Contested Transition

State and Capital against Community

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The groundWork Report 2022

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Contested Transition: State and Capital against Community

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Cover image is of Betty Zulu, in her homestead, part of the "Big House" settlement next to Komati power station in the background. Note the generator in the foreground; the homestead has no connection to the grid. With kind permission of Daylin Paul from the collection "Broken Land" see https://www.daylinpaul.com/broken-land.

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Acronyms

AbM	Abahlali baseMjondolo
API	American Petroleum Institute
BESS	battery energy storage system
Capex	capital expenditure
CARs	community activist researchers
CCS	carbon capture and storage
cfu	colony forming unit
CTL	coal to liquids
DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
ESIA	Environmental & Social Impact Assessment Report
GCC	Global Climate Coalition
GH_2	green hydrogen
GHG	greenhouse gas
Gt CO_2e	Gigatonnes of carbon dioxide equivalents
GTL	gas-to-liquids
GW	Gigawatt
IEG	Intrinsic Exchange Group
IPG	International Partners Group
IRP	Integrated Resource Plan
JET IP	Just Energy Transition Investment Plan
JETP	Just Energy Transition Partnership
JTF	Just Transition Framework
KPS PSA	Komati power station project study area
KTF	Komati Training Facility
MES	minimum emission standards
Mm	millimetre
MW	Megawatt
NAC	Natural Asset Company
NCEDA	Northern Cape Economic Development Agency
NBS	nature based solutions
NDC	nationally determined contributions
NYSE	New York Stock Exchange

Acronyms

PCC	Presidential Climate Commission
PCFTT	Presidential Climate Finance Task Team
PEM	proton membrane exchange
ppm	parts per million
REDD+	reducing emissions from deforestation and forest degradation
SDCEA	South Durban Community Environmental Alliance
SDLS	Supplier Development and Localisation Strategy
SEZ	special economic zone
STES	socio-technical-ecological systems
TIPS	Trade and Industrial Policy Strategies
TRUs	temporary residential units
UNFCCC	United Nations Framework Convention on Climate Change
WCA	World Coal Association
WMO	World Meteorological Organisation

Foreword

It is always an exciting time when the date arrives to launch *The groundWork Report*, which gives an account of the state of environmental justice in South Africa in relation to a focus theme. In 2022, we chose to speak with and listen to people who are living the transition. What is not a surprise is that it is not just. Indeed, we see many left on the waste heaps of an economy that feeds capital accumulation rather than what is promised in our celebrated Constitution: a development that is ecologically sustainable and that seeks to promote "justifiable economic and social development". The transition now is one of capital closing shop and moving on – from the Shell and BP oil refinery in south Durban to Eskom's power stations in Mpumalanga. People are reporting to work, and they are being told to go home. We are closed.

But capital is not closed. It is getting ready to feed from the trough of the 'just transition'. Every established corporate is embracing the process. But so are very many fly by nights that seek to climb into the Mpumalanga space to offer solutions that can make them a buck off the promise of a new tomorrow for the community.

groundWork has always called for a just transition. From the early days of fenceline struggles of oil refinery and toxic waste dump resistance with affected communities, to the very recent formal process of the Presidential Climate Commission. Our demands have been clear: for there to be a just transition, the system has to be changed and the momentum for a just change must come from "movements struggling for deep transformation of the way the world works".

Over the years we have had to engage with very bureaucratic processes such as the establishment of air pollution minimum emission standards which government, Eskom and Sasol were against, but they had to negotiate. And

because of these processes, we can now successfully challenge government to deliver environmental justice.

The lines of struggle are not always static and cannot be held fast. We have been successful in getting the just transition agenda on the table, both at a local community level – where much work still needs to be done alongside communities in struggle – to the presidential level. And in this vast mélange we have to consider our strategies.

