros a tonne during the second, and also adds a penalty of 30% for the next commitment period.

**Why the Clean Development Mechanism?**

The Clean Development Mechanism (CDM), one of the treaty's three market-based mechanisms, was conceived as a way to allow industrial countries greater flexibility in meeting their emissions targets, while at the same time transferring cleaner technologies to developing countries so they can build cleaner technologies into their own economic development programs. Thus, investors can identify projects in the developing world that will reduce emissions, and negotiate an agreement with the project developers to purchase the CERs generated by the project.

**Who participates in the CDM?**

Typically, a local project developer identifies the potential for CDM in a particular project, and seeks an investor through a carbon broker, a direct investor like the World Bank, or through his home country's Designated National Authority - the national body established to oversee CDM transactions in the country. So far, the World Bank has been a key investor in the developing world, and a key proponent of the CDM. The Bank's Prototype Carbon Fund - a body funded by national governments and industries in the developing world - acts as an investor in CDM projects, for which it will earn CERs that can later be sold on the open market.

**How does a CDM deal work?**

Every CDM project has to go through a process of approval, monitoring and validation in order to earn CERs. First, it must be approved by the Designated National Authority in its home country; then it must obtain overseas financing; undergo validation by an Operational Entity - an auditing firm recognised by the Kyoto Executive Board; obtain approval by the Executive Board; and have the carbon savings accrued during the project's lifetime verified and certified by the Operational Entity.

Dozens of projects around the world are in various stages of laying the groundwork for participating in CDM, but only one project so far is formally registered with the Executive Board.

**The Chicago Climate Exchange**

The Kyoto Protocol may be the first global environmental agreement, but it isn't the first attempt at creating a market for hot air. The Chicago Climate Exchange (CCX), a voluntary big-business initiative to curb emissions, pioneered by 28 large American corporations such as Ford and DuPont, opened in early 2003. The scheme involves participants making legally binding pledges to reduce their emissions, and provides for trade between members, along the same lines as Kyoto, to achieve this.

The CCX has been criticised for having a limited scope: participation is voluntary - though legally binding - and members pledge to curb their emissions by a modest 1% or more each year. But the scheme is working. More than 70 new participants have entered the exchange since it launched - and they are not just companies, but also universities, NGOs and cities. Analysts have also hailed the CCX as an important first step in getting American industry to act on climate change. The US pulled out during the Kyoto negotiations, but most environmentalists recognise that the treaty is unlikely to succeed in the long run, unless the world's largest greenhouse polluter comes back on board.

Initially a pilot project designed to run until 2006, the CCX recently announced that it would extend the scheme to 2010. Participating company American Electric Power announced that its participation in the scheme would lead it to reduce or offset about 46 million tonnes of carbon dioxide emissions during both phases of the scheme.'The members of the CCX have achieved real and significant reductions in the greenhouse gas burden, while proving that an emissions reduction and trading programme works,' says economist Richard Sandor, who spearheaded the CCX.

**A struggle to the finish for smaller projects**

Emily Tyler, who handles climate project transactions for SouthSouthNorth, a development organisation specialising in CDM projects with headquarters in Cape Town, says that the market structure of the CDM, combined with the current low price of carbon, makes it difficult for smaller sustainable development projects to attract funding. The Kuyasa Housing CDM Project, run jointly with the City of Cape Town, recently became the first project in Africa to be registered with the CDM Executive Board. The project neatly satisfies the criteria of the CDM, and even won third prize in April 2004 at the PointCarbon 'Carbon Insights' Conference in Amsterdam for the best CDM project. But its small scale, and intensive use of relatively costly renewable energy technologies, has proved an obstacle to getting the project off the ground, Tyler says.

The Kuyasa project will involve retrofitting 2,309 of the tiny matchbox houses the government builds for the poor with insulated ceilings, solar water heaters and

energy-efficient lighting. Designed to bring low-cost and energy-efficient services to the poor, while simultaneously reducing their use of dirty power, the project is also the first in the world to be validated against a Gold Standard methodology for CDM projects, developed by environmental groups. The Kuyasa project would earn 132,300 carbon credits over the next 21 years, which, at current market value, would only pay for 15% of the upfront capital costs of the project, Tyler says. The resulting gap in funding has held the project back.

Environmentalists and community groups complain that under the current pricing scenario, only the large-scale, inexpensive projects that concentrate on reducing large volumes of greenhouse gases such as methane are viable. The robust prices seen on the European market have yet to trickle down to developing countries, where CDM projects generally require upfront capital, experts say. Much-needed projects in areas like transportation are being pushed aside in favour of this 'low-hanging fruit' - the projects that are easier to do and earn lots of credits, Tyler says.

'The market-based emissions trading system is designed to find these cheap projects, but unfortunately what is happening to the renewable energy projects - the projects that change the way we do things in the economy - is that those projects are being pushed out initially by the market,' Tyler says. For the time being, SouthSouthNorth has many potential buyers interested in the carbon, Tyler says, but none will commit until the rest of the financing falls into place. As a result, SouthSouthNorth is trying to find other sources of financing for Kuyasa in order to continue developing it as a CDM project, in hopes of getting a better deal in future, when the market is better and the project is further along. As it is, investors tend to be wary of getting involved in high-risk schemes, Tyler says, and may be willing to pay a premium for the credits once the project has made progress.'By developing the projects further prior to the sale of the credits, the price (of carbon) increases,' she says. But finding other sources of funding can be just as tricky. Normally, Kuyasa would be a good candidate for overseas development aid, but the rules of CDM don't allow that.

In the end, the Department of Environmental Affairs and Tourism has agreed to put up a large chunk of the funding. Meanwhile, Tyler says, it is only a matter of time before all the low-hanging fruit gets snapped up and the cheap supply of carbon credits dwindles, driving carbon prices higher and creating room in the market for the more sustainable development-focused projects like Kuyasa.'If the (carbon) price was four times what it is at the moment, we would have far less of a problem,' she says.

# AN APPEAL FOR ZERO WASTE

BY MUNA LAKHANI

As we move along the slow road to reduced emissions that are contributing to climate disaster, it has become obvious that CDM is a failure - trade in waste has never been proven to work, so why should it be any different with "air" waste?

There are no reductions to speak of, and none likely - the low hanging fruit are being picked (HCFC's and landfill gas) with little or nothing in the way of Renewable Energy for our communities. If memory serves me correctly, those were the reasons why so many initially supported Kyoto/CDM, while some of us were wary of using the same approach to get us out of a mess that created the mess in the first place: overconsumption, no reductions, etc.

It is time we relooked at what we are supporting - it has become abundantly clear that nothing works towards emissions like real emissions reductions - allowing more pollution that is offset by less elsewhere is silly (no nett reduction), and when that same "clean air" is resold many times, then it makes a mockery of the process.

Think of the environmental and social justice issues first, before you think of more trade - people are sick and dying, while the CDM and the Gold standard play on the sidelines. Let us use all our collective and creative energies on real solutions, that genuinely benefit people of the South, and let us not take responsibility for the pollution of the north - do we wish to continue to be the dumping ground of the North, as is happening with nuclear waste in Somalia, Eritrea, Sudan and Mozambique?

Join the international call for real reductions, and let us not continue to be colonised mentally by those who think that trade in waste works. The reformist agenda has failed. Zero Waste works, nothing else has.

# PART THREE:
# DEVILS IN THE CDM DETAILS

## DURBAN'S PERFUME RODS, PLASTIC COVERS AND SWEET-SMELLING TOXIC DUMP

*BY TRUSHA REDDY*

Sajida Khan is a soft-spoken, dignified but intense Durban resident who opposes the World Bank's methane-to-electricity project at the Bisasar Road Landfill. Her passion is fighting - and almost palpably winning, now - against awesome forces, including environmental racism, global warming and international economic power.

It is a story that needs telling. But not before another - more personal - story, one which merges seamlessly with the history of the municipal dump whose closure Khan has been fighting for years.

In 1980, Bisasar Road Landfill in the Indian suburb of Clare Estate officially opened its gates to rubbish-dumping trucks. I was just three years old at the time and living in the suburb next door. During the course of my entire childhood, the Bisasar Road landfill was a regular topic of discussion, as my mother and I made trips to visit my grandmother nearby.

Clare Estate was the bridge between our familial residences. I vividly remember the preparations, as we hit that short stretch. Car windows had to be rolled up. Nostrils had to be squeezed tight with tiny, pincer-gripped fingers. Breaths needed to be held. The stench was reminiscent of my public school toilet on a really hot Durban day.

I would also marvel at the big houses on the hill lining the road on the opposite side of the dump (we lived in a block of flats). They stood majestically like something out of Fitzgerald's *Great Gatsby*, in sharp contrast to the huge stinking dump right in from of them. A few houses were owned by one of the wealthiest Indians in Durban, my mother used to boast, as if they were members of our own family.

I could never quite work out why rich people would live right across from a refuse dump. Little did my premature mind comprehend that everyone, including the rich Indian, could only live in an area designated under apartheid's Group Areas

Act. Since Clare Estate had a large quarry, it was deemed unsuitable for white people. Indians were allocated that area.

A few years after the opening of the dump at the site of that quarry, I remember my mother excitedly telling me that the Bisaser Road facility would be shut and transformed into a park for the community. As a child whose life was spent riding a bike around our tar-covered parking lot the idea of a park in our vicinity was just too thrilling.

**Perfume and toxics**

It's now 2005 and I'm 27 years old. We live in a non-racial democratic South Africa today. But Clare Estate's notorious dump is still there, although approaching it, I notice something very different.

The stench has changed markedly, into a kind of 'mutant funk', as comedian Jerry Seinfeld describes the combination of body odour and perfume deodorant. Bisaser Road landfill now exudes the stink of dump rot mixed with an artificial sickly-sweet smell, emanating from long 'perfume rods' lining the road on the outer rim of the landfill. These rods were installed to merely mask the fumes arising from the dump; but the effect is quite nasty. Again I pinch my nose.

This time, instead of driving past, I enter one of the Gatsbyesque houses on the hill, Khan's residence. The city councilor in the area had just announced to the media that the landfill was, finally, to be closed. So again, as in my youth, I felt almost ecstatic at the thought of this old dream now coming true.

But there is more to the story than met the nose.

Khan welcomes me warmly into her home. Her lounge is framed by glass doors overlooking the entire landfill below, and beyond to the informal shacks and formal homes directly adjacent to the landfill, and a technikon campus at the bottom end of the dump. Just out of eyesight are two primary schools, a secondary school and a home for the safety of abandoned children, all in close proximity to the Bisaser Road dump.

Apartheid's racist rationale for the location of the dump in an Indian residential area, even one with nice homes like Khan's, was obvious enough. But the location of dumps is a class issue as well: low-income, powerless people ultimately bear the consequences of over-consumption by higher-income groups.

'You should have come earlier', Khan tells me.'They were dumping sewage. Humph, the smell!' According to its original permit, Bisasar Road Landfill was a domestic waste site. Yet Khan reports that the dumping of sewage sludge is a daily occurrence, and is apparently included in Durban Solid Waste's contract. This is a violation of water law, which requires sewage sludge to be transported and disposed off in such a way as not to cause any odour or health hazard.

It is not only sewage sludge that contravened the law and caused offence, Khan argues. Medical supplies and industrial waste from Mondi (the paper mill), Huletts (sugar factory) and other industries in the nearby industrial area of Springfield are also regularly dumped there. In February 2001 a large shipment of rotten eggs exceeding 22 000 tons was also dumped, Khan recalls.'When combined with the stink of the sewage sludge, this made life extremely uncomfortable for the residents.'

To exacerbate the situation, according to Bryan Ashe of the NGO EarthlifeAfrica, South Africa's dumps only became landfills in the 1990's when new laws were being introduced. This meant, in effect, that rubbish was never recycled, treated and extracted, because dumping was the cheapest option for industries. That, in turn, has given rise to the challenge of extracting the methane that is formed by the rot of decades' worth of garbage.

**Closure – or a new threat?**

Most importantly from the perspective of Khan and her neighbours, I ask, might Bisaser finally be closed? Khan ridicules the newspaper article I had read. According to her, the source cited for the announcement, one Councilor Bechoo, is the source of community outrage, because he refuses to support efforts to win full closure of the dump. In fact, Bechoo was asked by the community to retract his statement and they were expecting to see it in the next edition of the newspaper.

Khan explains that the closure was officially declared a 'pro-forma closure' or 'partial closure'. Raymond Rampersad, Head of eThekwini Cleansing and Solid Waste, was quoted by the *Daily News* as saying the landfill was going through 'various stages of closure. That means it will only be shut down in about seven years, with a limited area remaining open for the recycling of specific non-smelly wastes such as builder's rubble and garden refuse.' Khan sees the council's move as 'playing for time', part of a deliberate attempt to mislead the public.

A new dumpsite for the catchment area's waste is proposed in Buffels Draai, but it will only be ready to accept Bisasar's volume in 2012. Buffels Draai is also located much further away from the city centre and thus Bisasar would remain a 'transfer site'. According to Khan, the rubbish that cannot be compacted will be left there to rot.

Khan's own research revealed that neither the local nor national branch of the Department of Water Affairs and Forestry had received a permit application from Durban Solid Waste (DSW) to close the dump, even though the local water system is affected by such a decision.

Khan recalls the council's long history of false promises to the community that it would close the dump. After reneging on a promise to close the dump in 1987, the council announced, 'The remaining life expectancy of the dump tip site is nine

years.' The town clerk then led the community to believe that the dump would indeed be turned into a recreational and sporting site. However, in 1996, the city again broke its promise, and another operator's permit was granted, without community consultation.

Public reaction was swift, as people blocked the site entrance of the dump, held demonstrations and marches, and circulated a petition to council that gained 6000 signatures. But nothing worked, so Khan decided to take legal action on behalf of the residents and schools.

As the battle raged, a wealthy white-dominated suburb to the north of Durban was quickly closing its landfill. Umhlanga, situated at the shore's edge and expanding into rolling sugarcane-covered hills, was 'earmarked for up-market property development,' according to Bryan Ashe. The rubbish tip, along with waste from other closed landfill sites elsewhere in Durban, was rerouted to Bisasar Road. Attempts to increase dumping in the African township of Inanda were met by community protests, including the stoning of Durban municipal trucks. Bisaser again received an added inflow.

Khan shows me the area the council said it would return to the community after the partial closure: two small strips of land on the Bisasar Road dump's outer edge. I ask about plastic covering that was lining some of the terrain. She urges me to inspect it carefully. Indeed, nursery plants are still intact in plastic pots, lying on plastic sheets rolled out several weeks earlier.

According to Khan, these are meant to create the public impression, however tenuous, that the soil is rehabilitated and that plants are indeed growing there. They stand in stark contrast to other, wilting plants in the same area but that are submerged in Bisaser Road soil. Khan explains that the proposed plan to turn the area into a recreational zone is also ridiculous, because after a dumpsite is closed, it cannot be used for another 30-50 years due to decommissioning requirements.

The city also tries to divide the African and Indian people in the area, she says. African people moved into the area when the Apartheid laws relaxed. They live in informal shack housing, some surviving by scavenging off the dump because of the high unemployment rate. The city's main concession to them was to build a few pitlatrines and chemical toilets on the edge of the settlement, abutting the road. These don't appear hygienic or, for women, particularly safe.

The immediate short-term interests of very desperate poor people are thus being posed against those of the other neighbours, although it is the lowest-income people who will no doubt suffer the most severe health and safety problems in the medium-term if the dump remains open.

As she stands up, Khan bats away a nagging fly.'If you cook you have to close everything,' she points out. At the beginning of 2003, DSW management gave residents insecticides 'Baythroid' and 'Bayt' to combat the debilitating fly problem. Complains Khan, 'This will cause even more harm to the environment.'

Khan's sister emerges from the kitchen to interrupt our conversation, warning that she is going to be late for her appointment with the doctor. Clutching a bag of medication and her car keys, Khan apologises and ushers me to the front door. Khan was diagnosed with cancer in 1996. Her nephew died of leukemia.

In fact, seven out of ten households in this downwind area of Clare Estate have reported tumour cases, and it is entirely probable that dump emissions are the culprit. According to studies, the limits of waste emissions considered potentially hazardous were exceeded at Bisasar Road many times over: hydrogen chloride by 50%, cadmium by 200%, and lead by more than 1000%. Limits for suspended particulate matter were also exceeded.

As the waste decomposes, there are additional concentrations of methane, benzene, toluene, trichloroethylene and formaldehyde. Further cause for worry comes from a New York State Health Department Study, which shows that women living near landfills have a four-fold increased susceptibility to cancer.

Having hoped so deeply for a new beginning and the end of the toxic dump, I leave feeling more than a little deflated. Beyond the fakery of perfume rods and plastic covers, I want to find out why Bisaser Road has suddenly become what the World Bank actually terms an 'environmentally friendly' pilot project, for the creation of a global greenhouse gas market.

**Climate crisis**

My next port of call is municipal waste official Lindsay Strachan, whose title is Manager of Engineering and Projects. Strachan has been intimately involved in the methane-to-electricity project, and is based on site at the Bisasar Road Landfill.'It's where the action is', he insists.

Strachan enthusiastically launches into the mantra of climate change doom that we are all getting accustomed to hearing in the media. There is every reason to be alarmed, he convinces me:

- 'Continental shelves are breaking off the size of Manhattan.'
- 'The president of the Maldives is worrying about his island going under.'
- 'Rising sea levels means the waves are a meter higher.'
- 'The increase in temperature gives rise to hundreds of types of diseases.'

So what can be done? The global establishment is divided:

- the US, Australia and a few other retrograde countries simply refuse to address global warming;

- the manic-growth industrial zones of China and India – as well as slow-growing South Africa - are not prepared to adopt more energy-efficient economic development strategies; and
- most of the global elites endorsed a deal hammered out in Kyoto, Japan, in December 1997, that had taken ten long years of deliberation, like an elephant birthing a mouse.

The Kyoto Protocol, which formally came into effect on February 16, is indeed a mere mouse in the evolution that our global society must urgently make, merely to survive. China, India and South Africa are not even pushed to change anything, as Kyoto now stands.

According to Heidi Bachram of the Oxford-based NGO network Carbon Trade Network, the Kyoto Protocol contains 'inadequate targets to reduce (greenhouse gas) emissions'. A key UN scientific advisory board, the Intergovernmental Panel on Climate Change confirms that Kyoto's targets for reducing emissions (5,2% by 2012) are miniscule compared to the 50 –70% reduction required to merely stabilise the existing concentrations of gas in the atmosphere.

Nevertheless, the signing of Kyoto and its even slower ratification by 156 countries are hailed as successes. Many environmentalists endorse it, because it is considered at least a first step towards more substantive change.

Even though South Africa ranks amongst the top twenty greenhouse gas polluters in the world, it was considered a 'developing' country, and hence was not listed by Kyoto as a target country for emissions reduction. Strachan explains, 'Our dustbins need to be filled before they can be emptied.'

Needless to say, Strachan avoids extending the metaphor: South Africa's wealthy communities have already overflowing dustbins, and low-income black people are left to rummage through these, in desperate search of thrown-away items of even minimal value. This is a particularly poignant issue in Bisasar Road, given how many people nearby survive by scavenging at the dump.

Still, Kyoto worries Strachan: 'What are we going to do about carbon trading, emissions reductions. Do we do something like Kyoto advises? Our president is saying, "Where is this project? Where is any project? Where's anything? Where can you show that X tons are being reduced by SA?"'

But Kyoto has a catch that concerns more probing ecologists. The emissions 'reductions' may actually occur in a form that leaves the world without any substantive reduction. To attract US support, which then never materialised, Kyoto negotiators agreed to the idea of market-based emissions trading.

The compromise is the Protocol's Achilles Heel, for it allows a major polluter to continue emitting carbon dioxide, but with an offset in the form of a carbon 'sink', or some other contribution to lowered emissions elsewhere. This strategy, says

Bachram, 'is likely to undermine these already weak targets and exacerbate global injustice in the process'.

Strachan sees carbon trading through more optimistic eyes: 'Let's have a flexible mechanism. Make it such that if profit makes you thrive, let's make it profitable to reduce emissions.'

This flexible, profitable mechanism allots carbon credits to projects like Clare Estate's Bisasar Road methane-to-electricity conversion. The credits can be purchased by industrialised countries and corporations, as a way of avoiding the reduction of their own emissions. Hence if a polluter over-pollutes it can buy credits from a polluter who had under-polluted.

But likewise, if a polluter (like Russia) under-pollutes (because of post-Soviet deindustrialisation), it has an incentive to sell credits – which are called 'hot air' - to an over-polluter. This means that there will be a tendency to pollute up to the maximum Kyoto allows, rather than achieve declines in leaps and bounds, which we all must do if we are to avoid heating up the atmosphere. In other words, the permissible ceiling for carbon emissions will, with this mechanism, become a floor.

In late 2004, when I began looking more deeply at this complicated world of economics and nature, the *Mail & Guardian* newspaper (10-16 December 2004) declared the merits of emissions trading: 'Carbon credits are a triumph of capitalism, creating a commodity from nothing – clean pockets of air that gain value through being certified. They have created a market that will be worth between $10- and $30 billion by 2008.'

The UK was the first country to establish a national market in greenhouse gases. Though the British Treasury provided more than R2 billion worth of incentives for emissions trading, the New Labour government shirked its commitment to increase energy supplied by renewables by 20%.

With this sort of official support, the carbon trade lobby has succeeded in getting the market off the ground. According to Strachan, 'In the last two years there was suddenly this birth of carbon traders. They never existed before, something like 400 000 carbon trading companies in the world. It's unbelievable.'

One such firm is even run with the support of the former South African tourism and environment minister, Valli Moosa, who in November was elected the president of one of the world's most important ecological agencies, the IUCN. The carbon trading lobby certainly appears formidable, especially with the World Bank playing a central role.

**Banking on the carbon market**

The Bank introduced its Prototype Carbon Fund (PCF) in 1999 in order to provide investment outlets for industrial country governments and corporations, ostensibly on behalf of 'Clean Development Mechanisms' (CDMs) in the Third World. A quick $180 million (more than R1 billion) was injected to finance projects such as the methane emissions extraction next to Khan's house. Her catastrophic fate, and those of others in

similar projects, was to be used as the clincher in thousands of business deals being brokered around the world.

Strachan is excited. Ahead of the World Summit on Sustainable Development in 2002, he says, there was already 'a big rush to get South Africa on the map'. Durban, in particular, decided 'to take the lead', with Mayor Obed Mdlaba and City Manager Mike Sutcliffe at the helm. City officials soon realised that their own goldmine could be unearthed from landfills like Bisaser Road.

And so it was that a $15 million deal to launch a CDM project was signed with the PCF and given the 'thumbs up', says Strachan, in October 2003. If it becomes operational, landfill gas will be collected from three sites in Durban, and methane (a harmful greenhouse gas) will be converted to electricity, and then supplied to the grid.

No one is against extracting the methane from the rotting garbage. But Durban officials say they won't go to the trouble of doing so without the $15 million subsidy, because the electricity generated in the process costs so much more per kilowatt hour than Eskom charges for its coal-fired power.

There are a host of technical and environmental objections raised by Khan in her 90-page critique of the World Bank's project, as well as the need to reverse the history of racist dumping which implicate so many wealthy Durban residents in Khan's cancer. But morality aside, the extraction of dangerous methane should be happening anyway, Khan agrees, so long as no further rubbish is brought to Bisasar Road.

And hence what bothers Khan is that the Bank's interests are now in keeping the dump open as long as possible, so they can make more money off rotting and often toxic trash that turns into methane and produces electricity. More cancer in Clare Estate is good for the World Bank's budding business, Khan concludes.

The documents appear to back her up. According to the Bank's baseline study, 'The production of methane can theoretically continue in excess of 30 years… Bisasar is sized and operated to be used for up to 15 more years.' Bisasar Road Landfill averages 4000 tons of waste dumped each day, an amount that 'will continue to increase in the near-term'.

So, if the Bank business plan is followed, not only will the dump *not* close, but the flowthrough of waste and the emission of toxins will actually increase. Khan's suspicions about the Council's inclination to break promises were confirmed when she looked into the PCF's 'crediting period'. The project opted for a seven-year crediting period, with the expectation of renewing it twice. So, in this scenario the project's lifetime rose to 21 years.

The final nail in the community's coffin came from the World Bank's baseline scenario which indicated that, 'because of the growing waste generation per capita in the municipality…there is no plan to close… the Bisasar Road site…during the PCF project life.' If the World Bank has its way, Khan may be fighting this dump for the rest of her life.

**Community costs and benefits**

In response, Strachan is adamant that the community will benefit from the project. Landfill gas comprises 50% methane and the gas wells (some of which were already installed because the gas was currently being flared) will suck out all that gas and convert it to electricity thus making the air safer to breathe.

Khan is not convinced, because the World Bank's own Monitoring Process document for the project reveals that whilst most of the gas emissions will be combusted in the engines for generation of electricity, some of the gas will still be released into the atmosphere and burned in flares.

Furthermore, the Bank concedes that the tools for measuring how much gas can actually be converted to electricity are highly uncertain. Engines and flares combust the landfill's gas with different efficiencies. A Bank document even admitted, 'It is unclear with which portion the gas from project wells is either flared or utilised.'

Although the World Bank says it will monitor this process at monthly intervals, a footnote (the small print) gives away the game: 'Not all methane collected will thus be converted into CO2 but a small portion will be emitted as methane into the atmosphere.' The community's already damaged lungs will be further clogged with landfill pollution, not merely the scent of perfumed rot.

Strachan also tries to convince me that the electricity generators will be placed on the site where the dispersion model shows it will cause the least harm. But the community is located all around the dump, I point out. His rebuttal is that the combustion process will spew out an equivalent amount of emissions to a rush-hour's worth of traffic on busy Umgeni Road (the major throughway at the bottom of the dump).

Khan disagrees, and pulls out a huge stack of reports for reference. She calculates that each year, the generators will pump out 95 tons of nitrogen oxides, 319 tons of carbon monoxide, 323 tons of hydro-carbons and 43 256 tons of carbon dioxide. Carbon monoxide reduces the oxygen-carrying capacity of the blood; nitrogen oxides are a respiratory irritant and exacerbated asthma; and carcinogens such as benzene and butadiene could be found in hydrocarbons.

Other dangers abound. Improvement of ground water and air quality are listed as World Bank priorities, yet one report confessed, 'It is difficult to provide the environmental safeguards that assure safety of the local population…' The Bank also concedes that the project might 'adversely effect the value of the land holdings surrounding the landfill site'.

Strachan's assurance that CDM projects have very stringent ecological controls is contradicted by PCF projects which are receiving a response similar to Khan's, in Brazil, Argentina and Thailand. In the Brazilian case, for example, a tree plantation that was not indigenous to the area is being grown to help finance a corporation, Plantar, which in turn will burn the trees into charcoal which will be used in an iron

smelter to produce more cars. Not only was community consultation deeply flawed, the whole logic simply falls apart under scrutiny.

Job creation was another pro-community rationale for the Bisasar Road experiment. However, there are plans for only 70 new positions (50 unskilled) over the 15-year lifetime of the project, hardly impressive for what may be a R100 million investment.

Part of the community distrust can be traced to DSW's history. For example, Khan points out that DSW is already flaring dangerous gases in Bisasar, instead of redirecting them into nearby gas piping. The city, which prides itself on its advanced attitudes, simply does not require gas capture and flaring from permit holders.

It is just one of the ways that Durban officials show an acute awareness about the costs that landfill operators would incur, and disdain for the health risks to the public.

**Consultation turns into intimidation**

But the power of the people has yet to be tested, and here a surprise appears to be in the offing.

Strachan assures me that consultation is central to Bisaser Road's Environmental Impact Assessment (EIA). Indeed, in all documentation, the World Bank emphasises the merits of consultation with affected communities.

Khan prepared thoroughly for this particular battle. As she wrote in a letter of complaint to the World Bank, neither the Clare Road City Councilor nor DSW management ever discussed the project's implications. But nor did the Bank take consultation seriously, for the time allocated for objections in late 2004 was a mere 10 days. More disturbing, consultation was to be conducted through the Bank's PCF website. According to Bachram, 'This shows that the PCF is woefully out of touch with the reality of a community living around a waste dump.'

But in jujitsu activist mode, Khan suddenly turned the flawed consultation process to her advantage. She filed a vast formal complaint, filled with technical environmental, health and social analysis. In November, Bank staff came to visit Durban to check on the project. Suddenly the fruits of Khan's labours became visible, as three newspaper articles described her problems, and as she and her supporters – local and even international - began flooding the Bank with complaints which were sufficiently substantive to cause widespread concern in the PCF crowd.

After sensing the rising grassroots anger, Bank officials and their financial backers began to seriously consider withdrawing from the project, Strachen admits.'Now the World Bank has given us a quick visit last year. We're talking about businessmen as well, we're talking about people who need to assign their money to projects,' he says.'They were probably

thinking, "Consult all you want but hell can't you hurry it up a bit. We only have 60 years on this earth!"'

Perhaps Khan's rebuttal, had she overheard, would be similar in frustration: 'Hell, can't you hurry closing the dump? At least your children have 60 years to live. My cancer-ridden body only gives me just a couple more years.'

Stachan later informed me that the World Bank's 'quick visit' resulted in a deadline imposed on the government to sort out the situation: December 2005. The city may fail to meet the challenge. In a follow-up interview by phone, Strachan confesses to me that the appeals process is 'rotten… We're being held hostage by a single person.'

Does Khan have any alternatives to suggest? One is to use the money going to the cost of the project to close the dump and create a buffer zone.'The city can afford to pay us replacement value for our homes and for damages, since the estimated costs of the project are greater than R120 million,' insists Khan.

Another idea is to pump the gas to the Petronet gas pipeline running past the site, instead of converting the landfill methane directly to electricity.'This would cost very little compared to the project cost,' says Khan.

Strachan's rebuttal sounds politically correct, yet doesn't quite make sense: '[What] if something goes wrong with this pipeline? If the land subsides or they do something funny with their pipeline, what happens to our gas? We rather opted for something whereby we sort it out on site, in our own home. That's an onsite solution. Don't send the problem to someone else's backyard and tell them to sort out our methane. We think it's very irresponsible. The world thinks it's very irresponsible.'

But to act as a front for investors who want to avoid their emissions-reduction obligations is far less responsible, I'm thinking. Instead of World Bank carbon trading, the more genuine solutions would be to impose strict government regulations against excessive greenhouse gas emissions, and introduce community-based power generation systems that use renewable, environmentally-friendly technologies.

Maybe what's obvious simply cannot be put on the agenda, because of these vested interests. I'm learning just how political this process has become. For example, research by Heidi Bachram shows that these sort of projects regularly ignore the problem of over-consumption by 'voracious rich minorities', the people and industries who caused the environmental mess-up that we were in today.

And that leads logically to a manipulated process of blame-shifting to the Third World, as the preferred international elite strategy. As Khan puts it, 'The poor countries are so poor they will accept crumbs. The World Bank know this and they are taking advantage of it.'

Bachram also argues that industries involved in buying credits to offset their emissions will simply continue to pollute, to the detriment of the communities in which their factories are based.

Engen, for instance, is a notoriously bad neighbour nearby in South Durban, and on the night of January 18 the entire residential community of at least 50 000 people was stunned by

an enormous explosion at the local refinery. These sorts of companies will continue to emit carbon and encourage unsustainable petrol consumption as long as it is profitable.

Bachram concludes, 'Communities like Clare Estate and South Durban will see no real benefits from emissions trading and in fact will be the victims of even more pollution.' In short, emissions trading represents 'carbon colonialism', she contends. The introduction of property rights to pollute the air means that whoever controls carbon credits effectively controls the atmosphere.

But where there is colonialism, there is also resistance. Khan's detailed rebuttal to the carbon trading project has slowed the process of approval. There are so many flaws in Durban's PCF proposal that she thinks she may win. She has certainly intimidated her opponents, and – like Julia Roberts of Erin Brokovich movie fame – is becoming a quiet kind of role-model heroine for me.

Strachan, meanwhile, is at first philosophical about what appears to be an impending defeat.'The first project in Africa is literally slipping through our fingers,' he says.'Stopped in its tracks. Completely.'

So instead of investing in Durban, the Bank PCF team appears to be forging ahead in Latin America, the Middle East and even Uganda, with Strachan helping as a consultant. In Kampala, the municipality will 'rake in R300 million on their project,' he tells me.'South Africa probably won't be able to say that we spearheaded the CDM market or better still we spearheaded the emissions reductions market. There is disappointment, but such projects will go on elsewhere.'

Because of Khan's appeal, the city is losing R20 000 each day, says Strachan, and he is obviously very frustrated: 'Her objection is 90 pages thick. She was invited by the World Bank to Milan to learn about clean development mechanisms.' In fact, Khan tells me later, two environmental groups – Carbon Trade Watch and the TransNational Institute - funded her 2004 trip so that more people around the world might understand the dangers of carbon trading. It was her teaching the World Bank, not the other way around.

Strachan continues, 'When an objection goes through the minister we have to spend money, time and effort… People are looking at the past. Not the new.'

But what is really new? It's a new project, with new money, and it also may be new feeling for white South Africans to be 'patted on the back' – as Strachan himself put it - by the big financial agencies and corporate players, for being first in Africa to implement a multimillion dollar carbon trading deal.

Even if at great cost, the resistance offered by communities – especially courageous grassroots women like Sajida Khan - was finally successful against colonialism and apartheid. We may be watching something quite formidable again.

# PROTEST OVER DUMP SITE PLAN

BY JUGGIE NARAN, *SUNDAY TRIBUNE HERALD*, 23 JANUARY 2005

'We don't want to hear, see or know anything about the proposed dump site. As far as we are concerned, you can take this to La Lucia or to the City Hall, but not anywhere near where we live.'

This defiant message was given by the residents of Asherville and surrounding areas to Pravin Amar Development Planners, at a meeting arranged by the eThekwini Department of Cleansing and Solid Waste at the David Landau Community Centre on Thursday.

The topic was an environmental scoping study of the proposed transfer of the Bisasar Road dump overflow to Electron Road, adjacent to the Makro store in Springfield.

The angry reaction from the more than 100 residents made it clear they would not entertain plans of another dump site near their homes. Speakers voiced their fury at the plans and the meeting ended dramatically, with most of the residents walking out. Pravin Amar, the facilitator, began the meeting with an impressive overhead projector display announcing the programme for the day.

And that was the only slide that remained on the screen.

The attack was started by Asherville Ratepayers Association stalwart, Swaminathan Gounden, who told the meeting that they should not allow what had happened at the Bisasar Road Landfill Site - which had been forced on the residents of Clare Estate by the 'white racist municipality' - to repeat itself there.

This was echoed by civic activist Ashwin Desai, who described the proposals as 'nothing but environmental racism', warning residents not to be sucked into a process they would later regret.

'We must fight them from the outset. If they want another dump site, tell them to go to La Lucia or other affluent areas.

'It is ridiculous for the city fathers to even think of developing a dump site near the homes of poor people whose lives are being put on the line by toxins and other environmental hazards.

Desai was joined by environmental activist, Sajida Khan, who has been at the forefront of the battle to close down the Bisasar Road Site.'Among the organisers of this meeting are the same people who were responsible for the disaster at Bisasar Road during the days of apartheid. We have now taken this issue to the High Court and my warning to the people is that they must not allow what happened at Bisasar Road to happen again,' said Khan.

Asherville Ratepayers Association vice-chairman Amar Ramlochan said, 'There has been no transparency or negotiations with the residents over this issue. We will, if necessary, take this matter to the highest court in the country.'

The final word went to Ratepayers Association chairman, Pravin Ram, who said, 'You are no doubt aware that the Bisasar Road site has been the subject of much controversy and tensions between the erstwhile Durban City Council and the community.

'Much of what the Clare Estate community has had to endure has been a consequence of apartheid planning.

'In this 11th year of our democracy, the new-found democrats appear to be resistant to correcting the injustices of the past. In fact, their insistence on protracting the issue of the non-closure of the site forthwith is something that is likely to lead to confrontation in the present circumstances.

'There have been litanies of correspondences and struggles that have gone on in an endeavour to have the site closed; yet there appears to be an insistence that this scourge be reinvented in different guises and incarnations.'

Ram told the meeting that a petition protesting against the proposed dump site had already been signed by 520 residents and the organisation had the support of the three schools in the area.

It would appear the message of the residents had reached the facilitator, Pravin Amar, who said, 'Taking into consideration the mood of the people, it would appear this matter will have to go back to the drawing board.'

# A NEW DUMP AT BISASAR ROAD: IMMORAL, STUPID MOVE

*SUNDAY TRIBUNE HERALD* EDITORIAL, 23 JANUARY 2005

A person walking down the street falls into a hole. That's an understandable accident. The next day the person falls in the same hole again. That's stupidity. If it happened a third time, that would be reckless.

eThekwini Department of Cleansing and Solid Waste must surely fall into that third category.

Not having learned the lessons of dumps such as the Bisasar Road site in Durban, they are seeking to put in place another one not far away. Akin to falling into the hole yet again.

The council needs to seek alternatives, including long-term ones. Recycling has not yet been shown to make a profit on a large scale.

That is the problem: 'profit' should not mean only monetary gain. Health problems and pollution all cost money, but are harder to quantify and so ignored.

Other sites will be out of the city and will cost more because of the distance travelled. But it is money worth spending.

Community health and the right to clean air are nowhere more savagely ignored than at the Bisasar Road site. The stench is horrid from kilometres away, and unimaginable for those bordering it.

Apartheid was an excuse for many bad decisions. But there is no excuse for the immorality of putting dumpsites in the middle of a city, much less for the stupidity.

## BISASAR COMMUNITY BUY-IN?

BY REHANA DADA

If the eThekwini municipality's disregard for the health and well-being of the residents of Clare Estate is surprising, even more so is the support from elements of the nearby Kennedy Road community for a project that would increase and extend their discomfort. On closer examination, we must ask whether that support is based on false expectations of the CDM project's alleged benefits.

In 1980, the white-run Durban municipality required a cheap, nearby dump for landfill waste. They didn't look further than a valley in Clare Estate, and certainly didn't feel obliged to ask the predominantly Indian community if they would mind the nasty stench of rotting rubbish.

At 50ha, the Bisasar Road dump is the largest in Africa. Up to 5 000 tons of trash comes onsite on a busy day. This much rubbish generates a substantial volume of landfill gas from normal decomposition: 7 000 m3/hour (cubic metres/hour). This much gas - nearly all of it methane and carbon dioxide - means that Bisasar is responsible for about 25% of Durban city's greenhouse gas emissions.

Hence drawing out that gas and reducing it to something less potent seemed like a brilliant way to tap into World Bank Prototype Carbon Fund finance, as well as a way to reduce eThekwini's contribution to climate change. According to Durban Solid Waste engineer Lindsay Strachan, the best way is to burn the gas to generate electricity. With methane 21 times more potent as a greenhouse gas than carbon dioxide, reducing NH4 to CO2 is considered a CDM project worthy of a significant World Bank investment.

When I visited his office in the course of filming a documentary, Strachan assured me that this project could only bring benefits to the community: reduced odours, many many jobs, putting Bisasar on the world map.

But community activist Sajida Khan has managed to halt the project - at least for the moment. In addition to her fears that the CDM project would prolong the life of a dump that she has spent years campaigning to shut down, burning the landfill gas would result in new toxins being released into the already-poisoned air. Flaring would increase 15-fold under Strachan's scheme, and whatever filters Durban Solid Waste proposes installing would never entirely contain the aromatic hydrocarbons, nitrous oxides, volatile organic compounds, dioxins and furans that would be produced - and no doubt emitted.

However, around the corner from Sajida Khan, community leaders speak out sometimes quite vehemently in favour of the project, citing wildly inflated benefits that they have heard will accompany the World Bank investment. In the not-

particularly-wealthy Sydenham Heights across the road and a bit from the dump, Jeannie Noel talks of 'helping our government'. An ANC supporter who is concerned about the image of the political party she supports, Noel strongly defends the municipality's right to continue using the dump, even saying that she does not find the smell offensive.

Alongside her, Frances Naidoo voices the greatest faith in her government, arguing that 'Somebody won't just do something if it's going to harm somebody… Look at Wentworth, people have been living for 30 years there and there's an oil refinery there'. Not only did Naidoo tell me that '200 jobs' will be created - and that her own sons might be employed - she also believes that the electricity price in her area will be reduced.

In the definitely-not-wealthy Kennedy Settlement practically on the slopes of the dump, Nonhlanhla Mzobe talks of jobs for everyone and 50 bursaries for engineering thanks to the CDM project. Having spent her childhood on the Bisasar dump alongside her mother who generated an informal income based on dump "recycling" initiatives, Mzobe sees Bisasar Road as a source of wealth rather than a polluting mass of rot. She is currently employed by Durban Solid Waste as the manager of a somewhat more formal recycling initiative that allows up to 20 people to scavenge on the site each day.

Although Kennedy Road community leader S'busiso Zikode's expectations of the social upliftment benefits of the CDM project are more realistic - five bursaries, improved infrastructure, a handful of jobs (estimates confirmed by officials) - he still expects that roughly R6 million will be spent entirely in his community. He anticipates libraries, better roads and a jump-start to a long-awaited housing supply, rather than personal benefit. He also believes that opposition to the CDM project comes from wealthy people who have no concern for the poor: 'What we have identified is that the people who want to stop this project are the high-class people, the people who got it all… If it means that only a few people are going to benefit, it means a lot to us, it means a lot to someone who is not employed.'

Zikode and his wife are both working and yet live in a shack. However, it is electrified, has two bedrooms, a comfortable lounge and separate kitchen with standard appliances. They have their own outside toilet – which requires some high-jumping over the stairs - but for water they rely on one of the four taps a few hundred metres away, which supply the entire settlement. Ironically, next to the dump itself, there is inadequate refuse removal. Durban Solid Waste still refuses to supply the community with the regulation black bin bags so that the rubbish strewn around the settlement can be taken a few meters away to the landfill.

Walking through this community of about 5 000 people, it's rather easy to understand how promises of a R6 million investment can shift their concerns away from long-term health, towards short-term basic needs. Whether those needs will be even slightly met by the CDM project is highly questionable.

Roughly 10% of the investment would be spent on 'sustainable development' of some sort. While Lindsay Strachan talks of housing and job-creation, the money technically becomes available only when the carbon credits are generated and sold. The World Bank has apparently agreed to make part of that R6 million available upfront. Chances are that the money will be spent 'somewhere' in eThekwini. Although city manager Mike Suttcliffe has reportedly conceded that it will be spent in Ward 25, the area around the dump, as yet there is no plan on how to spend it - or even where to spend it.

Meanwhile, instead of merely chasing the dream of a windfall from the potential registration of Bisasar as a carbon trading pilot, Zikode and his comrades have begun peaceful mass marches against their Durban councilor, Yacoob Baig, a former National Party politician accepted by the ANC. Some concessions have already been won. The most recent march, on 14 September, was accompanied by this memorandum to Baig:


Source: Indymedia

We the people of Ward 25, democrats and loyal citizens of the Republic of South Africa, note that this country is rich because of the theft of our land and because of our work in the farms, mines, factories, kitchens and laundries of the rich. We can not and will not continue to suffer the way that we do and so we unite behind the following demands:

For too long our communities have survived in substandard and informal housing, and for too long we have been promised land, only to be betrayed. Therefore, we demand adequate land and housing to live in safety, health and dignity.

Our communities are ravaged by poverty, and we demand that the government create the jobs that we so desperately need. Therefore, we demand the creation of well-paying and dignified jobs.

Those of us in municipal flats find that in addition to providing substandard housing, the council charges rents way in excess of our community's ability to pay. Therefore, we demand the writing-off of all rental arrears.

The government treats us with contempt, believing that because we are not rich, we have not earned their respect. Therefore, we demand participation in genuinely democratic processes of consultation and citizenship.

Our communities are affected by crime, police racism and serious environmental hazards. Therefore, we demand safe and secure environments in which we can work, play and live.

Many in our communities suffer from illness, and the scourge of HIV/AIDS affects us all. Therefore, we demand well-resourced and staffed health facilities.

Our young people are the future of our community, yet they have very few choices. Therefore, we demand attention to the needs of our communities' youth. The exclusion of the poor from school and other opportunities for educational must stop.

Those of us in municipal flats find that the council charges unaffordable rates. Therefore, we demand lower rates in municipal flat buildings.

Amongst those of us who are connected to water and electricity many can not afford the costs of these services and face disconnection. Therefore, we demand that these services be made free for the poor.

We are entitled to decent social services in our communities. Therefore we demand these services, including proper sanitation, refuse collection, community gardens for our poor, and support for orphans especially those in child headed households

Furthermore, just as people from around the city and the country are uniting in support of our struggle we express our support for our comrades elsewhere. We have stood with, and will continue to stand with our comrades in Chatsworth, Crossmoor, Marianridge, Merebank , Shallcross and Wentworth in their fight against the Ethekwini Municipality's attempts to evict them from their municipal flats. We will also continue to stand with the people of South Durban in their struggle against environmental racism; with poor students facing exclusion from technikons and universities and with comrades all over the country fighting for land, housing, work, education, healthcare, safety and democratic development. At this time we note with particular concern the threats directed against Fred Wagner of the Eastwood Community Forum in 'Maritzburg and declare our full support for Fred and for everyone who is persecuted for standing up for the rights of the poor. We also express our full support for the Western Cape Anti-Eviction Campaign before their mass rally in

Khayelitsha on 17 September. We affirm that their struggle to resist eviction from their homes and to win basic services is just. We stand with them against the repression of their legitimate struggle.

Finally, for his failure to work with his constituents to meet our basic needs, for putting local business interests ahead of those of the poor and for treating the poor and popular democracy with contempt, we therefore demand that Councillor Yacoob Baig, a career-politician with a history of working for apartheid, announce his resignation within two weeks. We further demand that if Baig does not resign we, ourselves, will declare that Ward 25 does not have a councillor.

# BELLVILLE'S 'SOCIALLY SUSTAINABLE' DUMP

BY MPUMELELO MHLALISI

What's going on at the Bellville dump? South Africa is not fostering sustainable development. So far, people on the ground are uninformed about the dangers of the Clean Development Mechanism. It's only the officials on the project who know what's going on. It is absurd to call this a 'socially sustainable' project given this situation.

As a member of the Environmental Justice Networking Forum, I focus on waste management and renewable energy education and am closely involved with the communities affected by the proposal to capture landfill gas for electricity at the Bellville dump. I don't think it's working. I don't think we should be pro-CDM. Engaging in CDM won't make a difference to global emissions reductions and therefore won't make a difference to the people most affected.