This report recognises that "people need to fight through the unfolding situation rather than subordinate strategies to engraved positions which end in paralysis or defeat". It is a changing world full of complexity and nuances and vested interests created since 1994. In 1992, Ben Turok, in his closing words at the Earthlife Conference titled *What does it mean to be green*, called for social movements and society to "fight the cause as though we have something positive to offer, an alternative which is our own agenda". Thirty years later we have come part of the way, but now it is critical that we get our hands dirty, not only as Turok suggests with community daily struggles but also with the various spaces where power presently lies and where we need to challenge this head on. We cannot be made moribund by ideological positions, but must always remain true to the values that drive us – especially the value of an open democracy. And, as I often say, a true democracy is messy. It is not linear.

As always, *The groundWork Report* gives an overview and update of the important spaces of struggle. Again, Hallowes and Munnik have produced a remarkable report for us to get to grips with and use in the very many spaces we find ourselves in.

In conclusion, we engage with an uncertain future in which we have to ensure our agenda is rooted. From the local level to the international – and all that lies in between. And this is an important read for the years of struggle ahead.

Bobby Peek

Director of groundWork

Introduction

A Just Transition has been at issue in the groundWork Reports for two decades with, since 2016, the focus on coal. This report is the third in a sequence of reports specifically on the just transition: 2019 Down to Zero on the politics of the (un)just transition; and 2020 The Elites Don't Care: reporting from people on the frontlines of Covid, climate and coal.

In the introduction to the 2019 report, we set out groundWork's overall positioning on just transition – that to be just, it must be about system change; the wholesale transformation of relations of power and the way the world works. This serves for the series as a whole. And it is given concrete form in the open political agenda developed with coal affected communities. This is not, however, produced on a blank slate outside history. On the one hand is the uneven and messy decline of political and economic institutions that were themselves produced through a history full of brutality and deceit. On the other, the environmental and climate crisis is growing ever more intense and will exact rising costs. In the end, it will likely blow what's left of the institutional house down. Such dynamics are documented in the 2019 and 2020 reports and we open this report with an account of escalating climate impacts arriving faster and harder than predicted. This opens the question of whether we are being led across thresholds – or tipping points – with no turning back. Bad weather is accompanied by a chronicle of bad politics and criminal deceit.

Since 2019, the just transition debate has moved fast, with some social actors shifting their positions. This process has been driven by on the ground activism, the growing climate and environmental justice movements and through formal 'stakeholder' dialogues – at national level, the Presidential Climate Commission (PCC), and locally on the Highveld, the dialogues organised by Trade and Industry Policy Strategies (TIPS), the National Labour and Economic

Development Institute (Naledi) and groundWork.[1] The commission pushed the debate at fast pace and at high level but was also challenged to engage communities and workers. Chapter 2 tracks the process over the first two years of the PCC and reports on research conducted by activists on the coal fields to give an account of community responses to it. The PCC's key output from this period was the Just Transition Framework (JTF) and Chapter 3 both explains it and gives it a critical reading.

The PCC was mandated to build a national consensus for a just transition. The question is whose consensus and transition to what. The major business forums led by the National Business Initiative (NBI) moved fast to establish the elite answer: an expanded power system based on privatised renewables with some gas, electric vehicles in place of internal combustion engines (ICE), and 'green' hydrogen to address 'difficult to abate' sectors (iron and steel, cement, aviation). This agenda brings major corporations of the minerals energy complex [Fine & Rustomjee 1996] – including Anglo, Sasol and Eskom – into the business camp for an energy transition and all are careful to add the word 'just'. The basic vision is ecological modernisation: reindustrialising the economy and remaking the MEC around renewables and associated minerals while reproducing existing relations of power. For the most part, justice must trickle down.

The PCC did not preside over the question of funding the transition. Various negotiations leading up to CoP 26, the climate negotiations in Glasgow, culminated in the announcement of the Just Energy Transition Partnership (JETP) between South Africa and the Northern powers who promised $8.5 billion (R130 billion) funding for the transition. President Cyril Ramaphosa then established the Presidential Climate Finance Task Team (PCFTT) to negotiate the deal for South Africa. The task team produced an overall Just Energy Transition Investment Plan (JET IP) for the next five years, looking at who should pay for what and estimating the cost at R1.5 trillion. The JETP contribution was negotiated within this frame while its value shrank on

1 TIPS is an economic research institution, Naledi is the research arm of the Congress of South African Trade Unions (Cosatu).

scrutiny. Chapter 4 looks at the IP and locates the JETP deal in the broader context of the failure of climate finance.