When I think about climate change I think about future water shortages, and how these are a present threat through cutoffs. The city forces people to reduce the amount of water they are using mostly in the poor areas like Khayaletsha and Gugulethu, and people who are dependent on agriculture for survival are directly affected - crops cannot grow as well as expected or on time, and harvesting is disrupted.

We need to subsidise people who are using renewable energy, instead of promoting the idea that CDM money will flow in through the international carbon market.

But there is a lack of political drive. To assist, we should be educating our politicians. One route is the greening of parliament. I'm not talking about planting green trees, but about changing their mindset through education, engaging them in these debates.

# SASOLBURG'S FILTHY AIR

BY CAROLINE NTAOPANE

Not surprisingly for a town named after a heavily polluting industry, Sasolburg is one of South Africa's air pollution hotspots. It suffers unacceptable atmospheric levels of pollutants such as benzene and emissions of thousands of tons of volatile organic compounds, sulphur dioxide and hydrogen sulphide. With a population of about 138 000, initially migrant labourers from Limpopo, KwaZulu-Natal and Mpumalanga, the town is a major centre for the chemical industry - agricultural, mining and industrial.

Sasol, the industry around which the town was built some 50 years ago, is the main culprit responsible for the toxins in the air. It manufactures synthetic fuel and agricultural chemicals, and owns many of the other chemical industries in the region - none of whom provided information or support for community members whose health was affected.

Even though my aunt and many of the people I know suffered eye irritations and respiratory and sinus problems, they do not know the full risks or the link to industrial emissions. I currently live about 100m from Sasol, and the chemical smell constantly assails me. It's a personal issue that made me campaign against Sasol. People have known all along that these chemicals made them sick but they didn't know how.

When the environmental organisation groundWork came into our community to share information and provide support, I started to mobilise people and raise awareness. When you talk to people they say 'Sasol is a big company, there's no way we can fight'. But you don't have to be a scientist, we are just making sure that the communities have a way in so they can do something to stop the big companies.

Although numerous environmental campaigns were attempted over the years, most lasted only as long as it took for the leaders to get jobs - usually at Sasol. People are sick and people are not working - there is 60% unemployment and Sasol is still using the contractors to hire people. People are employed for a month or perhaps a few months and when the contractors are done they are again left jobless.

The community has suffered the health and pollution costs but Sasol is hiring people from outside. People living next to Sasol are not benefiting. With the introduction of the bucket brigade with groundWork's help, the Sasolburg community took charge of testing the levels of chemicals in their air. The first test in 2002 revealed a dangerous cocktail of 20 chemicals, 15 of which were lethal toxins.

Despite Sasol's announcement of their intention to reduce their emissions of benzene and other toxins, they are not yet committed. Tests in July 2005 show that

benzene levels are higher than ever.

There is very poor capacity in our municipalities to monitor and police industries. Perhaps the Air Quality Act that is now in place will ensure cleaner air. This is a process but we are hoping that because of the new act - if it is implemented well by the department – some of the issues will be addressed.

Pollution levels from Sasol are set to be reduced thanks to the company's diminished coal resource and their new natural gas pipeline from Mocambique. Gas is a cleaner burner than the sulphurous coal that South Africa seems to prefer for domestic use and in this case was a more sensible option for the company than trucking in coal from other mines or building a new highly controversial mine. But despite making a profit on the pipeline, Sasol is attempting to pass this off as a Clean Development Mechanism project, claiming that it would not be affordable without carbon financing.

Even though this project does reduce carbon emissions by 6,5 million tons annually, it should fail as a CDM project because the company is not doing anything it would not have done anyway. Affected communities in Mozambique were consulted, but other than this, the Sasolburg community is comfortable with the gas pipeline. People are quite happy because the pollution is going to be reduced and also the health problems are going to be reduced.

However, Sasol has been telling people that the pipeline is going to lose money. The community is being led to believe that this 'expensive' option was chosen mainly out of concern for the health of the people. Once again, the community has been excluded from discussions around the CDM component of the project, and aside from a few of us, we do know anything about CDM.

# LOW HANGING FRUIT ALWAYS ROTS FIRST:SOUTH AFRICA'S CRONY CARBON MARKET

BY GRAHAM ERION

**Introduction**

With climate change posing one of the gravest threats to humanity in the 21st Century, and free market economics potentially being our most powerful ethos, it is little wonder that so much effort has gone into making the latter a solution to the former. The result of these efforts in known as carbon trading: rather than forcing countries or firms to reduce their greenhouse gas (GHG) emissions, participants in a 'carbon market' are given a reduction target that they can meet either through their own reductions or by purchasing 'carbon credits' from countries/firms that reduce beyond their target level. Prior to 1997, carbon trading did not exist per se, but there were forms of other emissions trading. These were usually restricted to a single pollutant (i.e. sulphur dioxide) in a single region (i.e. the United States.) However, since the advent of the Kyoto Protocol ('Kyoto') the carbon market now exists on a global level and includes all six greenhouse gases.[1] The vast majority of carbon market activity falls under the auspices of Article 12 of Kyoto; the Clean Development Mechanism (CDM.) The CDM is the mechanism whereby developed countries (Annex 1) receive certified emission reductions (CERs) for investments in projects that reduce or sequester GHG emissions in developing countries.

Since the Kyoto Protocol came into force on 16 February 2005, there has been a massive increase in CDM activity. At the start of the year, the CDM Executive Board (EB) had certified just one project. As of September 2005, there are twenty-one projects certified and another fifty-eight at the validation stage of the EB.[2] With the EB representing the final stage of accreditation, it is safe to assume there are literally hundreds more CDM projects in development that still must have their sustainable development indicators and methodology/reductions claims certified by their host country's Designated National Authority (DNA) and Designated Operational Entity (DOE), respectively. In spite of the CDM's status as quite possibly the key international policy response to the climate crisis, it is very difficult to find any in-depth analyses of a host country's carbon market. This paper will attempt to begin to fill this void by studying in detail the ways in which the carbon market has developed in South Africa and what opportunities social actors have to engage in this issue and shape climate policy in favourable ways.

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[1] The six greenhouse gases are: Carbon dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF6)

[2] UNFCCC.'CDM: Project Activities' online: http://cdm.unfccc.int/Projects/registered.html

As the only African country with any serious project development, the success or failure of the CDM in South Africa will have enormous implications for the carbon market on the rest of the continent. With over a dozen projects in various stages of development, South Africa certainly has fewer projects than some other countries yet it still maintains a nice variety of methodologies and project developers. This allows a relatively small sample size of South African projects to better represent overall trends in the global carbon market. Moreover, South Africa's rich history of social mobilisations, especially during the Apartheid era, provides a unique context to study the opportunities for social actors to influence carbon trading projects and policy in a host country.

The methodology employed while undertaking this analysis is strongly influenced by Michael Buroway's 'Extended Case Method,' whereby the researcher immerses him or herself in the field to observe personally the interactions of the various parties and to maximise opportunities for uncovering primary sources.[3] Thus in the course of this research project eleven weeks were spent in South Africa uncovering primary source materials, conducting over two dozen interviews with participants in the carbon markets, and doing a number of site visits to actual CDM projects.

The results of this research will be presented in the next four Sections. Section One provides further background and critical perspectives on carbon trading and the CDM more generally. Section Two takes a more empirical look at how the carbon market has developed in South Africa through four separate project case studies. Section Three considers the ability of governance structures to provide oversight of this market. Section Four looks at how social actors are organised around this market and what influence they have on its shape. I conclude with some ideas for future strategic interventions in the South African carbon market for social activists.

Through all of this analysis, it will be shown that despite some good intentions, the South African carbon market appears to be developing in a direction that will deny any real benefits to local communities nor do much to further the struggle against the impending climate crisis.

**The CDM and its critics**

This Section is primarily intended to provide some background context for audiences with little to no knowledge of carbon trading or international climate policy. This will be done through a brief overview of the history of this idea, a review of some legal terminology and processes, current market trends, and a review of some of the key critiques of this approach to fighting climate change. Those readers with more of a background in this area should feel free to skim this Section or skip it altogether.

[3] Michael Burawoy, 'The Extended Case Method,' Sociological Theory Vol. 16, No. 1 (March 1998): 8.

*A brief history of carbon trading*

The intellectual origins of carbon trading can be traced back to a small publication in 1968 entitled 'Pollution, Property and Prices' by Canadian economist John Dales. Like Garrett Hardin who penned his famous essay, 'The Tragedy of the Common' that same year, Dale believed that natural resources in their unrestricted common property form would face tragic overexploitation by people's self-interest. Yet Dales went much further than Hardin in his solution to this problem. Dales proposed to control water pollution by setting a total quota of allowable waste for each waterway and then set up a 'market' in equivalent 'pollution rights' to firms to discharge pollutants up to this level.[4] These rights, referred to as 'transferable property rights…for the disposal of wastes' would be sold to firms and then they could trade them amongst themselves.[5] The more efficient firms would make the largest pollution reductions and sell their credits to less efficient firms, thereby guaranteeing a reduction of pollution at the lowest social cost.

Though Dale's proposal took a backseat to the command and control approach to environmental policy during the 1970s, his idea would resurface in the following decades. Proponents of pollution trading – typically a triumvirate of industry groups, neoliberal ideologues, and 'free-market environmentalists' – echoed Dales' logic about greater efficiency, and added claims of less administrative costs and greater incentives for innovation. After a series of proposals and pilot projects by the Environmental Protection Agency, the United State Congress amended the *Clean Air Act* in 1990 to create a national emissions-trading (ET) scheme in the pollutants that cause acid rain, namely sulphur dioxide. The amendment also allowed regions to set up their own schemes and in 1993 the Regional Clean Air Incentives Market was launched in the Los Angeles Basin. Up until 1997, the United States was the only country in the world with any significant pollution trading scheme. This of course would change following the Kyoto Protocol.

*Carbon trading and the Kyoto Protocol*

When the Brazilian and American delegations presented their proposal for carbon trading mechanisms in the final days of the negotiations at the third Conference of the Parties in Kyoto, Japan they were initially met with hostility from most of the European delegation as well as a number of environmental non-government organisations (ENGOs). Nonetheless, the carbon trading proposal was eventually adopted and appears in three separate articles of the final text of the Protocol. Article 17 of the Protocol establishes a system of 'Emissions Trading' whereby Annex 1 countries (e.g. developed countries that have accepted binding emissions reductions

[4] John Dales, *Pollution, Property and Prices: An Essay in Policy-Making and Economics* (Toronto: University of Toronto Press, 1968) 81

[5] *Ibid*, 85

targets) can trade emissions credits amongst themselves if they overshoot their targets. In practice emissions trading as conceived in Kyoto is only applicable to two countries: Russia and the Ukraine. The collapse of the former Soviet economy around 1990 has meant that these countries will remain well under their reductions targets as that is the base year. However, unlike other forms of carbon trading, emissions trading has faced considerable political backlash. The unfavourable label 'hot air' has been widely applied to this form of trading thus making it difficult for countries to use these credits to achieve their Kyoto targets. The second type of carbon trading is Joint Implementation – Article 4 – whereby Annex 1 countries can invest in other Annex 1 countries to help them reduce emissions and the investing country will get the reduction credits rather than the host country. Like emissions trading, joint implementation has thus far not played a significant role in the international carbon market. The global carbon market is thus transactions under Article 12, the Clean Development Mechanism. As was stated in the introduction, the CDM provides an opportunity for Annex 1 countries to receive emission reductions credits to use against their own targets by investing in project to reduce or sequester GHG emissions in non-Annex 1 countries (read: developing countries.)

One of the most controversial aspects of Article 12 is that it requires projects to show that 'Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.' [6] This requirement has become known as 'additionality' and tries to ensure there is a net emissions reduction. Another controversial aspect of the CDM is the requirement that projects must also help developing countries in 'achieving sustainable development.'[7] The sustainable development requirement represented a hard fought victory by many of the countries and ENGOs that were initially against the CDM. However victorious this battle was, it appears the war has been lost as subsequent COPs have allowed countries to set their own definition of sustainable development and judged whether a project meets these criteria, rather than adopt a universal definition that would better ensure the accountability of those persons overseeing project approval.

In order to judge the above criteria a number of domestic and international governance structures have been set up to oversee CDM projects. A good way to illustrate these structures is by going through the steps necessary to verify a CDM project. The first step is entirely optional whereby a project developer can submit a Project Identification Note (PIN) to the country's Designated National Authority (DNA.) The PIN tells the verifier what the project plans to do and usually has less detail than a formal Project Design Document (PDD.) The purpose of this stage is to allow a project developer to get a sense of how they will be viewed by the DNA and should this be positive they can ask for a letter of no objection. Whether or not a PIN

[6] The Kyoto Protocol, Article 12, paragraph 5 (2)
[7] *Ibid.* at Article 12, paragraph 2

is submitted, everyone must submit a PDD to the Designated Operational Entity (DOE.) Countries with a large number of CDM projects usually have their own DOE, but for smaller countries, such as South Africa, there will be a regional DOE. The purpose of the DOE is to ensure the validity of the project's methodology, that their claimed emissions reductions and baseline scenarios are accurate, and that the project is additional. All of this information must be laid out in the PDD. This is also the first time the public may comment on the project, assuming they have internet access. Following the approval of the DOE, the PDD then goes back to the DNA, who must sign off on everything, but most importantly whether the project meets their sustainable development criteria. There is another opportunity for public comment at this stage, and unlike the DOE, the decisions of the DNA can also be appealed to the relevant minister. The final step for a project is the CDM Executive Board whereby they review the findings of the DOE and DNA and make a final decision whether to grant certified emissions reductions credits (CERs). There is also a thirty-day public comment period while the project is being validated.

*Carbon market trends*

With the process of validation now established and some of the relevant institutions explained, let us turn our attention to how the global carbon market has developed since Kyoto. The first thing to note is that much of the activity seems to be concentrating around large private sector players. For example, a number of consultancy firms such as Ecosecurities, Ecofys, and Norway's Det Norske Veritas have played key roles in much of the project development and validation thus far. Equally prominent in the carbon market has been the World Bank's Prototype Carbon Fund (PCF.) In partnership with six governments and seventeen companies and a budget of $52 million, the PCF describes itself as 'a leader in the creation of a carbon market to help deal with the threat posed by climate change.'[8] As the single largest purchaser of CERs, the PCF has thirty-two projects under preparation, (including one in South Africa) with a total CER value potential of $165 million.[9]

A second noteworthy trend is that the market is heavily concentrated in medium income countries, notably India, Brazil, and Chile. Emerging countries in the carbon market are China and Mexico. By contrast poorer countries, especially in Africa, have almost entirely been left behind. According to the PCF, 'This under-representation of Africa raises deep concerns about the overall equity of the distribution of the CDM market, as the vast majority of African countries have not, for the moment, been able to pick up even one first deal.'[10] As of September 2005, Uganda and South Africa are the only two sub-Saharan countries where large-scale

[8] Prototype Carbon Fund.'PCF Annual Report' (Washington, DC: World Bank Group, 2004) 7
[9] *Ibid* at 7
[10] Prototype Carbon Fund.'Carbon Market Trends 2005' (Washington, DC: World Bank Group, 2005) 25

carbon transactions have been completed, although transactions are being prepared in Nigeria, Ghana, Sierra Leone, and Zambia. The PCF admits that 'this concentration of CDM flows towards large middle-income countries is consistent with the current direction of Foreign Direct Investment.'[11]

A third trend is the concentration of carbon capital around non-renewable energy methodologies. The destruction of hydroflorocarbons (HFC23) – which were banned in OECD countries as part of the Montreal Protocol's efforts to fight ozone depletion – are by far the dominant type of emission reduction projects in terms of volumes of credits generated. Even more astounding is that just two HFC23 projects make up 30% of the credits issued thus far.[12] The reason being is that HFC23 has 11,700 times the potency of CO2 and since credits are in CO2 equivalent (CO2e) a relatively small capture of HFC23 can bring a huge windfall of credits. Projects capturing methane and nitrous oxide from animal waste rank second with 25% of the total credits issued, ahead of hydro, biomass energy and landfill gas capture (about 11% each). This leave traditional energy efficiency and renewable energy projects, which were initially expected to represent the bulk of the CDM, to now account for less than 5% of the market. As we will see later in the article, this represents a serious challenge to the CDM's sustainable development criteria.

*The CDM and climate justice*

In concert with the growth of carbon market has been a growing body of literature critical of carbon trading. Activists and academics have taken issue with a number of aspects of carbon trading: legal minds take issue with the unjustified property regime it creates in the air,[13] biologists note the dubious science around carbon sinks[14], and progressive economists debunk myths of greater innovation and costs savings.[15] Respecting all of these critiques, this author would like to focus on explaining just one approach to this problem: climate justice. The basic idea of climate justice is that the richest persons and countries have caused this problem through their profligate burning of fossil fuels and poorer countries and persons are most vulnerable to its effects. In the context of a study of climate change and a developed country, which also happens to have one of the highest rates of inequality in the world, this perspective is worthy of further elaboration.

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[11] *Ibid* at 5

[12] International Institute for Sustainable Development.'Realising the Development Dividend: Making the CDM Work for Developing Countries' (Ottawa, ON: IISD) 26

[13] Gerald Torres, 'Seventh Annual Lloyd K. Garrison Lecture on Environmental Law Who Owns the Sky?' *19 Pace Envtl. L. Rev. 515* and Cole, Daniel H.'Clearing the air: four propositions about property rights and environmental protection' 10 *Duke Environmental Law & Policy Forum*, 1 p103 (Fall 1999)

[14] Cathleen Fogel 'Biotic Carbon Sequestration and the Kyoto Protocol: the Construction of Global Knowledge by the Intergovernmental Panel on Climate Change' (forthcoming)

[15] See: Ian Parry.'Fiscal Interactions and the Case for Carbon Taxes over Grandfathered Carbon Permits' (Washington, DC: Resources for the Future) October 2003

To add empirical evidence to the basic contention of the climate justice approach, in 1990 – the base year for the Kyoto Protocol – industrialised countries were responsible for 75% of all CO2 emissions that year and 88% of the emissions that had previously caused global warming.[16] More recently, in 2003 the US and the EU were alone responsible for 45% of all global CO2 emissions, even though they only had 10% of the world's population.[17] As to the effect of these emissions, a September 2005 study by the research group System for Research Analysis and Training revaled 'Poor developing countries are least developed to adapt to climate change, although most of them play and certainly will continue to play an insignificant role in causing it.'[18] The hardest hit region, according to the study will be Africa where extreme weather patterns, caused by climate change and leading to drought, will trigger deepening food shortages in Africa where most people rely on rain-fed crops to survive.'Climate change will exacerbate hunger, which now affects about 50% of our population,' the study's lead author was quoted.'Above all, climate change will worsen poverty on the continent.'[19]

As serious as the threat of climate change is to Africa, there are other poor countries in Asia and Latin America whose development is already being impeded by climate change. In his address to the sixth Conference of the Parties (COP6) in The Hague in 2000, Sheik Mohammed Khan of Guyana told the delegates, 'Our 750 000 population has not gone up in 30 years. We constantly have disasters, floods, and droughts; just coping with it uses up 30% of our national economy.'[20] Contrast this with lobbyists' efforts at the same conference to convince Britain of taking more serious action on climate change by warning them that they could stand to lose 70% of their golf courses in the next 20 years from rising sea levels and one can grasp the notion of climate justice.[21]

Having established that climate justice is real and supported by plenty of empirical evidence, it is imperative that our approach to solving this problem addresses the fundamental inequalities that have caused it. It is through this lens that we can now study the development of the carbon market in South Africa.

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[16] Tom Athanaisou.'The Science of Drawing the Line' Climate Equity Observer. Downloaded from http://ecoequity.org/ceo/ceo_6_2.htm

[17] Heidi Bachram *et al* 'A new form of colonialism: emissions trading' unpublished document. 2004.

[18] Reuters News Service.'Climate change hurts Africa most, scientists say' (22 September 2005) Downloaded from: http://abcnews.go.com/US/print?id=1148885

[19] *Ibid.*

[20] Paul Brown.'Islands in peril plead for deal' *The Guardian* (24 November 2000.)

[21] *Ibid.*

**South African CDM project case studies**

Prior to discussing the four specific CDM projects that this Section will focus on, it is first necessary to provide greater context as to the development of the carbon market throughout South Africa. This context will be governed by three general questions: what types of projects are being developed, who is developing them, and how the four projects chosen are a fairly representative sample.

Beginning with the former, as of October 2005, only one South African CDM project has been approved by the CDM Executive Board: the Kuyasa low-cost urban housing energy upgrade project in Khayelitsha, outside of Cape Town (see Section 2,4 for a discussion of this project.) Furthermore, another two projects are currently at the validation stage of the EB; the Durban landfill gas projects at the Mariannhill and La Mercy sites (eThekwini officials have not yet filed an application for the Bisasar Road site, which is discussed in the next Section) as well as a small scale hydro project at Bethleham Falls in the Free State. As to the earlier stages of the project cycle, there are another eight or so projects that have submitted either a Project Design Document or a Project Identification Note to the Designated National Authority. Among these projects are a variety of methodologies being used to reduce emissions: four are fuel switching, three are methane capture, three are small-scale renewables (two hydro projects and one solar energy project), and two biogas projects. In addition to the projects that have submitted documentation, there are a number of other CDM projects 'in the pipeline.' (read: various stages of development prior to the official validation cycle.) These future projects being discussed generally fall into just two categories: industrial fuel switching and municipal landfill gas capture.[22]

In terms of whose developing these projects, the private sector is out front with the majority of them, but there continues to be very visible project development at the municipal level and this is projected to continue, especially in the area of landfill gas capture. What unites both the private and public sector developers is almost their universal reliance on outside private/public consultants. The need for these consultants is rooted in the expertise required for the complex validation process that is rarely found in the private firms doing the projects and never found in the municipalities. These consultants fall into a number of categories: first there are the foreign private experts such as Ecosecurities and the World Bank's Prototype Carbon Fund. Secondly, there are domestic private consultants, such at the Palmer Development Group in Johannesburg. Finally, there are non-profit, foreign-funded consultants such as South South North (SSN) and PACE (Promoting Access to Carbon Equity) in Cape Town and CBLA (Capacity Building, Leadership and Action) in Johannesburg.

[22] Ingrid Salgado.'Companies target millions from Kyoto' *Cape Times, Business Section* (20 July 2005)

The involvement of these non-profit groups in the CDM market poses some interesting questions about the use of official development aid and carbon credits. According to the Marrakech Accord on the CDM, 'public funding for clean development mechanism projects from Parties in Annex I is not to result in the diversion of official development assistance.'[23] This requirement has become somewhat controversial as it has been interpreted in a variety of ways by Annex I countries. For example, the Canadian government has given strict instructions to CBLA that it is not to spend any of its budget writing PDDs or any other activities tied to actively bringing projects to market. This leaves CBLA helping its clients identify opportunities to reduce emissions through feasibility studies and advising them on the potential of the CDM to help cover some or all of the costs of such efforts. This is largely the position the United Kingdom takes with PACE as well, preventing them from doing PDDs and any verification.

However, the Dutch government has taken a very different position with their funding of SSN. This organisation has been around longer than any other non-profit consultants having formed in 1999 to promote indicators for the sustainable development criteria of the CDM. Since that time however, their mandate has changed to now include 'design, implementation and transaction of CDM pilot projects.'[24] In practice this means that they are basically in the driver's seat throughout the project development planning the projects, writing the PDDs, and maintaining active involvement post-verification. This has fostered a widely-held perception among actors in the CDM market that SSN is 'more a private company than an NGO' and that the Dutch government is violating the Marrakech Accord.[25] But the Dutch government's aggressive use of official development aid (ODA) with SSN in nothing new: they also funded the entire start-up costs for the DNA, are the largest investor in the PCF, and are the largest single buyer of CERs with 16% of the total market.[26] It is safe to say that the global carbon market, and the South Africa carbon market especially, would look very different without such active involvement by the Netherlands.

A final point of context necessary before discussing the project case studies is to explain why they were chosen as representative of the South African carbon market. Briefly, the projects are Durban Solid Waste's landfill gas capture, Sasol's fuel switching, Bellville's landfill gas capture, and Kuyasa's low-income housing energy upgrade. Collectively these projects represent the three most popular methodologies, are located in three entirely separate areas of South Africa, are all in different stages of development and verification, and are a good mix of the diversity

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[23] UNFCCC 'Modalities and Procedures for the Clean Development Mechanism' (Marrakech, Morocco: 2003) at paragraph 44

[24] South South North homepage: http://southsouthnorth.org/

[25] Geoff Stiles, CBLA personal interview 29 June 2005

[26] PCF, *supra* note 10 at 20-21

of project developers. Having said this, these projects are not intended to give a complete picture of all the trends in South Africa's carbon market. With a dozen projects in the validation cycle and more on the way, such an undertaking is outside the scope of this paper. Yet through these four projects some general observations can safely be made about South Africa's carbon market and its ability to further the global struggle against climate change.

***Landfill gas capture in Durban***

The appropriate starting point for any serious discussion of the CDM in Africa is the landfill gas capture project in Durban. This was the first CDM project on the continent, initially proposed in 2002 when the country hosted the World Summit on Sustainable Development. It also received $15 million from the World Bank's Prototype Carbon Fund in start-up capital, one of the first projects the PCF ever supported. Finally, with the possible exception of the Plantar sinks project in Brazil, this is the most controversial CDM project to date and has easily garnered the most attention of international activists and media.[27]

On the face of it, the Durban Solid Waste (DSW) project seems simple enough. At three landfill sites across the city – Bisasar Road, La Mercy, and Mariannhill – wells are drilled to capture methane gas that would otherwise be released into the atmosphere as a greenhouse gas twenty-one times more potent than CO2. Currently landfill gas is captured and flared at the Bisasar Road and Marianhill landfill, but this is only about 7,4% of the potential gas that could be captured.[28] The proposed project plans to substantially increase the efficiency of the gas capture up to a high of 83% in 2012, and dropping to about 45% collection efficiency over the twenty-one year life of the project.[29] Once the gas has been captured it will be put into electricity generators for use by industrial consumers, thus offsetting coal emissions from the electricity these industries would have used normally. Had this project got underway in 2004 it was claimed that it would offset a total of nearly two million tones of CO2 equivalent (CO2e) by 2010.[30] This project is claimed to be additional since it is capturing methane gas well beyond levels proposed by the regulations and the capacity of local officials, plus local industries would not want the electricity from this absent the carbon credits subsidy since it would be cheaper to get power from coal.

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[27] See: Carbon Trade Watch.'The Sky is Not the Limit' *TNI BRIEFING SERIES No 2003/1* (Amsterdam: Transnational Institute) 2003; Trusha Reddy 'Durban's perfume rods, plastic covers and sweet-smelling toxic dump' (Durban, South Africa: Centre for Civil Society Research Reports) 2005; Shankar Vedantam 'Kyoto Credits System Aids the Rich, Some Say' *The Washington Post* (12 March 2005) A12

[28] Prototype Carbon Fund.'Durban Gas to Electricty Project – Project Design Document' (July 2004) Online: Prototype Carbon Fund
http://carbonfinance.org/pcf/Router.cfm?Page=Projects&ProjectID=3132#DocsList at 3

[29] *Ibid.* at 4

[30] *Ibid.* at 26

As relatively uncontroversial as the above summary of this project sounds – all ideological arguments aside – one need not look far to find reasons why opposition to this project has been so fierce. For starters there is the location of the landfill sites: the La Mercy site might be well away from residential areas but both the Mariannhill and Bisasar Road sites are in residential areas. This is less of a problem in Mariannhill as there are large buffer zones on all sides of the landfill. In contrast, there are no large buffer zones at the Bisasar Road site where the landfill is literally within a few meters of residential houses on two sides and across the street from a school on a third. Worse still, Bisasar Road is the largest landfill site in Africa and one of the largest in the Southern Hemisphere. Thus the root of this controversial project is entirely the Bisasar Road landfill as it dwarfs the other two in terms of size, potential emissions reductions, and of course local opposition.

*A short history of Bisasar Road*

To tell the story of Bisasar Road one must begin not with the landfill, but with the *Group Areas Act* of 1961 whereby the Apartheid government relocated the Indian population across Durban to the area known as Clare Estates, where Bisasar Road is situated. As was typical of Apartheid, no compensation for this act was or has ever been paid and many Indians were forced into greatly inferior housing settlements. At the time of the resettlement there was an enormous quarry on Bisasar Road that was lined with trees and green space. In 1980 when the local government was running out of landfill space, they converted the quarry into the Bisasar Road Dump. The fact that this was almost an entirely Indian neighborhood at the time of racial facism should not be seen as coincidental.

From the very beginning Bisasar was a controversial and contested. Many of the Indians in Clare Estate were relatively middle class and thus had the resources to quickly become very organised against the dump. The response of the City was to announce that the dump would close in 1987. Seven years later they reneged on this promise, but assured the community that the dump would close in 1996 and then be converted into a recreational and sporting site.[31] When 1996 came around the city began a public consultation process intended to get the permit to close the dump (South Africa requires permits not just to open a landfill site but to close it as well.) It was at these meetings that local resident Sajida Khan – who lives directly across the street from the landfill, found out that the permit process was actually intended to extend the life of the dump rather than close it. When Khan discovered this, 'I just went nuts! I wouldn't let anyone else talk. I was just so angry.'[32] Khan quickly channeled her angry into an organised campaign. With ten public schools within

[31] Reddy *supra* note 27 at 3

[32] Sajida Khan, personal interview 24 May 2005 (note: all subsequent quotes from Khan can be sourced to this interview)

one square kilometer of the landfill, Khan chose to target children in her campaign and through this 'the parents and other people would get roped in.' Khan's campaign tactics included placard demonstrations, blockades of the dump (this was the only activity little children were not involved in for fear of injury), a community-wide petition with 6 000 signatures, and a media blitz. Yet despite Khan's best efforts, the permit to extend the life of the dump was granted. Worse still, in a wealthy white-dominated suburb to the north of Durban the Umhlanga landfill site was quickly closing its doors as it was 'earmarked for up-market property development.'[33] The rubbish from this site was of rerouted to Bisasar Road.

*Health effects of the dump and CDM*

In addition to being the year that the Bisasar was extended and took on more rubbish from Umhlanga, 1996 was also the year that Sajida Khan first developed cancer. In her informal surveys of the neighbourhood, Khan claims that seven out of ten residents in the area of Clare Estates closest to the landfill have reported at least one person in their household developing cancer. Among these victims is Khan's own nephew who died of leukemia. For Khan and other residents in Clare Estates there is only one place to lay the finger for their poor health: the dump. Prior to the 1990s there were very few government regulations on waste management and thus Bisasar was able to have a medical waste incinerator on its site and accept other forms of hazardous waste.[34] Even when stricter regulations were put in place and the landfill ceased incinerating hazardous waste, Khan still cites unsubstantiated studies where the limits of waste emissions considered potentially hazardous were exceeded in hydrogen chloride by 50%, cadmium by 200%, and lead by more than 1000%. Limits for suspended particulate matter were also exceeded.[35]

It is not surprising that Sajida Khan's assessment of the health impacts of Bisasar Road would be disputed by officials at Durban Solid Waste. According to Lindsay Strachan, head of DSW and the major force behind the CDM project, 'We've brought in experts to assess the health risks. Their main concern was formaldehyde, but the health experts couldn't discern if it was burning from Kennedy Road or if it was landfill.'[36] Strachan believes that any health threats in the area would indeed come from the informal housing community on Kennedy Road who regularly burn wood and other materials for heating and cooking as they do not have electricity. As to Khan's survey of ten households in Clare Estates with high rates of cancer, Strachan questions her methodology and research qualifications ('absolutely codswallop!'). Furthermore, Strachan points out that there is a one in four cancer incidence rate in

[33] Reddy *supra* note 27 at 3
[34] Reddy *supra* note 27 at 3
[35] *Ibid.* at 5
[36] Lindsay Strachan. personal interview 13 June 2005. Note: unless otherwise stated all future quotations from Mr. Strachan are from this source.

Durban and therefore 'how do we know (these people's cancer is) from the dump? With those odds, it could be from anything.'

Whether cancer rates can be attributed to the landfill or not, a growing concern in Clare Estates is that the CDM project will create more air pollution and potentially adverse health effects rather than alleviate them. Khan calculates that each year, the methane electricity generators will pump out 95 tons of nitrogen oxides, 319 tons of carbon monoxide, 323 tons of hydro-carbons and 43 256 tons of carbon dioxide. Nitrogen oxides are a respiratory irritant and exacerbated asthma, carbon monoxide reduces the oxygen-carrying capacity of the blood, and carcinogens such as benzene and butadiene could be found in hydrocarbons.[37] These figures should not be interpreted literally however as the scientific validity of Khan's own calculations has not been confirmed.

*The issue of closure*

Though the Clare Estate community remains concerned over potential health impacts from the CDM project, their main point of contention with this project is the widely held perception that it will further prolong the life of the landfill site. Lindsay Strachan adamantly rejects this perception and argues that the landfill gas must be captured either way so it doesn't matter if the landfill is still accepting waste or not. In addition, Strachan is just as insistent that 'the dump is closing…the city is saying we'll close it.' The way the city is going about this is through the creation of a waste transfer station near the south end of the landfill so that when the site closes waste can be transferred to a new landfill further away.

According to Strachan, the environmental impact assessment for the transfer station is costing the city about R1 million, which could then be expanded to include closure for the landfill, 'The transfer station is the start of the closure process.' Ironically, Strachan blames the resident's opposition to the transfer station – which they see as just further development and pollution in their neighbourhood – as an impediment to closure, 'If you walk into a room and you're just heckled, you can't talk to people. So the dump continues.' At the end of the day, Strachan wants to sympathise with the local residents and claims to be much more concerned about the viability of the CDM project than the continued operations of Bisasar Road. He states, 'I haven't received a closure demand in 2 years; they're now driving the anti-CDM train; they should keep driving the site closure train and make it quite clear that if you close the landfill we want this gas project as long as the landfill is closed.'

As convincing as Lindsey Strachan tries to be about a commitment to closure and that the CDM and continued operation of the landfill are not related, he is contradicted by facts of which he is well aware. For example, in the 2004 project design document that Strachan helped to prepare, the baseline methodology for the project states:

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[37] Reddy *supra* note 27 at 8

> All three landfills have remaining capacity and, with the exception of La Mercy, can continue to operate throughout the crediting period. Considering the high costs of developing new landfill sites, it is not reasonable to expect that the municipality would close these landfills before they are full, nor are there any plans for the construction of replacement sites.[38]

The crediting period referred to in the PDD was seven years with two optional renewals of the same amount. When Strachan claims 'the dump is closing' he fails to mention that this would be in twenty-one years. In addition, one of Strachan's engineers at DSW, a man who had worked there for four years, admitted he did not know anything about an impemding closure while giving a tour of the landfill: 'What closure? There's room here for at least another decade of landfill.'[39]

While there is still no irrefutable evidence that CDM project is what is keeping the Bisasar Road Landfill open, there does appear to be a casual link between the two. This linkage comes through carbon credits, or to be more precise, an estimated $20 000 per day of potential carbon finance that could be coming into Durban, according to Strachan's calculations. Yet when he was asked whether these calculations involve the landfill site being open or closed, Strachan told a local newspaper reporter, 'The site has the potential to produce 8 000 cubic metres of methane an hour and closure would bring that down to 7 000 cubic metres, so the difference is somewhat negligible.'[40] Whether a difference of 12,5% of production is 'negligible' in a $15 million deal with the World Bank's PCF should be treated as more than a rhetorical question. When asked, Strachan refused to indicate whether he used the higher or lower number in his discussions with them and in the PDD. One can't help but suspect that he probably erred on the high side.

One final issue to mention around closure, often glossed over in representations of the Bisasar Road landfill controversy, is the informal housing settlement on Kennedy Road, directly adjacent to the landfill. As some of the Apartheid laws began to relax in the late 1980s, in particular the *Group Areas Act*, a sizable group of people moved into the area around Kennedy Road that runs along the western boarder of the Bisasar Road landfill. This settlement also illustrates the unique tendency for groups of people to gravitate *towards* waste management facilities where 'waste picking' offers an alternative means of survival when unemployment rates are astronomical.[41] This settlement of now nearly 1 000 people next to the landfill creates obvious conflicts with the rest of Clare Estates who had the landfill involuntarily imposed on them. An employee of DSW

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[38] PCF *supra* note 28 at 8

[39] Annonymous DSW employee. Personal interview13 June 2005.

[40] Tom Robbins 'Durban Signs SA's First Carbon Finance Deal' *Business Day* 13 November 2002

[41] Lindsay Horton 'Environmental Justice and the CDM in Durban' Undergraduate Honors thesis, (Dartmouth College, New Hampshire)109-110

describes the divergence between Kennedy Road and others in Clare Estate as 'one community built up *because* of the landfill, while the other wants the landfill closed.'[42]

In the struggle around landfill closure and the CDM, the strategic support of the Kennedy Road community by DSW is considered a very high priority. To this end, the World Bank commissioned a formal recognition of the Kennedy Road community, which activist and scholar Raj Patel observes, 'seems central to the community's support of the project…in contrast with richer activists (who ignore Kennedy Road.)'[43] Moreover, in eliciting the support of the community for the CDM project, Lindsey Strachan allegedly offered dozens of jobs and three bursaries to children from 'affected communities to study engineering, possibly in Uganda'. It should be noted that within the Kennedy Road settlement, this figured is believed to be fifty scholarships.[44] Whatever the figure, community leaders in Kennedy Road are convinced that the continued operation of the landfill offers them the best opportunities for economic advancement while remaining in relative proximity to the city centre. This results in active opposition of the campaigns of Sajida Khan and others in the Clare Estate to close the dump and a general breakdown of community relations. For her part, Sajida Khan points the finger at Lindsey Strachan for using this divide and conquer strategy and claims 'I have nothing against these people…I am fighting for all of us, no one wants to live next to a smelly dump.'[45]

*Present status of the project*

In June 2002, just after the PCF signed an Emissions Reductions Purchase Agreement with DSW for the CDM project, Sajida Khan filed a lawsuit against the eThekwini municipality and the federal Department of Environmental Affairs and Tourism for negligence in the permitting the continued operation of the Bisasar Road Landfill. After three years of delays, the case was due to be heard in October 2005 but Khan's health condition rapidly deteriorated and the case will remain in the docket until she is fit enough to participate in the legal action. In the meantime, the Department of Water and Forestry at the provincial level has been delayed in rendering a decision on an appeal regarding the same manner, estimated to have cost the city R40 000 to fight.[46]

In light of these delays at Bisasar there was an unsubstantiated rumour circulating around Durban that the World Bank had told DSW that it had until October to sort out the 'outstanding issues' relating to Bisasar Road or it would pull out of the project.[47] Though Lindsey Strachan flatly denied this, it may not be coincidental that in late August 2005, DSW submitted a PDD to the CDM Executive

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[42] *Ibid.,* at 99
[43] Raj Patel. Personal Interview. 18 May 2005
[44] *Ibid.*
[45] Khan *supra* note 32
[46] Strachan *supra* note 36
[47] Khan, *supra* note 32

Board for the two projects at La Mercy and Mariannhill but did not mention anything about Bisasar Road. This is a significant admission as these two smaller project total a mere 3 MW of power between them and only 50 000 tonnes of CO2e emissions reductions, compared to 10 MW at Bisasar Road and 3,1 million tones of CO2e. Thus it appears for at least the time being that Sajida Khan's many years of tireless campaigning have won her a temporary victory in delaying this CDM project. There have been no recent decisions or announcements relating to the eventual closure of the Bisasar Road Landfill site.

***Sasol's pipeline***

As one of South Africa's largest companies – nearly US $12 billion in assets in 2004 and a total profit of $1,4bn – it is little wonder that Sasol gets a city named after it. Sasol describes its business as 'Chemicals, mining, and synthetic liquid fuel synthesis'[48] and owns two plants in South Africa: headquarters in Sasolburg (60 kilometres south of Johannesburg), and another plant in nearby Secunda (100 km west of Johannesburg) which has the dubious distinction of being the largest point source emitter on the African continent.

Sasol's entry into the carbon market was initiated following its decision to build a 865 kilometre pipeline to carry natural gas from the Temane and Pande fields in Mozambique to its facilities in Sasolburg and Secunda. The pipeline is being used to supplement coal as the feedstock in Sasol's liquid fuel synthesis processes at the Secunda plant and replace it entirely in Sasolburg.

This particular CDM project is unique for a number of reasons. For starters, with an estimated annual reduction of 6,5 million tonnes of CO2e, it represents one of the largest CDM projects in Africa to date (by comparison Bisasar Road is about half this size and that is with a gas eleven times more potent than CO2, while Sasol proposes just CO2 offsets). Secondly, this is the only project this author is aware of that was developed entirely absent of any input from foreign or domestic CDM consultants. Sasol appears to be doing this all by itself, which is quite rare considering the level of expertise required to navigate the complex processes and nomenclature of the CDM. Third, and perhaps most importantly, this project highlights some of the most critical questions about the additionality requirement.

The root of Sasol's additionality issue is their upfront admission in their Project Identification Note that their coal mine in Sasolburg 'reached the end of its economic life in 2001.'[49] This was a well-known fact at the time, since the drop of production at the mine from 70 million tones/year to 2 million had forced enormous layoffs and attracted media attention. Following this, Sasol began trucking ~12,500 tonnes of

[48] Sasol homepage: www.sasol.co.za

[49] Sasol.'Project Identification Note: Sasol Natural Gas Conversion Project' Submitted to the DNA: 31 January 2005 at 4

coal per day into Sasolburg from Secunda, a procedure they admitted 'was not an economically sustainable mode of operation.'[50] Therefore, the company devised two potential options forward; build a new mine further outside of Sasolburg or build a natural gas pipeline to Mozambique.

In their PIN, Sasol argues that their baseline scenario would indeed be to build the coalmine, despite 'public concern over the strip mine proposed by Sasol…which would have been situated on the banks of the Vaal river.'[51] Even though there was 'a desire from Sasol and the South African government to reduce local air pollution…there was no incentive or legal obligation to do so at the time' and thus continued coal emissions were a suitable baseline scenario.[52] This was contrasted by the 'numerous and difficult to manage barriers' of building the pipeline including capital costs, political instability, and fluctuating natural gas prices. Taking these barriers into consideration, Sasol's most likely baseline scenario was to build another mine, and thus absent carbon finance they would not have built the pipeline.

If one were only to read Sasol's PIN it would be difficult to offer sufficient evidence to properly counter their baseline scenario. Fortunately, this researcher was able to find out the real story about Sasol through an uninvited appearance at a meeting of the South African National Energy Association at the Siemens Headquarters in Sandton, outside of Johannesburg. At this meeting of energy representatives and lobbyist, Sasol's Natural Gas Supply Manager, Peter Geef, gave a very informative PowerPoint presentation on the pipeline and the reasons that Sasol built it. While Mr. Geef went through his presentation including slides such as 'What was this project about?' and 'What made the project possible?' any mention of carbon finance was curiously absent. Even when discussing specifics of project finance, there was no mention of ERCs, just that the project's $1,2 billion sticker price has been 'completely paid for.' Finally when it was time for questions, Mr. Geef was directly asked whether there were any outstanding financial inputs for this project, to which he responded in the negative. At that point I asked Mr. Geef if Sasol was indeed pursuing carbon credits for their pipeline. Mr. Geef answered,

> Yes we are indeed trying to get some carbon finance for this pipeline…(But) we have this problem of additionality; we think there's a case to be made for that, we're in discussion with the South African government now and we're trying to make the case for it…*The Biggest issue is additionality; we would have done this project anyway***.** (Emphasis added.)[53]

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[50] *Ibid* .at 5
[51] *Ibid*. at 5
[52] *Ibid*. at 5
[53] Peter Geef. Presentation to South Africa National Energy Association, Sandton, South Africa. 21 June 2005.

Having publicly admitted that their project does not meet the additionality requirement of the CDM, the question then became why they are pursuing carbon finance. To this, Mr. Geef answered, 'Mainly financial reasons; you get a lot of pay-back in terms of dollars per tonne.'[54]

Not wanting to entirely trust the unassuming musings of a mid-level manager unaware of the consequences of his actions,[55] Sasol's 'Greenhouse Gas Abatement Officer' Gerrit Kornelius was contacted for further comment. In response to questions about finance, Mr. Kornelius forwarded an article from the June 2004 edition of *Global Energy Review* on the project. Though this article goes into great detail about the project's 'financing strategy' and includes a 'summary of financing package,' it never once mentions anything to do with carbon finance.[56] Following up on this point, Kornelius justified Sasol's pursuit of carbon finance on the basis that 'a recent review has indicated that the IRR is (at this stage) somewhat lower than envisaged in the original board submission for project approval, and that did not meet the normal hurdle rates for projects - this is one of the arguments for the additionality claim.'[57]

Thus, Sasol's apparent interpretation of additionality is not in comparison with *what you would have done* anyway, but rather an additional bonus for something *you already did and just wished was more profitable*. For Richard Worthington of the South African Climate Action Network, an organisation not known to be hostile to the CDM, 'We will consistently criticise Sasol for this; the local coal mine is tapping out, you're a (very) rich company, and this pipeline entrenches their monopoly. To look for CER capital is just baseless greed.'[58] On the face of it, it is very hard to disagree with this interpretation.

***Landfill gas capture in Bellville***

It was the original intention of this research project to give a broader overview of the South African carbon market, in particular, to provide a better context to the disproportionate attention that the Bisasar Road landfill has received in academic and mainstream media. Therefore, although reviewing a second landfill gas (LFG) capture project might not serve the purpose of providing the widest possible representation of the South African carbon market, it does greatly assist in the objective of providing much better context to what is happening in Durban.

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[54] *Ibid.*

[55] Richard Worthington of SACAN also attended the meeting and sent out my summary of it to approximately sixty activists, researchers, and project developers across South Africa the next morning.

[56] Greg Fyfe.'Gas – The African Way' *Global Energy Review* June, 2004. 46

[57] Gerrit Kornelius. Private correspondence. 22 July 2005

[58] Richard Worthington. Personal interview. 20 June 2005 (Note: unless otherwise noted all future citations from Mr. Worthington arose out of this interview.)

*Project background and Durban comparisons*

South Africa's second LFG CDM is located at the Bellville South Waste Disposal (BSWD), which used to be in the city of Bellville – north of Cape Town – until it became incorporated into the larger Cape Town municipality in 1997. The LFG project itself is quite similar to Durban; drilling wells to capture LFG through active extraction, aimed at optimising gas production that would result in a 'conservative' 70% of the gas being captured and utilised instead of the 30% which is presently just flared.[59] Since BSWD is smaller than Bisasar Road, the expected annual emissions reductions from the LFG capture and offset coal emissions are one third of Durban's with 1,2 million tonnes CO2e. This figure is somewhat controversial, at least to Lindsay Strachen, who believes 'they're over-estimating their LFG potential.'[60]

In terms of the present status of this project, the baseline methodology, initial technical and financial feasibility studies have been completed. A PDD has also been prepared, though it hasn't been submitted to the DNA. Outstanding milestones include a conclusive technical and financial feasibility study, the establishment of a management structure, ability to deal with the extraction and sale of the gas, as well as undertaking the required EIA and public participation processes.[61]

Taking a step back and comparing the two LFG projects, there are some notable similarities and differences between them. It has already been mentioned that BSWD is smaller and at an earlier stage of development. The Bellville project is also being developed under the close supervision of SSN, a non-profit consultancy that claims, at least to anyone who will listen, to be much more concerned about developing sustainable projects than other consultancies like Ecosecurities, or in the case of Durban, the PCF.[62]

Finally, there are some notable differences in terms of the host municipality. In Durban, the environmental planning department has eleven staff and CDM projects are almost entirely handled by Deborah Roberts, who admits 'climate change is something we get to between half past two in the morning and three.'[63] In Cape Town, 106 people work in environmental planning, and climate change gets its own office, headed by the very capable Craig Haskins. Cape Town is also very active in the Cities for Climate Protection program and boasts an unparalleled expertise of the issue compared with almost any other level of government in the country. It is perhaps the more progressive nature of the municipality and non-profit consultancy that led to BSDW being on track

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[59] SSN 'Project Design Document: Belville South Landfill Gas Recovery and Use Project' Downloaded from: www.southsouthnorth.org

[60] Strachan *supra* note 36

[61] SSN.'Bellville Landfill Gas Recovery and Use Project' online at: http://southsouthnorth.org/country_project_details.asp?country_id=5&project_id=72&project_type=1

[62] According to Lester Malgas of SSN, 'Durban's perfume rods (used to offset the rotting stench of garbage) leave a bad taste in everyone's mouth.' (personal interview, 30 June 2005)

[63] Deborah Roberts, personal interview 28 July 2005

to be a 'Gold Standard' CDM project. The legitimacy of the Gold Standard in relation to this particular project is an issue we shall return to shortly.

Yet in light of these contextual differences, there are some very key similarities between the two landfills, mainly their location in urban areas and the ongoing struggles over closure. Though these two issues should be recognised as co-related, they will be dealt with separately for the purposes of this analysis.

The BSWD site was used in the early 1930's for sewage disposal and has been in operation as a waste disposal site since the 1960's. This landfill site was initially built remote from any human settlements but is now surrounded by the Belhar community as close as just 10 metres from the western boundary due to rapid urban development dramatic urban sprawl that has taken place over the past two decades.[64] As is typical of South Africa, the Belhar community is composed largely of coloured and Indian inhabitants as white people rarely live within any close propinquity to landfill sites. The site was closed prematurely for a period of time due to the 'close proximity to residential areas and the risk of contamination to the underlying Cape Flats aquifer.'[65] Following reconstruction of local government in 1997, the Cape Town Municipal Corporation over the responsibility for operating the site from the former Bellville Municipality and extended the catchment area to try to protect the aquifer.

The decision to re-open the landfill enraged local residents, who formed two separate organisations; the poorer and blacker Landfill Monitoring Group, and the richer and more Indian-based Belhar Development Forum to fight the landfill. The residents from both groups were somewhat placated by the city's pledge to close the site in 2006. However, the city is presently trying to extend the dump until 2009. With this process taking place at the same time as discussions around the CDM project, many residents are beginning to connect the two.

As was the case in Durban, the project developer, Walter Loots, head of Cape Town Solid Waste, adamantly denies even the slightest causal connection between keeping the dump open and the CDM project. For Loots, the simple fact of the matter is that Cape Town 'is running out of landfill space…the only alternative is a regional landfill 60 kilometers out of town. This will have significant costs attached to it.'[66] Moreover, the project developers at South South North believe, 'For CDM project to happen, landfill has to be capped. Even with an extension to 2009, the portion that stays open will be capped soon and the portion for 2006 will be capped now.'[67]

How it can be that the landfill must be capped for Cape Town to extract the gas, yet Durban can keep a dump open for twenty-one years and get 3 millions tonnes of CO2e per year remains a mystery. It was also never revealed whether there is a difference in

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[64] SSN *supra* note 61

[65] City of Cape Town.'*Cape Town Integrated Waste Management Plan'* at 5-1 downloaded from: www.capetown.gov.za (?)

[66] Walter Loots. Personal interview. 14 July 2005

[67] Sheriene Rosenberg (SSN) personal interview 30 June 2005

available gas to be captured if the landfill stays open or not and whether this was included in the PDD's calculations, as was so clearly the case in Durban. Therefore, it is difficult to conclude with any degree of certainty the role the CDM project may play in the continued operations of the Bellville South facility. What is known though is that local residents oppose this continued operation, and the CDM's even proximate association to that raises some questions about how much LFG capture projects contribute to the well-being of the local communities in Cape Town, Durban, or anywhere else. The fact that this particular project appears to be certified as a 'Gold Standard' for the highest level of environmental and social sustainability makes these questions all the more pressing.

*The Gold Standard*

As has previously been mentioned, the ability for host countries to set their own sustainable development criteria has been condemned by social actors as impeding the accountability of the DNA and the development of quality projects. In trying to prevent this situation, SSN with the support of the Climate Action Network established a set of universal sustainable development benchmarks in 1999. These efforts culminated in the 'SSN Matrix' yet were to be ignored during the following Marrakech negotiations that set the rules for the CDM, where each country was allowed to judge projects by their own criterion. As the market began to develop in ways that these ENGOs feared it would – i.e. widespread 'failure to demonstrate 'additionality' and deliver added environmental and social benefits'[68] – the World Wildlife Fund once again undertook efforts to establish universal benchmarks. In May 2003 the WWF released the 'Gold Standard': a code of best practices and some extra screens 'necessary to deliver real contributions to sustainable development in host countries plus long term benefits to the climate.'[69]

The Gold Standard, which admittedly shares strong similarities with SSN Matrix, differs from the regular benchmarks of a CDM project in three important ways. First, there are fewer methodologies that qualify for a Gold Standard rating as compared to a normal CDM, and they must fall into the two broad categories of renewable energy and energy efficiency. Second, the additionality requirements are claimed to be stricter than the CDM since project developers must show that carbon credits enable the project activity to overcome at least one barrier from a list of five categories: financial, political, institutional, technological and economic. Most importantly, the Gold Standard seeks to ensure that the sustainable development aspects of CDM project activities are 'maximised' through the obligatory use of 'sustainability matrix Environmental Impact Assessment (EIA) procedures.' These enhanced EIA procedures stress public consultation and evidence that the project

[68] BASE '*Gold Standard backgrounder*' Downloaded from: www.cdmgoldstandard.org at 1
[69] *Ibid* at 3

contributes to sustainability in three main areas: a) local/regional/global environment: impacts on air/water/soil quality and biodiversity; b) social sustainability: impacts on poverty alleviation, access to energy services, and human capacity (i.e. empowerment, education, gender); and c) economic development: employment, balance of payments, technological self-reliance.[70]

The Gold Standard is currently being overseen by BASE in Switzerland. They have already certified the Bellville South project to be 'in compliance to the Gold Standard Label.' More specifically BSWD was seen to have 'a positive scoring for all the pillars, with significant contribution in term of the local, regional and global environment and has scored lesser, but by no means insignificant contribution toward social sustainability and economic and technological development.'[71] The certification of this CDM project to be in compliance with the Gold Standard raises a number of critical questions about the validity of this measure and the CDM market in general.

To begin with the issue of economic development, SSN, the project developer, admits that the economic development impacts of this project 'would be less significant, this is however counter balanced by the cost effectiveness of the project due to the potential income from carbon finance and the sale of gas.'[72] Thus the impression is that as long as the project is capable of making a lot of money, it can in theory contribute to economic development depending on how that money is spent. Yet within the city of Cape Town there is no consensus for how carbon finance from BSDW would be used. The people at SSN hope to apply the carbon profits from Bellville to other CDM projects in the area that are much less economically viable, such as the Kuyasa energy upgrade (discussed in the next section.) Craig Haskins at the City of Cape Town was unable to confirm if there are any formal plans for how this carbon money is to be spent and does not even recall participating in serious discussions on the matter. Should SSN's proposal be adopted it is unclear how taking carbon finance out of the local community in Bellville would further economic development there.

As to social indicators, it seems ironic that a project that is widely opposed by the local community could register a 'by no means insignificant contribution towards local sustainability.' Does this imply that persons living in the vicinity of the Bellville South landfill do not understand the meaning of sustainability and know what is good for them? Or rather does it reflect the supposed confusion between the continued operations of the landfill and the CDM project, as is the case in Durban? Taking this as the case, it is still curious how a CDM project that operates on a landfill site that has remained open far beyond the desires of local

[70] *Ibid.* at 6e
[71] SSN *supra* note 61
[72] Rosenberg *supra* note 67

residents can somehow lead to improved livelihoods among local residents. This might be possible if the electricity generated from the project was to be distributed freely to the surrounding community, yet this is a proposal that has not been given any consideration in Bellville nor Durban.

Finally turning to environmental sustainability, it seems to be commonsense that a project that reduces harmful GHG emissions would by its very nature deserve recognition as furthering local and global sustainability. The only way this may not be the case is if the project were to result in such damage to either the air, water, or soil in the surrounding area to cause a net negative impact on the environment. Although there are some questions about the impact of the landfill on the local aquifer and the releases of particulate matter from the methane generators, these do not appear to subsume the ecological benefits of preventing methane release. Yet one can still make a very strong case that this project should not be considered sustainable by any definition of the word.

According to the Gold Standard, Bellville South is a 'renewable energy' project under the category of 'ecologically sound biogas.'[73] Yet for this to really be considered 'ecologically sound' a number of important questions about waste management deserve to be answered. In December 2000, the City of Cape Town released an 'Integrated Waste Management Plan' (IWMP) that recognised the need to find alternatives to the present status quo around waste management in the city. In particular, the IWMP focused on the need to development strategies for waste reduction as a top sustainable development priority, a discussion completely absent in this CDM project.

In addition, Walter Loots, head of Solid Waste for municipality and the lead author of the IWMP, admits that the present landfill practices are not sustainable, especially in light of lack of available space for landfills: 'land is at an absolute premium.'[74] For Loots, the 'real solution to the problem is in sorting and treating waste.'[75] According to the IWMP, approximately 50% of the waste in Cape Town landfills comprises of biodegradable organic material. If this was separated out from the non-organic material, the City of Cape Town would be able to vastly decrease its need for landfill space as well as capture a much higher amount of methane. Methane is generated from rotting organic material, yet when this is mixed in with non-organic material as is typical practice in landfills, the amount that can be captured is reduced. For example, the best capture rate proposed in the Bellville project is still only 70% (it's 83% in Durban) but with separated organic material this amount gets much closer to 100%. Thus to try to capture methane from a regular

[73] BASE *supra* note 61 at 1
[74] City of Cape Town *supra* note 65 at 6-25
[75] Loots, *supra* note 66

landfill, as is the aim of this CDM project, is 'an inefficient solution to an avoidable problem,' according to Loots.[76]

It is curious that a project deemed an 'inefficient solution to an avoidable problem' by the very expert in waste management who designed the project should also be considered to make a 'significant contribution in term of the local, regional and global environment,' by the Gold Standard. The reason for this apparent contradiction is two-fold. First, as Loots is only too ready to admit, the City of Cape Town simply does not have the resources to institute a large-scale recycling and waste separation scheme. For Loots, 'our first priority is equitable service delivery. We are getting lots of pressure to have a better recycling program and I would love to have a wet/dry program. But it is simply politically unacceptable for recycling to happen in richer neighbourhoods while there is still no roadside collection of waste in poorer ones.'[77] To support this position, Loots cites the 155 000 families in informal settlements across the municipality, especially the township of Khayelitsha, who lack access to basic services including waste pickup. Deborah Roberts, the director of environmental management at eThekwini, echoes her Cape Town colleague's sentiment:

> We are a couple of decades away from that ideal in terms of solid waste management. South African society simply isn't ready for that type of policy. We consider it bloody marvellous that we can even get waste into the landfill. People here believe that if you throw something down the street it creates jobs.[78]

Thus the argument for the CDM in South African landfills even as a Gold Standard is not that it is the most sustainable solution but rather that it is the only one they can afford in light of present political considerations.

Yet this conclusion only reinforces the failure of imagination in the carbon market to produce forward-thinking projects that have long-lasting social and environmental benefits for the community. A CDM project that provided the capital for a municipality to put in a widespread recycling and waste separation system would have undeniable environmental and social benefits. The space required for landfills would be vastly reduced and without the organic material rotting they would cause much less nuisance to surrounding areas. In addition to improving productive methane capture from the sorted organic material, the better solution for avoiding climate change, the very act of sorting this would create thousands of employment opportunities, the importance of which cannot be denied in a country like South Africa with an estimated unemployment rate of 44%.

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[76] *Ibid.*
[77] *Ibid.*
[78] Roberts, *supra* note 63

Surely this is the type of project that a 'Gold Standard' for the CDM should be certifying. Instead they have chosen to certify a project that provides no employment gains or other social benefits and only further entrenches an unsustainable form of waste management. As such, the Gold Standard seems to have become the victim of the very scourge it was set up to avoid: the propensity of Northern governments to only invest in projects that offer maximum return on investment with little added environmental and social benefits. Worse, it has now given these projects greater legitimacy and demand.

Yet as we shall now see, even if this Gold Standard project was able to provide all of the social and environmental benefits as listed above, the global carbon market has developed in such a perverse way that it would be unable to make it financially viable.

***The Kuyasa low-cost housing energy upgrade project***

On 27 August 2005, the CDM Executive Board officially certified the Kuyasa low-cost housing energy upgrade project as both the first African project and the first Gold Standard project to receive certified emissions reductions credits. It was a great day for the project developers; the City of Cape Town and SSN, as well as the ten beneficiaries of the project living in Kuyasa, a neighbourhood in the township of Khayelitsha outside of Cape Town. In addition to being the first African and Gold Standard CDM project on the planet, the Kuyasa CDM was the only African project this author is aware of where the local residents actively *supported* the project, rather than opposed it (as is the case with the LFG capture) or at best were indifferent. As such, Kuyasa has been held up as an example of the enormous potential of carbon trading to both fight climate change and improve living conditions in local communities. Unfortunately the reality of the situation is just the opposite; rather than being an example of what the CDM can deliver, Kuyasa is a testament to what it cannot.

*2.4.1 Project background*

On the face if it, there is very little not to like about the Kuyasa CDM project. The first phase of the project got underway in July 2002. It involves retrofitting ten RDP (Reconstruction and Development Programme) homes with insulated ceilings (where there would normally just be a corrugated steel roof), replacing regular lighting with low-watt compact florescent bulbs, and installing solar water heaters on the roofs. In the absence of the water heaters, residents would use electric geysers to heat their water and thus the project creates a suppressed demand for coal-fired electricity. In total, 2,85 tonnes of CO2 per household per year are avoided as a result of the project. Ensuring the accuracy of this figure was one of the aims of the first phase of the project where much emphasis is on monitoring the 'baseline methodologies.' The second phase of the project hopes to replicate the baseline

study on 2039 RDP homes throughout Kuyasa. At this time, the baseline study has been official certified by the EB, but phase two is still has numerous financial inputs outstanding. This is a point we shall return to shortly.

One of the most likable aspects of this project is that from the very beginning there have been extensive consultations with the community. The City of Cape Town and SSN have worked closely with the ward development forum (WDF) in Kuyasa, who put together a broad-based steering committee of community members who were able to take ownership of the project through key decisions. These decisions included assisting the design of the project, deciding what ten households would participate in it, and how to move forward into phase two of the project. The steering committee also played an active facilitation role between the project developers and broader community so there were ongoing opportunities for public input over the project.

In terms of the Gold Standard, this project 'attains positive scores in all of the pillars. It has a particularly high rating in terms of social sustainability and local development and has a minimal impact, apart from the reduction of GHG on the natural environment.'[79] As to the social/economic development, the project creates employment opportunities through the instillation and maintenance of the solar water heaters, which are locally manufactured. Furthermore, the R625 average annual savings on electricity bills can go back into the local economy and create further economic spin-offs.[80]

During a site visit in Kuyasa, this researcher had the opportunity to interview one of the project participants named Muzelli, an unemployed man in his thirties confined to a wheelchair. Through a translator (Muzelli only speaks Xhosa, as is not uncommon in Khayelitsha) Muzelli told of how he now saves over 600 Rand per year on his electricity bills, which he is able to send back home to support his children still living in the Eastern Cape. When the weather gets cold at night (it can get below ten degrees Celsius during winter evenings) all of Muzelli's neighbours come over to visit as his ceiling keeps the house much warmer than anywhere else in the neighbourhood. Though he admitted that he did not know much about climate change, Muzelli made it clear that people support the project for many other reasons, namely the money they save and having warmer houses. As he stated, 'this is a good project. People are very impatient to get their homes upgraded, they really want this project.'[81] During our interview word got around the neighbourhood of my arrival and by the time I went to leave a small crowd had gather outside of the house eager to shake my hand and ask when their water heaters would arrive. One need not require much more evidence than that to support a project like this.

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[79] SSN *supra* note 67

[80] *Ibid.*

[81] Muzelli (Kuyasa project beneficiary) personal interview 6 July 2005

*The financial imperative*

As wonderful as this project appears to be, when one begins to look into the financial aspects of it, the unfortunate reality of the carbon market is revealed. Of the total budget for the first phase of this project, carbon finance will cover no more than 20% depending on the spot market price of CERs when the developers sign a purchase agreement. To quote Lester Malengis from SSN who has worked on this project for the past two years, 'this is first a project that uplifts Kuyasa, not a carbon project…that funding is not sustainable.'[82] With carbon credits making up only a fraction of the budget, this project has been able to go ahead due to the generous funding it has received from other sources: R12,4 million from the Department of Environmental Affairs and Tourism in Pretoria, another R4 million from the province of the Western Cape, and R450 000 from Electricity de France as part of their Corporate Social Responsibility campaign.[83] In addition to this funding, SSN and CCT also donated hundreds of hours of labour not compensated through project finance. For Richard Worthington of SACAN, though Kuyasa seems to be an example of the project people had in mind when the CDM was conceived, 'it's clearly got to where it got to because it's been treated as a charity case. It's been damn expensive and not at all an example of how to put a project together.'[84]

The question then becomes how this project can go forward into phase two under the present carbon market conditions. According to SSN's own analysis, the upfront capital costs for phase two will be around R12 million with ongoing maintenance costs of R383 000 over the ten-year period. Of the remaining financial inputs, the analysis noted,

> Based on conservative assumptions, the CER revenue will cover 15% of the upfront implementation costs of the project, and represents a revenue stream over an eight year period until 2012. Bridging finance in year zero is likely to be required for this amount as very few CER purchasers will pay upfront.[85]

With only 15% of the budget coming from carbon finance, SSN is looking to residents to help cover some of the project costs, what they refer to as 'ensuring ownership of these technologies.'[86] One of the ways this is being considered is through the use of pre-paid electricity meters that would simply deduct a payment amount over three to five years. However, in discussions with Craig Haskins at the City of Cape Town he admitted, 'this is an election year and thus not a viable option to discuss right now.'[87]

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[82] Malgas *supra* note 62
[83] Rosenberg, *supra* note 67
[84] Worthington *supra* note 58
[85] SSN 'The Kuyasa Low-cost Housing Energy Upgrade Project' downloaded from: www.southsouthnorth.org at 3
[86] Rosenburg *supra* note 67
[87] Craig Haskins, personal interview 4 July 2005

With funding from residents temporarily out of the question (though one suspects not for long) another option project developers are looking at is the 'offset' market. The offset market exists entirely outside of the CDM as a vehicle by which private companies or individuals can purchase emissions reductions (hopefully independently certified, but rarely through the EB) to offset the continued emissions of GHG from their operations (a Corporate Social Responsibility-type initiative) or a purchase they are making (i.e. plane trips.) The upside to the offset market according to Sheriene Rosenberg at SSN is 'its turning out to be one of the biggest contributors to sustainable development; people don't want projects like Mondi (read: low-hanging fruit was dubious additionality.)'

The downside to the offset market was not realised by Rosenberg when she admitted, 'Just for the offset market, Kuyasa can be sold over and over again.' With no oversight capacity in the offset market there is nothing stopping projects like Kuyasa from recycling the same carbon credits in multiple deals. However, every time a deal is completed Kuyasa's environmental benefits are compromised as equal amounts of CO2 will be emitted into the air. Should this happen more than once there will be a net negative effect on climate change.

The final funding option for Kuyasa would be continued support from all three levels of government. As compared to the previous two options this seems most preferable. However it is difficult to rely on such political charity as it is dependent on a myriad of factors, especially the urgency of other priorities. To give one example of another priority, housing activist Peter van Heusden cites a backlog of 260 000 houses that need to be built in the City of Cape Town, which is growing at a rate of 20 000 per year; 9 000 from old/derelict homes and 11 000 from new arrivals.[88] This backlog has almost doubled since 1994, which is due in part to the influx of people into the area post-Apartheid, but mainly state's unwilling/inability to tackle the problem. For example, the City of Cape Town underspent its housing budget in 2004. That year only 4 000 new housing opportunities were developed. In 2005 their aim is 8 000, though this will not even cover the new demand for homes, let alone address the backlog. In light of this dire situation it is difficult to expect the City to spend much money on energy upgrades for people who already own their homes when millions of people don't.

Thus the residents of Kuyasa are left with the genuine problem of additionality. It cannot be denied that absent carbon finance the plan to provide 2089 homes with energy upgrades may not go ahead. All other funding sources are problematic. Thus although this is exactly the type of project that many people hoped the CDM could deliver, now that it exists the carbon market simply cannot support it. The basic problem is that the projects that are out there are driven first and foremost by economic considerations and thus are driving down the price of carbon. This can

[88] Peter van Heusden, personal interview 19 July 2005

been seen in all of the other three case studies that have been reviewed: Durban and South Bellville are still very profitable at a lower carbon price because the potency of methane still means they get twenty-one times more carbon credits than a project like Kuyasa that only involves CO2 reduction. Sasol's project has already been entirely paid for so anything they receive in terms of carbon finance will be pure profit. Kuyasa doesn't have either of these luxuries, which helps explain why renewable energy projects are only 5% of the global carbon market. When you are not low-hanging fruit, you're simply not that appetising to carbon capital.

**Institutional oversight**

As we have just seen, there are some major flaws in the South African carbon market that translate into questionable projects being developed and potentially verified, while better projects are unable to find sufficient carbon finance. The question now becomes what capacity exists to oversee this market and filter out the dubious projects so they cannot impede some of the more progressive projects. To answer this question, this Section will consider institutional capacity at all levels of government within South Africa as well as the international governance structures.

*The Designated National Authority*

As mentioned in Section One, it is the role of the DNA to set up sustainable development criteria for the host country and then judge projects on this basis. The DNA can also comment on methodologies and baseline scenarios, but that responsibility is largely left to the Designated Operation Entity (see Section 3.2 below for that discussion.) In South Africa there appear to be three main challenges to the DNA's ability to play its oversight role as laid out in the Marrakech Accord. These include its compromised placement within the Department of Minerals and Energy, its limited resources, and its broadly defined sustainable development characteristics.

One of the first real struggles around the CDM in South Africa was over the decision about which department the DNA should be located in. Environmental groups, led by the SACAN, wanted the DNA either in the Department of Environmental Affairs and Tourism (DEAT) or the Department of Trade and Industry (DTI). Yet it was the Department of Minerals and Energy (DME) who were able to convince cabinet that since most CDM projects are energy related they should be in the place where there is the most energy expertise. As to the alternatives, the DNA claims that DEAT didn't want them in their department; 'they were scared of this; they said "it's going to be huge."'[89] Nonetheless many activists,

[89] Luwazikazi Tyani, personal interview 28 June 2005 (all subsequent quotes from Mr. Tyani are from this source)

such as Richard Worthington of SACAN, continue to believe that the DME's role of promoting CDM projects has left the DNA in an ultimately compromised position in its attempts to vigorously adjudicate the same projects.[90]

One unfortunate consequences of the controversy over where to house the DNA was that it was not until December 2004 that the office eventually got up and running. Even when it did, the DNA was solely one person: Luwazikazi Tyani. When interviewed, Ms. Tyani admitted to being a bit overwhelmed during the first six months on the job as it was very difficult to maintain the strict turn-around times (usually thirty days) expected of validators in the CDM project cycle. Though this human capacity problem seems to be getting addressed by the recent arrival of some admin staff to the DNA, they still lack the resources to really engage the public on potential projects. The only mechanism the DNA has for this task is their website where citizens can post comments on projects within a thirty day time period. For the millions of South Africans without internet access there is no alternative for them to participate in the 'public' consultation. Still worse, the DNA does not have a budget to place notices about public comment periods in local media around affected communities, thereby restricting the opportunities even citizens with internet access have to the process. In light of these systemic barriers it should not be seen as surprising that the DNA has yet to receive a single public comment on any of the projects posted to its website.

Perhaps the greatest obstacle preventing a more progressive oversight role for the DNA is their apparent willingness to ignore their own sustainable development indicators. Much like the departmental location of the DNA, there was a bit of a struggle over what indicators the DNA would use for sustainable development, especially with the SSN Matrix being invented in their backyard. In a somewhat brilliant political move the DNA adopted overly broad criteria that it claims it will 'evaluate' CDM projects on the basis of, yet also pledges to 'be informed by consideration' of much more specific project indicators inline with the SSN Matrix. In practice this means that legal recourse options against the DNA for approving any projects is somewhat limited as the social and economic criteria they have pledge to follow are nothing more than 'Does the project contribute to national economic/social development?'[91] The intentional vagueness of these questions means it is practically impossible to prove that the DNA erred in judging a project to be in compliance as this is entirely a subjective decision. They are under no obligation to follow the actual project indicators such as impact on local skills development, FDI, existing economic activity in the area, employment levels, community social structures, etc.

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[90] Worthington, *supra* note 58

[91] DNA.'South Africa's Designated National Authority' (Pretoria: Department of Minerals and Energy, 2005) at 3

Yet even with this legal loophole where the DNA has broad discretion to judge CDM projects almost anyway it likes, Luwazikazi Tyani admitted 'I can foresee so many of these projects that are not going to meet SD criteria.' Though she felt unable to elaborate on which projects these were and what stage of validation they were in, Tyani assured me that 'these are not necessarily bad projects; they maybe good on one area, just not meet the others.' The most troubling aspect about this situation was the ways Tyani proposed to deal with it. One option she proposed was to expand the indicators so more projects would qualify. Just how much more expanded 'Does the project contribute to national economic development?' could get was unclear. The other option proposed was to allow projects to go through no matter how they scored on the indicators as long as 'they do something good with the carbon credits' such as environmental or social investments. This may seem like an adequate compromise until one recalls the financial additionality requirement; if a project developer can afford to use the carbon credits to satisfy sustainable development indicators than they are not using that money to make the project economically viable. If that is the case, then the project is by its very nature not financially additional (i.e. they could have done it anyway without carbon finance.) When confronted with this reality, Tyani admitted that she had not thought of that and maybe it was best then just to expand the criteria. Strangely enough, a third potential option of rejecting projects that failed to meet the criteria demanded of them was never mentioned in our discussion.

*The Department of Minerals and Energy*

Though the DME has already been discussed as potentially undermining efforts to thoroughly adjudicate the CDM projects it is trying to promote, there are other ways that Pretoria and this department specifically influence the carbon market and efforts to prevent climate change in South Africa. The first of these if through the government's *White Paper on Renewable Energy* that was released in 2003. The White Paper includes a target of 4% of total generation from renewables by 2013, which the government never fails to make reference to on the international stage.[92] With such a progressive policy in place, there should be a plethora of opportunities and reasons for the government to support small-scale renewable projects that might not be able to compete against the 'low-hanging fruit' in the global carbon market.

Yet this is simply not the case. For starters, the 4% target is *cumulative,* meaning that it will be satisfied if the annual percentage of electricity coming from renewables every year adds up to 4% by 2013. Therefore if new renewable capacity goes online next year totally just 0,5% of the market and no other new supply goes online, this target will be satisfied. Needless to say, this point usually does not make

[92] This target was first promoted by the South African government at the Bonn Renewables Conference in 2004 and then again a year later at the Seminar of Government Experts at SB-22 in Bonn in May 2005.

it into the government's presentations to the international community. What is more troubling is Richard Worthington's assertion that this target was intentionally set so low due to the influence of the World Bank and donor countries such as Denmark and the Netherlands, which convinced the government that this was as much CDM finance as they could be assured of.[93] This played well into Pretoria's budgetary preference not to spend any money on meeting the White Paper target. According to Kevin Nessip, Chief Director for DME's Energy Planning Unit, 'Green power is not a funding priority. From a fiscal point of view priorities are welfare, healthcare, education, job creation… We're low down on the pecking order.'[94] Thus Pretoria has neither the budget nor the strong desire to be of much assistance to small-scale renewable energy producers. After all, Nessip argues, 'energy should be self-sustaining.'[95]

While Pretoria seems content to leave renewable energy (RE) producers out in the cold, the national electricity company Eskom has taken a much more proactive stance in trying to minimise their role in the market. With complete control of the national power grid, Eskom is able to use this monopolistic power discriminately to limit access for certain producers and/or to certain customers. This can quickly make RE economically unfeasible, especially when compared with Eskom's preference for cheap coal and subsidised nuclear power. In acknowledging this practice, Nessip admitted he was 'disappointed' in Eskom and is trying to ensure non-discriminatory grid access. However, a better place to start might be limiting the access Eskom has to the DME. The White Paper on Renewable Energy was co-written by Eskom employees seconded to the DME.[96] Similarly, Eskom has representatives in the official South African government delegation to the Conference of the Parties to the United Nations Framework Convention on Climate Change, even though Eskom is the country's largest GHG emitter.

If the DME's reluctance to spend much money on renewables or challenge Eskom's overwhelming political influence did not already pose enough of a challenge to renewable energy in South Africa, the perverse incentive of the CDM to progressive energy policy might be the final nail in the coffin. The logic of the CDM as a perverse incentive is that if the government imposes certain standards or statutes concerning renewable energy or energy efficiency this will compromise the additionality requirement since everyone will be forced to do what is legislated rather than argue they are doing it because of carbon finance. The EB has stated that it won't allow the CDM to become a perverse incentive, but South African government officials already admit it has been. For example, Kevin Nessip in

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[93] Worthington, *supra* note 58

[94] Kevin Nessiep personal interview 28 June 2005

[95] *Ibid.* (Note: despite Nessiep's assertion, Pretoria hands over enormous subsidiesto Eskom every year, for their nuclear program especially.)

[96] Worthington, *supra* note 58

revealed that in 2004 the government considered a proposal legislating solar water heaters for houses over a certain size but realised such an undertaken might require carbon finance and thus 'additionality' and therefore the government decided not to pursue the policy. Similar decisions were taken around a mandatory blend for methane in petroleum and increasing the amount of landfill gas that requires capture.[97] If the carbon market were actually supporting these types of projects, the government's decision not to legislate in this area might not be so bad. Yet with the exception of landfill gas, the market has thus far proven unwilling to engage in these types of projects and therefore producers are denied both the carbon capital and legislative impetus to develop their industry.

*Local and provincial governments*

With Pretoria failing to provide much in the way of oversight of CDM projects or incentives for renewable energy, this task has been downloaded on the other levels of government who are unable and/or unwilling to accept it. Three years after the PCF signed the Emissions Reductions Purchase Agreement with Durban, Lindsey Strachan confessed 'the province has only now come to grips with this project.'[98] Strachan also recognises 'a major flaw' in the province's ability to process documentation and cites examples of waiting over six months to get documents back. It should be pointed out that provinces in South Africa are not nearly as powerful as they are in other federal systems as the country is heavily centralised so provincial governments are quite often given little responsibility and even less resources.

This of course means even more pressure is put on the municipalities to fill the voids left by the other levels of government. As one of the first African cities in the Cities for Climate Protection (CCP) program, Cape Town got a jump start on addressing this issue when it received an initial start-up budget of $60 000 to identify ways to reduce its emissions and develop energy alternatives/efficiencies. Having identified where the opportunities exist to reduce emissions, Cape Town is now beginning to allocate staff and a budget to addressing this problem. This is supplemented with a public education campaign around renewable energy and climate change through Cape Town's quarterly climate newsletter. These climate initiatives of are additional to the CDM projects in Kuyasa and Bellville.

Yet even with all of these progressive initiatives around climate change, municipal officials are only too willing to admit their need for support from the national government to be really effective. Craig Haskins - the head of the CCP program - admits 'the basic model is that cities lead and the national government follows. This is a pity really, as we'd love to have more leadership from the national

[97] Nessip, *supra* note 94
[98] Strachan, *supra* note 36

government.'[99] Cape Town has shown itself capable of coming up with some creative ways to address climate change, but without the legislative and financial resources from Pretoria there is only so much of an impact they can make.

Much like Cape Town, Durban's experience with Pretoria underlines the lack of coordination and cooperation by different levels of government in South Africa around this issue. When asked about this relationship, Lindsey Strachan complains 'there hasn't been a single phone call from Pretoria asking for the status of this project.' When Strachan is forced to work with Pretoria he often finds himself turning to alternative sources to access the information he requires in a timely fashion. Yet Strachan stresses 'the national government should be disseminating the information, not the Danish embassy.' As a result of Pretoria's inability to be of much assistance and the municipality's limited resources, Strachan has basically become the 'project champion' for the CDM in Durban, 'there has to be much more institutional support, that's why it's gone on this long…We must stay away from 'project champions.' That doesn't work, the champion should be DME.' Finally, in demanding a more active role by the public sector, Strachan also explicitly rejects the notion that the private sector is filling this void:

> Take Mondi (South Africa's largest pulp and paper company with two CDM projects in development)), their own financial directors say, show me a profit in three years. They openly say this, three years! That's the problem here, it shouldn't be about profit…It won't work if it's not being driven by the public sector, they're thinking triple bottom line, and the private sector is thinking single bottom line; this is a public issue, this is a global issue.

Though the public sector may indeed by the only ones thinking about the triple bottom line, this has not yet resulted in many positive interventions in the South African carbon market by any level of government. This apparent incapacity appears ready to be replicated at the international level, where as we shall now see, we find more people in compromised situations than proactive ones.

***International structures***

For a CDM project to be approved it must go through two stages – the DOE and EB – that are not connected to its national bureaucracy. These requirements, at least in theory, help maintain proper checks and balances on the host country so even if the DNA approves of dubious projects that are not guaranteed CERs. What the theory does not take into account is human fallibility, or to be more precise, conflicts of interest. Such may be the case in both of the international verifiers associated with CDM projects in South Africa.

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Beginning with the DOE, it has been widely known among actors in the South African carbon market that the transnational consulting firm KPMG is trying to become the DOE for the Southern African region. In countries with large numbers of CDM projects (i.e. India, Brazil) there will be multiple DOEs, some of which will specialise in certain methodologies. However, in Southern Africa where there are still relatively few projects (only a couple of Uganda and then the dozen or so in South Africa.) there can be a DOE certified for the entire region rather than the country. Thus far KMPG has been validated by the EB as a DOE for certain types of methodologies and as of September 2005 they seem to be in the process of certifying them for the Southern African region specifically. Assuming this comes to pass, it raises an interesting conflict of interest around the Sasol CDM project. As we can recall, the Sasol project has some misleading claims around additionality in its PDD that are directly contradicted by some of its own managers. It is precisely the job of the DOE to validate a project's baseline scenarios, meaning its additionality. Where this gets interesting is that in Sasol's PIN they state that 'KPMG has assisted Sasol develop the CDM aspect of the SNGCP (Sasol Natural Gas Conversion Pipeline) since 2000.'[100] In email correspondence with Sasol to verify this statement, Gerrit Kornelious confirmed that KPMG have 'assisted (and are assisting) in drawing up CDM project documentation.'[101] Therefore, it is looking like KPMG will be in a position to verify the very PDD that it was commissioned to write. Although it's certainly possible that 'Chinese walls' or other ethical measures could be taken to minimise this conflict of interest, one may still question the likelihood of KPMG refusing to verify its own client.

Should Sasol be approved by its PDD author, it would be up to the CDM Executive Board to refuse them certification. The only African member of the EB is a South African by the name of Dr. John Kilani. In addition to his esteemed international experience, Kilani has an accomplished career in the South African mining industry. He is currently the Senior Manager of Sustainable Development for African Rainbow Minerals and prior to that held a senior management position at Anglovaal, which at the time was a subsidiary of Anglo American. Anglo American owns Mondi and Transalloy, both South African companies with CDM projects in development. Anglo was also listed as one of Sasol's major consumers of natural gas from their new pipeline.[102] Though it's doubtful a direct conflict of interest exists here as since Kilani is no longer employed by Anglo, this should at least raise some flags about the potential for corporate influence over this process. This contention is further supported by Kilani's active involvement in two South African lobby groups: as a trustee for the 'Fossil Fuel Foundation' from 2000 to 2004 and a representative

[100] Sasol *supra* note 49 at 1
[101] Kornelius *supra* note 57
[102] Geef *supra* note 47

member of the Chamber of Mines of South Africa. As would be expected, Kilani's involvement in these organisations put him on the front lines of lobbying on behalf of some of the very companies he could shortly be asked to certify for CERs (i.e. Sasol, Anglo.) How Kilani plans to deal with these situations is an interesting question, but the undeniable fact is that the South African arbitrator of last resort for the CDM is a man with deep ties to one of the regulated industries. This provides little comfort for those worried about the problematic development of the South African carbon market.

**Civil socity and the carbon market**

With domestic and international structures raising further concerns about the South African carbon market rather than alleviating them, we turn our attention now to the role played by social actors. As there is a multiplicity of social actors, there are numerous roles they play in this arena. In an attempt to accurately portray this, social actors will be divided into three main categories depending on their views on carbon trading and type of engagement in the carbon market. First we shall discuss the private sector developers; the 'true believers' in the CDM whose central concern is reducing barriers to easy access of carbon finance. The second group are ENGO 'reformers' who recognise more serious problems within the carbon market, though these can be solved through the right mix of policy reform and oversight. Finally, there is the international network that views carbon trading as inherently flawed and believe alternate solutions should be pursued. This group does not believe the problems inherent in carbon market can be fixed by marginal adjustments but instead require a complete rethinking of our approach to fighting climate change and north-south relations. Without further ado, let us now review each of these groups in more detail.

*Project developers*

Among even the most ardent supporters of the CDM there is a sense that all is not well in the South African carbon market. The problem, according to people like project developer Johan Vanderberg of Cape Town-based 'CDM Solutions' is one of institutional capacity. For Vanderberg, it isn't so much of the failure of the DNA to provide oversight of the CDM market in South Africa, but rather their inability to process projects quickly enough.'The biggest issue with the CDM is that it takes a long time; people put a lot of their own money on the line and there are lots of obstacles to overcome. Coming to bank-ability (read: CER purchase agreement) means giving up a pound of flesh in transaction costs.'[103] Vanderberg estimates that

[103] Johan Vanderberg, personal interview, 13 July 2005 (note: all subsequent quotations of Mr. Vanderberg are from this source)

it costs approximately R40 000 to get a project approved and a minimum of six months. This cost and time commitment are prohibitive to small-scale producers doing either energy efficiency or renewable energy. Even if project developers are able to finance the process and commit the time getting a project verified, there are still uncertainties around whether the project will be approved and how much they can sell the carbon credits for.

Though the government cannot set the spot market price of carbon to address this latter concern, project developers argue that they could increase the efficiency of the approval process, which will both reduce the time lag and the costs involved.'A fast track procedure is sorely needed,' Vanderberg argues.'There should be a prime face view that a CDM project is environmentally beneficial.' The suggestion is that since projects already reduce GHG emissions, the DNA's sustainable development indicators are an unnecessary expense and inefficient bureaucratic red tape. The idea of requiring a Gold Standard or internationally applied benchmarks is 'like saying to a guy with a heart transplant, if this doesn't take away the wrinkles on your face you can't get a new heart.'

At the root of much of the opposition to the costs and time involved in project verification is almost a neoliberal faith in the free market not shared by other social actors in this field. Michael Goldblatt, a CDM consultant for the Palmer Development Group, believes 'the CDM is a more innocuous than people realise…the national government doesn't have that much of role to play, just make sure they're not an obstacle and let the market develop.'[104] Presumably Goldblatt agrees with Vanderberg that rigorous oversight of the carbon market is such an obstacle to its proper development, though this argument is rooted as more in an ideological faith in the market than in practical examples of where fewer regulations have produced better projects.

In terms of advocacy, these 'true believers' engage in more closed door campaigns where they are able to leverage their very privileged access to politicians and bureaucrats to influence outcomes in their favour. The root of this access varies depending on the project developer. For persons like Gerrit Kornelius at Sasol it comes from the power of being one of the country's largest corporations with deep political ties to the state. For small business developers, like Michael Goldblatt, it comes from a long history of engagement on the issue. In 2001, Goldblatt authored the *South African National Strategy Study on the CDM*, commissioned by the World Bank and Pretoria. Following its release, Goldblatt continued to serve as a consultant for the DNA and oversaw the consultation process around which department it should be located in.

Palpable results of the project developer's market interventions can be seen in the future projects that are approved and policy changes undertaken. To listen to

[104] Michael Goldblatt, personal interview, 24 June 2005

Luwazikazi Tyani at the DNA speak about broadening the sustainability criteria to approve of more projects, it appears the government is only too ready to cooperate.

***Domestic ENGOs***

For the vast majority of ENGOs in South Africa the problems associated with the carbon market run much deeper than what project developers would like to think, and thus require much more creative and engaged solutions. The views of this broad community can be fairly accurately represented through just two organisations: South South North and the South Africa Climate Action Network. SSN, as has been previously mentioned, has been involved with the CDM longer and more intensely than probably any other ENGO in the world but certainly more than anyone else in South Africa. SACAN's involvement is somewhat more limited as they deal with all aspects of climate change, not just carbon trading. Having said that, SACAN has taken a number of strong positions around the CDM and since they are a network of sixteen ENGOs across South Africa it is fair to assume that many of these positions are widely held.

One of the first key differences between these ENGOs and the project developers is their comprehension and in some cases sympathy with the ideological critiques against carbon trading. In the July 2002 edition of 'Climate Action News,' SACAN's quarterly newsletter that is disseminated throughout South Africa, the headline of the front cover story on the CDM read 'Can we justify selling Africa's atmosphere?' The byline of this story was even more to the point:

> The rich developed countries have emitted most of the greenhouse gases currently in the atmosphere and now the more enlightened of them are prepared to pay to further pollute our atmosphere, or more exactly, they will provide money so that they can continue their pollution while we decrease ours.[105]

The concern that the CDM is maintaining an unequally access to the atmosphere between rich and poor countries was also recognised by Sheriene Rosenberg at SSN who in the context of certain dubious projects admitted, 'you shouldn't be selling off your crown jewels so the North can keep polluting.'[106]

While appreciating some of these theoretical critiques, ENGOs see the injustices of the CDM can be seen most clearly in some of its more controversial projects. From the moment Sasol announced its intent to have its pipeline recognised as a CDM project SACAN has been publicly denouncing it. In the November 2003 issue of *Climate Action News*, Richard Worthington made clear that 'SACAN is totally

[105] SACAN 'Can we justify selling Africa's atmosphere?' (*Climate Action News:* July 2002) 1
[106] Rosenberg *supra* note 67

opposed to Sasol claiming credits for the project under CDM.'[107] The concern for Worthington was that the project has been in the pipe-line for many years and was 'motivated by improved efficiency with long-term cost-savings as well as dwindling coal reserves in the vicinity of the plant.'[108] To try to claim CDM credits for this is 'clearly an opportunistic add-on' and should be rejected for a lack of additionality as well as the improved efficiencies that will entail a net loss of jobs, thus failing the sustainable development criteria.

The other project that is widely opposed by ENGOs in South Africa is Bisasar Road. For SSN, the cause of all the problems in Durban lies with the involvement of the Prototype Carbon Fund and the World Bank. The argument against the PCF is that it is governed solely by free market ideals, which are often in conflict with community benefits. In their words, the PCF is after 'a cheap bang for their buck; they basically just get the low cost credits… (they) pillage the country and don't contribute to sustainable development.'[109] SACAN holds a similar suspicion around this project and devoted their March 2003 newsletter to a debate on it. This debate raised a number of critiques of the project from activists across South Africa including the PCF's motives, the incentive for poor waste management, a lack of community consultation, and the lack of commitment on a specific closure date.

While these ENGOs have found plenty of problems with the CDM and seem to sympathise with the claim that free market economics contributes to this, they reject the idea that the two forces must be addressed simultaneously. Richard Worthington opposes rejection of Kyoto on the basis of its flawed market mechanism. To take such a position implies, that

> we have to change the world economic system before tackling climate change. Sure, I'd love it if we had a more co-operative economic system in place, but we can't wait for that before tackling climate change... (Opposition to Kyoto is) a poor strategy that plays into the hands of Bush.[110]

Thus a more reformist approach to the problem is adopted, rooted in the acceptance that 'Whether we like it or not, there will be trade in certified emission reductions; the best we can do is influence how these are created.'[111]

In practical terms, the attempts of ENGOs to influence this process is by shaming bad projects, supporting better ones, and advocating for strong reforms so there is more to support and less to shame. A number of references have already been made to how SACAN uses their newsletter to inform many activists on the

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[107] Richard Worthington 'Sasol CDM Project Questioned' *Climate Action News* (November, 2003) 3
[108] *Ibid* at 3
[109] Rosenberg *supra* note 67
[110] Worthington *supra* note 58
[111] Worthington, *supra* note 107 at 4

ground about some of the problems with the CDM and shame projects that reflect this. As a network they are also able to use other means to get their message out, such as when Worthington emailed over forty social actors engaged in this issue about Peter Geef's confession that Sasol's project is not additional the morning after it was made. In terms of more active engagement around negative projects, SACAN has written to the PCF and DSW expressing their concerns over the Durban project and also conveyed their opposition to this and other projects in Pretoria.