Chapter 5 steps back to consider the uneven transition and climate finance in the context of the crises of capital and its search for the next 'fix'. It looks at the disintegration of the minerals energy complex powered by coal in South Africa. The Eskom death spiral continues, big users are looking for cheaper and more dependable renewable power and the big transnational corporate coal miners have sold out, leaving their environmental liabilities behind. In their place is a new trio of big national coal corporations. With coal prices on a record high following Russia's invasion of the Ukraine, they are making record profits and finance houses that looked to their climate credentials a year ago are all in for the money. Global and local capital are meanwhile looking for new spaces, resources and 'asset classes' for expansion and finding it in the renewable economy and in making nature pay. Big finance, or a large faction of it, is no longer denying the climate and ecological crisis so much as looking at how to control and profit from the response to it.

Chapter 6 zooms in to focus on the actual transition as it hits the ground at Komati, the first power station to formally shut down. The World Bank is the main funder for this project and says it will provide a demonstration of how the just transition will work. The chapter opens with a view of the coal value chain and the way it is framed to suggest that the end of coal can be managed within the existing capitalist order. In Komati, it finds people unprepared for the end of coal and confronted by a set of plans for 'repowering' and 'repurposing' Komati to which only a few had made input through focus groups. It describes a five-point plan for the Komati area in some detail and provides a critique of the way in which the local community is described in terms of its 'ownership' of seven types of capital. The chapter concludes by discussing these plans and comparing them to promise in the JTF to "put people at the centre of decision making".

Next to coal, the transition from oil and gas is getting more attention. On the ground in south Durban, communities called for a just transition when the Engen refinery shut down following yet another explosion at the plant,

reported in gWR 2020. Shell and BP closed their Sapref plant in 2022 as the oil majors prefer to import refined fuels rather than invest in meeting new fuel specifications. Meanwhile, struggles around oil and gas are intensifying, locally, regionally and globally. Chapter 7 opens with a brief account of the dash for gas in Africa where governments see new finds as a bonanza. With the support of transnational oil and gas corporations, they proclaim the right to develop it in the name of development or even of climate justice, and brand resistance as the work of neo-colonial interests. It then reports on the extraordinary mobilisation against offshore oil and gas in South Africa, the result of building a campaign over several years, and the court victories which stopped two seismic surveys. The next big offshore battle is against Total which is applying for a production right. Onshore, government is winding up the rhetoric in favour of fracking for shale gas while minor companies are betting big on coal bed methane.

In a brief concluding chapter, we look for a way forward. This brings us back to the question, 'What transition?' Government is obviously central to the transition. The demand, and fight, for open democracy is thus part of the community just transition agenda. This goes beyond 'procedural justice', as exclusion is constitutive of inequality. Democratic decision making is thus a precondition for creating an egalitarian society and implies that present power relations are overturned.

However, the state and government are already compromised: first, they are subservient to capital; second, corruption, always a feature of the modern state, is now pervasive and both symptom and cause of a wider societal breakdown; third, energy and economic systems are in crisis; and fourth, the crisis of the biosphere is exacting exponentially increasing costs.

Thus, the prospects for a just transition are scarcely propitious. Communities – the common people – are fighting for their lives as they fight for justice. On the one hand, the fight is for the societal imaginary – creating a counter-hegemony to challenge the common sense of capitalist society – and, on the other, for specific objectives such as political accountability, functional services

or technology transitions. The course and outcome of these struggles is not assured – there will be wins, losses and partial win/losses.

As is already the case, people need to fight through the unfolding situation rather than subordinate strategies to engraved positions which end in paralysis or defeat. At the same time, they need to increase their autonomous control of resources, for example through food or energy sovereignty programmes, as well as the capacity for coordination and effective solidarity to expand strategic options including on policy and government resources.