Despite Worthington's belief that the Kuyasa project is a poor financial model for a CDM project, SACAN has been a strong public supporter of it and continues to support the Gold Standard as a necessary reform model to maximise the benefits of carbon trading. This is also the position of SSN who for all intents and purposes is the intellectual force behind the Gold Standard. The strategy employed in supporting the Gold Standard is active on a number of levels: through a domestic campaign with the DNA, internationally through the Conferences of the Parties, and within the market itself where these projects are 'incentivised' to be seen as appealing to purchasers of CERs.[112]

As to the success of the reformers' efforts, the most obvious one to quantify is the fact that SSN has had a Gold Standard project certified and has another on its way. This has certainly raised the profile of an alternative model to the 'low hanging fruit' associated with the PCF and some of the other questionable projects. As to legislative reforms, the ENGOs appear to have failed in their campaign to have the DNA adopt the Gold Standard or other objective criteria that projects would have to meet to get their approval. In fact, most ENGOs do not appear aware of the project developers' desires to loosen the weak criteria already in place and may get sideswiped in such a campaign. At the international level, efforts to get the G77 to adopt the Gold Standard have also thus far proved elusive as 'rather than use it to further everyone's collective interests, (the G77) has become a vehicle for them to keep tabs on each other.'[113]

Despite some of these setbacks, ENGOs continue to try shaping the South African carbon market. It is safe to assume that for all its flaws, the market may have developed in even more troubling ways without their input.

***Climate justice activists***

The birth of the global grassroots movement against carbon trading occurred at a conference titled 'Commodifying Carbon: Consequences and Strategies' in October 2004 in Durban, South Africa. The conference was attended by nearly thirty energy and environmental activists, academics, and persons from affected communities. Every continent was represented at the meeting and the majority of the participants

[112] Rosenberg, *supra* note 67
[113] Worthington, *supra* not 58

were from the Global South. Throughout the weekend-long meeting stories about the affects of CDM projects across the world were shared, activist bonds were formed, and strategies to combat the carbon market were discussed.

Perhaps the most important outcome of the meeting was the creation of the 'Durban Declaration.' Under the banner of 'Climate Justice Now!' the meetings' participants rejected the claim that 'carbon trading will halt the climate crisis.'[114] Rather this crisis is caused by the mining and use of fossil fuels, something that carbon trading fails and in many ways solidifies, thus making it a 'false solution which entrenches and magnifies social inequalities.' In its conclusion, the Declaration committed its signatories

> to seek real solutions (to the climate crisis) that are viable and truly sustainable and that do not sacrifice marginalised communities…(and) to help build a global grassroots movement for climate justice, mobilise communities around the world and pledge our solidarity with people opposing carbon trading on the ground.

Taking its name from the declaration and conference location, the *Durban Group for Climate Justice* ('Durban Group') has indeed developed as a global grassroots movement, as pledged in the Declaration. In the days following the conference an internet listserv was established to allow the participants to disseminate information on carbon trading and climate change developments in a quick and inexpensive fashion as well as coordinate events and campaigns. As more groups and individuals signed the Declaration so to did the listserv grow to include wider perspectives and more regions.

As to the strategic activities of the Durban Group, the first event they had a presence in following the meeting was the tenth Conference of the Parties (COP10) in Buenos Aries, Argentina in December, 2004. At COP10 a number of members of the Durban Group held a well-attended side event on the impacts of the CDM on local and indigenous communities in the Global South. The following month a larger number of members were able to attend the World Social Forum in Porto Allegre, Brazil, where members held well attended public discussions on carbon trading, met more privately with other ENGOs to discuss the issue and possible strategic alliances, and to plan their own campaigns for the following year. These activities came to include an open letter to Kofi Annan and the United Nation about their concerns over carbon trading and the CDM on 16 February 2005, the day the Kyoto Protocol came into force.

With Tony Blair making climate change one of the central issues of the G8 meeting in Gleneagles, Scotland in July, members of the Durban Group released a

[114] Durban Declaration on Climate Justice, 1

publication critical of the G8 countries' climate change and carbon trading policies just prior to the meeting.[115] Finally, with COP11 upcoming in Montreal, where discussions on the post-2012 climate regime will commence, the Durban Group has been active in planning events and strategies to get its message on the radar screens of delegates and media representatives.

As for the presence of the Durban Group in South Africa, participants at the October 2004 conference have almost exclusively confined their strategic actions to the struggle around Bisasar Road and have shown little awareness and less engagement with other CDM projects. The activities around Bisasar Road include op-ed pieces in the national media (a piece co-authored by Patrick Bond and Rehana Dada in the *Mail & Guardian*) and the making of short film on the subject for the South African Broadcasting Corporation by local filmmaker Rehana Dada. Amsterdam-based Carbon Trade Watch and other organisations involved with the Durban Group also issued a public letter to the PCF articulating their concerns over the lack of consultations on the CDM project and its entrenching of environmental injustices in the community. Finally, Sajida Khan has continued her courageous court battle against the landfill, though it should be noted that this commenced long before the Durban Group was formed.

Though it seems premature to judge the impacts of the Durban Group only one year after it has formed, it can be lauded for being the lone critic of carbon trading left in the international arena following COP9 in Marrakech, the last time major ENGOs discussed the subject. Moreover, as more signatories are added to the declaration it appears that their message is resonating with a lot of people frustrated by the status quo of continued growth of emissions in most Annex 1 countries. Yet for the most part this has yet to translate into successful local campaigns against carbon trading projects in Southern countries. South Africa is no exception to this and one could argue that with the exception of Bisasar Road project, signatories to the Durban declaration in South Africa have had less impact on their own carbon market than the more moderate ENGOs who are not signatories.

**Conclusion**

This study set out to investigate the ways in which the carbon market has developed in South Africa and how social actors can influence this market. In answering this question, we began by setting out the context of global carbon market that includes some troubling trends in the way it has thus far developed, namely projects concentrating in medium income countries around 'low hanging fruit.' Much of the global carbon market trends are replicated in the South African case studies that we

[115] See: Carbon Trade Watch 'Hoodwinked in the Hothouse: the G8, climate change, and free-market environmentalism' (Amsterdam, Transnational Institute, 2005) online: www.carbontradewatch.org

reviewed: dubious projects adversely impacting local communities, profit-oriented private sector developers neglecting additionality, and a 'model' RE project financially unsustainable. At an institutional level, compromised and/or under-resourced civil servants only contribute to the 'crony' nature of this market rather fundamentally address it.

As is often the case when it comes to technical aspects of socio-economic issues, the more faith people have in the carbon market (and thus the more inline with the government's objectives) the more influence they appear to have with friendly verifiers. Social actors more critical of trading have begun to raise the profile of the issue in the international policy arena and, to a lesser extent, with domestic audiences. However the actual struggle against projects on the ground continues to be in isolation as there is no activist networking or widespread opposition to carbon trading in South Africa. This puts local communities at an even greater disadvantage when they wish to engage in this process as each time they have to learn the elite-centred technical jargon (i.e. additionality does not translate well into Zulu or Xhosa) and complex validation cycle.

Yet juxtaposed to all of the bleakness are some real opportunities for civil society to have a positive impact in this process and make some real gains in the struggle to prevent catastrophic climate change. The root of such optimism is two-fold: first, there are already many progressive energy and environmental activists working in South Africa who are doing great work and having a positive impact on their communities. Secondly, history has shown that the legitimacy of this market is much more fragile than its supporters like to admit and thus the resistance of a handful of people can make a substantial impact.

One of the reasons that the carbon market has been able to develop the way it has is that the issue of climate change and carbon trading are treated rather quietly in South Africa. A perceived reason for this is often the inability of social activists to link their struggles with global warming and see how issues of resource extraction, access to clean energy, north-south relations, and corporate accountability are all deeply tied into this issue. Though these connections could certainly be strengthened, a better place one might start is recognising the implicit efforts of certain elites to maintain the status quo and isolate the public from these issues.

For example, why is it that the DNA has yet to receive any public comments on any of the projects it has approved? The Kuyasa project went through the entire validation cycle without a single comment at either the DNA, DOE, or EB. Surely energy and social activists might have something to say about SSN's musings over getting 'ownership of these technologies' through further indebting participants with pre-paid electricity meters? South African housing activists have also been engaged for years on issues around design, including mandatory ceilings, and could easily contribute to a discussion of certain aspects of this project's additionality. Their silence on these issues has been taken as consent. It should be seen as the

probable results of systemic efforts to disengage the public. Once we confront this reality the potential of these people to contribute their vast knowledge and experiences to these debates becomes palpable.

When South Africans do make the connections between carbon trading and the issues they are campaigning on, the record has shown there are able to influence outcomes in their favour. Durban activists successfully linked the environmental injustice of the Bisasar Road landfill in their community to the injustice of Northern countries bribing Southern ones with carbon credits to allow them to maintain their disproportionate pollution levels. The efforts of just a few involved citizens created an international stir among activists and media, who began a deeper questioning of the legitimacy of the carbon market. Were there to be like-minded persons in Cape Town, Sasolburg, and other cities with CDM projects in South Africa it is easy to argue that the carbon market would look very different in this country. The time has now come to develop these linkages and recapture the climate debate. The stakes could not be higher, but those fighting for justice and community rights need not look any further than the Durban struggle for hope or inspiration.

# CLIMATE FRAUD AND CARBON COLONIALISM

*BY HEIDI BACHRAM,* CAPITALISM NATURE SOCIALISM, *DECEMBER 2004*

> 'The rush to make profits out of carbon-fixing engenders another kind of colonialism.' – Centre for Science and the Environment, India

To understand the impact of 'pollution permits' and 'emissions trading'[1] on the ecological crisis, the findings of the international scientific community must be noted. The Intergovernmental Panel on Climate Change (IPCC), a UN advisory body numbering 3 000 scientists, concluded in 2001 that 'the present $CO_2$ concentration has not been exceeded during the past 420 000 years and likely not during the past 20 million years'.[2] The clear and alarming consensus in the scientific community is that humankind is wreaking havoc on the atmosphere. Across the world 80 million people are at severe risk of their homes and livelihoods being destroyed by flash flooding as sea levels rise, fed by melting icecaps, and extreme weather events become more frequent. Although these weather changes will occur everywhere, poorer countries will have less ability to adapt. Meanwhile the emissions of greenhouse gases, that are creating the problems, come overwhelmingly from the richer industrialised countries that do have the resources to adapt. For example the USA and the EU, with only 10% of the world's population, are responsible for producing 45% of all emissions of carbon dioxide ($CO_2$), the principle greenhouse gas.[3]

Three-quarters of all the $CO_2$ emitted by human activities is from burning fossil fuels.[4] The rest mostly comes from deforestation. The IPCC concludes that an immediate reduction of 50-70% of carbon dioxide emissions is necessary to stabilise

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[1] For the purposes of this paper, the term 'emissions trading' refers to credit-and-trade (Clean Development Mechanism and Joint Implementation) as well as cap-and-trade systems in the Kyoto Protocol.

[2] According to the IPCC, 'There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities." IPCC Third Assessment Report. Summary for Policymakers. A Report of Working Group I of the Intergovernmental Panel on Climate Change 2001. http://www.ipcc.ch/pub/spm22-01.pdf

[3] World Resources Institute website:
http://earthtrends.wri.org/maps_spatial/maps_detail.cfm?theme=3
http://earthtrends.wri.org/maps_spatial/maps_detail.cfm?theme=3
USA 4,6% world population: http://earthtrends.wri.org/searchable_db/index.cfm
EU's population grows by 1,5m: http://www.itv.com/news/Related1428225.html

[4] IPCC Second Assessment - Climate Change 1995. A Report of the Intergovernmental Panel on Climate Change. IPCC Second Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the UNFCCC: http://www.ipcc.ch/pub/sarsyn.htm

the concentrations in the atmosphere. In their most recent report, they state that 'eventually $CO_2$ emissions would need to decline to a very small fraction of current emissions.' Faced with this looming climate crisis, the global community of states response has been passage of the Kyoto Protocol in 1997, slowly ratified by 156 countries, and infamously rejected by the world's biggest polluter – the USA. At the core of the Protocol is an agreement to reduce emissions by an average of 5,2% below 1990 levels of greenhouse gases by the year 2012.[5] Larry Lohmann vividly sums up the inadequacy:

> Shortly after the treaty was initialled in 1997, a scientific journal pointed out that 30 Kyotos would be needed just to stabilise atmospheric concentrations at twice the level they stood at, at the time of the Industrial Revolution. At this rate, 300 years of negotiations would be required just to secure the commitments necessary by the end of this decade.[6]

Also agreed upon in 1997 was the main mechanism for achieving this target, tabled by the USA in response to heavy corporate lobbying: emissions trading. This market driven mechanism subjects the planet's atmosphere to the *legal* emission of greenhouse gases. The arrangement parcels up the atmosphere and establishes the routinised buying and selling of 'permits to pollute' as though they were like any other international commodity. The Dutch institute RIVM estimate that with emissions trading the actual reductions achieved under Kyoto will only be 0,1%, far below the already inadequate 5,2% reduction from 1990 levels.[7]

In addition, as we shall show, emissions trading is rife with controversy and the potential for exacerbating environmental and social injustice. The changes necessary to avert climate catastrophe are simple enough, namely, a switch away from fossil fuels and to renewable energy like solar and wind, along with a reduction in energy use generally. Instead, world leaders have taken ten years to agree to inadequate targets and the deeply flawed mechanism of emissions trading. Although emissions trading is represented as part of the solution, it is actually a part of the problem itself. Despite the scope and gravity of the dangers posed by greenhouse gases, and the major role of emissions trading in compounding them, this arrangement has not been seriously challenged in any international forum. The continuing acquiescence toward emissions trading is not an accident or bureaucratic oversight. The smooth sailing of this arrangement is attributable to the arm-twisting tactics of the richer nations and their constituencies of corporate polluters whenever global treaties are

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[5] Kyoto Protocol, UNFCCC website:http://unfccc.int/resource/docs/convkp/kpeng.html

[6] "The Kyoto Protocol: Neocolonialism and Fraud." Talk given at "Resistance is Fertile" gathering, The Hague. Larry Lohmann. April 2002.

[7] "Evaluating the Bonn Agreement and some key issues", The National Institute of Public Health and the Environment (RIVM) p 22. The Netherlands, 2001.

hammered out. The failure of the Kyoto Protocol to deal adequately and effectively with climate change is also representative of wider issues of democratic decision-making and symptomatic of the injustices that permeate international relationships between peoples.

**What is emissions trading?**

Under the Kyoto Protocol the 'polluters' are countries that have agreed to targets for reducing their emissions of gases in a pre-defined time period. The polluters are then given a number of 'emissions credits' equivalent to their 1990 levels of emissions minus their reduction commitment. These credits are measured in units of greenhouse gases, so one ton of $CO_2$ would equal one credit. The credits are licences to pollute up to the limits set by the commitment to achieve the average reduction of 5,2% agreed in Kyoto. The countries then allocate their quota of credits on a nation-wide basis, most commonly by 'grandfathering,' so that the most polluting industries will receive the biggest allocation of credits.[8] In this system it pays to pollute.

Several possibilities then exist:

1. The polluter does not use its whole allowance and can either save the remaining credits for the next time period (bank them), or sell the credits to another polluter on the open market.

2. The polluter uses up its whole allowance in the allotted time period, but still pollutes more. In order to remain in compliance, spare credits must be bought from another polluter that has not used up its full allowance.

3. The polluter can invest in pollution reduction schemes in other countries or regions and in this way 'earn' credits that can then be sold, or banked, or used to make up shortfalls in its original allowance.

Credit-earning projects that take place in a country with no reduction target (mostly in the 'developing' world) come under the contentious rubric of the 'Clean Development Mechanism' (CDM). There have already been signs that traditional Overseas Development Aid (ODA) given by developed countries will be used to fund CDM projects. Instead of building wells, rich countries can now plant trees to 'offset' their own pollution. Projects which take place in countries with reduction targets come under Joint Implementation (JI). For example, an energy efficiency program in Poland funded by a UK company could qualify. It appears that JI projects will mainly take place in Eastern Europe and Russia, where equivalent reductions can be made more cheaply as costs and regulatory standards are lower.

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[8] International Emissions Trading Association website: Meeting the Kyoto Protocol Commitments Summary - Domestic Emissions Trading Schemes. January 2001
http://www.ieta.org/Documents/New_Documents/StatusonDomesticTradingSchemes_GeirHoybe.htm

Both CDM and JI projects can be of different kinds: monoculture tree plantations, which theoretically absorb carbon from the atmosphere ('carbon sinks'); renewable energy projects such as solar or wind projects; improvements to existing energy generation; etc. The amount of credits earned by each project is calculated as the difference between the level of emissions with the project and the level of emissions that would occur in an imagined alternative future without the project. With such an imagined alternative future in mind, a corporate polluter can conjure up huge estimates of the emissions that would be supposedly produced without the company's CDM or JI project. This stratagem allows for a high (almost limitless) number of pollution credits that can be earned for each project. It allows the company to pollute more at other sites, to sell its credits to other polluters, or to engage in a combination of these lucrative tactics. Its long-term consequences are (1) increased greenhouse gas emissions and (2) increased corporate profit obtained from their production.

There is yet another provision in emissions trading that introduces increasing levels of complexity and confusion: the pollutants are interchangeable. In effect, a reduction in the emission of one greenhouse gas (e.g. carbon dioxide) enables a polluter to claim reductions in another gas (e.g. methane). Thus, progress in 'cleaning up' the atmosphere might appear to be going forward, while closer scrutiny reveals that no actual improvement is taking place.

**Climate fraud**

While many hundreds of millions of dollars are being invested in setting up emissions trading schemes all over the world (the UK government alone has spent UK £215 million on its trial trading scheme), virtually no resources are being channelled into their regulation. This imbalance can only lead to an emissions market dangerously reliant upon the integrity of corporations to file accurate reports of emissions levels, and reductions. In practice, corporations such as PricewaterhouseCoopers are acting as both accountants for and consultants to polluting firms, and as verifiers of emission reduction projects. Some entrepreneurial firms such as CH2M Hill and ICF Consulting are also offering consultancy and brokerage as well as verification services. These potential conflicts of interest were at the heart of scandals relating to Enron and Arthur Andersen who were both pioneers in emissions trading.

Opportunities for fraud abound as the poorly regulated emissions markets develop. This is inevitable in the *laissez-faire* environment in which emissions trading is conducted. In the first year of the UK's trial emissions trading scheme in 2002, Environmental Data Services (ENDS) exposed the main corporations involved in the scheme as having defrauded the system. They found that three chemical corporations had been given over £93 million in 'incentives' by the UK government

for their combined commitments to reduce pollution by participating in the voluntary trading scheme. However, the corporations had already achieved their promised reductions under separate compulsory EU-wide regulations. ENDS estimated that one corporation, DuPont, could make a further £7 million from the market value of the 'carbon' credits generated.[9] Therefore the corporations had received millions of UK taxpayers money for doing nothing. This was only highlighted by the independent work of the ENDS service and no government monitoring of the scheme revealed these instances of fraud. No subsequent action was taken by the government to respond to these revelations.

**Monitoring the monitors**

At present, there is no consensus on the international monitoring of emissions trading or the means to verify claimed reductions in greenhouse gas emissions. The prospects for such monitoring and verification are still under discussion in the official negotiations. Nevertheless, hundreds of credit-generating projects are going ahead and at least three EU countries (Denmark, The Netherlands and the UK) have begun their own internal greenhouse gas trading schemes, with an EU-wide market set to begin in 2005. What has been emerging in place of UN or government-led guidance are initiatives taken by Non-Governmental Organisations (NGOs); corporate-led self-monitoring; and entrepreneurial verification schemes by consulting firms.

Environmental NGOs such as the World Wide Fund for Nature (WWF) are developing labelling standards for CDM projects, similar to other controversial labelling schemes such as the Forest Stewardship Council accreditation.[10] Alongside this, more critical NGOs such as SinksWatch, World Rainforest Movement and the CDMWatch attempt to monitor trades and support communities affected by projects by providing them with crucial research and campaigning tools. However, these latter groups are often poorly funded and under-resourced, and it is impossible for NGOs to systematically monitor the thousands of transactions that are expected to take place globally once the greenhouse gas markets come into being.

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[9] ENDS Report February 2003, ENDS Report 327, pp 3-5 article.cfm?ArticleRef=327001, ENDS Report 337, pp 5-6 article.cfm?ArticleRef=337003. For more info: www.endsreport.com/trading

[10] The Forest Stewardship Council (FSC) is an association of environmental and social groups, the timber trade and the forestry profession, indigenous people's organisations, responsible corporations, community forestry groups and forest product certification organisations from around the world who provide standards for responsible forestry (http://www.fsc.org). They have been criticised by groups such as the World Rainforest Movement for including plantations in their certification schemes. WRM argue that plantations are not forests and should not be considered for the FSC label (http://www.wrm.org.uy/bulletin/64/viewpoint.html#viewpoint).

Meanwhile, oil giants BP and Shell have been experimenting with internal trading schemes and have employed self-monitoring to report trades and verify reductions. There are obvious conflicts of interest affecting the reliability of data produced in this way. For example BP state that their internal trading scheme achieved 5% reduction in $CO_2$ emissions, half of their voluntary commitment of 10% reductions below 1990 levels. The scheme also earned them $650 million in extra profits as most reductions were achieved through energy efficiency and reducing gas flaring. They admitted that measuring reported emissions is 'never 100% accurate'.[11] However, there is no independent corroboration for these figures as the data was monitored internally by BP itself.

Lastly, consulting firms such as Det Norske Veritas (DNV) have taken up the verification of emissions reductions. In 2002, for instance, DNV validated a eucalyptus plantation, a project funded by the World Bank's new Prototype Carbon Fund. The plantation is the target of local and international campaigns as monoculture eucalyptus causes severe problems for local peoples and the environment. While admitting in their report that they could not guarantee that the carbon would be permanently stored in the plantation, DNV nonetheless recommended the project to the Clean Development Mechanism Board.[12]

There are serious concerns about the effectiveness and wisdom of relying upon any of these monitoring and verification practices, yet a reliable surveillance system is essential to prevent the Kyoto targets from being undermined by fraudulent and destructive projects. However, it is difficult to imagine how any organisation, UN-sanctioned or otherwise, could cope with the vast amount of trade that will take place globally.

**Carbon colonialism**

The Centre for Science and the Environment India observes that so-called carbon-fixing projects are in reality opening the door to a new form of colonialism, which utilises climate policies to bring about a variation on the traditional means by which the global South is dominated.[13] In particular this trend is seen in the use of monoculture plantations which allegedly 'sequester' or remove $CO_2$ from the atmosphere. Scientific understanding of the complex interactions between the biosphere (trees, oceans etc.) and the troposphere (the lowermost part of the

[11] Presentation by Head of Climate Change at BPAmoco, Mark Akhurst. February 19th 2002. Okura Hotel, Amsterdam, The Netherlands.

[12] DNV, "Validation of the Plantar Project", Report No 2001-1263, 12.6.02; www.prototypecarbonfund.org. Please note that DNV pointed to the lack of guidance from the official UNFCCC rules in clarifying this problem.

[13] See Equity Watch newsletter on Centre for Science and Environment India website, October 25th 2000. *Carbon Colonialism.* http://www.cseindia.org/html/cmp/climate/ew/art20001025_4.htm

atmosphere) is limited. Further, there is scientific consensus that the carbon stored above-ground (i.e. in trees) is not equivalent to the carbon stored below-ground (i.e. in fossil fuels). Therefore there is no scientific credibility for the practice of soaking-up pollution using tree plantations.[14] Yet entrepreneurial companies such as FACE International are charging ahead with plantations while propagating the idea that consumers need not change their lifestyles. This new logic dictates that all that need be done is to become 'carbon neutral' by planting trees. The majority of these projects are being imposed upon the South.

The key questions revolve around whether the concept of 'carbon offsetting' is either tenable or desirable. The various schemes of Clean Development Mechanisms (CDM) and Joint Implementation Mechanisms of the Kyoto Protocol rely on the notion that emissions from a polluting source can be 'nullified' through investments in renewables or 'carbon sinks'. These compensation mechanisms vary in complexity and design, but all are enthusiastically promoted by the emerging offset industry which is being developed to service the new markets. As a result, clients wishing to go 'carbon neutral' are bombarded with a plethora of new, untested, and poorly thought-through offset products and services.

Companies such as Future Forests sell branded carbon offset products to promote so-called CarbonNeutral™ living. They offer a consumer the possibility to take CarbonNeutral™ flights, go CarbonNeutral™ driving, live in CarbonNeutral™ homes, and be a CarbonNeutral™ citizen, by planting trees which theoretically absorb carbon from the atmosphere.[15] The gathering of global business elites, the World Economic Forum, promotes their events as CarbonNeutral™ with the aid of these self-styled 'offset' businesses. The allure of offset culture is understandable. Corporations, ever conscious of cost and image, seek quick-fix solutions that do not require radical changes to fundamental business practice.

However, there are many problems with this approach. Offset schemes typically do not challenge the destructive consumption ethic, which literally drives the fossil fuel economy. These initiatives provide 'moral cover' for consumers of fossil fuels. The fundamental changes that are urgently necessary, if we are to achieve a more sustainable future, can then be ideologically redefined or dismissed altogether as pipe dreams. Furthermore, land is commandeered in the South for large-scale monoculture plantations which act as an occupying force in impoverished rural communities dependent on these lands for survival. The Kyoto Protocol allows industrialised countries access to a parcel of land roughly the size of one small Southern nation - or upwards of 10 million hectares - every year for the generation

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[14] For a more detailed discussion of this see The Corner House briefing, *Democracy or Carbocracy? Intellectual Corruption and the Future of the Climate Change Debate* by Larry Lohmann. October 2001: http://www.thecornerhouse.org.uk/briefing/summary/24carboc.html

[15] See Future Forests website: http://www.futureforests.com/

of CDM carbon sink credits.[16] Responsibility for over-consumptive lifestyles of those in richer nations is pushed onto the poor, as the South becomes a carbon dump for the industrialised world.[17]

On a local level, long-standing exploitative relationships and processes are being reinvigorated by emissions trading. Indigenous communities, fisher folk, and other marginalised rural Brazilian peoples were systematically removed from land during the colonial obsession with plantations. Now the World Bank is funding a eucalyptus plantation in Brazil run by an existing plantation company called Plantar, with the intention that it be approved as a CDM project. While plantations have their own ecologically destructive qualities such as biodiversity loss, water table disruption and pollution from herbicides and pesticides, their social impact is equally devastating to a local community. Lands previously used by local peoples are enclosed and in some cases they have been forcibly evicted. This was the case in Uganda when a Norwegian company leased lands for a carbon sink project which resulted in the eviction of 8 000 people in thirteen villages.[18]

The workers on such plantations have little or no health and safety protection and are exposed to hazardous chemicals and dust particles. Plantar is a company with an especially sordid history. In March 2002 the Regional Labour Office (DRT), prosecuted fifty companies, among them Plantar, for the illegal outsourcing of labour, a process synonymous with extreme degrees of exploitation. Indeed, in the nineties, the Montes Claros (MG) Pastoral Land Commission (CPT), an organisation originating in the Catholic Church and well-respected in the region, verified that slave labour was used on the company's property.[19]

Similar disregard exists for the natural environment. Thus local fisher folk in the regions around the plantations in Brazil are poverty-stricken and devastated due to the pollution caused by the over-use of pesticides and herbicides, which contaminates rivers and water sources and kills fish. In some cases, the water in streams and rivers has entirely dried up because the non-indigenous eucalyptus is a

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[16] Sinks in the CDM are limited to 1% of Annex I countries annual emissions. Based on the average rate of growth of plantation trees this brings this figure. See the SinksWatch website for more information on sinks and Kyoto: http://www.sinkswatch.org

[17] For more discussion of this point see World Rainforest Movement website:
http://www.wrm.org.uy/publications/briefings/CCC.html#sinks
*Uganda: Carbon sinks and Norwegian CO2lonialism*
http://www.wrm.org.uy/bulletin/35/Uganda.html
*Climate Change and the Market Politics of Environment.* The National Forum of Forest People and Forest Workers. Soumitra Ghosh: http://www.sinkswatch.org

[18] Uganda: Carbon sinks and Norwegian CO2lonialism
http://www.wrm.org.uy/bulletin/35/Uganda.html

[19] Evaluation report of V&M Florestal Ltda. and Plantar S.A. Reflorestamentos, both certified by FSC - Forest Stewardship Council. Brazil, November 2002
http://www.wrm.org.uy/countries/Brazil/fsc1.html

thirsty tree. With the World Bank's assistance, this plantation will now expand by 23,400 hectares. This is a disaster for local agriculture and people dependent on water sources for subsistence. The ruination caused by the trafficking in pollution credits serves only to place the cloak of ecological respectability over local and global unequal power relations.

**Might makes right**

One of the more tragic ironies of the Kyoto Protocol is that 'carbon sinks' (forests, oceans, etc.) can only qualify for emission credits if they are managed by those with official status. This means that an old-growth rainforest inhabited for thousands of years by indigenous peoples does not qualify under Kyoto rules as 'managed,' and cannot get credits. However, a monoculture plantation run by the state or a registered private company does qualify. This exposes the vested interests which are served by emissions trading, as ordinary people are not recognised by the official process. Neither does Kyoto offer protection for forests. Instead emissions trading provides an opportunity for extended encroachment on the lives of indigenous peoples by government and corporations, expanding the potential for neo-colonial land-grabbing. Further, other ecosystems such as grasslands are not protected under Kyoto, therefore a monoculture plantation could supplant them. Under the guise of creating solutions for one environmental problem, climate change, further destruction of diverse ecosystems has been legitimised.

Emissions trading represents the latest strategy in an ongoing process that stems from 16th century European land enclosures to the recent World Trade Organisation (WTO) negotiations on public health and education, to privatise and liberalise the global commons and resources. By its very nature, an emissions credit entitles its owner to dump a certain amount of greenhouse gases into the atmosphere. Control of such credits effectively leads to control of how the atmosphere, perhaps the last global commons, is used. The Kyoto Protocol negotiations has not only created a property rights regime for the atmosphere. It has also awarded a controlling stake to the world's worst polluters, such as the European Union, by allocating credits based on historical emissions. A similar relationship applies to the process leading to the agreement of Kyoto.

**The 1992 Rio Earth Summit**

From the beginning of international discussions about climate change Northern governments and corporate polluters have been opposed to the structural changes needed to truly combat the problem. Before the Earth Summit, an International Negotiating Committee (INC) was set up to formulate a draft text. Within the INC, both the US and the EU argued against binding reductions in greenhouse gas

emissions.[20] The Earth Summit did however produce the United Nations Framework Convention on Climate Change (UNFCCC). Despite some obvious merits such as a recognition that climate change was an urgent issue for the first time in an international agreement, the UNFCCC did not include any commitment to legally binding emission reductions. Nor did it recognise the role of industry, over-consumption and free trade policies in exacerbating climate change.

Meanwhile in 1991 the UN Conference on Trade & Development (UNCTAD) had set up a department on the trade in greenhouse gases. Emissions trading then found its way onto the INC's agenda at its third session held in Nairobi in September 1991. UNCTAD also set up the International Emissions Trading Association (IETA), a corporate lobby group dedicated to promoting emissions trading. These activities led to a May 1992 report entitled 'Combating Global Warming: Study on a global system of tradable carbon emission entitlements,' produced with financial support from the governments of the Netherlands and Norway. The intimate connections between business and the UN is further evidenced in that the former head of UNCTAD's emissions trading division, Frank Joshua, is now the Global Director for greenhouse gas emissions trading at Arthur Andersen.

Formal proposals for trading emissions, however, were not made until the mid-1990s. By then UNCTAD's research on greenhouse gas trading was well advanced; it never pursued research on other alternatives, or even on other market-based instruments such as pollution taxes. The neo-liberal bias of the UN in this instance seems less a question of succumbing to corporate pressure than of an organisational culture oriented towards corporate-friendly solutions as a matter of course.

**The role of corporations**

Corporate lobby activity before the Earth Summit remains to be researched, but it is telling that most of industry's goals for the Earth Summit (i.e. promoting 'cost-effective policies' and 'self-regulation') were achieved. Considering the corporate connections to government delegations, it is unsurprising that they were so successful. For example, the chair of the Working Party on Sustainable Development in one of the most powerful corporate lobby groups in the world, the International Chamber of Commerce, was also a member of the UK official delegation in Rio.[21] The ICC continues to have privileged access to policymakers and regularly makes statements to the International Negotiating Committee (INC) on climate change,

[20] Halpern, S. 1992. United Nations Conference on Environment and Development: Process and documentation. Providence, RI: Academic Council for the United Nations System (ACUNS). http://www.ciesin.org/docs/008-585/unced-ch1.html#PC-climate

[21] Beder, Sharon. "Global Spin" (1997). Page 29. Green Book Ltd, Devon.

representing the 'voice of business.' The voices of neoliberal ideology seem consistently to be heard 'loud and clear' in all international forums on climate change.

Corporations also promote business-friendly solutions through 'partnerships' with NGOs, governments and the UN. This tactic is new, and exposes some dissension within corporate ranks. Enron, for example, saw that Kyoto 'would do more to promote Enron's business than will almost any other regulatory initiative,' and was one of the main proponents of emissions trading.[22] Along with expensive PR campaigns such as British Petroleum's environmental 'Beyond Petroleum' makeover, so-called progressive corporations have successfully advanced the concept of Public-Private-Partnerships (PPPs), wooing NGOs and public opinion with slick public relations campaigns and advertising. This approach was epitomised by what happened at the World Summit on Sustainable Development in Johannesburg in 2002. No legally binding agreements were reached at this second Earth Summit. Instead, over 280 PPPs were showcased, highlighting the lack of political will on the part of governments, and the extravagant enthusiasm of corporations for taking control of the issue.

**Co-opting NGOs**

Environmental NGOs have also been hypnotised by corporate 'multi-stakeholder' dialogues. Part of the formula for developing an image of the 'good corporate citizen' is to enlist the help of friendly NGOs in controversial activities, effectively outsourcing legitimacy. Environmental NGOs can therefore provide a moral stamp of approval for corporations involved in emissions trading. The conflict of interest involved in verifying the emissions of companies who are paying you to do so while also providing general funding for your organisation, is obvious.'Working with business is as important to us as munching bamboo is for a panda,' according to a World Wide Fund for Nature (WWF) representative. Unsurprisingly, since WWF receives approximately £1 million a year from corporations in the UK alone and has an operational budget larger than the World Trade Organisation.[23] Recently WWF stated that emissions trading in the European Union could be an '…important element' in climate policy and help to '…prevent dangerous climate change…as cost-effectively as possible'.[24]

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[22] Controlling Hypocritical Authority: Gore's Expertise . Horner Op-Ed in National Review Online by Christopher C. Horner April 23, 2002. http://www.cei.org/gencon/019,02972.cfm

[23] "Corporations "Get Engaged" to the Environmental Movement" by Andy Rowell http://www.prwatch.org/prwissues/2001Q3/engaged.html published in PR Watch, Volume 8, No. 3, USA.

[24] WWF Position Paper on the Directive proposal on greenhouse gas emission trading presented by the Commission on 23 October 2001 – COM(2001)581, February 2002.

However, it is not just conservative environmental NGOs that have been neutralised by strategies of corporate polluters. At the original Earth Summit in Rio the NGO Global Forum produced an alternative treaty, designed to influence the official Rio Declarations. In this visionary document, the NGOs declared that the climate negotiators should 'avoid any emission trading schemes which only superficially address climate change problems, perpetuate or worsen inequities hidden behind the problem, or have a negative ecological impact.'[25] After Kyoto, however, the large NGOs that had helped produce the alternative treaty in Rio began to abandon their stand against emissions trading. By November 2000 at the sixth meeting (COP6) of the signatories to the UN Framework Convention on Climate Change, even some of the more radical NGOs like Friends of the Earth had changed their position on emissions trading. At COP6 they moderated their demands to calling for a 20% limit on the use of emissions trading. Eight months later, after agreement was reached on key controversial issues in the Kyoto Protocol at COP6 in Bonn in July 2001, press statements from Friends of the Earth International heralded the agreement as a 'new hope for the future' – even though it placed no specific limits on the use of emissions trading, and was actually weaker than the deal they had described as 'junk' in COP6.

In Johannesburg at the 2002 World Summit on Sustainable Development, Greenpeace and the World Business Council for Sustainable Development (WBCSD), which includes corporations such as Dow Chemical and General Motors, made a joint declaration on climate change, urging governments to move forward. This happened despite the fact that the WBCSD still does not necessarily endorse implementation of the 1997 Kyoto Protocol, in sharp contrast to the stated aims of Greenpeace. At the Earth Summit in 1992, Greenpeace and the WBSCD had been 'fighting like cats and dogs.' Ten years later they stood on the same platform, but without a substantial common vision of how governments should move forward.

A number of mainstream NGOs that have long campaigned for an international agreement on climate change are now persuaded that business support is crucial. Part of the reason is technocratic. In the lengthy negotiation process, the talks tend to become extremely technical and the language impenetrable to the point that most people participating do not understand fully the implications of the compromises made. In effect, environmental policy decisions are often left in the hands of 'climate experts' in organisations with the knock-on effect that democracy and understanding within NGOs suffers and public statements are reduced to simplified slogans. At times, even well-intentioned activists in NGOs are persuaded by the win-win scenario rhetoric that accompanies emissions trading. Talk of 'technology

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http://www.panda.org/downloads/europe/positionpapergreenhousegasemission.pdf

[25] NGO Alternative Treaties, Global Forum at Rio. June 1-15, 1992.
http://www.igc.org/habitat/treaties/

transfer' and 'leapfrogging industrialisation' is seductive. Yet at the heart of this corporate paternalism lies the stone-cold logic of the free market. This has created a situation where the NGO world has been thrown into confusion and discord. While mostly Northern mainstream NGOs support, or do not resist, emissions trading, many social movements and smaller NGOs are vehemently opposed to it. Now that NGOs have been effectively diverted, corporate interests have been placed at the heart of political negotiations and industry has been defined as a legitimate stakeholder.

**The impact of the World Trade Organisation on emissions trading**

Proponents of emissions trading argue that as schemes are implemented the rules governing them can be tightened and improved, and fraud avoided. This view is at best naïve and at worst, dishonest. As emissions trading emerges as the principal component of government climate change policy, the rules for its use will have to conform to the general rules governing trade. Any efforts to improve the rules of emissions trading, or to curb its use, will be subject to the general forces of liberalisation. Industry lobby groups and neo-liberal think-tanks want World Trade Organisation (WTO) compliance across the board, with no exceptions made for other purposes or values. Many corporate lobby groups, in particular, want unrestricted free trade in greenhouse gas credits rather than government regulation and taxation to achieve emissions reductions.[26] Since the rules for the Kyoto mechanisms are still being developed, and the WTO's Committee on Trade and Environment (the principal committee responsible for evaluating the relationship between Multilateral Environmental Agreements such as the Kyoto Protocol, and the WTO) is still deliberating, much remains speculative. However, there are already many areas of likely conflict. The net effect may be to water down regulation of emissions trading in order to avoid trade conflicts.

**Environmental justice**

A further fundamental problem of emissions trading is its tendency to perpetuate and aggravate environmental injustice. The six greenhouse gases due to be traded all have toxic co-pollutant side effects.[27] This aggravates other dimensions of social injustice inasmuch as polluting industries are disproportionately located in low-income areas and communities of colour. In the case of a sulphur dioxide trading

[26] Corporate Europe Observatory.'Greenhouse Market Mania: UN climate talks corrupted by corporate psuedo-solutions'. CEO, November 2000.

[27] The six greenhouse gases focused upon in the international negotiations are; carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF6).

scheme in Los Angeles, RECLAIM, where localised pollution of the local Latino communities around factories involved in the scheme continued unabated.[28] It is likely that this phenomenon will be widely replicated with global greenhouse gas trading. Reductions will not need to take place at their source, allowing factories to continue polluting locally. And the communities affected are those with the least power to resist; 'pollution ghettoes' are thereby created, bringing the seemingly abstract nature of the market into deadly focus.[29]

The introduction of emissions trading means that precious time and resources are being channelled away from the solutions that could successfully resolve climate change in a just way. It took ten years to put the RECLAIM program into place in Los Angeles, and the Kyoto market will not officially begin trading until 2008. By then national governments will have spent millions setting up their internal schemes in preparation for the international market. Brokers, consultants, NGOs, corporations, PR firms, speculators, as well as opportunistic experts and consulting firms that offer 'science for sale' will be created in anticipation of the new carbon economy. All this energy, investment and time could be put into more positive and effective strategies to resolve climate change, and at the same time, to combat environmental injustice. Besides central government measures, from taxation and subsidies to laws, grassroots initiatives of all kinds could provide answers at low cost while also successfully tackling issues of environmental injustice and carbon colonialism.

**The alternative**

One alternative to corporate-led schemes such as emissions trading is government regulation. This can include taxation, penalties for polluting, and imposed technological 'fixes', such as scrubbers and filters on smokestacks. Such an approach has been successfully adopted in Iceland (where 99% of electricity comes from geothermal sources) and Costa Rica (where 92% of energy comes from renewables). Additionally, government fossil fuel subsidies and tax breaks could be withdrawn and subsidies for small-scale renewables increased instead. However, there are problems with this approach as well. In Iceland, one of the main producers and distributors of renewable energy is the oil giant Shell. Although the product has changed from fossil fuels to renewables, the corporation is still the same. The power dynamic remains; often the renewable investments of large fossil fuel corporations

[28] "Pollution Trading and Environmental Injustice: Los Angeles' Failed Experiment in Air Quality Policy". Richard Toshiyuki Drury, Michael E. Belliveau, J. Scott Kuhn and Shipra Bansal (1999) Duke Environmental Law & Policy Forum.

[29] Preventing Toxic Pollution: Toward a British Columbia Strategy. A Report to the B.C. Hazardous Waste Management Corporation by Calvin Sandborn, William J. Andrews and
Brad Wylynko. 1991. West Coast Environmental Law Research Foundation Vancouver, Canada.

are another tactic in a cleverly planned 'greenwash' campaign to improve their public image. Additionally the failure to challenge corporate monopolies in the renewable energy sector could stifle diversity and innovation as was shown when comparing developments in The Netherlands and Germany. In the Netherlands, subsidies for the solar industry in the 1990s were concentrated on Shell and eco-consultants Ecofys. This limited the number of solar panel firms to just a few main players and Shell gained a virtual monopoly in solar panel installation. In contrast, German subsidies were distributed more fairly across different sized firms. By 2002 there were over 300 companies involved in supplying solar panels.[30] Even a future where wind and solar are the main source of energy still fails to challenge underlying patterns of consumption and does not guarantee that transnational corporations will suddenly behave in an environmentally or socially just way.

Many grassroots initiatives have nevertheless arisen to tackle these problems and it is here that we can see the outlines of an holistic approach to the problem posed by climate change. Thousands of small-scale projects successfully balance social and economic injustice with environmental sustainability have already sprung up around the world. The Centre for Alternative Technology in Wales, for example, is in the process of building a wind turbine, a project that was initiated and is managed by the local community. The energy will be used locally, and any surplus sold and the dividends are to be shared among the community group.[31] Another initiative is in the process of being launched in Northern Spain by a project called ESCANDA who are engaged in planning and forming a renewable energy co-operative to invest, build and maintain wind and solar energy. This challenges corporate control of energy production and distribution, promoting empowerment and democracy as decision-making is held by the people producing and using the electricity generated. It is hoped that the project can provide a model for other communities in Spain and perhaps be applied Europe-wide.[32]

Another method is employed by Khanya College in Johannesburg where a community education programme to tackle issues of climate change from an environmental justice perspective is being planned. Community educators and activists will conduct workshops to both inform and train township residents in the province on the impacts and effects of climate change upon their lives. The workshops open up a safe political space where the community can explore the issues and create their own solutions.[33] This unique synthesis of education and empowerment is absent from the official process, and diametrically opposed to the

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[30] Interview with Frank van der Vleuten, Free Energy Europe, Netherlands office, December 2002

[31] Community Wind Turbine – CAT website
http://www.cat.org.uk/gallery/CWTphotodiary.tmpl?cart=32549200181239561&startat1&subdirgallery

[32] Renewable Energy for local benefit project. ESCANDA. http://www.escanda.org/

[33] Please contact Dudu Mabona at Khanya College for more information on dudu@union.org.za or Heidi at heidi@tni.org

top-down solutions offered by proponents of emissions trading schemes. What all these community-based projects have in common is an innovative, yet practical, combination of economics, ecology, democracy and participation.

**Conclusions**

In the best case scenario that emissions trading is strictly regulated, it is still unlikely to achieve even the woefully inadequate reductions in greenhouse gas emissions enshrined in the Kyoto Protocol. This would be true even if the US joined the rest of the major polluting countries in ratifying the Protocol. Yet should a foolproof monitoring system be put in place, the whole system would lose its appeal of being cheap and unchallenging for corporations, and so any attempt to introduce such methods will be strongly opposed. Furthermore, the neoliberal trends in international trade make it unlikely that emissions markets will ever be tightly regulated. The strategy and tactics of emissions trading have been adorned with the rationale of neoliberal ideology; they have become so institutionalised in international forums that regulatory initiatives are unlikely to be proposed from within their circles.

Yet even if emissions trading were adequately regulated, the reality is that the trading in pollution best serves the needs of those with the most to lose from resolving the climate crisis. As climate change exposes fundamental flaws in the current world order, only the most challenging responses will have any prospect of success. Transnational fossil fuel corporations and the governments of industrialised countries will not concede power willingly. That is why emissions trading is being used to distract attention away from the changes that are urgently needed. In this way corporations and government are able to build the illusion of taking action on climate change whilst reinforcing current unequal power structures. Emissions trading therefore becomes an instrument by means of which the current world order, built and founded on a history of colonialism, wields a new kind of 'carbon colonialism'.

As with the colonialism of old, this new colonising force justifies its interference through moral rhetoric. As the colonisers seek to resolve climate change, they conveniently 'forget' the true source of the problem. With the looming climate crisis and the desperate need for action, the resulting course recommended by corporations and government is not analysed critically. The debate is transformed, shifting the blame onto the poor masses of the global South. Lost in this discourse is the reality that the world's richest minorities are the culprits who have over-consumed the planet to the brink of ecological disaster. Instead of reducing in the rich countries, a carbon dump is created in the poor countries. Thus rich countries can continue in their unequal over-consumption of the world's resources.

> 'The poor countries are so poor that they will accept crumbs. They know that and they are taking advantage of it.' - Sajida Khan, community organiser campaigning against an emissions trading project in Durban, South Africa.

On almost every level of emissions trading, colonial and imperialistic dimensions exist. There may be new labels for these phenomena, such as environmental injustice, but the fundamental issues are the same. The dynamics of emissions trading, whereby powerful actors benefit at the expense of disempowered communities in both North and South, is a modern incarnation of a dark colonial past. European colonialism extracted natural resources as well as people from the colonised world. In the 20th century, international financial institutions took on the role of economic coloniser in the form of Structural Adjustment Policies (SAPs) for the 'Third World'. Now an ecological crisis created by the old colonisers is being reinvented as another market opportunity. This new market brings with it all the built-in inequities that other commodity markets thrive upon. From the pumping of pollution into communities of colour in Los Angeles to the land grabbing for carbon 'sinks' in South America, emissions trading continues this age-old colonial tradition.