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This report would also not be possible without the ongoing exchange of views with the staff of groundWork and of the Life After Coal campaign and its three representatives in the PCC: Makoma Lekalakala, Melissa Fourie and Bobby Peek. Bobby gave comments on all chapters and Eugene Cairncross commented on Chapter 4. They are not, of course, responsible for any remaining mistakes. Thanks to Jane Harley for keeping our grammar in order and for doing the

layout. Gill Addison, groundWork's deputy director and one of the founders, has retired after 23 years keeping the organisation together and much more. She has given vital support to the whole process of producing The groundWork Reports since the first one came out in 2002.

1 The moment

On 11 April 2022, extreme flooding inundated coastal KwaZulu-Natal. The port city of Durban was at the centre of the storm with over 300mm falling in 24 hours at Virginia Airport. Coastal towns south of Durban also recorded over 300mm. The rain fell on saturated ground as the weather system, an unusually slow-moving 'cut-off low', had already dropped up to 160mm in the three days before the flood. To the north, 230mm fell over four days on Richards Bay, with 120mm falling on the night of 11 April. Gale force winds gusting at 70 km/h forced the ports to shut down, but severe flooding caused the major damage.[2] This was the third major flood in five years, and it doubled the previous one-day rainfall record of 160mm set in the Easter floods of 2019.

The floods killed nearly 500 people, displaced 40 000, destroyed or damaged 12 000 homes and about 550 schools and many local clinics along the KwaZulu-Natal coast.[3] Major factories were flooded and shut down. Bridges and roads, electricity wires, water pipes and sewage pipes were broken and swept away. Hundreds of trees were uprooted and swept out to sea, along with millions of plastic bottles and debris of all kinds, car tyres and even a fuel tanker lorry. The freeway from the south into the city of Durban was under a metre of water and dozens of shipping containers from toppled stacks floated down the road.[4]

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2 Lyse Comins, ***KZN FLOODS: 20 dead, Durban port operations, logistics come to grinding halt***, Freight News, 12 April 2022. https://zululandobserver.co.za/268433/city-of-umhlathuze-sources-provincial-and-national-funding-for-storm-repairs/;

3 https://reliefweb.int/disaster/fl-2022-000201-zaf.

4 Des Erasmus, ***KwaZulu-Natal flooding death toll tops 250 as visibly affected Cyril Ramaphosa sees devastation first-hand***, Daily Maverick, 13 April 2022; Phillip de Wet, ***KZN saw eight new rain records on Tuesday, with Margate doubling a high set 25 years ago***, Business Insider SA,13 April 2022; South Africa braces for more heavy rain after floods kill hundreds; Jason Burke, ***President describes 'catastrophe of enormous proportions' as more than 300 people die in Durban area***, The Guardian, 14 April 2022.

A World Weather Attribution study found that climate change is increasing the intensity and frequency of extreme floods on South Africa's east coast.[5] Nevertheless, floods are nothing new in KwaZulu-Natal. Cut-off lows regularly cross the country from west to east and periodic floods have been documented since the mid 1800s, says Francois Engelbrecht of Wits University Global Change Institute.[6] "So the first question is, why are we not prepared for them?" Most obviously, people living within the flood lines or on steep slopes should be properly rehoused. We return to this question below.

Past events will no longer be a reliable guide to the intensity of future events. The warming of the seas will likely bring cyclones formed in the Indian Ocean further south to make landfall on the KwaZulu-Natal coast with wind speeds of 200 km/h. The April floods showed that cyclones may form in a second way. As the cut off low moved from the land and out over the warm sea, it tightened to take the shape of a tropical cyclone with a circle around an eye. It then changed direction and moved back over land, bringing more rain but dissipating quickly. Engelbrecht says this is the first time that a cut off low has changed structure in this way. His team is now modelling to test if, with increased global warming, such events may result in full blown cyclones.