**Further reading:**

*"The Sky is Not the Limit: the emerging market in greenhouse gases."* Carbon Trade Watch (a project of the Transnational Institute). Briefing No.1. TNI Briefing Series No 2003/1. Paulus Potterstraat 20, 1071 DA Amsterdam, The Netherlands. Email: ctw@tni.org. Website: http://www.tni.org/ctw

*"Where the Trees are a Desert – Stories from the Ground."* A joint publication of FASE-ES and Carbon Trade Watch. Paulus Potterstraat 20, 1071 DA Amsterdam, The Netherlands. Email: ctw@tni.org. Website: http://www.tni.org/ctw

# IS FOLLOWING THE AMERICAN POLLUTION TRADING MODEL A RECIPE FOR INJUSTICE IN GLOBAL CARBON MARKETS?

BY LARRY LOHMANN, JUTTA KILL, GRAHAM ERION AND MICHAEL K. DORSEY

## Introduction

The Kyoto Protocol, as the former Executive Secretary of the United Nations Framework Convention on Climate Change, Michael Zammit Cutajar, has recently written, was 'made in the USA'.[1] The Protocol institutes pollution-trading mechanisms of a type proposed by North American economists in the 1960s;[2] put into practice in US markets for lead, nitrogen oxides and sulphur dioxide and other pollutants beginning in the 1970s and 1980s;[3] and successfully pressed on the UN by the US government, advised by US economists, in the 1990s.[4] Critics of the Kyoto Protocol carbon market and similar carbon trading schemes are almost invariably referred to the US experience, particularly with sulphur dioxide trading, as a

[1] Michael Zammit Cutajar, 'Reflections on the Kyoto Protocol – Looking Back to See Ahead' (2004) 5 Int'l Rev. for Environmental Strategies, 61-70, 64.

[2] Ronald H. Coase, 'The Problem of Social Cost' (1960) 3 J.L. & Econ.1-44; Thomas D. Crocker, 'The Structuring of Atmospheric Pollution Control Systems' in Harold Wolozin, ed., *The Economics of Air Pollution* (New York: Norton, 1966), 61-86; J. H. Dales, 'Land, Water and Ownership' (1969) 1 Can. J Econ.791-804.

[3] A. Denny Ellerman et al., *Emissions Trading in the US: Experience, Lessons and Considerations for Greenhouse Gases* (Washington: Pew Center on Global Climate Change, 2003); Robert W. Hahn and Robert N. Stavins, 'Trading in Greenhouse Permits: A Critical Examination of Design and Implementation Issues' (1995), in H. Lee, ed., *Shaping National Responses to Climate Change* (Washington: Island Press, 1995); Dallas Burtraw et al., 'Economics of Pollution Trading for SO2 and NOx' Resources for the Future Discussion Paper 5-05, (Washington: RFF, 2005); Robert W. Hahn & Gordon L Hester, 'Marketable Permits: Lessons for Theory and Practice' (1989), 16 Ecology L. Q. 361, 381-91; David M. Driesen, 'Is Emissions Trading an Economic Incentive Program? Replacing the Command and Control/Economic Incentive Dichotomy' (1998) 55 Wash. & Lee L. Rev. 289; Susan A. Austin, 'Designing a Nonpoint Source Selenium Load Trading Program' (2001) 25 Harv. Envtl. L. Rev. 337; Rena I. Steinzor, 'Toward Better Bubbles and Future Lives: A Progressive Response to the Conservative Agenda for Reforming Environmental Law' (2002) 32 Envtl. L. Rep. News & Analysis 11421; Lisa Heinzerling & Rena I. Steinzor, 'A Perfect Storm: Mercury and the Bush Administration' (2004) 34 Envtl. L. Rep. News & Analysis. 10297, 10485; Carol M. Rose, 'Expanding the Choices for the Global Commons: Comparing Newfangled Tradable Allowance Schemes to Old-Fashioned Common Property Regimes' (1999) Duke Envtl L. & Pol'y F. 45; Richard Toshiyuki Drury et al., 'Pollution Trading and Environmental Injustice: Los Angeles' Failed Experiment in Air Quality Policy' (1999) 9 Duke Envtl. L. & Pol'y F. 231.

[4] Cutajar, op. cit.; Michael Grubb et al., *The Kyoto Protocol: A Guide and Assessment* (London: Royal Institute for International Affairs, 1999) at 108-09; Loren Cass, 'Norm Entrapment and Preference Change: The Evolution of the European Union Position on International Emissions Trading' (2005) 5 Global Environmental Politics 2, 38-60

'success story' whose lessons can be adapted to tackle the problem of global warming.[5]

Two propositions underpin the UN's decision to model the Protocol on a US pollution trading model. First, it is claimed, pollution trading regimes in the US, and in particular the sulphur dioxide trading programme (Title IV of the Clean Air Act Amendments of 1990), have succeeded better than more conventional regulation in reducing pollution quickly, cutting costs and stimulating technological innovation.[6] Second, it is assumed, the conditions that made US trading programmes feasible also hold for current regimes for controlling greenhouse gas emissions.[7]

Both these claims are poorly supported. US pollution trading schemes have produced no more reductions, and probably spurred less innovation, than comparably designed traditional regulation would have, and have cut only short-term costs, and costs for only some actors. In addition, various technical conditions which made emissions trading schemes such as the US's sulphur dioxide programme feasible cannot be fulfilled in global regimes for controlling greenhouse gases. Hence the argument outlined above for promoting US-style pollution-trading schemes to address global warming is unsound. The US experience with pollution trading is an argument not for, but rather against, greenhouse-gas trading schemes such as the Kyoto Protocol and the European Union Emissions Trading Scheme.

In the course of exploring the reasons why this is so, this article will fashion four arguments of its own.

First, US emissions trading programmes in sulphur dioxide and other pollutants have not produced incentives for radical or structural technological innovation, and there is no good reason to expect future trading schemes to perform better than

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[5] Yale Law School property rights specialist Carol Rose calls the set of 'hybrid property' models like the US sulphur dioxide program a 'poster child' for 'property and market solutions' to global commons problems. See Rose, op. cit. supra note 3, at 51.

[6] Robert W. Hahn & Robert N. Stavins, 'Trading in Greenhouse Permits: A Critical Examination of Design and Implementation Issues, in Henry Lee, ed., *Shaping National Responses to Climate* Change (Washington: Island Press, 1995) at 190;

Adam B. Jaffe et al., 'Environmental Policy and Technological Change' (2002) 22 Envtl. & Resource Economics 41, 51; Bruce A. Ackerman & Richard B. Stewart, 'Reforming Environmental Law: The Democratic Case for Market Incentives' (1988) 13 Colum. J. Envtl. L. 171, 183; Daniel Dudek & John Palmisano, 'Emissions Trading: Why is this Thoroughbred Hobbled?' (1988) 13 Colum. J. Envtl. L. 217, 234-5; Robert W. Hahn & Robert N. Stavins, 'Incentive Based Environmental Regulation: A New Era from an Old Idea' (1991) 18 Ecology L. Q. 1, 13; Richard B. Stewart, 'Controlling Environmental Risks through Economic Incentives' (1988) 13 Colum. J. Env. L. 153, 160; Robert N. Stavins, 'Policy Instruments for Global Climate Change: How Can Governments Address a Global Problem?' (1997) U. Chicago Legal F. 293, 302-3; Cutajar, op. cit. *supra* note 1, Richard Rosenzweig et al., *The Emerging International Greenhouse Gas Market* (Washington: Pew Center on Global Climate Change, 2002) at 6.

[7] Richard L. Sandor et al., 'An Overview of a Free-Market Approach to Climate Change and Conservation', in Swingland, I. R., ed., *Capturing Carbon and Conserving Biodiversity: The Market Approach* (London: Earthscan, 2002) at 56.

traditional regulation in this respect. This finding is especially significant in that such innovation is far more crucial for tackling global warming than it was for achieving the relatively modest, narrow goals of the US sulphur dioxide and other trading schemes.

Second, the inclusion of credit-producing pollution 'offset' projects in US trading schemes also failed to produce radical or structural technological innovation. This failure is today being replicated in the Kyoto Protocol's Clean Development Mechanism (CDM), whose progress, particularly as shepherded by the World Bank, functions to support expansion of fossil fuel-dependent energy and transport systems and all the obstacles to sustainability they entail.

Third, the US's much-praised sulphur dioxide emissions trading programme became possible only when certain emissions quantification technologies became available, and would have been counterproductive without them. Parallel measurement technologies that would provide the numbers needed for a greenhouse gas trading scheme, by contrast, are not yet in place. Hence the experience of the sulphur dioxide programme constitutes an argument against, not in favour of, a similar emissions trading scheme for greenhouse gases.

A fourth lesson that the US experience with pollution trading holds is that attempts to integrate credits generated by pollution 'offset' projects into trading schemes are hampered by permanent obstacles to verification of measurement. Indeed, the US's sulphur dioxide trading programme was as successful as it was only because it excluded credits from 'offset' schemes. Where 'offset' credits have been traded for emissions, they have made the quantification necessary for enforcement unverifiable. Unlike the difficulty caused by inadequate measurement instrumentation, certain difficulties connected with the measurement of 'offsets' – including the isolation and quantification of a single emissions baseline – are permanent and not amenable to technical solutions or resolvable by technological progress. Because the Kyoto Protocol depends on the emissions permits and the credits produced by 'offset' projects being interchangeable, its 'reductions', too, are permanently unverifiable.

As post-Kyoto Protocol attempts to mitigate global warming are coming under increasingly serious discussion, it is now more important than ever to review carefully the lessons both of the past failures of US pollution trading schemes and of the parallel, emerging failures of the Kyoto Protocol's market and other carbon markets.

**Will American emissions trading help combat global warming?**

What is emissions trading? Imagine that two power plants each emit 200 tonnes of sulphur. A regulator decides to reduce the resulting 400 tonnes of pollution by 100 tonnes. One way of doing this is to obligate each plant to eliminate 50 tonnes of

pollution. Alternatively, the regulator can mandate the same reduction but authorise emissions trading. In that case, she might (for example) distribute permits to pollute the atmosphere with 150 tonnes of sulphur to each power plant, but make those permits tradeable. Each polluting facility would then have three options: use all of its permits and pollute up to the level they allow; cut its pollution below 150 tonnes and sell the excess permits to the other facility; or keep its emissions at a level above 150 tonnes and arrange to buy credits from the other facility. Thus the facility facing higher control costs might choose to make no reductions but instead pay the other to eliminate 50 tonnes of pollution at its plant. The seller would make the full 100-tonne reduction mandated by the regulator, complying with its own 50-tonne requirement and generating an additional 50 tonnes' worth of credits to sell to the plant making no reduction.[8]

If this market functioned perfectly, the result would be the same 100 tonnes of total reduction as the traditional regulation;[9] Emissions trading is not designed to reduce net emissions any more than traditional regulation with the same emissions limits. However, the trading scheme could distribute the reductions in a way that would save money for private companies participating in the scheme. For example, suppose a utility in North Carolina used coal with a pound of sulphur in each tonne and another utility in Indiana used coal with three times that amount. A scrubber installed at the Indiana facility would then remove more sulphur per dollar invested than the same scrubber at the North Carolina plant. It might cost the North Carolina company $300 to collect a tonne of sulphur, but the Indiana generator only $100. As a result, the Indiana operation could sell its North Carolina counterpart allowances at $200 per tonne, making $100 for itself and at the same time saving its sister plant $100.

Such markets in tradeable permits, it is often said, foster innovation by providing polluters with the incentive to compete to do even better than they are required to do by law. While conventional regulation can force change in technology, it is claimed, trading encourages even more change, since companies can make money by 'overshooting' the minimum requirement and selling the resulting credits to firms less willing or able to reduce emissions or banking them for their own future use.[10]

What this claim leaves out, however, is the fact that while trading provides financial incentives for *some* polluters to seek ways of reducing emissions, it simultaneously provides financial incentives for *other* polluters, whose costs of reduction are higher, *not* to reduce emissions, and to buy permits from other firms

[8] David M. Driesen, 'Does Emissions Trading Encourage Innovation?' (2003) 33 Envtl. L. Rep. News & Analysis 10094.
[9] Hahn & Stavins, *supra* note 5, at 8-9.
[10] Jaffe, *supra* note 5 at 51; Stewart, *supra* note 5 at 160.

instead. In other words, emissions trading provides two incentives. First, it gives incentives to industries for whom pollution-reducing technological changes are the cheapest, easiest and least challenging to make the most of that advantage. Second, it gives incentives to industries 'with high abatement costs,' for whom such changes are more difficult and expensive, 'to reduce emissions less'[11] than they would have to do under conventional regulation.[12] The question regarding innovation, therefore, is whether a measure that increases incentives for technological change for some facilities while decreasing them for others will strengthen or weaken *net* incentives for innovation among facilities subject to a regulation.[13]

The first step toward answering this question is to note that the incentives for change that are increased by trading will be ones that are cheaper for the aggregate of participating firms, at least in the short term; as David M. Driesen of Syracuse University School of Law emphasises, emissions trading disfavours costlier types of innovation. Furthermore, buyers of permits, for whom technological change is difficult and expensive, naturally have an incentive to purchase the cheapest credits possible. Knowing this, rational sellers will not bother to generate credits unless they cost less to produce than prospective buyers have to lay out in pollution control, and are also competitive with credits produced by other sellers.[14]

In most pollution trading systems, of course, the number of available permits is gradually ratcheted down over time by the state or by international agreement. The resulting scarcity and price rises are intended to increase the market incentive for companies to reduce pollution themselves rather than buy credits from others. Society-wide, the result is supposed to be a net increase over time in more expensive or difficult types of technological change. These changes, however, are not brought about by trading as such, but by the ratcheted-down 'cap' imposed by the state, which could equally well be applied with standard regulation. Their effectiveness depends not on whether or not trading is employed, but on how strict the cap is, how strictly it is ratcheted down, whether the government is committed to continue challenging industry to make improvements, and so forth. Given the same industry-wide limits on pollution, what trading does is encourage cheaper types of change than more conventional regulation would.

Should this increased proportion of cheaper changes be regarded as a net gain or a net loss in innovation? To answer this question, it is necessary to be more precise about what kind of change societies are looking for in any particular case. In the case of air pollution abatement, the innovation most desired, other things being equal, is that which produces the most radical cuts and the most sustainable and

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[11] A. Denny Ellerman, et al., *supra* note 3 at 14.
[12] David A. Malueg, 'Emissions Credit Trading and the Incentive to Adopt New Pollution Abatement Technology' (1987) 16 J. Envtl. Econ. & Mgmt. 52.
[13] Driesen, *supra* note 7 at 10097
[14] *Ibid.*

environmentally desirable results. Serious innovation of this kind is at a particular premium in the case of global warming. The degree of climate change to which the world is already committed may well turn out to be devastating,[15] and any additional fossil carbon put into the atmosphere can only increase the effects. Drastic cuts in fossil fuel use must accordingly be instituted as soon as possible, with an eye to eliminating below-ground to above-ground carbon flows at the earliest date feasible.[16] The question is whether the prospect of having to spend a lot of money spurs corporations to more innovation of the desired sort than the prospect of having to spend little.

The common sense that necessity is the mother of invention suggests the former. So does the induced innovation hypothesis widely employed by economists, according to which the lower costs associated with pollution trading schemes should result in less innovation, not more. Such assumptions have underpinned a good deal of policy. For example, the low-emissions vehicle (LEV) program enacted by several US states to stimulate innovation and secure emissions reductions did not require merely that emissions standards be met. That goal could be achieved merely by tweaking existing technology through, for instance, introducing very efficient catalysts. Rather, the program recognised that some economically-'unjustified' zero-emissions vehicles (ZEVs) had to be introduced as well, in order to jump-start more serious technological change. The most efficient short-term solution, it was understood, would not necessarily deliver environmentally-superior technological innovation.[17]

This is not to say that in many circumstances, cheaper innovations are not more sustainable and environmentally desirable than expensive ones. But if the objective is bringing about the structural change necessary to reduce radically, and eventually eliminate, Northern industrialised countries' use of fossil fuels, as is required for long-term sustainability,[18] the innovation required is unlikely to be the cheaper sort for which emissions trading selects. As Atle Christiansen notes, 'incremental innovations and cumulative improvements in existing infrastructure cannot alone surpass the technological and institutional constraints of the current 'carbon-logic'.'[19]

This is largely because of what is known as 'lock-in', or 'path-dependence', which creates inertia around technologies that, for whatever reason, have gained a

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[15] Intergovernmental Panel on Climate Change, *Third Assessment Report* (Cambridge: Cambridge University Press, 2001).
[16] Jeremy Leggett, *The Carbon War: Dispatches from the End of the Oil Century* (London: Allen Lane, 1999).
[17] Driesen, *supra* note 7 at 10098.
[18] Leggett, *supra* note 15.
[19] Atle Christer Christiansen, 'Technological Change and the Role of Public Policy: An Analytical Framework for Dynamic Efficiency Assessments' Fritjof Nansen Institute Report 4/2001 (Lysaker, Norway: FNI, 2001) at 14.

historical head-start on other technologies and become entrenched in far-reaching technological, political and cultural webs which give them the advantage of economies of scale, synergies with other industries, access to policymakers, and subsidies of various kinds. Locked-in technologies – including fossil-dependent energy and transport systems – are expensive to change in the short term even when they were not originally adopted for efficiency reasons and are economic dead ends in the long term. Innovations that could provide a starting point toward restructuring such technological webs are often penalised by being deprived of these economies of scale, synergies and political and cultural entrenchment.

The US, for example, is organised, technologically and politically, around a high level of fossil fuel dependence. By triumphing in early political and cultural struggles, US fossil-dependent technologies got first crack at economies of scale; were able to begin building a base of skills, research and resources that guaranteed rapid development; managed to integrate themselves first into transport, production, consumption and other cultural systems, building up a rich web of new habits and lifestyles; starved competing technologies of research and resources; helped build and ensure demand; and ultimately won adherents in subsidy-providing state bureaucracies.

Petroleum-fuelled internal combustion engines, for instance, were considered the least promising source of automobile propulsion in 1885. But chance events such as the closing of horse troughs used to supply steam vehicles led one manufacturer to shift to petrol engines, providing a mass production base that drove prices down, improved performance, and locked in dominance. At around the same time, alternating-current (AC) electricity technology, which allowed long-distance transmission and centralised generation close to large fossil-fuel sources, closed out more efficient direct-current technology because it won judicial, political and public relations battles and was more attractive to aspiring monopolists. AC's advantage then snowballed into technological and economic hegemony. Through such processes, fossil fuels became 'locked in' to the US's transport and electricity generation sectors; together, these sectors today account for approximately two-thirds of global carbon emissions.[20] A set of subsidised structures engineered for high fossil fuel use – interstate highway systems, auto industries, refineries, suburban sprawl, centralised power plants, supermarket-centred food systems and so forth – became inextricable from the livelihoods of millions of people, while a subsidised extraction network employing many more, ranging from military machines to university geology departments,[21] emerged to locate, secure and exploit

[20] Gregory C. Unruh, 'Understanding Carbon Lock-In' (2000) 28 Energy Policy, 820.

[21] Military and foreign aid costs associated with ensuring the flow of oil to major consumer countries from the Arabian Gulf vary dramatically but are substantial. One study in 1990, when Saudi Arabian oil was selling at around $15 a barrel, argued that another $60 should be added to yield the real cost to the US. More recently, the director of the Earth Institute at Columbia University reckoned that the 'dollar costs of

fossil fuel fields around the world. (Annual subsidies to fossil fuels in the decade up to 2002 have been estimated at up to $235 billion, not including military subsidies such as those involved in pursuing the war against Iraq.)[22] It was only following such political and social processes, which included far-reaching changes in both individual and societal goals, that fossil-fuelled technologies eventually become coherently describable as cheaper or 'more efficient' than certain other alternatives. Claims to the contrary amount largely to Whiggish historiography under cover of economics. It is as a result of these processes having occurred that addressing the climate crisis is likely to require not only getting the carbon out of energy, but also getting energy companies out of fossil fuel deposits, Northern military establishments out of oil-rich regions, and even Northern agribusiness out of Southern lands needed for basic local requirements.

In current contexts, innovations which radically decrease this reliance on fossil fuels are likely to be expensive to develop in the short term. This is not to say that they will not prove cheaper in the long term than continuing with fossil fuel use. On the contrary: any initially expensive technology that permanently reduces dependence on costly inputs may prove cheaper over the long term than tweaking a high-input status quo. Suppose, for instance, that an end-of-pipe control limiting air pollution at a chemical plant requires an initial capital outlay of $100 000 and $5 000 a year in operational costs thereafter. But also suppose that one could reengineer the process making a specific chemical for $150 000 and that this reengineering cut back on the use of fossil fuels, generating a $1 000 a year cost savings. Here the cumulative cost of the reengineering solution would decline over time, while that of the end of pipe control would only increase. No matter how high the discount rate was set, the innovative, reengineering solution would at some point begin to save the company money, even though in the short term the end of pipe solution is cheaper and appears more 'efficient'.[23]

In addition, over the long term, savings associated with economies of scale and other aspects of 'lock-in' are likely to benefit new non-fossil technologies just as they benefited fossil fuel dependent technology.[24] For example, although photovoltaics are still so expensive that emissions trading offers little incentive for utilities and

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US military operations in the Middle East attributable to policing the energy flows are tens of billions a year, if not 100 billion or more. This amounts to a hidden subsidy to oil use of $10 or more per barrel exported from the region'. See Toby Shelley, *Oil* (London: Zed Books, 2005) at 162-3.
For universities, see PLATFORM et al., *Degrees of Capture* (London: PLATFORM, 2003).

[22] J. Pershing and J. Mackenzie, 'Removing Subsidies: Levelling the Playing Field for Fenewable Energy Technologies' (Lecture presented to the International Conference for Renewable Energies, Bonn, June 2004) [unpublished]. Subsidies, of course, are difficult to quantify, as they may involve not only direct financial transfers but also trade restrictions, regulatory instruments, preferential tax treatment, police and military budgets, legal changes, company bailouts or publicly-funded research and development.

[23] David Driesen, *The Economic Dynamics of Environmental Law* (Cambridge: MIT Press, 2003) at 83-4.

[24] Driesen, *supra* note 7 at 10097.

other corporations to prefer them to coal-fired power, they have long been recognised as an environmentally superior technology which, once produced on a large enough scale, would become far cheaper per unit cost of power,[25] and cheaper still if other parts of the technological and political context were changed – if subsidies were shifted from nuclear power, for instance. Fuel cells, too, even taking into account the energy needed to produce them, could drop in cost when produced in large enough quantities, although emissions trading is again unlikely to foster their development.[26]

The rising and ultimately overwhelming costs of continued reliance on fossil fuels to all enterprise and indeed most livelihoods constitutes another reason why innovative non-fossil technologies are likely to appear increasingly attractive economically over time. These costs will not spare industrialised societies, as the recent New Orleans disaster suggests. Andrew Dlugolecki, a climate change specialist with CGNU, the sixth largest insurance company in the world, notes that while world economic growth is averaging three% a year, insurance losses because of extreme weather are increasing by an annual 10%: 'By 2065 the two growth graphs cross, the world economy can no longer sustain the losses, and collapse will follow.'[27] Indeed, industrialised societies' locked-in dependence on an enormous fossil-oriented technological and institutional system of unparalleled inertia and inflexibility makes them in some respects more vulnerable than others to global warming.

Imposing costs on a heavily-polluting industrial sector, moreover, may well produce overall economic benefits if it leads to innovations that lower the prices of products from cleaner competing sectors.[28] Michael Porter of Harvard Business School argues that innovations spurred by stringent environmental regulation that imposes extra costs in the short term may enhance competitiveness in the long term to a greater degree than merely maximising static efficiency, gaining access to cheaper inputs, or increasing scale.[29] There are also sure to be substantial (if partly unanticipated) savings associated with well-known ancillary benefits of non-fossil technologies, such as relief from the damage caused by pollutants other than greenhouse gases, destruction of land due to oil drilling and coal mining, water pollution, and so forth. Finally, what are seen as individual and societal goals, together with the economic demand for means to achieve them, are likely

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[25] *Report of the Secretary General* OR Commission on Sustainable Development, UN Doc.E/CN.17/2001/PC/20, (2000) at 4.

[26] Christiansen, *supra* note 18 at 2.

[27] Paul Brown 'Islands in Peril Plead for Deal' *The Guardian* (24 November 2000) online: The Guardian Unlimited: http://www.guardian.co.uk/climatechange/story/0,12374,782560,00.html

[28] Driesen, *supra* note 23 at 24.

[29] Michael E. Porter and Claas Van der Linde, 'Toward a New Conception of the Environment-Competitiveness Relationship' (1995) 9 J. of Economic Perspectives 97.

themselves to become more ambitious as costs come down as a result of new technological and social patterns becoming 'locked in'.[30] This shift in goals is unlikely to occur within a locked-in fossil-dependent system.

Nevertheless, the long-term benefits and cost savings of innovative non-fossil technologies are virtually impossible for pollution traders or policymakers to estimate and integrate into balance sheets, particularly using conventional economic methods. Pollution trading partners have no reason to calculate the effects of a money-saving trade on actors outside the exchange in question. Nor are they likely to engage in the quixotic task of trying to quantify precisely in advance the economic benefits of 'locking-in' a future, alternative technological system. At the same time, if US experience with air pollution is any guide, regulators and traders will overestimate greatly the cost of emissions regulation.[31] The regional economic consequences of climate change resulting from continuing fossil fuel use will remain radically uncertain. Any attempt to value the effects on ecosystems is riddled with obstacles. Estimating the savings that might result from future economies of scale applied to non-carbon technologies which have not yet been developed is problematic. Just as US economists' estimates of the costs and benefits of doing something about sulphur dioxide varied wildly,[32] so orthodox economists' estimates of the costs and benefits of the US doing something about global warming differ by many hundreds of billions of dollars per year, depending on variations in the assumptions plugged into conventional economic models.[33] Little or none of this

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[30] Driesen, *supra* note 23 at 86.

[31] Thomas O. McGarity, *Reinventing Rationality: The Role of Regulatory Analysis in the Federal Bureaucracy* (New York: Cambridge University Press, 1991) at 131. Note: Economist Dallas Burtraw points out that the fall in the cost of low sulphur coal, fuel switching cost reductions and so forth that 'have caused marginal abatement costs to fall also would have lowered the costs of achieving the sulphur dioxide emissions cap via some form of command and control policies' as well (Source: Dallas Burtraw, *Cost Savings, Market Performance and Economic Benefits of the US Acid Rain Programme*(Washington: Resources for the Future, 1998))

[32] In the late 1980s, US officials and experts could not agree even approximately on what the costs of reducing sulphur dioxide emissions would be. The American Electric Power Company predicted in 1981, on the assumption that scrubbers would be used, that the cost would be $500 per tonne of sulphur dioxide removed. The Tennessee Valley Authority came up with a figure of $155, the Department of Energy $153-273, the Office of Technology Assessment $116-313. Most estimates did not anticipate the historical accident of cheaper Powder River coal prices. See: Curtis A. Moore.'The 1990 Clean Air Act Amendments: failing the acid test' (2004) 34 Envtl. L. Rep. News & Analysis 10366 at 23.

[33] The Competitive Enterprise Institute states that the costs of complying with the Kyoto Protocol alone would cost the US $300 billion per year, losing 28% of GDP over 10 years (cited in Vijay V. Vaitheeswaran, *Power to the People* (London: Earthscan, 2005)). Energy expert Amory Lovins claims, by contrast, that reductions in carbon emissions would *save* $300 billion annually given better capital allocation and correction of organisational and regulatory failures, lack of information, perverse incentives, and so on. See 'Climate Protection for Fun and Profit' (1997) 13 Rocky Mountain Institute Newsletter 3, Fall/Winter, 3. The US Department of Energy concludes that the US could cut its predicted energy consumption by 20% by 2020 and its CO2 emissions by a third, bringing them close to 1990 levels,

jungle of speculative numbers can be reasonably expected to form part of the 'rational' calculations of economists, traders or policymakers intent on quantifying allocative efficiency or matching supply and demand within a particular technological regime. Concerned power industry figures themselves point out that the long-term price of tradeable emissions allowances is too uncertain to be a driver of systemic technological change in an industry whose generating capacity investments must be planned over 30-year periods.[34]

By their nature, moreover, well-organised trading systems are more likely to provide incentives for reducing single substances than for reducing a whole complex of substances or harms, partly because doing so avoids the hazards of attempting to measure and exchange like for unlike. Thus while in theory capable of reducing the short-term cost of cuts in single substances, the best-designed trading systems have the drawback that they may wind up selecting for methods and technologies that are more expensive in cleaning up the atmosphere in other respects. For example, integrated gasification combined cycle (IGCC), when viewed as an sulphur dioxide-reducing technology, has the 'unfortunate' and 'costly' side effect of also reducing NOx, mercury, CO2 and so forth. It is thus not as cost-effective to a sulphur dioxide trader's eye as other technologies, in spite of the fact that if the goal changed to one of reducing all such compounds, IGCC would be cheaper than installing separate scrubbers for each one.[35]

In short, the efficiency of the reductions theoretically made possible by trade, while sometimes an important policy consideration, simply need not correlate with, and may impede, innovation, creativity, experimentation, growth, competition, or long-term cost savings for industry or society as a whole. Focusing on efficiency without fostering a positive dynamic of strong and continuous incentives for radical

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all the while saving $124 billion on its energy bill (US Department of Energy, Office of Energy Efficiency and Renewable Energy, *Scenarios for a Clean Energy Future* (Washington: DoE, 2000); P. Raeburn, 'It's Perfect Weather to Fight Global Warming' *Business Week* (11 December 2000), 36.) Differences in assumptions even among conventional economic models, Stanford economist John Weyant notes, can 'easily lead to cost estimates that differ by a factor of ten or more'.'If you ask the broader question of how much tackling climate change will cost over this century,' concludes Vaitheeswaran, 'the honest answer must be that we simply do not know'.

[34] Vincent de Rivaz, 'Short Term Strategies Can Distort Emissions Progress', *Financial Times*, (28 July 2005), 19; 'Emission trading 'no good without targets'', *Environment Daily* 1739, (4 October 2004) ('The EU's industrial emission trading scheme will not help the bloc reduce greenhouse gases unless governments agree to emission reduction targets extending at least 15 years into the future, according to UK firm Enviros.' Even carbon prices of 50 Euro per tonne are unlikely to 'provide the stimulus necessary' for firms to invest 'to drive down greenhouse gases.')

[35] Curtis A. Moore, 'Marketing Failure: The Experience with Air Pollution Trading in the United States' (2003) [electronically published] Downloaded from Health and Clean Air: healthandcleanair.org/emissions/marketing_failure.pdf at 7. In theory, this problem might be avoided by a trading programme featuring emission limits for multiple pollutants and a separate trading scheme for each.

innovation in Northern societies may just lead to more and more counterproductive and time-consuming attempts to calculate the incalculable; and in the end, paradoxically, to inefficiency.[36] At the same time, innovations that fail early efficiency tests often generate wealth and save money over the long term.[37]

The concrete experience of the US confirms that the bias of pollution trading schemes toward cheaper reductions has been unfriendly to more interesting, radical and sustainable types of technological change that require long-term, broad-ranging efforts. Even the better-designed US pollution markets, while encouraging certain technological adjustments, have provided fewer incentives for fruitful innovation than performance standard programmes of identical stringency with no trading. By lowering rather than raising the cost of obeying pollution laws, they have tended to take advantage of differences among technologies that already exist for a particular purpose more than to develop new or more broadly effective technologies – at most to improve current state-of-the-art technology, not to lead to a new state of the art.

The US sulphur dioxide programme instituted in 1990, for instance, produced only one or two main technological responses, and these involved well-understood, indeed very old, technologies. One was scrubbers – a standard end-of-pipe approach. The program did produce limited innovations in scrubber design. But so had previous regulation, so these cannot be attributed to any special innovation-producing power of trading.[38] Another technological change that occurred during the implementation of the trading programme was the wider use of low-sulphur coal. In addition to not being a technological innovation, this change probably came about as a result of railroad deregulation, not trading.[39]

There was also some tweaking of operating procedures – for instance, plants might run their less-polluting units more frequently than their highly-polluting units in order to generate saleable credits.[40] But there were no radical innovations

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[36] Driesen, *supra*22 at 158, 164.

[37] In its first years, FedEx lost money building the infrastructure necessary to implement reliable overnight mail delivery. Once it had put the necessary infrastructure in pace, however, it began to profit by offering the service. Venture capitalists financed Jeff Bezos's 'inefficient' Amazon.com for years in the hope that the company would eventually turn a profit, even though it lost hundreds of millions of dollars to start with. By contrast, venture capital for environmental technologies in the US has dropped in recent years at a time when emissions trading has gained unprecedented prominence. See Driesen, op. cit. supra note 23 at 93-97.

[38]M. Taylor et al., 'Regulation as the Mother of Invention: The Case of SO2 Control' (2005) 27 Law & Pol'y 348-78; David Popp, 'Pollution Control Innovations and the Clean Air Act of 1990' (2003) 93 J. of Pol'y Analysis & Mgmt. 390.

[39] David M. Driesen, Syracuse University School of Law, personal communication, 2005. But see also Curtis A. Moore, *supra* 34 at 11, who states that the market did have a role, but writes dryly that the 'innovation' it stimulated 'in new railroad tracks, on- and off-loading systems and other ways of bringing lower-sulphur coal from the Powder River Basin to market.'

[40] N. Madu (ed.) *Handbook of Environmentally Conscious Manufacturing* (Boston: Kluwer Academic Publishers, 2001) at 32-33.

addressed at, say, supplanting coal-fired capacity or reducing demand. No innovations resulted on the order of integrated gasification combined cycle, wind turbines, or conservation programmes that can reduce many different pollutants simultaneously. Nor should any of these have been expected. In the definition of 'cheaper' activated by the trading programme, buying less coal from high-sulphur mines was a 'cheaper' way of reducing sulphur dioxide to the necessary levels than installing IGCC, wind, solar, fuel cells or conservation. What the market encouraged was shrewd use of existing technology to save money to meet an isolated standard for one substance, not the opening of new environmental horizons for society.[41]

The fact that the US's sulphur dioxide programme overshot its modest target in 1995 may seem to be *prima facie* evidence that trading stimulated innovation. In fact, what happened was that companies wanted to 'bank' credits for future use in the next, more demanding phase of the programme.[42] Little trading was in fact involved[43] and even less innovation. In addition, the overachievement was small in absolute terms. As with other trading schemes, the long-term effectiveness of the sulphur dioxide programme depends on regulatory decisions about underlying emissions limits: trading is not a substitute for making hard choices.

The US programme is expected to cut sulphur dioxide emissions by only about 35% by its 20th anniversary in 2010. In contrast, Germany cut power plant emissions by 90% from the first proposal in 1982 to completion of its programme in 1998, without trading.[44]

Indeed, trading enthusiasts' claim that pollution trading enables faster reductions than other forms of regulation is contradicted by much of the empirical evidence. For example, the US required 23 years to eliminate leaded gasoline through a trading programme, a task which took China three and Japan 10, without trading.[45] Even in the short term, the US lead trading programme can be said to have slowed the phaseout of lead in gasoline. Lead trading allowed refiners that banked purchased lead credits to continue exceeding lead limits through 1987, whereas the previous regulation had required refiners to meet the standard by 1986.[46] The 'innovation' generated – the virtual elimination of lead from gasoline – could meanwhile also have been achieved through conventional performance-standard regulation.

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[41] Driesen, *supra* 22 at 79-80.

[42] Ellerman, *supra* 3 at 14.

[43] Once the trading scheme got under way, many installations managed to cut emissions without trading at all. Most of those who did trade traded only within their own firm. Inter-firm trading came to only two% of total emissions (Moore, *supra* 31 at 26).

[44] Moore, *supra* 34 at 7-8.

[45] Moore, *Ibid.*, at 9; David M. Driesen, 'Is Emissions Trading an Economic Incentive Program? Replacing the Command and Control/Economic Incentive Dichotomy' (1998) 55 Wash. & Lee L Rev. 317.

[46] Driesen, *supra* note 23 at 66.

Trading does not appear to have encouraged the development of innovative technologies under the US's less well-designed pollution programmes, either. Southern California's RECLAIM market, for instance, appears to have sidelined the development of fuel cells, low-emitting burners and turbines, and so forth, whose development had previously been subsidised by a percentage of car registration fees. At least one innovative entrepreneur making low-NOx burners, Alzeta, probably lost rather than gained sales as a result of the programme.[47] An emerging method of reducing NOx, SCONOx, was also thwarted. SCONOx is more expensive than the dominant selective catalytic reduction method, but arguably could have penetrated the market given stringent regulation generating less 'spatial flexibility' about where reductions were made.

Similarly, Richard Liroff demonstrates that 'innovations' under the 'bubbles' of early US pollution trading programs tended merely to be rearrangements of conventional technologies rather than the invention, development or commercialisation of the non-obvious technologies necessary for achieving a longer-term social or environmental goal.[48] The same appears to be true of the more recent internal system of emissions trading instituted in 2000 by the Anglo-American oil firm BP Amoco, which committed its business units collectively to shaving 10% off their 1990s greenhouse gas emissions by 2010. (The emissions resulting from sales of the hydrocarbons the company extracted and refined were not counted, although they of course dwarf the firm's in-house releases. In 2001, just the one-year growth increment in emissions from the products BP sold by itself came to double the greenhouse gas emissions from the company's own operations.[49] BP's oil and gas production has only increased since 1990.[50]) BP Amoco's trading system did help the company make the easy one-third of the cuts required more cheaply. These cuts were mostly in obvious areas like process efficiencies – finding and shutting down spare turbine generators, minimising downtime by cleaning machinery without shutting it down, steam and power cogeneration, and so forth. But in attempting to make the rest of the cuts, company divisions were able to avoid more radical change simply by looking 'outside [BP's] operations [to] see what can be done by working with others' – for example, by setting up cheap, low-tech, 'offsite carbon reduction' schemes like tree plantations in distant locations.[51] By 2002, the company expected

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[47] Curtis A. Moore, 'RECLAIM: Southern California's Failed Experiment with Air Pollution Trading' (2003) [electronically published] Downloaded from Health and Clean Air: www.healthandcleanair.org/emissions/reclaim.pdf at 24.

[48] Richard A. Liroff, *Reforming Air Pollution Regulation: The Toil and Trouble of EPA's Bubble* (Washington, DC: Conservation Foundation 1986) at 100.

[49] 'BP's Credibility Gap over Carbon Emissions', 326 *Environmental Data Services Report* (March 2002), 4.

[50] 'BP -Annual data - reported basis' online: http://www.investis.com/bp_acc_ia/ar/htdocs/reports/report_17.html

[51] Shaun Harley, 'Outback to the Future' (2000) 1 *Shield* (BP Magazine) 38.

only half of its so-called 'emissions reductions' to come from credits bought in from outside.[52] At no point was there any move toward genuinely innovative technology.

In short, the experience of the US, on which the Kyoto Protocol is based, suggests, ironically, that trading systems' cost-saving opportunities are not the innovation-fostering opportunities that climate change demands. Trading alone is unlikely to provide enough incentives for breaking the logjam required for starting industrialised societies down a path away from their current locked-in dependence on fossil fuels.

To generalise, while a given trading scheme can in theory

- save *participating private firms* money in
- reducing emissions of *specific substances*
- to a *particular degree*
- over *particular time periods* and
- within a *particular larger technological system*,

the same trading scheme may not be the best choice if the objective is to

- save money for *society or industry as a whole*, or
- in attaining a more *general environmental goal*, or
- in making *more drastic reductions*
- with *long-term* goals in mind, or
- in bringing about a *change in a larger technological system*.

The 'cost-effectiveness' of an emissions trading system, in other words, is always relative to a narrow, measurable set of actors, objectives and time horizons. Emissions trading systems do not automatically select for the better or even the cheaper long-term alternatives for a society. When trading advocates assert that trading systems are 'cost-effective' without specifying for whom, in what, and over what time period, they are accordingly guilty of vagueness.[53]

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[52]'BP's Credibility Gap over Carbon Emissions', 326 *Environmental Data Services Report* (March 2002), 4.

[53] Christiansen, *supra* 18 at 19. Such economic jargon also tends to conceal a politics of transfer of wealth from society as a whole to private firm traders, from poor to rich and from younger generations to older. See, e.g., Barbara White, 'Coase and the Courts: Economics for the Common Man' (1987), 72 Iowa L. Rev. 72, 577-635, 595-603; Larry Lohmann, 'Making and Marketing Carbon Dumps: Commodification, Calculation and Counterfactuals in Climate Change Mitigation' (2005) 14 Science as Culture 3, 1-33.

**Looking to Kyoto**

It is worth noting that the emissions trading component of the Kyoto Protocol and its offshoot, the EU Emissions Trading Scheme, has also so far failed to encourage innovation of the sort required to tackle global warming. The main response of companies involved in the EUETS so far, for instance, has been not to seek ways out of reliance on fossil fuels, but rather to lobby for more initial allowances or more advantageous ways of distributing allowances within their sectors;[54] to consider moving operations abroad;[55] to contemplate some shifts to gas-fired capacity; and to seek credits from countries that have suffered economic setbacks, such as Russia, or from projects that make minor adjustments to existing technological structures, such as schemes to convert HCFCs or burn methane seeping out of coal mines or waste dumps (see below). Costs of buying extra pollution permits are being passed on to consumers without any incentives for systemic change being created, generating new windfalls for utilities and other corporations.[56] As the Heinrich Böll Foundation's *Jo'Burg Memo* observes, 'the 'polluter pays' principle has been turned into a 'polluter buys his way out' principle. Decarbonisation will not really take place in this manner, since the resource base of Northern economies is not being restructured.'[57]

It is sometimes argued that this does not matter, since the function of using trade to reduce the costs to corporations of making incremental improvements in carbon-intensive technology is to buy time in which to make the advances which can overthrow that technology entirely and free the world from fossil fuel dependence. The idea is that the market can help make the world's fossil fuel technologies state-of-the-art, or moderate their climatic effects, while solar and other renewable technologies are being developed to replace them.

There are two difficulties with this argument. First, shifts in technological and industrial structure do not just happen on their own. Solar energy technology, for

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[54] Under pressure from industry, the British government, for instance, attempted on 26 October 2004 to revise emissions allocations under its National Allocation Plan for the European Union Emissions Trading Scheme, leading to a dispute with the European Union.

[55] Kevin Morrison 'Europe's Pollution Penalties up 10% to Record' *Financial Times* (4 July 2005) Note: Chris Rowland, head of utilities at Dresdner Kleinwort Wasserstein, said the higher emission costs could force some industrial companies to move production out of Europe; 'If emission prices go higher then it may be more viable for some companies to stop producing, sell their allowances, and move their production outside Europe.'

[56] UK power generators, for example, are expected to receive an annual £500 million windfall which they will then be 'able to convert . . . into valuable income on their balance sheets' (House of Commons Environmental Audit Committee (2005). *The International Challenge of Climate Change: UK Leadership in the G8 and EU. Fourth Report of Session 2004-5* (London: The Stationery Office) at 17, Ev130. See also Wendy Frew 'Dirty Power Plants Making Millions out of Green Scheme,' *Sydney Morning Herald* (14 September 2005.)

[57] Wolfgang Sachs et al., *The Jo'Burg Memo* (Berlin: Heinrich Boll Foundation, 2002) at 38.

example, is not 'advancing' busily by itself in a bubble independent of politics, funding and society. Its developers struggle continually to develop a network of research and investment against a structure of large competing subsidies still being given to fossil or nuclear energy and other arguably 'sunset' technologies. A shift in this pattern of subsidies cannot be delivered by emissions trading.

Second, emissions trading schemes, even the better-designed ones, rather than buying time for governments or corporations to make structural changes, may actually slow or block the needed technological developments, by squandering ingenuity and resources on making small refinements that extend the life of an overwhelmingly fossil-oriented energy and transport structure. No empirical evidence exists that current greenhouse gas trading programmes are functioning as transitional solutions on the way to a fossil carbon-free future; indeed, all the available evidence is on the other side.

**Problems with project-based "offset" credits**

So far, this article has concluded that the efficient allocation of emissions promoted by emissions permits markets does not encourage innovation of the kind needed to make progress against global warming, and has returned a negative answer. Many pollution markets, however, are not just emissions permits markets. Many also include commerce in credits generated by special pollution-saving projects. These credits are assumed to compensate for emissions, and indeed are commonly, if incorrectly, known as 'emissions reductions', to signify the fact that they can be used to satisfy emissions reduction requirements of firms whose emissions levels are in fact static or increasing.

For example, in current global greenhouse gas markets, an electricity utility in Japan or Europe that is unable or unwilling to reduce its greenhouse gas emissions in line with legal requirements can instead buy credits generated by, say, a fast-growing eucalyptus monoculture in Brazil that is claimed to be 'sequestering' carbon in its trees. Or it may invest in some other project certified to be 'saving' carbon: for example, a Korean scheme that captures or destroys industrially-produced hydroflourocarbons such as HFC-23, a potent greenhouse gas; a hydroelectric dam in Guatemala that 'replaces' electricity generated by fossil fuels; a project to feed supplements to Ugandan cows to reduce their methane flatulence;[58] or projects that burn off methane, another potent greenhouse gas, from waste dumps in South Africa, coal seams in China, pig farms in Chile, or flaring towers in Nigerian oil fields. Such projects demonstrate that they are 'saving' carbon by showing that they are an improvement over a 'business-as-usual' baseline identified

[58] Climate Neutral Network, Business and the Environment, XI, 5, May 2000: http://www.climateneutral.com/pages/press_bus_env.html.

and quantified by contracted experts. That is, such projects can generate tradable credits only if they show their existence is due to the finance generated by the credits.

The question for this section is whether trading schemes that admit such credits are any better at producing radical or structural technological innovation than ordinary emissions markets. Here again, the evidence from the US stacks up not for, but rather against, the hypothesis that such markets provide incentives for innovation.

One example is the Regional Clean Air Incentives Market (RECLAIM) implemented in Los Angeles.[59] Under RECLAIM, the South Coast Air Quality Management District (SCAQMD) allocated pollution allowances to 370 big polluters including oil refineries, power plants, aerospace companies, asphalt batch plants, chemical plants and cement plants. The aggregate number of these permits was then decreased year by year, in theory creating incentives for technological changes to cut pollution. But polluting facilities had the option of avoiding emissions reductions by buying credits generated by licensed car scrappers who destroyed old, high-polluting cars. Beginning in 1997, SCAQMD also offered to award marketable credits to businesses or individuals who repaired emissions-related components in high-emitting vehicles, bought clean buses or other vehicles, electrified truck stops and tour bus stops to prevent engine idling, bought battery-operated lawn mowers and so on. Whether or not these 'offset' technologies are themselves regarded as innovative, they were used to relieve pressures on large emitters to make other, more substantial technological changes.

Similarly, 'offsets' used in the US Environmental Protection Agency's 'bubble' programmes often allowed credits from activities that would have occurred anyway to enable firms to avoid pollution reduction obligations. In the 1970s, states lured new industry by providing them with 'offsets' that the states themselves created – in one case credits for 'an asphalt substitution process that already was occurring for nonenvironmental reasons'.[60] Without such 'offsets', polluters would have had some incentive to innovate to control their own emissions; with them, this incentive was eliminated through use of credits generated by an already-existing technology. Firms have also claimed credits for shutting down emissions sources or for production slowdowns, even when this has been for business reasons. Writing of such 'paper credits', environmental lawyer David D. Doniger wrote in 1986 that 'in practice . . . there has been far more innovation in shell games and sharp accounting practices than in pollution control technology.'[61]

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[59] Drury et al., *supra* note 5; Curtis A. Moore, *supra* note 46.

[60] Richard A. Liroff, *Air Pollution Offsets: Trading, Selling and Banking* (Washington, DC: Conservation Foundation,1980) at 16. See also Liroff, *supra* note 47 at 117.

[61] David D. Doniger, 'Point... And Counterpoint' (1986) 4 Envtl. F. 29,34

In a similar way, the Kyoto Protocol's market includes credit-generating mechanisms – Joint Implementation (JI) and the Clean Development Mechanism (CDM) – designed in a way that allows industries in the wealthiest countries to avoid innovation in their own technological systems by funding the installation of off-the-shelf technology in Southern or Eastern European countries. These mechanisms have been a particular failure in promoting renewable energy, in which innovation is especially desirable.

This is for several reasons. First, the more a Southern country makes it a matter of policy to promote renewable energy or climate-friendly technology generally, the harder it makes it for itself to attract CDM projects. The more serious it is about weaning its technological structure off fossil fuels, the harder it becomes to prove that good projects would not have happened without the CDM.[62] The CDM, in other words, gives governments perverse incentives for choosing the short-term benefit of CDM revenues aimed at plucking 'low-hanging fruit' over the long-term benefits of environmental policy promoting climate-friendly technological change. For example, high-level government bureaucrats in South Africa's Department of Mines and Energy have admitted that they have faced pressure from the private sector not to make renewable energy targets too stringent, for fear future CDM projects will not be able to prove that they are better than what would have happened otherwise.[63] Pressures for holding off on innovation are worsened by the fact that credit buyers and consultant validators seeking future contracts likewise have incentives to postulate and bring about 'business as usual' scenarios which are the highest-emitting possible, in order to make the projects that they back appear to be saving as much carbon as possible.

Second, some proposed CDM projects claim carbon credits simply for obeying the environmental laws of the host country. One example is a proposed project to divert the natural gas now being flared by Chevron, Shell and other corporations in Nigeria. Flaring is already prohibited in Nigeria, and the companies have been

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[62] Marte Nordseth, 'CDM EB takes measures against 'perverse incentives'', CDM Monitor, 27 October 2004. ('The problem with perverse incentives may occur when, for example, climate-friendly sectoral policies are put in place in developing countries. In these cases, projects can be considered non-additional and therefore excluded from the CDM. This has, in some cases, led CDM host countries to refrain from implementing climate-friendly policies so that projects can still generate Certified Emissions Reductions.' The CDM Executive Board decided in 2004 to require that policies introduced after the 1997 Kyoto Protocol that have led to increased greenhouse gas emissions not be included in project baselines. Yet if incentives for more emissions exist in practice, they 'should be taken into account in the baseline'. The Board also decided that policies aimed at reducing greenhouse gas emissions implemented after the adoption of the Marrakesh Accords in 2001 should be disregarded in the baseline. In other words, project developers can claim credits on a baseline that pretends that such climate-progressive policies do not exist.

[63] Graham Erion, 'Low Hanging Fruit Rots First', this volume.

paying a penalty for non-compliance.[64] Proponents of such projects often claim that they help ensure that laws are obeyed. However, the prospect of carbon finance gives both host countries and project proponents incentives for ensuring that environmental laws, including those creating incentives for structural change and innovation to lower emissions, are normally *not* enforced. Another example is South African regulations that methane emissions from landfills be captured once they reach a certain level.[65]

Third, and perhaps most important, the cheapest carbon credits that the CDM has to offer, and thus the ones most in demand by industrialised countries, will be those that do the least to help develop a structure of renewable energy and transport in Southern countries. Industrialised country investors, understandably, are more interested in projects that deliver large volumes of cheap credits than in ones that deliver a small volume of expensive credits. In practice, that means projects that capture or destroy non-$CO_2$ gases released from a few, easily isolatable existing facilities with well-established, easily monitored technology. Tinkering with such installations does little to incentivise strategies for broad or innovative technological change in the energy or transport fields.

Some of the largest credit generators in the current CDM portfolio, for example, do nothing except decompose HFC-23, a very damaging greenhouse gas emitted at existing HCFC-22 facilities, or $N_2O$, another powerful greenhouse gas emitted in the production of adipic acid. Of the 236 million credits claimed to 2012 by 106 proposed CDM projects as of March 2005, 40 million come from two HFC-23 projects, and another 70 million from one $N_2O$ project; that is, nearly half of all CDM credits originate from these three projects alone.[66] Of the nine CDM projects which had actually been registered by the CDM Executive Board by June 2005, the only three that were likely to generate significant volumes of credits were the two HFC-23 projects (in Gujarat, India and Korea), and a landfill gas capture project in Brazil.[67] Two additional HFC-23 projects in India are projected, while a consortium of Japanese, Italian and Chinese partners are investigating a project spread across 12 HCFC-22 plants in China that would yield 60 million credits a year from 2008.

While such projects, assuming they would not have been implemented anyway, do carry environmental benefits, they are essentially end-of-pipe add-ons to single, existing plants; could have been carried out through traditional regulation; and do not help to effect broader, novel structural change in critical climate-related sectors such as energy or transport. As the US lead and sulphur dioxide programmes had

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[64] See Environmental Rights Action, 'No Carbon Credits for the West African Gas Pipeline', online at http://www.eraction.org/modules.php?name=ERA_News&file=article&sid=33.
[65] *Ibid.*
[66] Carbon Trade Watch, 'CERS Claimed to 2012 by CDM Projects' (11 March 2005) online: CDM Watch www.cdmwatch.org
[67] See the Clean Development Mechanism website at http://cdm.unfccc.int. [CDM]

already demonstrated, because trading 'focuses solely on reducing a single pollutant by an exact date and a precise amount at least cost, techniques and practises that deliver multiple benefits – e.g., new ways of energy conversion, as well as conservation, and renewable forms of energy – are frozen out of the market'.[68]

The Gujarat HFC-23 project in India, for instance, will prevent the emission of only 289 tonnes of HFC-23 annually, yet, because HFC-23 is such a potent greenhouse gas, it will yield 3,3 million carbon credits per year, more than all the four dozen proposed CDM renewable energy projects would generate together.[69] Similarly, coal-bed methane projects do nothing but capture and burn methane seeping from coal mines, converting it into energy and CO2, which is a less potent greenhouse gas. The same is true of carbon credit-earning gas flaring projects in oil fields. Both can thus be seen not only as contributing nothing to radical or structural technological change, but also as directly shoring up the continued transfer of fossil fuels from under the ground to the atmosphere.

As a recent overview of the CDM by the OECD noted, 'a large and rapidly growing portion of the CDM project portfolio has few direct environmental, economic or social effects other than greenhouse gas mitigation, and produces few outputs other than emissions credits. These project types generally involve an incremental investment to an already-existing system in order to reduce emissions of a waste stream of GHG (e.g. F-gases or $CH_4$) without increasing other outputs of the system.'[70]

Renewable energy projects, in contrast to gas capture and conversion schemes, tend to be capital-intensive, greenfield developments that provide low rates of return and generate relatively small volumes of credits.[71] The fact that transaction costs are generally similar regardless of project size, moreover, militates against smaller renewables projects, which are less able to afford to shoulder the burden of the necessary documentation, validation, ongoing monitoring and verification of emissions reductions that is required of CDM projects. No market system which prioritises price per unit of carbon credits will benefit renewables, as the World Bank, among others, recognised early on. If anything, this disadvantage will become even more pronounced as the CDM portfolio grows. HFC-23 and $N_2O$ projects now have approved methodologies and stand a greater likelihood of approval than other types of project that lack approved methodologies, and investment by Japan – a country key to CDM finance – has shifted more and more toward landfill gas projects.

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[68] Curtis A. Moore, 'Air pollution trading – marketing failure' [electronically published] online: www.acidrain.org/AN2-04.htm.

[69] CDM *supra* note 74.

[70] Jane Ellis et al., 'Taking stock of progress under the CDM' (Paris: OECD, 2004)

[71] The comparatively small credit volume yielded by such projects is due partly to the fact that they are designed to 'reduce' carbon dioxide rather than, say, methane, which is 21 times more potent as a climate-forcing gas, or some HCFCs, which are 11 000 times more potent.

Today, while renewable energy projects are still the most common project *type* in the CDM, they generate only a declining 10% of the total *volume* of carbon credits proposed. If tests whether projects 'would have happened without carbon credits' are credibly applied, this volume will decline even further.[72] Significantly, none of the nine remaining renewables projects being developed under the Dutch-funded CERUPT carbon-trading programme has been able to demonstrate that it 'would not have happened otherwise'. Indeed, the first CERUPT project to seek approval – the Suzlon wind farm in India – was withdrawn in May 2004 on the grounds that it clearly would have happened without CERUPT funding.[73] The nine CERUPT renewable energy projects account for about 25% of all renewables projects, and are responsible for over 30% of the carbon credits that such projects are claiming in total. Similarly, the largest current renewable energy project – the Darajat III geothermal project in Indonesia – recently had its baseline methodology rejected due in part to its inability to demonstrate that it 'would not have happened otherwise'.[74] Darajat III accounts for nearly six million of the 25 million credits currently being claimed by all CDM renewable energy schemes. Meanwhile, the Zafarana wind farm in Egypt, which is generating over four million carbon credits, uses a soft loan from the Japanese Bank for International Cooperation in breach of CDM rules against using overseas development aid money, and will likely be rejected on those grounds, and also on the grounds that it would have been built without CDM money. An additional handicap for renewable energy projects, which have to pay more of their costs upfront than many other projects, is the commodity transaction model overwhelmingly followed by CDM and Joint Implementation projects, in which credits are bought as they are delivered over the 10 or 21 year crediting period.[75]

Innovative renewable energy projects have a financial profile that is the opposite of that favoured by the CDM. Even efficiency projects have been few in number to date.[76] Recent calculations by the World Wide Fund for Nature show, moreover, that the amount of financing expected to be mobilised by the CDM for renewable energy is a fraction not only of existing investment and Overseas Development Assistance (ODA) flows, but also of Global Environment Facility (GEF) financing for renewable energy. WWF estimates that the CDM will account for less than 0,5% of the annual renewables market in Southern countries if current trends continue.[77]

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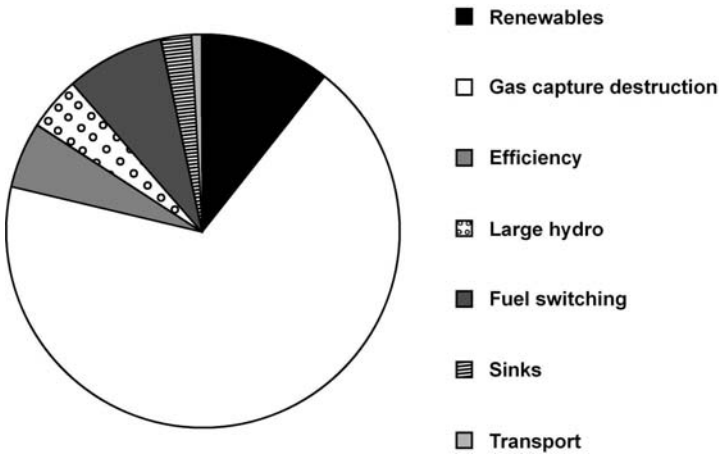
[72] Ben Pearson, 'Market Failure: Why the Clean Development Mechanism Won't Promote Clean Development' (2004), online: CDM Watch www.cdmwatch.org at 2.
[73] To see submissions on Suzlon go to www.cdmwatch.org.
[74] CDM *supra* note 74.
[75] World Bank, *State and Trends of the Carbon Market 2004* (Washington, DC: World Bank) online: World Bank Prototype Carbon Fund www.carbonfinance.org
[76] Erik Haites, for the World Bank Carbon Finance Business Unit, 'Estimating the Market Potential for the CDM: review of models and lessons learned', June 2004.
[77] Pearson *supra* note 81 at 3.

**Types of CDM projects**[78]




Unsurprisingly, CDM host countries have made few attempts to promote 'premium quality' CDM credits capable of driving innovation and strategic change, since they are less attractive to investors. Only months after the 2001 Marrakech Accords, the consultancy Ecofys examined the opportunities for renewable energy projects and concluded: 'Various studies indicate a limited role for renewable energy projects under the Kyoto Mechanisms . . . Kyoto Mechanisms dominated by least-cost approaches only would seriously limit the scope for renewable energy projects'[79]. The World Bank has more recently explicitly called attention to the 'the non-economic' nature of the renewable projects in the CDM portfolio, noting that the current proportion of experimental renewable energy projects is bound to diminish in the 'mature CDM market'.[80]

Where investors are putting money into credit-generating renewable energy schemes, they are treating them mainly as green decorations for portfolios dominated by conventional energy rather than as sober market investments. The Finnish government, for example, recently put up four micro-hydro projects in Honduras for validation by the CDM, yet their credit generation is so small – one project is claiming to generate only 9 000 tonnes of CO2 credits over 10 years – that it is difficult to see how credit sales could even cover transaction costs.[81] Similarly, the

[78] This graph is due to Ben Pearson. See *ibid.* at 2.
[79] Ecofys, 'Opportunities for Renewables under the Kyoto Mechanisms' (The Netherlands: Ecofys, 2002.) online: Ecofys www.ecofys.com
[80] Pearson, *supra* note 81 at 3.
[81] *Ibid.* at 6.

minimum R40 000 ($6 300) price tag for certifying a CDM project in South Africa puts carbon finance out of reach of most small-scale renewable energy project developers.[82]

In sum, while CDM is discovering some low-cost options for cutting greenhouse gas emissions, it cannot, as a market mechanism, achieve the objectives of a renewable energy promotion instrument or a 'sustainable development' fund. The function of the CDM market will continue to be to identify and fund low-cost carbon credits, not make investments that drive strategic change in energy and transport. Like US emissions markets, the CDM market is necessarily blind to the fact that not all so-called 'emissions reductions' locations and types are equal in environmental value and potential for driving long-term, system-wide structural innovation and change toward non fossil-dependent energy and transport.

It would thus be inaccurate to characterise the current market including credit-generating 'offset' projects, as 'at least a small step in the right direction' or as 'doing more good than harm' with regard to technological change. An industrialised country that accepted emission targets that it had to meet entirely domestically would have far more incentive to implement fundamental shifts in energy production and use than if it were able to meet half of its target through cheap carbon credits from CDM projects.[83] Unable to buy credits from the reduction of HFC-23 emissions from pipes in India or the planting of industrial eucalyptus monocultures in Brazil, European countries would have more incentive to support renewable energy or demand-side management, creating jobs, skills and investment with greater long-term climatic value.

**Where is the measurement technology?**

The previous two sections of this article have argued that the framers of today's carbon markets would have benefited from greater attentiveness to the lessons for innovation of the US experience with permit and credit trading systems. For those

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[82] Erion, *supra* note 72.

[83] This was a lesson not lost on much of the Canadian public, to judge from an editorial in the Toronto Star on 13 April 2005 entitled 'Costly Safety Valve for Kyoto Targets'. The editorial charged that Ottawa's decision that the 'lion's share of the C$1 billion Climate Fund set out in the February 2005 budget — the government's largest, single initiative in its Kyoto plan — will likely go to buy emissions credits from other countries . . . is akin to someone paying an Olympic sprinter $1 million for his gold medal without even running the race. . . . even if Canada fails to meet its Kyoto target, wouldn't it be far better to make every effort to do our best in the race? . . . Money sent abroad is money that would be better spent on the emissions-reducing mass transit we need, on helping big industrial emitters achieve as much as they can and on helping to build a cross-country grid to bring clean hydroelectric power to Ontario from Manitoba and Quebec.' The editorial goes on to lament that the Canadian government 'puts so little emphasis on the kind of industry-by-industry reductions' that the oil and gas industry, utilities that generate electricity by burning fossil fuels, and the mining and manufacturing sectors need to achieve.'

concerned with long-term climate-friendly technological change, the US experience should have constituted an argument against rather than for adopting permit and credit trading mechanisms to combat global warming.

There is, however, another, equally important lesson of the US experience with pollution trading that has yet to be assimilated fully by advocates of the carbon market. This is the necessity, for any market, of adequate measurement technologies. The US's much-praised sulphur dioxide emissions trading programme became possible only when certain emissions quantification technologies became available, and would have been counterproductive without them. Because parallel measurement technologies are not in place for greenhouse gases, the experience of the sulphur dioxide programme in the US again constitutes an argument against, not in favour of, a similar emissions trading scheme for greenhouse gases. Here again, the US model should have provided more discouragement than encouragement to the project to frame a market-oriented Kyoto Protocol.

Indeed, if there is a model to be looked to for pollution control schemes relevant to global warming, it is less likely to be the 1990 Act which launched the sulphur dioxide programme than the original US Clean Air Act of 1970. Although the theory of tradeable permits had been formulated by the late 1960s, the US's pioneer 1970 Act had no provisions for pollution trading. It was fortunate that it did not, at least with respect to sulphur dioxide. In 1970, there would have been no way of making a sulphur dioxide market work, because at the time there was no way of measuring how much sulphur dioxide each firm was releasing at any particular time. As one specialist noted, 'emission measurement technology is presently inadequate to meet the requirement that a regulatory agency be able to determine with some precision just how much an individual polluter is contributing to the atmospheric burden'.[84] In 1970, there were only 86 ambient sulphur dioxide monitors in the entire US, and those were only crudely accurate.[85] Point source monitoring was in an even more primitive state. That meant there would have been no way of verifying independently either what each firm's baseline emissions level was or monitoring emissions afterwards to find out how much they were exceeding or falling short of their quotas. Even if firms had been allocated quotas, they would have had no means of finding out whether their emissions were in line with them, nor any incentive to do so. So there would have been no point in allocating different amounts of atmospheric 'dump space' or property to each firm to use to put its sulphur dioxide emissions in. Still less would there have been any ability or incentive on the part of firms buying quotas to verify what they were buying:

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[84] Daniel H. Cole, *Pollution and Property: Comparing Ownership Institutions for Environmental Protection* (Cambridge: Cambridge University Press, 2002) at 75.
[85] *Ibid.* at 73.

'Polluters purchasing emissions allowances have no interest in the quality of the goods. Buyers of blue jeans care about whether they wear out; buyers of pollution reduction credits only care about whether regulators will accept them in lieu of local compliance. If regulators do not perform their traditional role of making sure that claimed reductions reflect real reductions, they will make trading programmes into failures.'[86]

In short, debits, credits and trading would have been impossible (as would have been taxes).

The 1970 Act worked only because it took a different, directly regulatory approach. Instead of trying to monitor each firm's emissions, it insisted that each firm install technology of a certain standard. As long as each firm did so, the government could be assured that some emissions reductions were being made, even if it could not precisely measure them, because officials could easily visit each installation and see whether the right technology was in place. In the early 1970s, for instance, the Los Angeles County Air Pollution Control District managed to inspect the technology at every major source once a month, at a time when it would not have been possible for it to monitor point-source emissions for all regulated pollutants at finite cost.[87]

Pollution trading theorists might assume that this approach was necessarily less efficient in achieving the Act's goals than trading would have been. But, in context, it was in fact more efficient, given the state of pollution measurement at the time.[88] Trying to trade would have been, in effect, infinitely costly due to the lack of the necessary measurement technology. With technology-based regulation, on the other hand, the technology itself was the monitoring device. As Michael T. Maloney and Bruce Yandle explain, 'If the approved technique was in place, and working order documented, emission control was being accomplished.'[89]

This points up a general lesson summarised by Daniel H. Cole of the Indiana University School of Law: the 'comparative efficiency of alternative environmental instruments cannot be determined in isolation from the institutional and technological circumstances in which they operate.'[90] Trading systems are 'quantification-heavy'. They cannot reduce the costs of achieving an emissions reduction goal except in the presence of an extensive, far-reaching, uniform and accurate system of emissions measurement and monitoring. Although, as Marc Roberts observes, '[w]hen economists discuss such matters as emissions trading they

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[86] David M. Driesen, 'Markets are Not Magic', The Environmental Forum, November/December 2003, 18-27 at 22.
[87] Cole, *supra* note 99 at 75.
[88] Driesen, *supra* note 4 at 311.
[89] Michael T. Maloney & Bruce Yandle, 'Estimation of the Cost of Air Pollution Control Regulation' (1984) 11 J. of Envtl Econ & Mgmt 244, cited by Cole, *supra* note 99 at 71.
[90] Cole, *supra* note 99 at 70.

sometimes talk as if monitoring devices were widely available to cheaply and reliably record the amount of all pollution emissions',[91] such devices cannot be taken for granted. The necessary monitoring technology is not always available, and when it is available, it is not costless. If it is not available, giving polluters pollution quotas makes little sense. Or to put it conversely: in those cases in which trading in atmospheric dump space would raise enforcement costs so much that they would offset likely compliance cost savings, it is *not* more efficient to institute a tradeable permit system than to engage in more conventional regulation.

In the US, it was only in 1974 and afterwards that the Environmental Protection Agency began experimenting with transferable pollution rights. A lead pollution trading scheme could be instituted, for instance, because lead content in gasoline is easily measured. Nevertheless, although sulphur dioxide measurement technologies improved (there were six times as many ambient concentration monitors in 1977 as in 1970, and they were more reliable), they were not good enough or cheap enough to support an efficient trading system (or taxes) until much later. The first continuous emissions monitoring systems became available only in 1975, and it was only the succeeding two decades of further technological development that made sulphur dioxide trading possible and cost-effective in the 1990s. In addition, thanks partly to environmentalist vigilance, a programme was set up to check emissions continuously at the expense of power generators themselves, who are required by law to put electronic monitors on their smokestacks, obviating a lot of costly government oversight.[92] The relatively small number of sulphur dioxide polluters was also a factor working in the programme's favour. In sum, the programme was less a matter of Congress suddenly grasping the economic theory of tradeable permits than of a change in the technological and institutional conditions that made a market possible. As the Environment and Natural Resources Policy Divison put it in 1993,

'the requirement for continuous emissions monitoring systems is the linchpin in this title, for without good emissions data, a problem that has hampered enforcement of the Act to date, no allowance or emissions trading scheme can effectively operate'.[93]

With respect to measurement of production and absorption of carbon dioxide and other greenhouse gases, the United Nations today is in a position similar to that the US was in in 1970 with sulphur dioxide – only worse. Like Marc Roberts's naïve economic theorists, the framers of the Kyoto Protocol 'simply presumed that a trading system would provide a lower cost mechanism than traditional command

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[91] Marc Roberts, 'Some Problems of Implementing Marketable Permit Schemes: the Case of the Clean Air Act' in Wesley A. Magat, ed., *Reform of Environmental Regulation* (Cambridge, MA: Ballinger, 1982), 93-117, cited in Cole, *supra* note 99 at 77.

[92] Cole, *supra* note 99 at 82.

[93] Quoted in Cole, *supra* note 99 at 82.

and control for meeting the Protocol's goal'[94] without looking carefully at whether the conditions for such a market, and thus for such savings, existed. Yet, as quickly became clear, the measurement systems required for the Kyoto market were simply not there. In fact, the prospects of a quantification system robust enough to support a market are a great deal less promising for the Kyoto Protocol than they were even for sulphur dioxide in the US in 1970.[95]

With respect to trading in emissions themselves, the problem is deficient direct pollution measurement and monitoring systems. Many countries – and not just Southern countries – lack the technical and institutional capability to quantify and monitor industrial greenhouse gas emissions precisely and regularly. Uncertainties about the quantity of greenhouse gases being emitted by national energy systems 'are in the range of plus or minus 10-30%', according to one survey.[96] This is inadequate for the purpose of detecting the small reduction signal needed to demonstrate compliance with Kyoto. In most countries the data is provided by polluting companies, often without continuous emissions monitoring systems, resulting in an economic incentive for companies to cheat. In England and Wales, the Integrated Pollution Prevention and Control system which monitors and controls industrial emissions relies heavily on emitters taking samples of their emissions and reporting the results to the British Environment Agency. A report from the Environmental Agency suggested that 40% of sites did not have satisfactory monitoring procedures in place. Despite this, from 2001 to 2005, the level of independent monitoring of industrial sites' emissions dropped by three-quarters.[97] BP, meanwhile, has acknowledged an uncertainty of 30-40% in the 1990 baseline it uses in determining whether it has reached the 10% reduction target of its in-house emissions trading programme, and the margin of uncertainty of its operations' current emissions, it admits, is still five%.[98] The problem is not only the level of technology and independent verification. The number of carbon dioxide sources is also vastly greater than the number of sources of sulphur dioxide – so much so that one businessman with successful experience in brokering US sulphur dioxide trading allotments, John Henry, Chief Executive Officer of Power Navigator in Washington, D.C., is concerned that international carbon trading – given the lack of ability to monitor so many sourcepoints and the absence of a national regulatory

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[94] Cole, *supra* note 99 at 84.

[95] Similarly, the US sulphur dioxide programme was instituted under a single government that was able to define and hand out free rights to pollute to corporations without much public controversy, and to impose penalties that were both tough and enforceable. Kyoto, by contrast, is an international agreement and it will be easy for parties to avoid penalties simply by withdrawing from, or not honouring, the treaty.

[96] Michael Obersteiner et al., 'Quantifying a Fully Verifiable Kyoto' (2002) 14 World Resource Review 542.

[97] 'Agency Slashes Check Monitoring of Industrial Emissions' (2005) 360 Environmental Data Services Report, London, January.

[98] 'BP's Credibility Gap over Carbon Emissions', 326 *Environmental Data Services Report* (March 2002), 3.

enforcement mechanism – will 'give the mechanism of emissions trading a bad name.'[99] Technicians' ability to measure biotic releases is also constantly being called into question. One recent example of many is the unexpected discovery in 2005 that the carbon content of British soils has been dropping steeply since 1978, with annual releases higher than the entire reduction in greenhouse gas emissions the UK has achieved between 1990 and 2002 as part of its commitment to the Kyoto Protocol – some 12,7 million tonnes annually.[100]

There is some hope that such obstacles might eventually be overcome, although measuring all greenhouse-gas emissions from tens of thousands of installations is more difficult than measuring sulphur dioxide emissions from a relatively few sources, or measuring flows of fossil carbon out of underground deposits, or measuring industrial releases of non-$CO_2$ greenhouse gases alone. But until then, there is 'no reason to expect that countries will reduce their greenhouse gas emissions to comply with quotas that cannot be effectively monitored and enforced'.[101]

**The Dirty Development Mechanism: Generating unverifiable project-based 'offset' credits**

Trading systems, such as the Kyoto Protocol, that include credits generated by special pollution-'offset' projects, are also afflicted by problems of measurement which add to those sketched in the previous section, and are much more severe. US experience has suggested, and the subsequent history of the CDM and JI has confirmed, that including project-based 'offset' credits in a trading scheme makes the verifiable quantification necessary for enforcement not simply temporarily impracticable, or a matter of developing new and better instrumentation, but impossible.

Here is why. As described above, two of the Protocol's 'flexible mechanisms', Joint Implementation and the Clean Development Mechanism, are designed to generate credits from a wide range of projects which are certified to 'save' greenhouse gases by being less climatically damaging than their business-as-usual alternatives. Carbon 'savings' generated by such projects are calculated by showing how much less greenhouse gas is entering the atmosphere as a result of their presence than would have been the case 'otherwise'. The emissions associated with the with-project scenario must be subtracted from the emissions associated with a unique, otherwise identical, business-as-usual storyline. Industrialised countries or

[99] Quoted in Ross Gelbspan, 'History at Risk: The Crisis of the Global Climate' (1999) online: The Heat is Online http://www.heatisonline.org/htmloverview.cfm.
[100] John Pickrell, 'Soil May Spoil UK's Climate Efforts' *New Scientist* (7 September 2005).
[101] Cole *supra* note 99 at 84.

corporations can then buy credits representing the emissions that are claimed to have been saved in lieu of reducing their own fossil fuel use.

Many trading proponents themselves, however, frankly acknowledge the 'impossibility of measuring or even defining savings that are additional to those that would have occurred in the absence of emissions credits',[102] conceding that counterfactual without-project scenarios 'cannot be measured',[103] that there can be no single 'right' account of 'what would have happened without a project'.[104] The central difficulty is that many counterfactual without-project scenarios are always possible, and the choice of which one is to be used in calculating carbon credits is a matter of political decision rather than economic or technical prediction. To assume otherwise is to reduce 'social conditionalities . . . that do not easily lend themselves to prediction . . . (*inter alia*, socio-economic development, demographic trends, future land use practices, international policy making) . . . to technical and methodological uncertainties'[105] or mere imprecision or data gaps. Thus while there is scientific consensus about how to read dials, calibrate gas detectors, and perform all the other tasks necessary for directly measuring real emissions (providing the necessary instrumentation is present), no such consensus exists about how to isolate one single counterfactual storyline from among many possible storylines and measure the hypothetical emissions associated with it. Estimates of hypothetical 'emissions reductions' for many projects can be expected to differ by hundreds of percent with small changes in initial assumptions,[106] with no agreed-upon criteria for choosing between the different estimates. In short, while a scientific basis exists for markets in emissions only, provided the necessary instrumentation is available, no scientific basis exists for the measurement necessary for markets in project-based 'offset' credits, or markets in which emissions permits and project-based credits become interchangeable.

The impossibility of verifying any single baseline for an 'offset' project over all others opens rich opportunities for corporations and governments alike to employ creative accounting to postulate their own baselines in order to claim carbon credits, thereby reducing their obligations to cut emissions. As trading expert Michael Grubb and colleagues observe, 'every government and every company'[107] wanting

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[102] Grubb *supra* note 4 at 138.

[103] C. Fischer, 'Project-Based Mechanisms for Emissions Reductions: Balancing Trade-Offs with Baselines' (2005) 33 Energy Policy 1807.

[104] Erik Haites & Farhana Yamin, 'The Clean Development Mechanism: Proposals for Its Operation and Governance' (2000) 10 Global Environmental Change 10, 27-43.

[105] Eva Lovbrand, 'Bridging Political Expectations and Scientific Limitations in Climate Risk Management – On the Uncertain Effects of International Carbon Sink Policies' (2004) 67 Climatic Change 2-3, 451.

[106] Michael Lazarus, 'The CDM Quantification Challenge: Time for a More Standardised Approach' (Presentation at World Resources Institute/ World Business Council on Sustainable Development side event at the Ninth Conference of the Parties to the UNFCCC, Milan, 10 December 2003) [unpublished].

[107] Grubb, *supra* note 4 at 229.

carbon credits has thereby been given an incentive to try to secure them for projects which it is already implementing or had planned even before carbon markets came along. The result, as one barrister and banker, James Cameron of Climate Change Capital, notes bluntly, is that many carbon project proponents 'tell their financial backers that the projects are going to make lots of money' at the same time they claim to CDM officials 'that they wouldn't be financially viable' without carbon funds.[108] In 2003, for example, the Asian Development Bank funded the proposed Xiaogushan dam in China, portraying it as the cheapest and most economically robust alternative for expanding electricity generation in Gansu province. Construction went ahead without any mention being made of the need to secure CDM funding beforehand, and is scheduled to be completed next year. Yet in a June 2005 application for Xiaogushan to be considered as a CDM project, the World Bank claims that without CDM support, the dam 'would not have been able to reach financial closure, mitigate the high project risk, and commence the project constructions.'[109] Similarly, CDM credits are now being sought for the Bumbuna hydroelecric project in Sierra Leone on the grounds that the project is unviable without them, although the project was approved for financing by the World Bank in 2005 as the least-cost project for the country's power sector.[110] South Africa's synthetic fuels and chemicals producer Sasol, by the same token, hoped to secure carbon finance for a natural gas pipeline from Mozambique which was already planned, paid for, and had completed construction.[111]

Unsurprisingly, the market in project-derived carbon credits has been riven by lengthy disputes among experts and persistent yet hard-to-resolve concerns about gaming and fraud. Most CDM carbon accounting methodologies proposed to date have been rejected by the CDM methodological panel for having implausible counterfactual baselines.[112] DuPont has accused its rival Ineos Fluor of overstating emissions 'reductions' from abatement projects (using a methodology that was approved by the CDM Executive Board) by a factor of three due to inflation of

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[108] *Financial Times* (16 February 2005.)

[109] International Rivers Network, 'Comments Submitted to the Japan Consulting Institute (JCI) Clean Development Mechanism (CDM) Center regarding Xiaogushan Large Hydroelectric Project (XHP)' (August 21, 2005) online:
http://www.irn.org/programs/greenhouse/index.php?id=050823xiaogushan.html.

[110] Clean Development Mechanism, Project Design Document for Bumbuna Hydroelectric Project, n.d., http://cdm.unfccc.int/UserManagement/FileStorage/FS_756041443.

[111] Future Energy Solutions and Energy Research Institute, *The Clean Development Mechanism: A Guide for Potential Participants in South Africa* (Rondebosch: Univesity of Cape Town, 2002) at 34.

[112] Many private 'offset' schemes including those associated with firms such as the Carbon Neutral Company and the Chicago Climate Excahnge, which do not have to pass such checks, are also likely to have implausible counterfactual baselines, but information is difficult to obtain due to commercial confidentiality. For information on the Carbon Neutral Company (formerly Future Forests), see www.sinkswatch.org.

baselines.[113] A UK Parliamentary Committee recently lambasted the experimental UK Emissions Trading Scheme, which had paid more than £100 million to four companies 'for keeping emissions down to levels they had already achieved', as 'bullshit', 'stupid', a 'mockery', and an 'outrageous waste of public money' which undermined government emissions reduction policies.[114] In announcing its withdrawal from CDM projects in 2004, Holcim Cement warned that CDM carbon-accounting methodology 'will create other Enrons and Arthur Andersens'.[115] World Bank officials, accounting firms such as PriceWaterhouseCoopers, financial analysts and many businesses have all admitted, publicly or privately, that no ways exist to demonstrate that carbon finance is what made a project possible. A New South Wales government spokesman attempting to defend a state greenhouse gas trading scheme accused of providing coal-burning power plants with huge windfalls recently flatly admitted that 'it is not possible to distinguish between production or investment decisions made as a result of the scheme and those that would have been made anyway.'[116] Such claims and counter-claims lead one to speculate that the CDM maybe more aptly dubbed a DDM or Dirty Development Mechanism.

This unverifiability of measurement should not have been unfamiliar to students of pollution trading programmes in the US, where trading schemes have also been racked by accusations that meaningless pollution credits are being handed out to industries for actions that would have happened anyway ('anyway tonnes' in the humorous US locution). For example, under the Los Angeles Regional Clean Air Incentives Market (RECLAIM) described above, the South Coast Air Quality Management District (SCAQMD) allowed factories and refineries to avoid installing pollution control equipment if they purchased credits generated by licensed car scrappers who destroyed old, high-polluting cars. The idea was that it would be cheaper to reduce overall pollution by buying up and destroying old cars than by forcing stationary sources to make technological changes in their plants. But car scrappers often generated fraudulent pollution credits by crushing car bodies without destroying the engines, which they then sold for re-use. In addition, the pollution credits generated by scrapping cars were based on the assumption that if they were not scrapped, the cars would be driven approximately 4 000 to 5 000 miles annually for an additional three years and that their owners would then replace them with automobiles with 'average' emissions. A SCAQMD audit, however, showed that many of the cars were at the end of their useful life, and would have

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[113] 354 Environmental Data Services Report, London, July 2004, 6.

[114] 352 Environmental Data Services Report, London, May 2004, 34-35.

[115] Bruno vanderBorght, 'Assessment of Present CDM Methodologies' (Presentation at World Business Council on Sustainable Development side event at the Tenth Conference of the Parties to the UNFCCC, Buenos Aires, 10 December 2004) [unpublished]

[116] Wendy Frew, 'Dirty Power Plants Making Millions out of Green Scheme,' *Sydney Morning Herald*, (14 September 2005).

been destroyed through natural attrition. Some 100 000-200 000 old vehicles are naturally scrapped or abandoned in the Los Angeles area annually in this way without the intervention of pollution trading programs. Most of the 23 000 cars that were destroyed under the pollution trading scheme during its first five years were probably among those that would have been destroyed even without the program. An old car that might have yielded $50 in scrap metal value could net its owner $600 through the pollution trading scheme. Of the cars that were not at the end of their lives, in addition, many were not regularly driven and would not have been driven for another three years. Inoperable cars were often brought to car scrapping facilities and minor repairs made solely for the purpose of obtaining the $600 payment from the scrapping program. Such cars were not generating any pollution, but merely collecting dust. Non-existent automobile pollution was transformed through the market into real pollution released from oil tankers or other sources. The end result was to increase aggregate emissions across the region.[117]

In the 'bubble' trading system instituted by the US Environmental Protection Agency, similarly, polluters almost never undertook fresh pollution control projects to satisfy regulations. Instead, they claimed credits for incidental reductions that presumably would have occurred without the regulation. For example, polluters often claimed credits for routine business decisions to slow down production or shut down facilities.[118]

The US's sulphur dioxide trading programme – the one most often cited as a 'success story' by trading advocates – had the advantage that it excluded project-based 'offset' credits.[119] What were measured and traded were emissions, not purported 'emissions reductions' derived from projects claimed to be improvements on 'business as usual'. The Kyoto Protocol, on the other hand, has fully embraced 'offset' projects in its trading programme, postulating a verifiable equivalence between the credits they produce and emissions permits. The different characteristics of the two trading schemes render invalid any inference from the enforceability or feasibility of the one to the enforceability or feasibility of the other. The capacity of the Kyoto Protocol's 'flexible mechanism' projects to 'compensate' for any given quantity of industrial carbon dioxide emissions is not remediable by improvements in instrumentation and will remain unverifiable.

Carbon trading schemes which include credit-generating projects that purportedly soak up carbon dioxide through tree-planting have further, special and equally well-rehearsed problems that add to the impossibility of verifiable quantification outlined above. The difficulty with such biotic projects is that above-

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[117] Drury, *supra* note 5.

[118] Driesen, *supra* note 3 at 314-5.

[119] See: Ellerman, A. D., Joskow, P. L. et al., *Markets for Clean Air: The US Acid Rain Program*, Cambridge, UK: Cambridge University Press, 2000) at 318 on problems of markets involving 'emissions reductions' rather than just emissions.

ground and below-ground carbon have different impacts on, or likelihoods of interaction, with the atmosphere. Fossil carbon flows into the biosphere/atmosphere system are essentially irreversible over non-geological time periods, while those from the atmosphere into the biosphere are easily reversible and not so easily controlled.[120] Moreover, while it is fairly trivial to keep accounts of carbon kept safely underground in fossil deposits, tallying up how much is being sequestered in a forestry project and then subtracting the amount 'leaking' over project boundaries (through fires, soil erosion, fossil emissions from transport required for the project, evictions leading to forest encroachment elsewhere, and the like) for decades or even centuries is enormously complicated. But it has been hoped that fossil emissions and biospheric sequestration can be commensurated through various fudge factors, including applying discounting formulas to sequestration credits based on how long trees survive, making sequestration credits temporary or available only for rental, and so forth. Means have also been suggested for identifying and quantifying all relevant 'leakage' from carbon projects.[121]

None of these methods work, however. Straightforward inadequacy of data is one obstacle. According to one detailed study, for example, mean net Russian carbon balance in 1990 can be pinned down only to the range of -155 to +1209 million tonnes per year. This swamps probable changes in total Russian carbon flux balance between 1990 and 2010, which are expected to be only 142 to 371 million tonnes, making the figures useless for verifying compliance with the Kyoto Protocol (Figure 1).[122] The fact that knowledge of carbon flows among the atmosphere, biosphere and lithosphere is inadequate 'to form the basis for . . . any viable trading scheme' is alone sufficient to make the Kyoto Protocol 'completely unverifiable'.[123]

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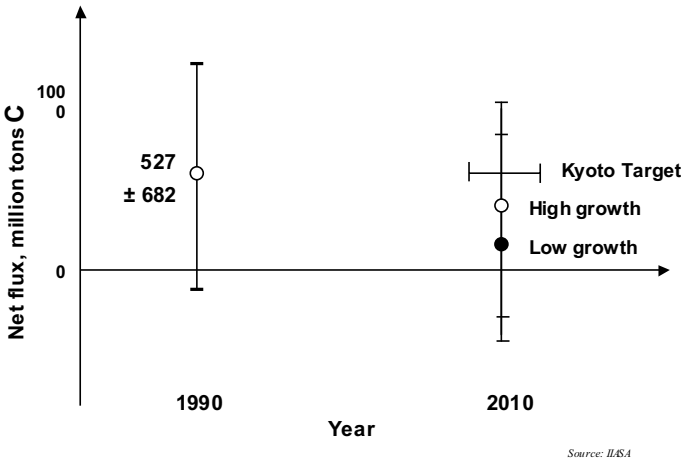
[120] Larry Lohmann, 'Making and Marketing Carbon Dumps: Commodification, Calculation and Counterfactuals in Climate Change Mitigation' (2005) 14 Science as Culture 3, 1-33.

[121] Larry Lohmann, 'Democracy or Carbocracy? Intellectual Corruption and the Future of the Climate Debate' (Sturminster, Newton UK: The Corner House, 2003) Online: The Corner House http:www.thecornerhouse.org.uk

[122] Sten Nilsson et al., *Full Carbon Account for Russia*, IIASA Interim Report IR-00-021 (Laxenburg, Austria: International Institute for Applied Systems Analysis, 2000) Online: http://www.iiasa.ac.at.

[123] Sten Nilsson, 'Editorial' (2000), *Options*, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria, Autumn,1.

**Figure 1**




Worse, usable estimates of the degree to which carbon sinks projects are climatically effective are rendered impossible by both conditions of uncertainty (in which not all the probabilities of various possible atmospheric outcomes of sink establishment are known) and conditions of ignorance (in which not even all the possible outcomes themselves are known).[124] The past two decades of research have continually uncovered hitherto unsuspected variables bearing on the response of ecosystems to climate change and vice versa, as well as surprises about the complexity and nonlinearity of relations between the two, and there is no reason to expect these discoveries to stop. Examples include revelations about the albedo effects of plantations on climate,[125] the unpredictability of climatic 'tipping events' such as the rapid release of methane from permafrost, peat or ocean floors;[126] nonlinearity of soils' or forests' ability to function as sinks under different conditions;[127] and many others.[128]

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[124] Paul Harremoes et al., *The Precautionary Principle in the 20th Century: Late Lessons from Early Warnings* (London: Earthscan, 2002).

[125] R. A. Betts, 'Offset of the Potential Carbon Sink from Boreal Forestation by Decreases in Surface Albedo' (2000) 408 Nature 9 November, 187-90.

[126] See, e.g., Ian Sample, 'Warming hits 'tipping point'' *The Guardian* (11 August 2005.)

[127] R. A. Gill et al., 'Nonlinear Grassland Responses to Past and Future Atmospheric CO2' (2002) 417 Nature 16 May, 279-283.

[128] German Advisory Council on Global Change, *The Accounting of Biological Sinks and Sources under the Kyoto Protcol – A Step Forwards or Backwards for Global Environmental Protection?* (Bremerhaven: GACGC, 1998); P. Falkowski et al., 'The Global Carbon Cycle: A Test of Our Knowledge of Earth as a System'

Finally, setting up a measurable equivalence among emissions and biological sequestration would require quantification of the effects of social actions and institutions that mediate carbon flows. Carbon transferred from underground to the atmosphere enters not only the biosphere but also social and cultural spheres. Physical actions (for instance, planting biomass for power plants) bring about social effects (for example, resistance among local farmers, diminished interest in energy efficiency among investors or consumers, loss of local power or knowledge), which in turn bring about further physical effects (for instance, migration to cities, increased use of fossil fuels) with carbon or climatic implications. Calculating how much carbon a new tree plantation actually 'offsets', for example, would require estimating how much the plantation has delayed the adoption of a technologically different energy-generation path on the part of carbon credit buyers, observing the 'carbon behaviour' of farmers evicted from the plantation site and their descendents for approximately a century (the atmospheric lifetime of carbon dioxide emissions), and so forth. No basis exists in either physical or social science for deriving numbers for the effects on carbon stocks and flows of such social actions.[129]

In sum, implementation of the Kyoto Protocol requires a baroque apparatus for measurement some of whose problems are similar to, but some of whose problems are much less tractable than, those that made a sulphur dioxide trading system impracticable in the US circa 1970, as well as those that have plagued US 'offset' trading schemes.