The Paris Agreement of 2015 committed the parties to hold warming "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C". The world is now about 1.2°C hotter than it was in 1850 and will almost certainly exceed 1.5°C. And while the scientists insist it is still possible to keep warming below 2°C – if not 'well below' 2°C – it seems unlikely. Assuming that all countries actually reduce emissions as promised in their 'nationally determined contributions' (NDCs), temperatures will rise by between 2.4°C and 3°C.

Warming is driven by the increasing concentration of greenhouse gases (GHG) in the atmosphere. In May 2022, carbon dioxide (CO_2) concentrations

5 https://www.worldweatherattribution.org/climate-change-exacerbated-rainfall-causing-devastating-flooding-in-eastern-south-africa/

6 Francois Engelbrecht, ***Did climate change cause the Durban floods?*** Webinar, 29 September 2022.

topped 421 parts per million (ppm). That compares with 280 ppm in the pre-industrial world and with the maximum 'safe limit' of 350 ppm defined by climate scientist James Hansen. Moreover, the concentrations of methane, the second most important GHG, are also rising fast, both from leaking fossil gas pipelines and natural feedbacks caused by the warming climate. Methane (CH_4) breaks down to CO_2 and water in the atmosphere. Over 100 years, a tonne of methane has about 28 times the warming impact of a tonne of CO_2. But it is 84 times more potent over 20 years. This shorter time horizon is what matters now as tipping points are increasingly likely to be crossed.

Under the Covid-19 lockdowns, CO_2 emissions from burning fossil fuels dropped by 5.4% from 36.6 billion tonnes (Gt) in 2019 to 34.6 Gt in 2020. Emissions immediately bounced back by 4.9% in 2021 to 36.4 Gt. Land use change – the destruction of forests and grasslands – adds around 5 Gt to make for total CO_2 emissions of about 41 Gt. Total GHG emissions, measured as CO_2 equivalents, were around 59 Gt CO_2e in 2019 and, following Covid, were likely about that level in 2021 [WMO 2022].

Fire and flood around the world

Globally, climate impacts are escalating ahead of scientific expectations and are linked with wider ecological and social crises. Global heating at 1.2°C is in line with projections but extreme weather events "are coming faster than predicted and are more severe than predicted" says Johan Rockström, director of the Potsdam Institute for Climate Impact Research in Germany.[7] Records were shattered in 2021 and 2022, compelling scientists to recalibrate their climate models. In countries across the northern hemisphere, heatwaves, drought and wildfires scorch one part of the country while floods inundate another. Or flood follows searing drought.

In June 2021, temperatures in Lytton, in Canada north of Vancouver, reached 49.6°C. In this temperate climate, the average maximum summer temperature

7 Robin McKie, *Cop27 climate summit: window for avoiding catastrophe is closing fast*, The Guardian, 30 October 2022.

is 28°C. The climate models used to project future warming did not come close. Two days later, the village burnt down in a wildfire. In the province of British Columbia, 500 people died of the heat. Five months later, record rains fell on the charred earth. With no trees or plant life to hold the water, the floods created massive runoff and landslides.[8]

In the hot parts of the world such as West and South Asia, temperatures over 50°C are now recorded more often. In May and June, temperatures in Jacobobad, Pakistan, topped 37°C for 50 days and went over 50°C on three days. Some 90 people died of heat stroke.[9] The drought was immediately followed by unprecedented monsoon rains, with seven times the monthly average falling in some areas. The earlier heat had meanwhile contributed to the rapid melt of Himalayan glaciers, including glacial dam bursts, which added to the flood waters. By late August, a third of the country was under water and more than 1 400 people dead. Millions lost their homes and their crops and livestock. The people are also the victims of poor planning and bad governance, according to local journalist Ali Tauqeer Sheikh. A self-interested elite has neglected local government, weakened state institutions and obstructed inclusive governance and "access to justice and resources that are otherwise central for climate resilience". The result is increased poverty making more people vulnerable.[10]