The irony is that, as the US experience itself again suggests, there are more effective, cheaper alternatives that do not demand an implausible and unworkable technical scaffolding for quantification. For instance, redirecting subsidies for fossil

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(2000), 290 Science, 12 October; Claire Tenner, 'Verification of the Kyoto Protocol: A Fundamental Requirement' (2000), VERTIC Briefing Paper 00/6, October; Houghton, R.A., 'Counting Terrestrial Sources and Sinks of Carbon'(2001) 48 Climatic Change, 525-534; David Victor, *The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming* (Princeton: Princeton University Press, 2001); Y. Pan et al., 'New Estimates of Carbon Storage and Sequestration in China's Forests: Effects of Age-Class and Method on Inventory-Based Carbon Estimation' (2004) 67 Climatic Change 2-3, 211; M. J. Schelhaas et al.'Closing the Carbon Budget of a Scots Pine Forest in The Netherlands' (2004), 67 Climatic Change 2-3, 309; J. G. Canadell et al., 'Quantifying, Understanding and Managing the Carbon Cycle in the Next Decades' (2004), 67 Climatic Change, 2-3, 147; P. W. Boyd et al., 'The Decline and Fate of an Iron-Induced Subarctic Phytoplankton Boom' (2004) 428 Nature 1 April, 549-553; D. A. Stainforth et al., 'Uncertainty in Predictions of the Climate Response to Rising Levels of Greenhouse Gases' (2005) 433 Nature 27 January, 403-07; W. Knorr et al., 'Long-Term Sensitivity of Soil Carbon Turnover to Warming' (2005) 433 Nature, 20 January, 298–302; J. Manley et al., 'Creating Carbon Offsets in Agriculture through No-Till Cultivation: a Meta-Analysis of Costs and Carbon Benefits' (2005) 68 Climatic Change, 1-2, 41; Matthias Jonas et al. *Full Carbon Accounting and the Kyoto Protocol: A Systems-Analytical View*, Interim Report IR-99-025 (Laxenburg, Austria: International Institute for Applied Systems Analysis, 1999); D. Read et al., *The Role of Land Carbon Sinks in Mitigating Global Climate Change* (London: The Royal Society, 2001); Larry Lohmann, *supra* note 128.

[129] Lohmann, *supra* note 136 at 40-41.

fuel extraction, refining and use, implementing certain kinds of technology-based emissions regulation, and recognising the legitimacy of local movements against destructive projects involving extraction, transport, refining and use of fossil fuels, airport expansion, and so forth, are all easily within the technical and enforcement capability of most industrialised signatories of the Kyoto Protocol as well as the US government, and assure some level of sustainable emissions reduction without requiring the onerous, all-pervasive, unattainable measurement and monitoring that the Protocol requires. Other policy alternatives are also possible which exploit market insights in the service of innovation without demanding impossible types of quantification.'Environmental competition statutes' that require polluters to pay costs that competitors incur in reducing pollution are one example.[130] Open public debate about such alternatives would by itself help policymakers realise that the debilitating technical demands that characterise the Protocol and other carbon trading and 'offset' schemes are not an inevitable accompaniment of programmes to mitigate climate change.

**Conclusions: Beyond what is living and what is dead in American Trading**

US pollution markets are usually seen as positive precedents for global carbon trading schemes such as the Kyoto Protocol. The article has argued, by contrast, that US experience with trading in sulphur dioxide and other pollutants in fact provides materials for strong arguments *against* carbon trading schemes.

In particular, the article has marshalled evidence that carbon trading creates weaker incentives for innovation of the kind needed for a transition to sustainable, non-fossil energy than conventional regulatory schemes would bring about, as well as inadequate incentives for initially expensive innovations that could offer long-term cost savings. The Kyoto Protocol is dampening forces for innovation both through the 'spatial flexibility' afforded by emissions trading proper and through the provision of project-based credits that enable industry to avoid thoroughgoing technological change to cut greenhouse gas emissions.

The article has also argued that the US sulphur dioxide trading programme is not an appropriate precedent to cite in support of the Kyoto Protocol in that the technological and methodological infrastructure for measurement that made sulphur dioxide trading possible in the US after the late 1980s is not available for global carbon trading schemes. First, instrumentation for directly measuring national greenhouse gas emissions with the needed precision and coverage is still lacking, as it was not for sulphur dioxide emissions in the US in 1990. Second, the US sulphur dioxide trading scheme had the advantage of excluding the credits from 'offset' projects which are so prominent in the Kyoto Protocol and other carbon

[130] Driesen, *supra* note 23 at 139-201.

trading programmes. Such credits create additional, crippling problems of measurement. One difficulty is that measurement of 'emissions reductions' from 'offset' projects is in principle unverifiable, as is often conceded by trading advocates themselves. Moreover, in many cases, measurement of such credits is afflicted by additional severe problems of uncertainty and scientific ignorance to which no satisfactory solutions have been proposed.

As the parties to the Framework Convention on Climate Change begin asking themselves 'what comes after Kyoto?', the received wisdom is that any future climate treaty must follow the Protocol's 'first step'[131] by continuing to try to build a world carbon market. Too often, discussion about the potential effectiveness of such a market has been cut short with a gesture toward the alleged 'success' of US trading in sulphur dioxide and other pollutants and the peremptory question, 'What's your alternative?' In fact, the terrain of policy alternatives is broad and expanding. But a prerequisite for exploring it is a more meticulous review of what is living and what is dead in US emissions trading and its Kyoto Protocol heir than has so far been carried out.[132]

[131] For an analysis of the weakness of this 'first step' metaphor, see Lohmann, *supra* note 135.

[132] Thanks to David M. Driesen, Ben Pearson, Daphne Wysham, Bo Kjellen, Niclas Hallstrom, Robert Osterbergh and Olle Nordberg for challenging questions and comments, and to the Dag Hammarskjold Foundation, Uppsala, Sweden, for financial and intellectual support. This article is part of a forthcoming project that also explores several more ways in which the lessons of US pollution trading programmes have not been learned by advocates of global carbon markets, relating to property rights, environmental justice, governance and public education.

# PART FIVE:
# BIG OIL – CARBON TRADING'S BIG BENEFICIARY

## PROFITS VIA PROTOTYPE CARBON FUND GREENWASH

BY LARRY LOHMANN, JUTTA KILL, GRAHAM ERION AND MICHAEL K. DORSEY

Who is investing in the World Bank's Prototype Carbon Fund and similar pilots, and will hence be well positioned to dominate the future of the carbon market? Major oil corporations such as BP and Shell, both enthusiastic initiators of internal emissions trading schemes, have never voiced any serious intention to curb their main activities of oil exploration or production. Although it has changed its name to 'Beyond Petroleum', for example, BP committed itself in 2002 to expand its oil and gas output by 5,5% per year over the succeeding five years. Its emissions in 2001 were equivalent to almost two years' carbon dioxide emissions from the UK.[1] The firm's investment in renewable energy remains at 1% of the $8 billion it spends on fossil fuel exploration and production every year.[2]

Similarly, the World Bank, a determined supporter of greenhouse gas trading through the Kyoto Protocol, has scorned the August 2004 recommendation of its own review commission that it halt support for coal extraction projects immediately and phase out support for oil extraction projects by 2008.[3] The commission, chaired by former Indonesian environment minister Emil Salim, had pointed out that such extractive projects did nothing to promote the bank's stated mission of alleviating global poverty. Instead, the Bank treats its carbon trading wing as what one prominent former staff member scathingly refers to as an 'epicycle'[4] of an overwhelmingly fossil-oriented approach to energy and transport.

This approach follows the 1981 demand of the US Treasury that the World Bank play a lead role in the 'expansion and diversification of global energy supplies to enhance security of supplies and reduce OPEC market power over oil prices.'[5] The

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[1] 'BP's Credibility Gap over Carbon Emissions', 326 *Environmental Data Services Report* (March 2002), 4.

[2] Paul McGarr, 'Capitalism and Climate Change' (2005) International Socialism issue 107: http://www.isj.org.uk/index.php4?id=119&issue=107

[3] Jim Vallette et al., *Wrong Turn from Rio: The World Bank's Road to Climate Catastrophe* (Washington: Institute for Policy Studies, 2004) at 2.

[4] Personal communication.

[5] Vallette et al., *supra* note 56 at 5.

World Bank remains one of the largest sources of public funds for the fossil fuel industry. In an average year, the Bank supported fossil-fuel projects with lifetime emissions of 1,457 billion tonnes of carbon – a figure '4-29 times the amount of emissions reductions anticipated under the CDM per year.'[6] From 1992 through late 2004, the World Bank Group approved $11 billion in financing for 128 fossil-fuel extraction projects in 45 countries – projects that will ultimately lead to more than 43 billion tonnes of carbon-dioxide emissions. This is hundreds of times more than the emissions reduction that signatories to the Kyoto Protocol are required to make between 1990 and 2012. Another $17 billion has gone for other fossil fuel-related projects. More than 82% of World Bank financing for oil extraction has gone to projects that export oil back to wealthy Northern countries. Bank financing for fossil fuels outpaces renewable energy financing by 17 to one.[7]

Many corporate investors in the Prototype Carbon Fund (PCF) – the Bank's flagship carbon fund, set up to facilitate projects that allegedly 'reduce' greenhouse gas emissions – are in fact receiving far greater amounts of Bank financing for fossil fuel projects that produce emissions.

**Who wins from the World Bank**

| Corporation | PCF contribution ($ million) for CDM and JI projects 1999-2004[8] | Received from WB for fossil fuel projects 1992-2002 ($ mn)[9] |
|---|---|---|
| Mitsui (PCF & Biocarbon Fund) | 16[10] | 1 807,5 |
| BP | 5 | 938,8 |
| Mitsubishi | 5 | 403,6 |
| Deutsche Bank | 5 | 165,6 |
| Gaz de France | 5 | 138,9 |
| RWE | 5 | 138,9 |
| Statoil | 5 | 242,3 |
| **Total** | **46** | **3,834,600** |

The involvement of BP and Statoil in the PCF is particularly notable given the ongoing financial support by the Bank's IFC for their efforts to open up the massive Azerbaijan oil fields for consumption in Western Europe and the US. In October

[6] Daphne Wysham, 'A Carbon Rush at the World Bank' (2005) Online: Foreign Policy in Focus http://www.fpif.org/papers/0502wbank.html.
[7] Vallette et al, *supra* note 56 at 3.
[8] This is the operational period of the PCF during which the funds are placed. This table is thanks to Ben Pearson.
[9] Figures taken from 'Transnational Corporate Beneficiaries of World Bank Group Fossil Fuel Projects, 1992 – August 2002'online: The Sustainable Energy and Environment Network www.seen.org.
[10] Mitsui invested an additional $1 million in January 2003.

2003, BP and Statoil were part of a group of corporations who received $120 million from the IFC for development of the Azeri-Chirag-Guneshli oil fields in Azerbaijan. Greenhouse gas emissions from the oil produced by this project will be over 2 000 million tonnes $CO_2$ over 20 years. In November 2003, the IFC approved another $125 million for the Baku-Ceyhan pipeline between Azerbaijan and Turkey, whose investment consortium is again led by BP. An estimated three billion tonnes of $CO_2$ will be released to the atmosphere through the burning of the oil that will be transported by the pipeline.[11] Similarly, just five months after the PCF was launched in 2000, the Bank approved over $551 million[12] in financing for the Chad-Cameroon oil pipeline. The financing package for the pipeline came to about three times the capitalisation of the PCF, and the expected lifetime emissions of approximately 446 million tonnes of $CO_2$[13] generated by the pipeline's oil amount to roughly three times the 142 million tonnes that will allegedly be 'saved' by PCF projects in total[14]. Significantly, PCF investors get carbon *credits* from PCF projects, but no *debits* for their Bank-supported projects involving fossil fuel extraction or use.

[11] Sustainable Energy and Environment Network, Washington, DC online: www.seen.org

[12] Extractive Industries Review online: http://eireview.info/doc/EOanalysis0209FINAL.doc

[13] 'The World Bank's Investments in Climate Changing Fossil fuels' *Environmental Media Services* (16 October 2003) online: Environmental Media Services www.ems.org

[14] Based on figures provided in the PCF's 2004 Annual Report, World Bank, Washington (www.prototypecarbonfund.org). Because some of the PCF's projects would have happened without the PCF, and thus cannot represent real reductions, the word 'allegedly' is necessary here.

# WHOSE ENERGY FUTURE?
# BIG OIL AGAINST THE AFRICAN PEOPLE
BY GROUNDWORK

Oil is not only unsustainable because it is so polluting and because the oil will run out, but also because it offers an energy future principally for the elite. Ordinary people living next to oil wells and oil refineries are most certainly not getting the benefits promised to mankind. In fact they are the scapegoat for the elite of mankind, for they not only have to live with the pollution of oil production processes but they also do not have access to the very energy for which they are made to sacrifice their health and wealth.

**Africa's oil rush**

The Gulf War has both pushed up the price of oil and reinforced anxieties about security of access to crude supplies both for countries and corporations. It has added impetus to Africa's oil rush but did not initiate it. Corporations have always been anxious to be in on the next big thing lest they should find themselves excluded later. This is particularly so as the number and size of new discoveries globally is falling while demand is rising. The Gulf of Guinea off west and central Africa is viewed by the oil industry as the world's premier 'hotspot', soon to become the leading offshore oil production centre.

Security and the cost of crude supplies is also top of the agenda for consuming countries. The US in particular has stepped up diplomatic and military activity in the region, edging in on the regional hegemonies of the former colonial powers of Britain and France.

The international financial institutions - the IMF and the World Bank - are key actors in support of the northern agenda. The World Bank itself has a direct financial interest in oil and gas. The bulk of lending by its private sector financing arm, the International Finance Corporation (IFC), is for resource extraction and the IFC makes its best profits from these loans. The Bank also acts to leverage capital from private financial institutions who are, of course, concerned with the profits of oil debt. Its presence as a lender provides political cover. It reassures both oil and finance corporations that they will get their profits out from projects in unstable countries. Thus, the financial arrangements for the Chad-Cameroon pipeline ensure that the interest owed by these countries is paid before they see the money.

Producing countries, and would-be producers, are no less enthusiastic. Their economic interest is primarily in oil revenues as well as balance of payments, although much lip service is also paid to technology and skills transfer.

Most have expanded production to cash in on current high prices while new exploration concessions have been awarded in almost all African countries, even where the hopes of finding oil seem slim. Everyone, it seems, is doing well by the escalation of prices - except ordinary people in oil producing countries. While the fabulous wealth of oil is paraded before them, they have been driven ever deeper into poverty. The very common association of oil wealth with the impoverishment of people and the failure of national economies has given rise to the notion of the 'resource curse'

The biggest producer, Nigeria, was also the first producer in Sub-Saharan Africa. Nigeria and Gabon were already major producers by the time of the first oil shock and both joined OPEC in the early 1970s and established national oil companies as part of their the assertion of national sovereignty rights. At the time of the second oil shock in 1979, Nigeria felt confident enough to nationalise BP's holdings on the grounds that it was breaking the oil embargo against apartheid South Africa. BP's assets were turned over to the Nigerian National Petroleum Company (NNPC), giving it a 50% holding in the Nigerian industry. Both countries also learnt to drive better bargains with the corporations.

Nigeria was racking up debts on the security of oil during the 1970s. It was thus exposed to the debt trap when commodity prices collapsed in the 1980s and it was one of the first OPEC nations to break ranks on oil prices as the northern powers reasserted their grip on producers.

These global scale manipulations were replicated in the activities of oil corporations at the national scale. The best evidence for this came to light in a French trial which resulted in the conviction of 30 senior Elf executives in 2003 for defrauding the corporation. Elf was the largest corporate producer in Sub-Saharan Africa with a dominant position in the Francophone countries and major interests in Nigeria and Angola.

The 'Elf system' revealed at the trial was described in detail by Global Witness in 2004. It involved the systematic corruption of African leaders through a variety of kick-backs, under-invoicing on crude bought from Elf's subsidiaries to skim the revenues owed to African countries, and the peddling of oil backed debts with the specific intention of creating a perpetual dependency on Elf. The debt system was purposely obscure so that Africans were only aware of the official lending bank [20] while Elf itself profited from the debt. It also profited from facilitating arms deals financed by the debt.

Elf's activities in Nigeria during the 1990s are also under investigation. But it is certainly not the only corporation to have instigated corruption. The French investigations have in turn led to investigations into allegations that US corporation

Halliburton was implicated in bribery in Nigeria. Allegations of corrupt dealing, price manipulation, political string pulling, and complicity with state brutality have also haunted Shell's operations in Nigeria.

**Working for the Americans**

While Chevron has been active in Africa for some time, the US corporations are prominent in the new oil fields - off-shore of Nigeria as well as in the new petro-states. Nigeria's take of oil revenues contrasts with the very poor deals done by late comers. Equatorial Guinea gets 10 to 20% and Chad only 10%. The oil project in Chad, however, would not have gone ahead but for World Bank participation because of the level 'political risk'. Chad initially negotiated its deal in 1988 and subsequently tried to revise it in 2004. Despite approximately $1,6 million in World Bank-financed legal assistance, the Chadian government was able to negotiate only a marginally better deal in the new convention [Gary and Reisch 2005: 39].

The World Bank justified its participation in the project on the grounds that there was no other developmental option in Chad, that its participation would ensure that Chad would escape the 'resource curse' and the project would thus contribute to poverty alleviation, and that poor Chadians need access to modern energy. Critics argued that Chad's governance and human rights record made it a dead ringer for the resource curse and that a project focused entirely on exports was scarcely conceived to access energy for poor people. Thus far, the experience of the project confirms the critics' view.

**Producing environmental injustice**

The industry likes to talk of the production chain as a value chain. The 'value added' at each link in the chain includes salaries and wages, taxes and other payments to governments, debt repayments and interest and, finally, what is taken as profits by the corporations and either paid out to shareholders or reinvested. It excludes the costs of raw materials and services provided by other businesses. Value added is thus the difference in value between what comes in and what goes out.

The notion of value added serves a vital ideological function. It proclaims that what it counts as value amounts to a general social good. And this proclamation is then turned into an assumption. Thus, a country's Gross National Product (GNP) is, put simply, the aggregate of value added from all economic activity. The basic assumption of mainstream economic thought is that the growth of GNP is in everybody's best interests even if some people benefit more than others.

Yet value added conceals more than it reveals. The calculation of value excludes major costs which are also produced at each link in the chain and imposed on other people, on society in general or on the environment. These costs could be called

'value subtracted' although they are more conventionally known as 'externalities'. Those who pay these costs - those from whom this value is subtracted - are those who are made poor by the process of wealth creation.

**Enclosure**

Enclosure involves the appropriation of a common resource and the dispossession of those who previous had rights to the resource.

Nigeria's Land Use Act, promulgated in 1978 by the then military regime under President Obasanjo, gives the state control of all land and allows it to evict people where land is required in the 'over-riding public interest'. The public interest specifically includes the requirement of the land for mining purposes or oil pipelines or for any purpose connected therewith' [quoted in HRW 1999:59]. The Petroleum Act makes oil and natural gas the property of the federal state. It provides for compensation for loss of use but any rent on the land goes to the state.

The practical effect of these two acts is that oil corporations can and do take what they want from the people within their areas of operation. The corporations themselves call this the 'land take'. They also decide what they will pay in compensation. The land take is enforced by the state security forces.

The elite of the Mobile Police are deployed within the oil installations and paid by the corporations themselves at well above normal rates. They are commonly known as the 'Shell police' or the 'Chevron police' etc. On at least one occasion Shell made a deal to supply arms to security forces. It denied doing so until confronted with evidence and then claimed that the deal had fallen through. Various gangs recruited from the ranks of unemployed youth and armed with anything from machetes to sub-machine guns have also been deployed to intimidate and terrorise people.

This is the pattern for the oil industry throughout Africa: the corporations are given the right to take what they want while all rents, royalties and other monies received in exchange for this right are taken by the state. Consultation with communities in Chad is touted by the World Bank as a model of best practice. Consultation, however, comes after the negotiation between the state and the corporations has already expunged people's rights in land and made them over to the corporations. That the oil project will go ahead and that the land required by the project will be appropriated is not up for negotiation in the course of consultation. Even the parameters of compensation are pre-defined. What is left to consultation amounts to little more than a public relations exercise.

**Externalisation**

Externalisation is about excluding the costs of pollution from the value chain so that these costs do not appear in the market price of the commodity. Externalised costs are thus made to constitute free benefits to the corporate producer. They are an unacknowledged subsidy. But these costs do not in fact disappear Rather, they are imposed on others: they reappear as uncompensated costs to communities and workers who suffer the loss of resources and health damaged by pollution and other forms of environmental degradation.

In the Niger Delta, externalisation is an extension of dispossession as polluted water sources, fields and fisheries are simply lost to their owners. But the effects are not restricted to this. The health impacts of air pollution spread across a wide area, and all who rely on locally produced food - whether from their own production or bought at market - risk contamination. At the global scale, the emissions of carbon dioxide and methane from Nigeria's flares make a substantial contribution to climate change and the costs will, again, fall heaviest on the poor.

Nigeria does have environmental laws that should notionally ensure that these costs are internalised - that they are actually paid by the corporations. The state does not, however, have the capacity or the inclination to enforce the law. This contrasts starkly with the political will and resources devoted to enforcing dispossession. Consequently, corporations have been almost entirely self-regulating in respect of their environmental practices in Nigeria and have externalised costs without inhibition. This began to change in the 1990s when the actions of local people's movements combined with international civil society organisations to expose corporate practices. The corporations, notably Shell, perceived this primarily as a public relations disaster and responded mostly with PR 'spin'. Such caution as they now exercise is proportional to the national, and particularly the international, visibility of their practice.

Chad is Africa's newest oil state and the externalised costs to date have been mainly those associated with exploration, drilling and construction. It has also been subject to unusual scrutiny as the political price that the World Bank paid for insisting that here it would demonstrate how oil extraction can contribute to alleviating poverty - even against the odds. The oil started to flow in 2003 and the flares are burning above the villages of southern Chad. The impacts will be felt in time and will most likely escalate over time. They will be mitigated only in so far as it is possible for local and international civil society to maintain present levels of scrutiny.

**Exclusion**

Exclusion relates to decision-making power in the market and in society. Given the weight of economic forces in shaping broader social institutions and relations, these two aspects of exclusion frequently reinforce each other. The institutions of the market are specifically designed to remove decision making from the public sphere and so exclude all who do not have an interest in profit. Thus, those who are dispossessed or who carry the externalised costs of production are prevented from contesting the theft or contamination of their resources.

Niger Delta communities have a long history of resisting the enclosure of their land. The Movement for the Survival of the Ogoni People (MOSOP) became the best known organisation of resistance and an inspiration for communities across the Delta. In 1993, it organised mass protests throughout Ogoniland and forced Shell to close down its Ogoni production wells although active pipelines still cross the territory.

Resistance was met with brutal repression. It started with security force attacks thinly disguised as inter-ethnic violence. At the same time, Shell was trying to buy off MOSOP leaders. Then, in 1994, four 'moderate' Ogoni chiefs were murdered at Giokoo. The circumstances indicate that they were killed by security operatives acting under cover. Prominent MOSOP leaders were immediately accused of the murders and arrested - without allowing time even for the pretence of an investigation. In 1995, Ken Saro-Wiwa and eight others were executed on the order of a rigged court.

The use of brutal security force violence did not begin or end in Ogoni. From the early 1990s protest across the Delta became more organised and numerous ethnic groups adopted charters loosely modelled on the Ogoni Bill of Rights. They commonly claimed the right to control land and natural resources, including oil, and demanded a meaningful political voice within a restructured Nigerian federation.

The savagery of the security force response also intensified throughout the decade. Ijaw youth greeted the new year of 1999 by mobilising in support of the Ijaw Youth Council's Kaiama Declaration [see Box 11]. In response, security forces killed over 100 people and burned down ten or twenty homes. In many similar incidents around the Delta, corporate helicopters and boats were seen carrying security forces. The corporations routinely deny involvement. However, new evidence brought to light in preparation for a court case against Chevron indicates that soldiers not only used Chevron's helicopters in a 1999 attack on the villages of Opia and Ikenyan, but that Chevron paid them for the operation.

The death of military dictator Sani Abacha in 1998 opened the way to a restoration of civilian rule and the election of Olusegun Obasanjo, himself a former military ruler, as president. The occupation of Ogoni was lifted but the Delta is still saturated with security forces and abuse of people is routine. On the other side,

people have occupied oil facilities and forced temporary shut-downs across the Delta. In 2002, several hundred women occupied ChevronTexaco's Escravos terminal in Delta State for 10 days, one example of the growing assertiveness of women in resistance.

In this period, gun trafficking in the Delta has escalated and armed youth groups, sometimes known as 'cults' or 'area boys', have emerged. Mostly, it appears that they have been armed by politicians to intimidate opposition party supporters, by local elites to secure their control over oil sub-contracts and pay-offs against rival factions, or through 'illegal bunkering' networks responsible fo r the wholesale theft of oil. Cult leaders have also been used to infiltrate and subvert resistance movements.

Chad's president, Idriss Deby, took power when his rebel troops captured the capital N'Djamena in 1990 but subsequently gave his regime a veneer of democratic legitimacy through rigged elections. Friends of the Earth report that, In 1997 and 1998, hundreds of civilians were massacred in the project area by national troops, for the sake of 'pacifying' the region to make way for oil development. Community consultations were conducted in the presence of security forces at least until 1997' and thereafter in the presence of government officials.

Chad ranks at the bottom of international league tables on most indicators of good governance including corruption and 'voice and accountability'. Government officials are increasingly appointed from a narrow clique around the president and arbitrary arrests, torture and summary executions by security forces are routine. Independent radio stations are regularly closed down and journalists arrested in response to critical broadcasts. In 2003, a station run by local human rights groups was closed down less than two weeks after international VIPs had been in the country for the October 2003 pipeline inauguration'.

These then are the means by which the value subtraction chain is made to work. A detailed documentation of every incident of abuse would be a very long book indeed. Rather, our intention is to show the oil industry at work and the stories told here are only a very small selection of the stories that could be told.

# OIL COMPANIES DRAIN AFRICA, NOW – AND WITH PRETORIA'S HELP, IN FUTURE?

BY PATRICK BOND

Who will buy the carbon credits, so as to permit ongoing C02 emissions and no real reduction in greenhouse gas pollution? Aside from governments - of which the Netherlands is the most important, supporting 16% of the carbon market - the primary beneficiary of emissions trading will be Big Oil, namely the huge corporations which are the main contributors to global warming. The oil majors have already invested a great deal of money and promotional work in establishing an untransparent, profoundly flawed system that will permit Kyoto emissions reducation targets to be foiled with fake carbon offsets.

These same companies have recorded windfall profits as the oil price has soared from around $10/barrel in 1998 to more than $70/barrel at peak in 2005. What kinds of policies are they now investing in, not merely with respect to a dangerous new carbon market? What other forms of extra-economic support can they claim? First, they are the beneficiaries of a formidable rise in militarism across the world, including Africa. With genocidal and dictatorial regimes such as Sudan and Equatorial Guinea hosting Big Oil, politicians in Washington, Beijing, Brussels and Pretoria suddenly forget their human rights and democracy rhetorics.

Likewise, we must ask, are the oil and other extractive firms that are responsible for so much greenhouse gas emissions paying the full price for looting Africa of her resources? As shown below, even the World Bank now concedes that the depletion of natural capital by large corporations has not been matched by revenues that leave the citizenry of many African countries better off; they are indeed much worse off after the plague of locusts we know as the oil majors. For these reasons, and because Northern production and consumption habits are creating disastrous climate change, the case for ecological debt – owed by the North (and South Africa) to the South – should be very forcefully raised.

**Imperialism, oil and Africa**

The period following Washington's failed early 1990s Somali intervention, when the Pentagon's warriors let Africa slip from view, may have come to an end on September 11, 2001. Between the search for oil and 'terrorist' threats – bearing in mind that the African National Congress was listed by the US State Department as

terrorist until the 1990s – the US military-petroleum-industrial complex has increasing reason to occupy Africa.

Army General Charles Wald, who controls the Africa Programme of the European Command, told the BBC in early 2004 that he aims to have five brigades with 15 000 men working in cooperation with regional partners including South Africa, Kenya, Nigeria and two others still to be chosen.[1] NATO's Supreme Allied Commander for Europe, General James Jones, confirmed the US geographical strategy in May 2003: 'The carrier battle groups of the future and the expeditionary strike groups of the future may not spend six months in the Mediterranean Sea but I'll bet they'll spend half the time down the West Coast of Africa.'2 Within weeks, 3 000 US troops had been deployed off the coast of Liberia (and went briefly ashore to stabilise the country after Charles Taylor departed). Potential US bases were suggested for Ghana, Senegal and Mali, as well as the North African countries of Algeria, Morocco and Tunisia.3 Another base was occupied by 1 500 US troops in the small Horn country of Djibouti. Botswana and Mozambique were also part of the Pentagon's strategy, and South Africa would remain a crucial partner.

Central and eastern Africa remains a problem area, and not merely because of traditional French and Belgian neocolonial competition with British and US interests.[4] President Clinton's refusal to cite Rwanda's situation as formal genocide in 1994 was an infamous failure of nerve in terms of the emerging doctrine of 'humanitarian' imperialism – in contrast to intervention in the (white-populated) Balkans.

With an estimated three million dead in Central African wars, partly due to struggles over access to coltan and other mineral riches, conflicts worsened between and within the Uganda/Rwanda bloc, vis-à-vis the revised alliance of Laurent Kabila's DRC, Zimbabwe, Angola and Namibia. Only with Kabila's assassination in 2001 and Pretoria's management of uneasy elite deals in the DRC and Burundi, did matters settle, however briefly, into a fragile peace combining neoliberalism with opportunities for minerals extraction. However, as turmoil resumed in mid-2004, it was clear that coups and outbreaks of strife would be a constant threat, demonstrating how precarious Pretoria's deals are when deeper tensions remain unresolved. Another particularly difficult site is Sudan, where US Delta Force troops have been sighted in informal operations, perhaps because although China showed some interest in oil exploration there during the country's civil war chaos, US oil firms have subsequently arrived. Both US and South African oil deals with Sudan may explain why their interventions against the Darfur genocide are so half-hearted.

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[1] Plaut, M. (2004), 'US to Increase African Military Presence,' http://www.bbc.co.uk, 23 March.
[2] http://www.allAfrica.com, 2 May 2003.
[3] Ghana News, 11 June 2003.
[4] Taylor, I. (2003), 'Conflict in Central Africa: Clandestine Networks and Regional/Global Configurations,' *Review of African Political Economy,* 95, p.49.

On the west coast, the major petro prize remains the Gulf of Guinea, and again Equatorial Guinea's deals with South Africa stand out as particularly obnoxious given the regime's dictatorial practices. South Africa's oil deals with Iraq and Nigeria have been exposed as fraught with ethical problems, as Daniel and Lutchman note. But it is the US which has the power and interests to make a much greater mess. With oil shipment from Africa to Louisiana refineries taking many fewer weeks than from the Persian Gulf, the world's shortage of supertankers is eased by direct sourcing from West Africa's offshore oil fields.

In this context, it is not surprising that of $700 million destined to develop a 75 000-strong UN peace-keeping force in coming years, $480 million is dedicated to African soldiers, and that South Africa also recently bought into US-aligned military strategies for troop deploymnet.[5] But Africa is also a site for the recruitment of well-tested private mercenaries. An estimated 1 500 South Africans – including half of Mbeki's own 100 personal security force – joined firms such as South Africa's Executive Outcomes and British-based Erinys to provide more than 10% of the bodyguard services in occupied Iraq.[6] Some African countries, including Eritrea, Ethiopia and Rwanda, joined the 'Coalition of the Willing' against Iraq in 2003, although temporary UN Security Council members Cameroon, Guinea and the Republic of the Congo opposed the war, in spite of Washington's bullying.

Also on the US geopolitical front, the Central African Republic proved reliable during the reconciliation of Jacques Chirac and the Bush regime in March 2004, when Haitian president Jean-Bertrand Aristide was kidnapped and temporarily dumped there, prior to taking up a cautious residence in South Africa. Africa is also an important site for Washington's campaigns against militant Islamic networks, especially in Algeria and Nigeria in the northwest, Tanzania and Kenya in the east, and South Africa. Control of African immigration to the US and Europe is crucial, in part through the expansion of US-style incarceration via private sector firms like Wackenhut, which has invested in South African privatised prison management, along with the notorious Lindela extradition camp for 'illegal immigrants,' part of a highly racialised global detention and identification system.

Of course, the US military machine does not roll over Africa entirely unimpeded. Minor roadblocks have included Pretoria's rhetorical opposition to the Iraq war, conflicts within the UN Human Rights Commission (especially over Zimbabwe), and the controversy over US citizens' extradition to the International Criminal Court. On the eve of Bush's 2003 Africa trip, the Pentagon announced that it would withdraw $7,6 million worth of military support to Pretoria, because the South African

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[5] The major dilemma, here, appears to be the very high level of HIV-positive members of the armed forces in key countries. See Elbe, S. (2003), *Strategic Implications of HIV/AIDS,* Adelphi Paper 357, International Institute for Strategic Studies, Oxford, Oxford University Press, pp.23-44.

[6] *Vancouver Sun,* 11 May 2004.

government - along with 34 military allies of Washington (and 90 countries in total) - had not agreed to give US citizens immunity from prosecution at The Hague's new International Criminal Court. Botswana, Uganda, Senegal and Nigeria, also on Bush's itinerary, signed these blackmail-based immunity deals and retained US aid.[7] After Bush returned home, in mid-July, the US House of Representatives extended a ban on military assistance to 32 countries, including South Africa. But Washington's ambassador to Pretoria, Cameron Hume, quickly announced that several bilateral military deals would go ahead in any case. According to Peter McIntosh of *African Armed Forces* journal, the US 'had simply re-routed military funding for South Africa through its European Command in Stuttgart.' Hume reported the Pentagon's desire 'to train and equip two additional battalions to expand the number of forces the [SA National Defense Force] have available for peacekeeping in Africa.' South African newspaper *ThisDay* commented, in the wake of two successful joint US/SA military maneuvres in 2003-04: 'Operations such as Medflag and Flintlock clearly have applications other than humanitarian aid, and as the US interventions in Somalia and Liberia have shown, humanitarian aid often requires forceful protection.'[8]

The two countries' military relations were fully 'normalised' by July 2004, in the words of SA deputy minister Aziz Pahad. In partnership with General Dynamics Land Systems, State-owned Denel immediately began marketing 105 mm artillery alongside a turret and light armoured vehicle hull, in support of innovative Stryker Brigade Combat Teams ('a 3500-personnel formation that puts infantry, armour and artillery in different versions of the same 8x8 light armoured vehicle'). According to one report, 'The turret and gun is entirely proprietary to Denel, using only South African technology. At sea level, it can fire projectiles as far as 36 km.'[9] This followed a period of serious problems for the SA arms firm and others like it (Armscor and Fuchs), which were also allowed full access to the US market in July 2004 after paying fines for apartheid-era sanctions-busting.[10]

Given Pretoria's 1998 decision to invest US$6 billion in mainly offensive weaponry such as fighter jets and submarines, there are growing fears that peacekeeping is a cover for a more expansive geopolitical agenda, and that Mbeki is tacitly permitting a far stronger US role in Africa - from the oil rich Gulf of Guinea and Horn of Africa, to training bases in the South and North - than is necessary.[11] On the surface, Pretoria's

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[7] Sapa, 2 July 2003. Other African countries where US war criminals are safe from ICC prosecutions thanks to military-aid blackmail are the DRC, Gabon, The Gambia, Ghana, Kenya,Mauritius, Sierra Leone and Zambia.

[8] Schmidt, M. (2004), 'US offers to Train and Equip Battalions,' *ThisDay*, 19 July.

[9] South African Press Association (2004), 'Denel to Benefit from US Defence Trade', 21 July.

[10] Batchelor, P. and S. Willett (1998), *Disarmament and Defence Industrial Adjustment in South Africa*, Oxford: Oxford University Press; Crawford-Browne, T. (2004), 'The Arms Deal Scandal,' *Review of African Political Economy*, 31, pp.329-342.

[11] Black, D. (2004), 'Democracy, Development, Security and South Africa's "Arms Deal"', in P. Nel and J. van der Westhuizen (Eds), *Democratising Foreign Policy? Lessons from South Africa*, Lanham, MD, Lexington Books.

senior roles in the mediation of conflicts in Burundi and the Democratic Republic of the Congo (DRC) during 2003 appeared positive. However, closer to the ground, the agreements more closely resemble the style of elite deals which lock in place 'low-intensity democracy' and neoliberal economic regimes. Moreover, because some of the belligerent forces were explicitly left out, the subsequent weeks and months after declarations of peace witnessed periodic massacres of civilians in both countries and a near-coup in the DRC. By mid-2004, the highly-regarded intellectual and leader of the Rassemblement Congolais la Democratic, Ernest Wamba dia Wamba, was publicly critical of Pretoria's interference:

> When a [transition process] takes off on a wrong footing, unless a real readjustment takes place on the way, the end cannot be good... Some feel like South Africa has actively put us in the situation we are in. They had a lot of leverage to make sure that certain structural problems were anticipated and solutions proposed. They seem to have fallen in the Western logic of thinking that mediocrity is a less evil for Congolese, if it stops the war. They also have a lot of leverage to get a clear on-going commitment to resolve the contradictory fears of both the DRC and Rwanda; they do not seem to use it. This is why some feel that South Africa is too close to Rwanda.[12]

In light of the effective geopolitical and military alliance between Pretoria and Washington, how are we to interpret the South African government's recent global political zigzag? On the one hand, Pretoria's grand continental plan, the New Partnership for Africa's Development (NEPAD), was declared 'philosophically spot-on' by the Bush regime,[13] and Mbeki was anointed Washington's 'point man' for resolving the Zimbabwe crisis by Bush himself, during the US president's July 2003 visit to Pretoria, in spite of Mbeki's continual nurturing of Mugabe's repression. Hence in one breath in January 2003, Nelson Mandela remarked, 'If there is a country which has committed unspeakable atrocities, it is the United States of America'[14], but in another breath in May 2004, retracted his criticism, simply because 'The United States is the most powerful state in the world, and it is not good to remain in tension with the most powerful state.'[15] As Greg Mills of the SA Institute of International Affairs explained,

> I think there was a bluster by the South African government, or those associated near or around it, prior to the American invasion of Iraq in March last year, but that was toned down fairly quickly by the South African government and most notably, President Mbeki. Really, there has not been much in the way of condemnation of the American position since March last year.[16]

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[12] Majavu, M. (2004), 'Interview with Ernest Wamba dia Wamba,' http://www.zmag.org, 22 June.
[13] Gopinath, D. (2003), 'Doubt of Africa,' *Institutional Investor Magazine*, May.
[14] CBS News (2003), 'Mandela Slams Bush On Iraq', 30 January.
[15] CNN.com (2004), 'Mandela Extends Conciliatory Hand to United States,' 24 May.
[16] Williams, L. (2004), 'SA to Export Arms?', *Business Day*, 21 July.

Competition from other neocolonial sponsors has occasionally been a factor limiting US arrogance, for example in the only partially successful attempt by Monsanto to introduce genetically modified (GM) agriculture in Africa. Zambia, Zimbabwe and Angola have rejected World Food Programme and US food relief because of fears of future threats to their citizens, and not coincidentally, to European markets. Linking its relatively centralised aid regime to trade through bilateral regionalism, the European Union aims to win major Africa-Caribbean-Pacific (ACP) country concessions on investment, competition, trade facilitation, government procurement, data protection and services, which along with grievances over agriculture, industry and intellectual property were the basis of ACP withdrawal from Cancun.

The EU's 'Economic Partnership Agreements' (EPAs) under the Cotonou Agreement (which replaced the Lome Convention) will signify a new, even harsher regime of 'reciprocal liberalisation' to replace the preferential agreements that tied so many African countries to their former colonial masters via cash-crop exports. If the EPAs are agreed upon by late 2005 and implemented from 2008, as presently scheduled, what meagre organic African industry and services that remained after two decades of structural adjustment will probably be lost to European scale economies and technological sophistication. An April 2004 meeting of parliamentarians from East Africa expressed concern, 'that the pace of the negotiations has caught our countries without adequate considerations of the options open to us, or understanding of their implications, and that we are becoming hostage to the target dates that have been hastily set without the participation of our respective parliaments.' Even Botswana's neoliberal president Festus Mogae admitted, 'We are somewhat apprehensive towards EPAs despite the EU assurances. We fear that our economies will not be able to withstand the pressures associated with liberalisation.'[17] But the EU's substantial aid carrots and sticks will be the final determinant, overriding democratic considerations.

What of Washington's development aid to Africa? During the early 1990s, ,numerous US Agency for International Development mission offices in Africa were closed by the Clinton Administration. The highest-profile measures now relate to HIV/AIDS treatment, amounting to what the State Department called its 'full-court press' – including threats of further aid cuts - against governments which made provisions for generic medicines production, which Clinton only backed away from in late 1999 because of sustained activist protest.[18] Bush promised a $15 billion AIDS programme, then whittled it down to a fraction of that, then refused to provide funds to the UN Global Fund to Fight AIDS, TB and Malaria, and then prohibited

[17] http://www.epawatch.net/general/text.php?itemID=161&menuID=28, http://www.twnafrica.org/atn.asp

[18] Bond, P. (1999), 'Globalisation, Pharmaceutical Pricing and South African Health Policy: Managing Confrontation with US Firms and Politicians', *International Journal of Health Services*, 29, 4.

US government financing of generic medicines. Bush also introduced an innovative vehicle to fuse neoliberal market conditionality with, supposedly, greater social investment: the Millennium Challenge Account (MCA). With USAID budgets still declining in real terms, the delinked MCA funding will rise from $1 billion in 2004 to $5 billion in 2006, a 100% increase on 2004 spending for all US overseas development assistance. But of 74 'low income' countries that are meant to be eligible, of which 39 are from Africa, only 16 passed the first test of governance and economic freedom in May 2004. Half of these were African: Benin, Cape Verde, Ghana, Lesotho, Madagascar, Mali, Mozambique and Senegal. The criteria for funding these countries' aid programmes have been established by a series of think tanks and quasi-government agencies: Freedom House (civil liberties and political rights), the World Bank Institute (accountability, governance and control of corruption), the IMF and the Heritage Foundation Index of Economic Freedom (credit ratings, inflation rates, business start-up times, trade policies and regulatory regimes), and the World Health Organisation and UN (public expenditure on health and primary education, immunisation rates and primary school completion rates).[19] Washington's attempt to disguise and legitimise imperialism through aid that carries 'good governance' and 'social investment' conditionalities dates to the Clinton era, but under Bush's MCA it involves more sophisticated disciplinary neoliberal surveillance, especially in combination with the World Bank.[20]

However, with so few African states receiving MCA funding, and with so much more at stake than can be handled by the expansion of military spending, it is vital for Washington to identify reliable allies in Africa to foster both imperialist geopolitics and neoliberal economics. Does South Africa qualify? South Africa is, in many ways, playing a subimperial role in Africa. This has become acutely obvious in terms of energy, not only through Eskom's reach up continent, but through new oil agreements with two of the world's most vicious governments: Sudan and Equatorial Guinea.

A recent study by Human Science Research Council officials John Daniel and Jessica Lutchman bear this out:

> South Africa is dependent for approximately 98% of its crude oil needs on imports. Of this, 75% is imported from the Middle East and 23% from Africa.

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[19] Cited in SA Institute for International Affairs e-Africa, May 2004. These rating systems follow the examples set in the Africa Growth and Opportunity Act, which by 2003 applied to 39 countries; the remaining 13 African states were vetoed by the White House for various reasons. AGOA conditionalities include adopting neoliberal policies, privatising state assets, removing subsidies and price controls, ending incentives for local companies, and endorsing US foreign policy.

[20] See Alexander, N. (2004), 'Triage of Low-Income Countries? The Implications of the IFI's Debt Sustainability Proposal,' Washington, http://www.servicesforall.org/ html/otherpubs/ judge_jury_ scorecard.pdf.

This latter figure reflects a considerable increase in recent years. In 2001, for example, African imports stood at only nine percent. Its main African supplier is Nigeria with the others being Angola, Cameroon and Gabon. In the last five years, however, South Africa – or more precisely South African companies operating with state support - has moved to reduce its import dependency through a process of buying into the African oil market as either a sole proprietor or in a partnership arrangement. In pursuit of this goal, South Africa has employed a combination of economic muscle, technical edge and tactical diplomacy (e.g President Mbeki's agreement with Sudan and former Deputy President Zuma's state visit to Angola). Leading the attempt to secure this greater stake in African crude oil production have been Sasol and the CEF-owned PetroSA. PetroSA has agreements with Algeria, Angola, Gabon, Nigeria and Sudan. Sasol on the other hand is operating in Gabon and Equatorial Guinea…

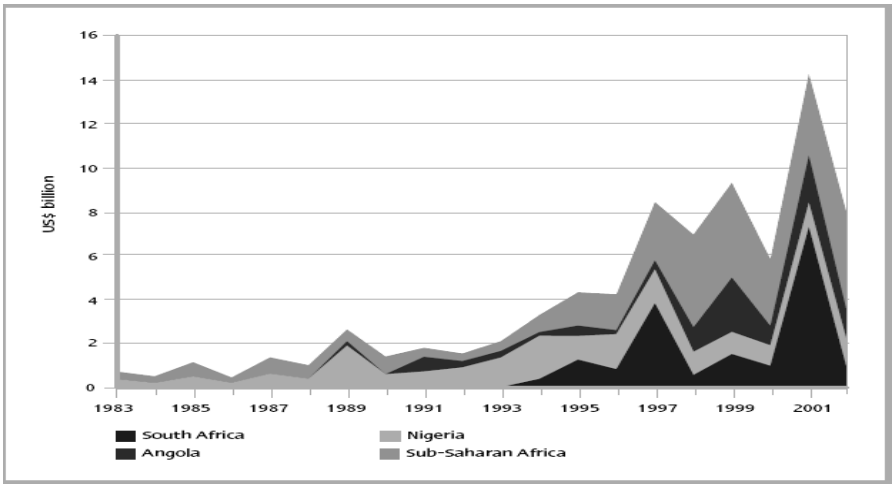
Access to Africa's range of energy resources will be a key to the success of South Africa's developing energy strategy. This sector is already contested terrain and other energy-deficit states are eyeing the African market. In its scramble to acquire a share of this market, the ANC government has abandoned any regard to those ethical and human rights principles which it once proclaimed would form the basis of its foreign policy. Its approach in regard to energy is one in which the national interest is being interpreted purely on material grounds.[21]

**Unpacking investments in African oil fields**

Who is South Africa competing with, and how? Given the appearance of growing foreign direct investment in Africa, a great deal of nuance is required in deconstructing the data, especially from 1997, for it appears that the peaks are associated with special circumstances. The Angolan 1999 oil investment peak was limited to the offshore Cabinda fields, while on the Angolan mainland, a repressive, corrupt state regime waged war against a rightwing guerilla army. The 1990s investments in Nigerian oil occurred largely under Sani Abacha's 1990s dictatorial rule, and were offset by his looting of state resources to private Swiss and London accounts. And the other peak of foreign investment, into South Africa, reflects both the failed telecommunications privatisation of 1997 and statistical accounting changes associated with the relisting of the country's largest firms to London.

[21] Daniel, J. and J. Lutchman (2005), 'South Africa in Africa: Scrambling for Energy', Presentation to the SA Association of Political Science Colluquium, University of KwaZulu-Natal/Pietermaritzburg, 22 September.