Pakistan's climate minister noted that the country was responsible for less than 1% of greenhouse gas emissions and called for reparations from the rich Northern powers for loss and damage. The provisional costs were put at $30 billion. UN General Secretary Antonio Guterres said he had never seen such devastation. Of the international failure to address climate change he said, "This is insanity. This is collective suicide."[11]

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8 Jonathan Watts, ***Canadian inferno: northern heat exceeds worst-case climate models,*** The Guardian, 2 July 2021; Adele Peters, ***How much are we underestimating the effects of climate change?*** Fast Company, 19 July 2021; Ashifa Kassam, ***Western Canada braces for more torrential rain after deadly mudslides***, The Guardian, 21 November 2022.

9 Zoha Tunio, ***In Jacobabad, One of the Hottest Cities on the Planet, a Heat Wave Is Pushing the Limits of Human Livability***, Inside Climate News, 20 June 2022;

10 Ali Tauqeer Sheikh, ***Victims of climate change or bad governance?*** Dawn, 4 September 2022.

11 Al Jazeera, ***'Never seen climate carnage' like Pakistan floods***, says UN chief, 10 September 2022; .

Great rivers drying

Great rivers are running dry from drought and overuse.[12] The Colorado in the US south west is one of the most overworked rivers in the world, supplying about 40 million people across seven states before crossing into Mexico and emptying into the Bay of California. Except that there is little water left by the time it reaches the mouth. Now the whole river catchment is drying out and the levels in America's largest dams are dropping towards 'dead pool' status, too low to be used for water distribution or hydropower. The region is in the grip of the worst drought in over a thousand years as measured in the record of tree rings. But this is not a drought that will end in time. Rather, the region is undergoing long term aridification.[13]

In Europe, 2022 was the hottest summer on record "by substantial margins of 0.8°C over 2018 for August and 0.4°C over 2021 for summer", according to the Copernicus Climate Change Service, and wildfires raged across the continent.[14] The temperature in London topped a previously unimaginable 40°C. The fires burnt right into the city. There are concerns that this may foreshadow a drying trend in Europe. Heat and drought parched the land and dried out major rivers. The Rhine flows north and west from the Alps to the North Sea port of Rotterdam and carries cargo upstream to Germany and France. The Danube flows east through nine countries to the Black Sea and is also navigable and a critical transport artery. Much of this freight traffic was stranded by the drought and this squeezed European economies, already made to feel the pinch following Russia's invasion of Ukraine.

Coal fired power stations in Germany were restarted to compensate for the loss of Russian gas supplies, but were left short of coal as the barges could not sail up the Rhine. They were also short of cooling water. Nuclear power in France did no better. The power stations are located on major rivers and were forced to cut output as they ran low on water for cooling and the return water

12 Climate Home News, ***Seen from space: Extreme drought dries up rivers across the globe***, 26 August 2022.

13 Gabrielle Canon and Richard Luscombe, ***US issues western water cuts as drought leaves Colorado River near 'tipping point'***, The Guardian, 20 August 2022;

14 https://climate.copernicus.eu/copernicus-summer-2022-europes-hottest-record posted 8 September 2022.

from the plants threatened to overheat what water remained in the rivers and so threaten river ecologies.[15]

The Yangtze in China supports 400 million people as well as farming and big industry zones with water, transport and hydropower. A searing summer heatwave and drought reduced the water flow by half in what should have been the wet season. Power output from the massive Three Gorges Dam as well as several upstream dams was curtailed just as people switched on air conditioners to survive temperatures of over 45°C. Farmers lost their crops, particularly fresh vegetables for local markets, while factories at the centre of global production networks – cell phone maker Foxconn and lithium battery maker CATL among many others – shut down for want of power.[16]

Further south, in June, the low-lying Pearl River Delta was inundated by severe floods caused as much by the sudden and unannounced release of water from overflowing dams as from the drenching rain. The linked up cities of the region form a megacity of 60 million people. Known as the world's workshop, it is a major centre of production primarily geared for export and it accounts for about a third of China's massive trade. Floods are not unusual but are becoming more extreme and more disruptive.[17]