**Rising foreign investment in Africa**




Source: The Blair Africa Commission

The oil sector is a clear case whereby in which profit and dividend outflows, often lubricated by corruption, have had extremely negative consequences. As demonstrated by the Open Society-backed campaign, 'Publish what you Pay', elites in Africa's oil producing countries - Angola, Chad, Congo, Equatorial Guinea, Gabon, Nigeria and Sudan - are amongst the world's least transparent.[22] In Nigeria, demands by the Ogoni people relate not only to the massive destruction of their Delta habitat, but also to the looting of their natural wealth by Big Oil.[23] In all these respects, diverse forces in society have moved from considering oil merely a matter of private property, to be negotiated between corporations and governments (as was the case during much of the 20th century. Instead, these forces now treat oil as part of a general 'commons' of a national society's natural capital. George Caffentzis explains:

> There are three levels of claims to petroleum as common property, correlating with three kinds of allied communities that are now taking shape, for there is no common property without a community that regulates its use:

[22] www.opensociety.org

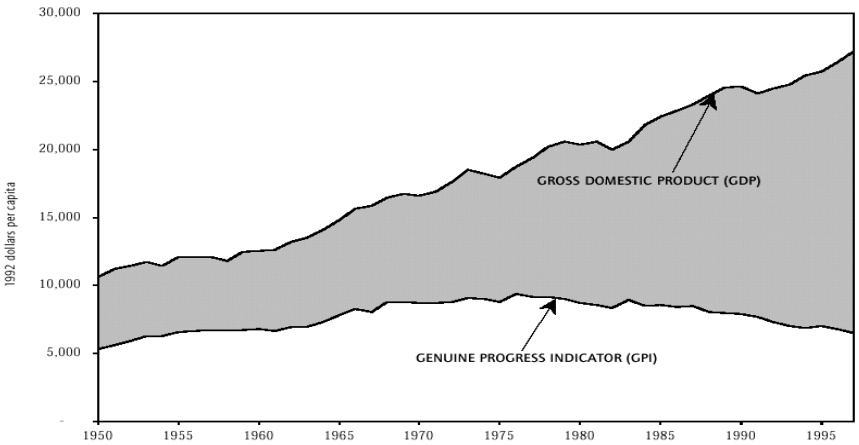
[23] According to Sam Olukoya, 'Reparations is a crucial issue in the struggle for environmental justice in Nigeria. Many of the ethnic groups in the Niger Delta have drawn up various demands. A key document is the Ogoni Bill of Rights which seeks reparations from Shell for environmental pollution, devastation and ecological degradation of the Ogoni area. Shell's abuses in Ogoniland were made infamous by the late playwright and activist Ken Saro-Wiwa, who was executed by the Nigerian government.' (Olukoya, S. (2001), 'Environmental Justice from the Niger Delta to the World Conference Against Racism', Special to CorpWatch, 30 August, http://www.corpwatch.org/article.php?id=18)

- first, some local communities most directly affected by the extraction of petroleum claim to own and regulate the petroleum under its territory as a commons;
- second, Islamic economists claim for the Islamic community of believers, from Morocco to Indonesia, and its representative, the 21st century Caliphate in formation, ownership of and the right to regulate the huge petroleum fields beneath their vast territory;
- third, UN officials claim for the 'coming global community' the right to regulate the so-called global commons-air, water, land, minerals (including petroleum) and 'nous' (knowledge and information). This imagined global community is to be represented by a dizzying array of 'angels' that make up the UN system, from NGO activists to UN environmentalist bureaucrats to World Bank 'green' advisors.[24]

If we take as given that there is some merit in considering 'natural capital' as a commons, its depletion plus associated negative externalities – such as the social devastation caused by mining operations – must be taken seriously. In the case of South Africa, for example, the value of natural minerals capital in the soil fell from $112 billion in 1960 to $55 bn in 2000, according to a 2004 UNDP estimate.[25] The World Bank has even addressed the issue of natural capital in a 2005 document, *Where is the Wealth of Nations?* The Bank methodology for correcting bias in GDP wealth accounting is nowhere near as expansive as that, for instance, of the San Francisco group Redefining Progress, which estimates that global GDP has been declining in absolute terms since the mid-1970s if natural resource depletion, pollution and a variety of other factors are accounted for.[26]

[24] Caffentzis, G. (2004), 'The Petroleum Commons: Local, Islamic and Global', *The Progress Report,* http://www.progress.org/2004/water26.htm.
[25] United Nations Development Programme (2004), *South Africa Human Development Report 2003,* Pretoria, Appendix 12.
[26] Subtract crime and family breakdown; add household and volunteer work; correct for income distribution (rewarding equality); subtract resource depletion; subtract pollution; subtract long-term environmental damage (climate change, nuclear waste generation); add opportunities for increased leisure time; factor in lifespan of consumer durables and public infrastructure; and subtract vulnerability upon foreign assets.

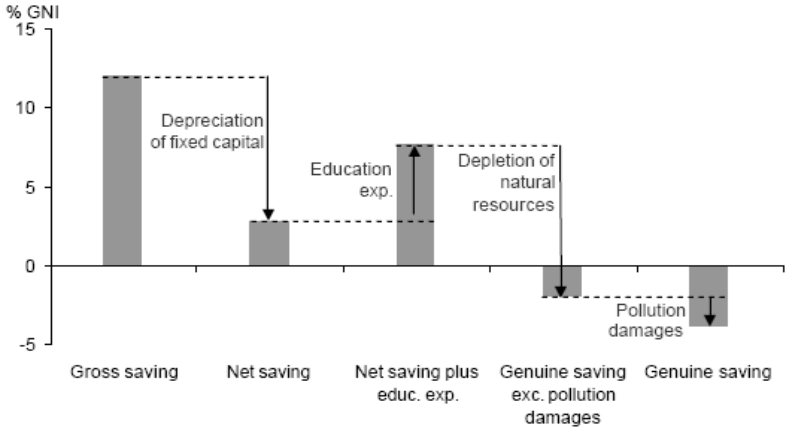
**Real eco-socio-economic welfare**




Source: Redefining Progress, San Francisco

Nevertheless, the Bank method is at least a step forward in recognising that FDI may not contribute to net GDP growth if resource depletion and pollution associated with extractive industries are factored in. In the case of Bolivia, for example, the Bank's first-cut method subtracts from an existing 12% savings/gross national income (GNI) the following: fixed capital depreciation, depletion of natural resources and pollution (while increasing savings based on education expenditure), leaving a net -3,5% savings/GNI rate.

**World Bank methodology for 'genuine saving' calculations**




Source: World Bank

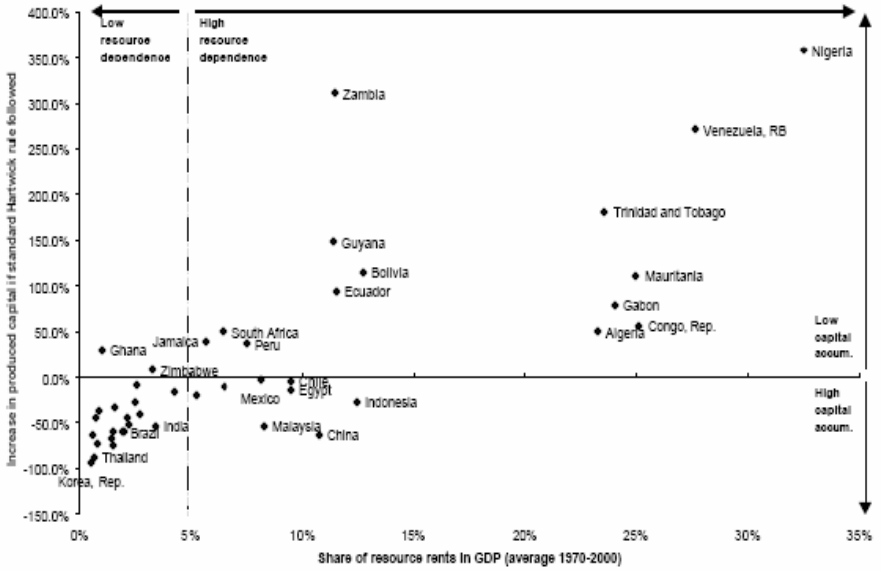
It should be noted here that in making estimates about the decline in a country's wealth due to energy, mineral or forest-related depletion, the World Bank has a minimalist definition based upon international pricing (not potential future values when scarcity becomes a more crucial factor, especially in the oil industry). The Bank does not calculate the damage done to the local environment, to workers' health/safety, and especially to women in communities around mines. Moreover, the Bank's use of average – not marginal – cost resource rents also probably leads to underestimations of the depletion costs.

However, the methodology at least indicates some of the trends associated with FDI-related resource extraction. In particular, the attempt to generate a 'genuine savings' calculation requires adjusting net national savings to account for resource depletion. The Bank suggests the following steps:

> From gross national saving the consumption of fixed capital is subtracted to give the traditional indicator of saving; net national savings. The value of damages from pollutants is subtracted. The pollutants carbon dioxide and particulate matter are included. The value of natural resource depletion is subtracted. Energy, metals and mineral and net forest depletion are included. Current operating expenditures on education are added to net national saving to adjust for investments in human capital.

Naturally, given oil extraction, the Middle East and North Africa have the world's most serious problem of net negative gross national income and savings under this methodology. But Africa is second worst, with several years during the early 1990s showing net negative gross national income once extraction of natural resources is factored in. Hence for every percentage point increase in a country's extractive-resource dependency, that country's potential GDP falls by 9% (as against the real GDP recorded), according to the Bank. The African countries most affected – i. e. , with high resource dependence and low capital accumulation - include Nigeria, Zambia, Mauritania, Gabon, Congo, Algeria and South Africa.

**Dependency upon extractive resources**




Source: World Bank

An even more nuanced breakdown of a country's estimated 'tangible wealth' is required to capture not just obvious oil-related depletion and rent outflows, but also other subsoil assets, timber resources, nontimber forest resources, protected areas, cropland and pastureland. The 'produced capital' normally captured in GDP accounting is added to the tangible wealth. In the case of Ghana, that amounted to $2,022 per person in 2000. The same year, the Gross National Saving of Ghana was $40 and education spending was $7. These figures require downward adjustment to account for the consumption of fixed capital ($19), and the depletion of energy ($0), mineral ($4) and net forest wealth ($8). The adjusted net saving was, hence $16 per person, and given a population growth of 1,7%, that brought per capita wealth down by $18 per person in 2000.

In the case of Ghana, $12 of the $18 decline can be attributed to minerals and forest-related depletions, and it is unclear how much of that is a product of transnational capital extracting these resources from Ghana. The largest indigenous (and black-owned) mining firm in Africa, Ashanti, was subsequently taken over by AngloGold, so it is safe to assume than an increasing amount of Ghana's wealth flows out of the country, leaving a net negative per capita tangible wealth for Ghanaians. Other mining houses active in Africa which had their roots here – Lonrho, Anglo, DeBeers, Gencor/Billiton – are also now based off-shore. While this makes calculating the outflow from Africa relatively easier, the drive by London,

New York and Sydney shareholders for profits means accumulation of capital within Africa is stymied.

Other African countries whose economies are primary product dependent fare much worse, according to the Bank methodology. In the worst case, Gabon's people lost $2,241 each in 2000, as oil companies deplete the country's tangible wealth. The Republic of the Congo (-$727), Nigeria (-$210), Cameroon (-$152), Mauritania (-$147) and Cote d'Ivoire (-$100) are the other African countries whose people lost more than $100 in tangible national wealth each in 2000 alone. A few countries did benefit, according to the Bank's tangible wealth measure, including the Seychelles ($904), Botswana (+$814) and Namibia (+$140), but the vast majority of African countries saw their wealth depleted.

**Wealth depletion due to resource extraction**

| | GNI per capita | Population growth rate (%) | Adjusted net saving per capita | Change in wealth per capita | Saving gap % GNI |
|---|---|---|---|---|---|
| Benin | 360 | 2.6 | 14 | -42 | 11.5 |
| Botswana | 2925 | 1.7 | 1021 | 814 | |
| Burkina Faso | 230 | 2.5 | 15 | -36 | 15.8 |
| Burundi | 97 | 1.9 | -10 | -37 | 37.7 |
| Cameroon | 548 | 2.2 | -8 | -152 | 27.7 |
| Cape Verde | 1195 | 2.7 | 43 | -81 | 6.8 |
| Chad | 174 | 3.1 | -8 | -74 | 42.6 |
| Comoros | 367 | 2.5 | -17 | -73 | 19.9 |
| Congo, Rep. of | 660 | 3.2 | -227 | -727 | 110.2 |
| Côte d'Ivoire | 625 | 2.3 | -5 | -100 | 16.0 |
| Ethiopia | 101 | 2.4 | -4 | -27 | 27.1 |
| Gabon | 3370 | 2.3 | -1183 | -2241 | 66.5 |
| Gambia, The | 305 | 3.4 | -5 | -45 | 14.6 |
| Ghana | 255 | 1.7 | 16 | -18 | 7.2 |
| Kenya | 343 | 2.3 | 40 | -11 | 3.2 |
| Madagascar | 245 | 3.1 | 9 | -56 | 22.7 |
| Malawi | 162 | 2.1 | -2 | -29 | 18.2 |
| Mali | 221 | 2.4 | 20 | -47 | 21.2 |
| Mauritania | 382 | 2.9 | -30 | -147 | 38.4 |
| Mauritius | 3697 | 1.1 | 645 | 514 | |
| Mozambique | 195 | 2.2 | 15 | -20 | 10.0 |
| Namibia | 1820 | 3.2 | 392 | 140 | |
| Niger | 166 | 3.3 | -10 | -83 | 50.3 |
| Nigeria | 297 | 2.4 | -97 | -210 | 70.6 |
| Rwanda | 233 | 2.9 | 14 | -60 | 26.0 |
| Senegal | 449 | 2.6 | 31 | -27 | 6.1 |
| Seychelles | 7089 | 0.9 | 1162 | 904 | |
| South Africa | 2837 | 2.5 | 246 | -2 | 0.1 |
| Swaziland | 1375 | 2.5 | 129 | 8 | |
| Togo | 285 | 4.0 | -20 | -88 | 30.8 |
| Zambia | 312 | 2.0 | -13 | -63 | 20.4 |
| Zimbabwe | 550 | 2.0 | 53 | -4 | 0.7 |

*Note:* All dollars at nominal exchange rates.

Source: World Bank

Even Africa's largest economy, South Africa, which from the early 1980s has been far less reliant upon minerals extraction, recorded a $2 drop in per capita wealth in 2000 using this methodology. According to the World Bank, the natural wealth of $3,400/person in South Africa included subsoil assets (worth $1,118 per person); timber ($310); non-timber forest resources ($46); protected areas ($51); cropland ($1,238); pastureland ($637). This sum can be compared to the value of produced capital (plant and equipment) and urban land (together worth $7,270 per person in 2000). Hence even in Africa's most industrialised economy, the estimated value of natural capital is nearly half of the measureable value of plant, equipment and urban land. Given the constant depletion of this natural capital, South Africa's official gross national savings rate of 15,7% therefore should be adjusted downwards. By substracting consumption of fixed capital at 13,3%, the net national savings is actually 2,4%, added to which should be education expenditure (amongst the world's highest) at 7,5%. Then subtract mineral depletion of 1%; forest depletion of 0,3%; pollution ('particulate matter') damage of 0,2%; and (probably undervalued) CO2 damage of 1,6%. In total, the actual 'genuine savings' of South Africa is reduced to just 6,9% of national income. How much of this deficit from the 15,7% savings rate can be attributed to foreign investors? Not only is mineral depletion biased to benefit overseas mining houses, the CO2 damage is largely done by the smelters owned by large multinational corporations, including Mittal Steel, BHP Billiton (Alusaf), and the Anglo group. The amount is substantive, and further estimates should reasonably be made.

**Carbon emissions and ecological debt**

CO2 emissions damage is, essentially, a draw-down from the global commons. During the early 1990s, the idea of the North's ecological debt to the South began gaining currency in Latin America thanks to NGOs, environmentalists and politicians (including Fidel Castro of Cuba and Virgilio Barco of Colombia). According to Spanish ecological economist Joan Martinez-Alier,

> The notion of an ecological debt is not particularly radical. Think of the environmental liabilities incurred by firms (under the United States Superfund legislation), or of the engineering field called 'restoration ecology', or the proposals by the Swedish government in the early 1990s to calculate the country's environmental debt. Ecologically unequal exchange is one of the reasons for the claim of the Ecological Debt. The second reason for this claim is the disproportionate use of Environmental Space by the rich countries.[27]

[27] Martinez-Alier, J. (2003), 'Marxism, Social Metabolism and Ecologically Unequal Exchange', Paper presented at Lund University Conference on World Systems Theory and the Environment, 19-22

In the first category, Martinez-Alier lists:

- Unpaid costs of reproduction or maintenance or sustainable management of the renewable resources that have been exported;
- actualised costs of the future lack of availability of destroyed natural resources;
- compensation for, or the costs of reparation (unpaid) of the local damages produced by exports (for example, the sulphur dioxide of copper smelters, the mine tailings, the harms to health from flower exports, the pollution of water by mining), or the actualised value of irreversible damage;
- (unpaid) amount corresponding to the commercial use of information and knowledge on genetic resources, when they have been appropriated gratis ('biopiracy'). For agricultural genetic resources, the basis for such a claim already exists under the FAO's Farmers' Rights.

In the second, he cites 'lack of payment for environmental services or for the disproportionate use of Environmental Space':

- (unpaid) reparation costs or compensation for the impacts caused by imports of solid or liquid toxic waste; and
- (unpaid) costs of free disposal of gas residues (carbon dioxide, CFCs, etc), assuming equal rights to sinks and reservoirs.

These aspects of ecological debt defy easy measurement. Each part of the ecological balance sheet is highly contested, and information is imperfect. As Martinez-Alier shows in other work, tropical rainforests used for wood exports have an extraordinary past we will never know and ongoing biodiversity whose destruction we cannot begin to value. However, he acknowledges, 'although it is not possible to make an exact accounting, it is necessary to establish the principal categories [of ecological debt] and certain orders of magnitude in order to stimulate discussion.'[28] The sums involved are potentially vast. Just to take the case of C02 emissions, according to Martinez-Alier,

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September. Martinez-Alier elaborates with examples of ecological debt that are never factored into standard trade and investment regimes: 'nutrients in exports including virtual water… the oil and minerals no longer available, the biodiversity destroyed. This is a difficult figure to compute, for several reasons. Figures on the reserves, estimation of the technological obsolence because of substitution, and a decision on the rate of discount are needed in the case of minerals or oil. For biodiversity, knowledge of what is being destroyed would be needed.' Some of these cases are considered in the discussion earlier concerning depletion of natural capital. See also www.deudaecologica.org

[28] Martinez-Alier, J. (1998) 'Ecological Debt - External Debt', Quito, Acción Ecológica.

> Jyoti Parikh (a member of the UN International Panel on Climate Change) [argues that] if we take the present human-made emissions of carbon, the average is about one tonne per person per year. Industrialised countries produce three-fourths of these emissions, instead of the one-fourth that would correspond to them on the basis of population. The difference is 50% of total emissions, some 3000 million tons. Here the increasing marginal cost of reduction is contemplated: the first 1000 million tons could be reduced at a cost of, say, $15 per ton, but then the cost increases very much. Let us take an average of $25: then a total annual subsidy of $75 billion is forthcoming from South to North.[29]

Excess use of the planet's C02 absorption capacity is merely one of the many ways that the South is being exploited by the North on the ecological front. Africans are most exploited in this regard because non-industrialised economics have not begun to utilise more than a small fraction of what should be due under any fair framework of global resource allocation.

**Conclusion**

As we have seen, the overlapping and interlocking roles of imperialism, South African subimperialism, and extractive FDI in oil and resource rich countries are closely related to the North's – and South Africa's - fossil fuel addiction. Hence any genuine accounting of national economic welfare stemming from further extractive investments should take into account not only the danger of imperial intervention and the financing of repressive dictatorships, but also the net negative impact on national wealth, including natural capital. The new World Bank accounting of genuine savings partially takes into account depletion of natural resources by foreign corporations, is a helpful innovation. To take the methodology forward and rigorously estimate an Africa-wide extraction measure, to account for the way extractive FDI generates net negative welfare/savings, still remains as an exercise.

But the overall conclusion is sufficiently disturbing, that a very different conception of oil wealth and politics begins to emerge. Indeed, given what powerful forces from Washington to Brussels to Pretoria and in between have shown themselves capable of, it may well make sense for African oil to stay in the ground until bottom-up democratisation allows for a more serious cost-benefit analysis to be done. Meanwhile, if civil society in Africa is to continue fighting against extractive industries on behalf of human, women's, workers and environmental rights – as we

[29] Martinez-Alier cites Parikh, J.K. (1995), 'Joint Implementation and the North and South Cooperation for Climate Change, *International Environmental Affairs*, 7, 1.

are taught so often from the Nigerian Delta to Chad to Botswana – then the rest of the world's conscientised people must increase their own efforts to repay the ecological debt owed to Africa. Such a turn, uniting the world's people against climate change and myriad forms of local destruction caused by Big Oil and financial institutions such as the World Bank, increasingly enforced by the Pentagon and the SA National Defense Force, would be a welcome direction for internationalism.

It is not an entirely pessimistic story, though. While the 24 September 2005 protests of 300 000 US residents against the Iraq War and IMF/World Bank annual meetings in Washington proved that what the *New York Times* termed the world's 'second superpower' – informed public opinion – is still actively hostile to the White House, South African civil society's Anti-War Coalition, Jubilee movement, anti-privatisation social movements, progressive Cosatu trade unions and other forces also have further obligations, to connect the dots and hit the streets.

# PART SIX:
# DOCUMENTATION

## PRETORIA'S CLEAN DEVELOPMENT MECHANISM POLICY

*DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM NATIONAL CLIMATE CHANGE RESPONSE STRATEGY*, SEPTEMBER 2004

South Africa, as a non-annex I country, is not required to reduce its emissions of greenhouse gases. However, the South African economy is highly dependent on fossil fuels and the country can be judged to be a significant emitter due to the relatively high values that can be derived for emissions intensity and emissions per capita. Such calculations put South Africa as one the world's top 15 most energy intensive economies, with a significant contribution to greenhouse emissions at a continental level.

There could be benefits to be derived from adopting a future strategy that is designed to move the economy towards a cleaner development path. This will further require development of a strategy to access investment through the Clean Development Mechanism (CDM) of the Kyoto Protocol, technology transfer and donor funding opportunities. However, even given this scenario, emissions can still be expected to increase with economic development, albeit at a smaller pace than would have happened without intervention…

Government urgently needs to establish procedures for the registration, coordination and reporting on projects to be undertaken through the CDM. Detailed discussions have been held between high-level delegations from DEAT, DTI and DME. The following mechanisms are proposed, are being developed or have already been instituted.

a) A CDM secretariat is being set up within DME and it is envisaged that the Director General of DME will act, for legal purposes, as the Designated National Authority (DNA) in terms of the Kyoto Protocol, in which capacity he will have full signing authority and the associated accountability.

b) The DNA will be advised by a steering committee, chaired jointly by DME, DEAT and the DTI. It is, however, essential that other departments (for example the Department of Foreign Affairs) be permanently represented on the committee, as should other stakeholders, including civil society.

c) The CDM secretariat will introduce proposals to the steering committee who will make recommendations to the DNA. The DNA will issue letters of approval.

d) DTI would provide guidance on possible trade and investment implications of projects and will assist in the marketing of potential CDM projects in South Africa.

e) DTI will be instrumental in ensuring that, where possible, the CDM is used to support national trade and investment measures.

f) The CDM secretariat would provide a single point of entry for all information pertaining to the CDM, and would be able to advise on all aspects of the necessary South African and international processes and requirements.

g) The secretariat would be responsible for the registration of all projects, but not for actual project management, which would be the responsibility of the project developers.

h) The secretariat would serve as a focal point to the CDM Executive Board, as set up under the Kyoto Protocol, and deal with correspondence from this Board.

i) The secretariat would also provide input into the negotiating process on the CDM, through the NCCC.

j) The arrangements could be considered as interim with the possibility of them being reviewed in light of performance achieved, status of the Kyoto Protocol negotiations and the future scale of the CDM market.

It should be understood up-front that CDM primarily presents a range of commercial opportunities, both big and small. This could be a very important source of foreign direct investment, thus it is essential that the DTI participate fully in the process. Contracting organisations from the recipient country can range from large private corporations, parastatals and the smaller commercial operations of academic institutes and consultancies aligned with NGOs. The actual range of potential projects is very large and can not be covered in detail here. However, as just a few examples, they could encompass fuel switching from coal to gas, clean coal technologies, energy efficient housing, the use of renewable energy resources or the production of electricity from landfill gas, as well as numerous other applications. The identification of suitable projects could be assisted by the results of the technology needs analysis referred to elsewhere in this document.

The overall governance and coordination of CDM is through the CDM Executive Board established under the Kyoto Protocol. The responsibility for constituting and appointing the Executive Board lies with the UNFCCC conference of parties/meeting of parties structures. There are mechanisms to ensure equitable regional representation and a balance between developed and developing nation representation. The Executive Board is mandated with the administration of an adaptation fund to oversee allocations to adaptation projects, specifically for the poorest and most vulnerable nations, with the prioritisation of funding in accordance

with criteria established from the vulnerability assessments submitted to the UNFCCC conference of parties.

All information should be entered into a project information management system. However, the Secretariat could keep all proprietary information confidential at all stages. The detailed evaluation of greenhouse gas reductions needs to be done according to standard methodologies as laid down by the Executive Board and through the Designated Operational Entities (DOEs) mandated by the Board. On applying for pre-approval, a 2-month turn around time, or shorter, should be guaranteed. The project should be evaluated for economic benefits, social benefits, and technological feasibility. The public will be consulted on the sustainable development criteria, which can be unique for South Africa. The process for the application of these criteria will be specified. The primary role of the CDM process is to assess projects against these sustainable development criteria, but those responsible will require the necessary information in order for them to do this. Technical feasibility could be evaluated through using specific members of an expert panel who have been chosen for their technical competence and willingness to respond rapidly. It is doubtful whether adequate capacity in this area would normally reside within the DNA and/or the steering committee or secretariat. However, the composition and role of this panel will need to be clearly defined as to the required level of their assessment and their terms of reference should be limited to that of acting in an advisory capacity only.

The expert panel would not be required to sit formally and review projects. Projects could be referred to the appropriate experts by Email. In cases that require an Environmental Impact Assessment (EIA), then a process of public participation will, in any event, need to be conducted and various stakeholders consulted. This type of process should not be duplicated, as it will inevitably result in the process becoming even lengthier. It should be noted that the risk with regards to obtaining approval of EIA's is borne by the project developers and the EIA could be carried out in advance of the CDM approval process should the project developer wish to do so. In addition the initiation or carrying out of an EIA should not be considered as invalidating the proposed project on the grounds that it represents 'business as usual'. The application for full approval should contain complete project specifications and a detailed account of the proposal for verifying the emissions reductions. The CDM Executive Board in Washington is likely to make approval conditional upon continued achievement of requirements. This process should not take longer than 14 weeks from start to finish, preferably much less, excluding the time taken to process the EIA, where necessary.

The allocation of certified emission reductions has not as yet been finalised. However, it is widely thought that ownership would essentially remain with the project developers to give the incentive to carry out CDM projects, with governments retaining overall custodianship of the national interests. It is expected that the CDM Executive Board would maintain a CDM registry and that South Africa, as the host party, as well as the project participants would have registry accounts into which certified emission reductions would be transferred directly by the CDM Executive Board.

# CLIMATE JUSTICE NOW!
# THE DURBAN DECLARATION ON CARBON TRADING

As representatives of people's movements and independent organisations, we reject the claim that carbon trading will halt the climate crisis. This crisis has been caused more than anything else by the mining of fossil fuels and the release of their carbon to the oceans, air, soil and living things. This excessive burning of fossil fuels is now jeopardising Earth's ability to maintain a liveable climate.

Governments, export credit agencies, corporations and international financial institutions continue to support and finance fossil fuel exploration, extraction and other activities that worsen global warming, such as forest degradation and destruction on a massive scale, while dedicating only token sums to renewable energy. It is particularly disturbing that the World Bank has recently defied the recommendation of its own Extractive Industries Review which calls for the phasing out of World Bank financing for coal, oil and gas extraction.

We denounce the further delays in ending fossil fuel extraction that are being caused by corporate, government and United Nations' attempts to construct a 'carbon market', including a market trading in 'carbon sinks'.

History has seen attempts to commodify land, food, labour, forests, water, genes and ideas. Carbon trading follows in the footsteps of this history and turns the earth's carbon-cycling capacity into property to be bought or sold in a global market. Through this process of creating a new commodity – carbon - the Earth's ability and capacity to support a climate conducive to life and human societies is now passing into the same corporate hands that are destroying the climate.

People around the world need to be made aware of this commodification and privatisation and actively intervene to ensure the protection of the Earth's climate. Carbon trading will not contribute to achieving this protection of the Earth's climate. It is a false solution which entrenches and magnifies social inequalities in many ways:

• The carbon market creates transferable rights to dump carbon in the air, oceans, soil and vegetation far in excess of the capacity of these systems to hold it. Billions of dollars worth of these rights are to be awarded free of charge to the biggest corporate emitters of greenhouse gases in the electric power, iron and steel, cement, pulp and paper, and other sectors in industrialised nations who have caused the climate crisis and already exploit these systems the most. Costs of future reductions in fossil fuel use are likely to fall disproportionately on the public sector, communities, indigenous peoples and individual taxpayers.

• The Kyoto Protocol's Clean Development Mechanism (CDM), as well as many private sector trading schemes, encourage industrialised countries and their corporations to finance or create cheap carbon dumps such as large-scale tree plantations in the South as a lucrative alternative to reducing emissions in the North. Other CDM projects, such as hydrochlorofluorocarbons (HCFC) -reduction schemes, focus on end-of pipe technologies and thus do nothing to reduce the impact of fossil fuel industries' impacts on local communities. In addition, these projects dwarf the tiny volume of renewable energy projects which constitute the CDM's sustainable development window-dressing.

• Impacts from fossil-fuel industries and other greenhouse-gas producing industries such as displacement, pollution, or climate change, are already disproportionately felt by small island states, coastal peoples, indigenous peoples, local communities, fisherfolk, women, youth, poor people, elderly and marginalised communities. CDM projects intensify these impacts in several ways. First, they sanction continued exploration for, and extraction, refining and burning of fossil fuels. Second, by providing finance for private sector projects such as industrial tree plantations, they appropriate land, water and air already supporting the lives and livelihoods of local communities for new carbon dumps for Northern industries.

• The refusal to phase out the use of coal, oil and gas, which is further entrenched by carbon trading, is also causing more and more military conflicts around the world, magnifying social and environmental injustice. This in turn diverts vast resources to military budgets which could otherwise be utilised to support economies based on renewable energies and energy efficiency.

• In addition to these injustices, the internal weaknesses and contradictions of carbon trading are in fact likely to make global warming worse rather than 'mitigate' it. CDM projects, for instance, cannot be verified to be 'neutralising' any given quantity of fossil fuel extraction and burning. Their claim to be able to do so is increasingly dangerous because it creates the illusion that consumption and production patterns, particularly in the North, can be maintained without harming the climate.

• In addition, because of the verification problem, as well as a lack of credible regulation, no one in the CDM market is likely to be sure what they are buying. Without a viable commodity to trade, the CDM market and similar private sector trading schemes are a total waste of time when the world has a critical climate crisis to address.

• In an absurd contradiction the World Bank facilitates these false, market-based approaches to climate change through its Prototype Carbon Fund, the BioCarbon Fund and the Community Development Carbon Fund at the same time it is promoting, on a far greater scale, the continued exploration for, and extraction and burning of fossil fuels – many of which are to ensure increased emissions of the North.

In conclusion, 'giving carbon a price' will not prove to be any more effective, democratic, or conducive to human welfare, than giving genes, forests, biodiversity or clean rivers a price.

We reaffirm that drastic reductions in emissions from fossil fuel use are a pre-requisite if we are to avert the climate crisis. We affirm our responsibility to coming generations to seek real solutions that are viable and truly sustainable and that do not sacrifice marginalised communities. We therefore commit ourselves to help build a global grassroots movement for climate justice, mobilise communities around the world and pledge our solidarity with people opposing carbon trading on the ground.

10 October 2004
Glenmore Centre, Durban, South Africa

**Durban Meeting Signatories**

*Carbon Trade Watch; Indigenous Environmental Network; Climate & Development Initiatives, Uganda; Coecoceiba-Amigos de la Tierra, Costa Rica; CORE Centre for Organisation Research &; Education, Manipur, India; Delhi Forum, India; Earthlife Africa (ELA) eThekwini Branch, South Africa; FERN, EU; FASE-ES/Green Desert Network Brazil 2; Global Justice Ecology Project, USA; groundwork, South Africa; National Forum of Forest People And Forest Workers, India; Patrick Bond, Professor, University of KwaZulu Natal School of Development; Studies, South Africa; O le Siosiomaga Society, Samoa; South Durban Community Alliance (SDCEA), South Africa; Sustainable Energy and Economy Network, USA; The Corner House, UK; Timberwatch Coalition, South Africa; World Rainforest Movement, Uruguay.*

**Supporting Organisational Signatories**

*50 Years Is Enough: U.S. Network for Global Economic; Justice, USA; Aficafiles, Canada; Africa Groups of Sweden, Sweden; Alianza Verde, Honduras; Ambiente y Sociedad, Argentina; Angikar Bangladesh Foundation, Bangladesh; Anisa Colombia, Colombia; Asociacion Alternativa Ambiental, Spain; Asociacion Amigos Reserva Yaguaroundi, Argentina; Asociacion de Guardaparques Argentinos, Argentina; Asociación Ecologista Piuke, Argentina; Asociacion para la Defensa del Medio Ambiente del Noreste; Santafesino, Argentina; Asociación San Francisco de Asís, Argentina; Association France Amerique Latine, France; Associacion Lihue San Carlos de Barloche / Rio Negro, Argentina; Association pour un contrat mondial de l'eau, Comité de Seine Saint; Denis, France; Associação Caeté - Cultura e Natureza, Brasil; Athlone Park Residents Association, South Africa; Austerville Clinic Committee, South Africa; Australian Greens, Australia; Aukland Rising Tide, New Zealand; BanglaPraxis, Bangladesh; Benjamin E. Mays Center, USA; Bluff Ridge Conservancy (BRC), South Africa; BOA, Venezuela; Boulder Environmental Activists Resource, Rocky Mountain; Peace and Justice Center, USA; CENSAT-Friends of the Earth Colombia, Colombia; Center for Economic Justice, USA; Centre for Environmental Justice, Sri Lanka; Center for Environmental Law and Community Rights Inc./; Friends of the Earth (PNG), Papua New Guinea; Committee in Solidarity with the People of El Salvador, USA; Centro de Derecho Ambiental y Promoción para el Desarrollo; (CEDAPRODE), Nicaragua; Christ the King Church Group, South Africa; Clairwood Ratepayers Association (CRA), South Africa; Cold Mountain, Cold Rivers, USA; Colectivo de Proyectos*

*Alternativos de México (COPAL), Mexico; Colectivo MadreSelva, Guatemala; Comité de Análisis 'Ana Silvia Olán' de Sonsonate –; CANASO,El Salvador; Community Health Cell, Bangalore, India; Corporate Europe Observatory (CEO), Netherlands; C.P.E.M. Nº29-Ciencias Ambientales, Argentina; Del Consejo de Organizaciones de Médicos y Parteras; Indígenas Tradicionales de Chiapas, Mexico; Ecoisla, Puerto Rica; EarthLink e.V.-The People & Nature Network, Germany; Ecological Society of the Philippines, Philippines; Ecoportal.net, Argentina; ECOTERRA International; El Centro de Ecología y Excursionismo de la Universidad de; Carabobo, Venezuela; Els Verds - Alternativa Verda, Spain; Environment Desk of Images Asia, Thailand; FASE Gurupá, Brasil; Forest Peoples Programme, UK; Foundation for Grassroots Initiatives in Africa, Ghana; Friends of the Earth International; Friends of the Earth Australia, Australia; Friends of the Siberian Forests, Russia; FSC-Brasil, Brasil; Fundación Argentina de Etoecología (FAE), Argentina; Fundación Los de Tilquiza, proyecto AGUAVERDE, Argentina; Groupe d'Etudes et de Recherche sure les Energies; Renouvelables et l'Environnement (GERERE), Morocco; Gruppo di Volontariato Civile (GVC-Italia), oficina de; Nicaragua, Nicaragua; House of Worship, South Africa; Indigenous Peoples' Biodiversity Network, Peru; InfoNature, Portugal; Iniciativa ArcoIris de Ecologia y Sociedad, Argentina; Iniciativa Radial, Argentina; Institute for Social Ecology Biotechnology Project, USA; Instituto Ecoar para Cidadania, Brasil; Instituto Igaré, Brasil; International Fund for Animal Welfare (IFAW), Belgium; International Indian Treaty Council; Isipingo Environmental Committee (IEC), South Africa; Isipingo Ratepayers Association, South Africa; Jeunesse Horizon, Camerun; JKPP /Indonesian Community Mapping Network, Indonesia; Joint Action Committee of Isipingo (JACI), South Africa; KVW Translations, Spain; LOKOJ, Bangladesh; London Rising Tide, UK; Malvarrosamedia, Spain; Mangrove Action Project (MAP), USA; Mano Verde, Colombia; Mercy International Justice Network, Kenya; Merebank Clinic Committee (MCC), South Africa; Movimiento por la Paz y el Ambiente, Argentina; Movimento por los Derechos y la Consulta Ciudadana, Chile; Nicaragua Center for Community Action, USA; Nicaragua Network (US), USA; Nicaragua-US Friendship Office, USA; NOAH-Friends of the Earth Denmark, Denmark; Núcleo Amigos da Terra, Brasil; Ogoni Rescue Patriotic Fund, Nigeria; Oilwatch International, Ecuador; Oilwatch Africa, Nigeria; Organizacion Fraternal Negra Honduirena, Honduras; Parque Provincial Ernesto Tornquist, Argentina; Pacific Indigenous Peoples Environment Coalition; (PIPEC),Aotearoa/New Zealand; Pesticides Action Network Latin America, Uruguay; Piedad Espinoza Trópico Verde, Guatemala; PovoAção, Brasil; Projeto tudo Sobre Plantas - Jornal SOS Verde, Brasil; Public Citizen, USA; Rainforest Action Network, USA; Rainy River First Nations, Canada; Red de Agricultura Orgánica de Misiones, Argentina; REDES-Amigos de la Tierra, Uruguay; Red Verde, Spain; Rising Tide, UK; Sahabat Alam Malaysia /FOE-Malaysia, Malaysia; San Francisco Bay Area Jubilee Debt Cancellation Coalition; USA; Scottish Education and Action for Development, UK; Silverglen Civic Association (SCA), South Africa; Sisters of the Holy Cross - Congregation Justice Committee, USA; Sobrevivencia, Friends of the Earth Paraguay, Paraguay; Sociedad Civil, Mexico; SOLJUSPAX, Philippines; Tebtebba Foundation, Philippines; The Sawmill River Watershed Alliance, USA; TRAPESE – Take Radical Action Through Popular Education; and Sustainable Everything, UK / Spain; Treasure Beach Environmental Forum (TBEF), South Africa; Uganda Coalition for Sustainable Development, Uganda; Ujamaa Community Resource Trust (UCRT), Tanzania; UNICA, Nicaragua; Union Chrétienne pour l'Education et Développement des; Déshérités (UCEDD), Burundi; Union Mexicana de Emprendedores Inios, A. C., Mexico; Wentworth Development Forum (WDF), South Africa; Western Nebraska Resources Council, USA; World Bank Boycott/Center for Economic Justice, USA; worldforests, UK; World Peace Prayer Society, USA.*

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To sign on to this declaration please send an email to info@fern.org or visit www.sinkswatch.org

# CONDEMN CARBON TRADING!
# SUPPORT FOR THE DURBAN DECLARATION ON CARBON TRADING

Exactly one year ago, the Durban Declaration on Carbon Trading was signed by environmental justice organisations and concerned citizens who spent the prior week analysing carbon trading, before rejecting the strategy.

Since then, yet more evidence of global warming has emerged. Leading officials concede that September's brutal hurricanes were mainly attributable to higher Gulf of Mexico water temperatures.

And yet as climate change generates destruction and misery, the very people and corporations responsible for these problems – especially in the US/EU-centred petro-mineral-military complex and associated financial agencies like the World Bank – are renewing their grip on power.

Without shame, the largest petroleum corporations visited Johannesburg in September to celebrate their world-historic profits.

Without a worry for his legitimacy, George W. Bush established a new alliance of hyperpolluters – the US, Australia, India and China – in July to again foil serious carbon reduction efforts.

Without caveat, the G8 leaders met in Gleneagles in July, giving the architect of the Iraq War, World Bank president Paul Wolfowitz, the green light to accelerate his institution's prolific contribution to climate change.

Without a thought to Wolfowitz's legacy or agenda, the chair of the World Bank/IMF Development Committee, South African finance minister Trevor Manuel, welcomed him to his new job in April, calling him 'a wonderful individual… perfectly capable'.

The South African government's willingness to buy into the North's agenda for the South's continued subordination is not an accident or aberration. It is, instead, an integral part of a system – named 'global apartheid' by president Thabo Mbeki – that must be fully dismantled. What role are Pretoria's politicians and technocrats playing? Is it similar to that of the elite collaborators of the apartheid-era Bantustans?

There is no better example than the South African government's 'National Climate Change Response Strategy' of 2004. What can only be described as the pimping of Clean Development Mechanism (CDM) projects appears as a central objective: 'It should be understood up-front that CDM primarily presents a range of commercial opportunities, both big and small. This could be a very important source of foreign direct investment, thus it is essential that the Department of Trade and Industry participate fully in the process.'

This is the same government – led by Eskom and the DTI - that has disconnected an estimated ten million low-income South Africans from electricity due to inability to pay, while committing billions of rands of subsidies to yet another energy-guzzling aluminium smelter, at Coega in the Mandela Metropole. Even before Coega, on a per capita basis, the carbon intensity of the South African economy was roughly twenty times worse than that of the United States.

To propose 'commercial opportunities' associated with carbon trading and, simultaneously, the intensification of South Africa's world-record CO2 emissions, does have a certain logic. It is the logic of an immature, greedy society led by calculating, corrupt politicians and neoliberal technocrats – not a society in which we can be proud of membership.

As in the first Durban Declaration on Carbon Trading a year ago, we again reject the claim that this strategy will halt the climate crisis. We reiterate that this crisis has been caused more than anything else by the mining of fossil fuels and the release of their carbon to the oceans, air, soil and living things.

A year ago, we suggested that people need to be made more aware of carbon trading threat, and to actively intervene against it. By August 2005, the inspiring rise of citizen activism in Durban's Clare Estate community forced the eThekwini municipality to withdraw an application to the World Bank for carbon trading finance to include methane extraction from the vast Bisasar Road landfill (instead, the application was for two relatively tiny eThekwini dumps).

But the heroic battle against Bisasar's CDM status was merely defensive. We join community residents in urgently seeking the safe and environmentally sound extraction of methane from the Bisasar Road landfill, even if that means slightly higher rubbish removal bills for those in Durban who are thoughtlessly filling its landfills, without recycling their waste.

We endorse calls for Clare Estate's apartheid-era dump to now finally be closed, a decade after originally promised. Simultaneously, we agree that good jobs and bursaries be given to the dump's neighbours, especially in the Kennedy Road cmmunity, as partial compensation for their long suffering. Their fight for housing and decent services has been equally heroic; the current handful of toilets and standpoints for six thousand people should shame the eThekwini municipal officials, whose reprehensible response has been to mislead residents into believing dozens of jobs will materialise through World Bank CDM funding.

We also seek a commitment to a zero waste philosophy and policies by eThekwini and all other municipalities in South Africa. In Bellville, Western Cape, we offer solidarity to the many residents who are also victims of apartheid-dumping, and who may also be victimised by the Bellville Landfill's status as a CDM project.

We also seek allies in South African, African and international civil society. A year ago, only cutting-edge environmental activists and experts understood the dangers of carbon trading. Others – including many well-meaning climate activists - argued that

the dangers are not intrinsic in trading, just in the rotting 'low hanging fruits' that represent the first and easiest projects to fund, at the cheapest carbon price.

Since October 2004, however, numerous voices have been raised against carbon colonialism. These voices oppose the notion that, through carbon trading, Northern polluters can continue their fossil fuel addiction, drawing down the global atmospheric commons in the process.

Rather than foisting destructive schemes like the toxic Bisasar Road dump on the South, the North owes a vast ecological debt. For playing the role of 'carbon sink' alone, political ecologist Joan Martinez-Alier and UN climate change commissioner Jyoti Parikh calculate that an annual subsidy of $75 billion is provided from South to North.

Many advocates of environmental justice signed the Durban Declaration and sponsored debates within their own organisations and communities. The South African Climate Action Network is overdue for such a debate.

A year ago we also noted that the internal weaknesses and contradictions of carbon trading are likely to make global warming worse rather than 'mitigate' it. We are ever more convinced of that in South Africa, partly because in August, a leading official of state-owned Sasol publicly conceded that his own ambitious carbon trading project is merely a gimmick, without technical merit (because he cannot prove what is termed 'additionality'). The 'crony' character of the CDM verification system may allow this travesty to pass into the market, unless our critique is amplified.

We said last year that 'giving carbon a price' will not prove to be any more effective, democratic, or conducive to human welfare, than giving genes, forests, biodiversity or clean rivers a price. Over the last year, the South African government's own climate change strategy has been increasingly oriented itself to the 'commercial opportunities' associated with carbon.

The results include inadequate subsidies and R&D commitments to renewable energy; a renewed focus on nuclear energy using the specious, incorrect argument that it is safer, cheaper and cleaner than coal; and a turn to potential hydroelectricity projects, which even the South African-based World Commission on Dams condemned as often contributing more to global warming than coal-generated electricity (through methane emissions from plant decay).

Last year we committed ourselves to building a global grassroots movement for climate justice. In coming days, weeks and months, we commit ourselves to returning to our roots in South Africa, and to mobilising communities around the country against the farce of carbon trading. Real solutions are needed, and with our world-leading CO2 emissions, South Africans must be at the cutting-edge of progressive climate activism, not partners in the privatisation of the atmosphere.

10 October 2005
University of KwaZulu-Natal Centre for Civil Society, Durban, South Africa
(Signatories were still being collected as this volume went to print)