The Mekong rises on the Tibetan plateau and flows through China, Laos, Thailand, Cambodia and to the delta in Vietnam. Some 65 million people rely on the river for their livelihoods according to the Mekong River Commission.[18] The catchment has seen four years of low rainfall but the major impact on water flow, particularly in the dry season, is from a cascade of eleven dams in China. More dams are under construction or planned for hydropower in Laos and Cambodia in the lower Mekong but, as International Rivers documents,

15 Jon Henley, ***Europe's rivers run dry as scientists warn drought could be worst in 500 years***, The Guardian, 13 August 2022.

16 Verna Yu, ***China reports 'most severe' heatwave and third driest summer on record***, The Guardian, 7 September 2022; ***Chinese factories close as drought hits hydropower***, Al Jazeera, 17 Aug 2022.

17 ***Floodwater Released Without Warning; Severe Floods Hit South China, Embankments & Bridges Collapsed!*** China Observer, 28 June 2022;

18 https://www.mrcmekong.org/about/mekong-basin/

these plans are resisted by those who live on the river. The dams have a profound effect on river ecology and threaten the rich fisheries that sustain millions of people. Millions more live off farming, notably on the flood plains fertilised with sediments deposited by annual flooding. Sediments from the upper Mekong are now cut off by the Chinese dams and will be further reduced as more dams are built. At the delta in Vietnam, the reduced flow and loss of sediments combines with sea level rise to increase coastal erosion as well as salination. China is reported to use its control of the flow in the Mekong to exert political pressure on the downstream countries.[19]

Africa – drought in the Horn

In the horn of Africa, the rains have failed for the last four years and are likely to fail again, says the World Meteorological Organisation (WMO). This is the longest and most severe drought in decades and has combined with conflict to put 50 million people in crisis, with high levels of malnutrition and little clean water. Over 300 000 people have abandoned their homes as their animals are dead and they have no food left. Most go to displacement camps which are increasingly overcrowded, short of food and water, unsanitary and dangerous – particularly for women. Some 22 million face starvation, the World Food Programme (WFP) reported in August 2022. That figure was up from 13 million facing starvation at the beginning of the year when the WFP put out an urgent call for funds. As crisis tips towards catastrophe,[20] little money has been forthcoming and the appeals of other UN agencies – the World Health Organisation (WHO) and the UN Children's Fund (UNICEF) – have also failed.[21] Famine remains the product of politics as much as climate.

19 https://www.internationalrivers.org/where-we-work/asia/mekong

20 Acute food insecurity is measured in five phases: 1. Minimal; 2. Stressed; 3. Crisis; 4. Emergency; 5. Catastrophe or famine.

21 Lisa Schlein, ***East Africa: Millions of Hungry People in Horn of Africa Resort to Extreme Measures***, AllAfrica, 3 August 2022; AFP, ***Horn of Africa drought places 22 million people at risk of starvation, says UN***, The Guardian, 20 August 2022; ***WMO: Greater Horn of Africa drought forecast to continue for fifth year***, UN News, 26 August 2022; ***Africa drought: Some children just 'one disease away from catastrophe' UNICEF warns,*** UN News, 23 August 2022.

Southern Africa – drought broken by successive cyclones

Southern Madagascar has also faced four years of drought and once green forests have turned into a red desert. A severe food crisis affecting over a million people risked turning into the first 'climate famine', according to the WFP, but the intervention of international relief agencies prevented an outright catastrophe.[22]

The drought was broken by flooding in 2022 as successive cyclones lashed the island. First, the 'moderate tropical storm' Ana drenched northern Madagascar and caused major landslides. It then gathered strength crossing the Mozambique Channel to bring devastating floods to the Mozambican province of Nampula and to Malawi. Just two weeks later, on 5 February, Batsirai crashed into southern Madagascar as a high intensity category 3 cyclone with winds peaking at 195 km/h and over 250mm of rain in some areas. It crossed the island and then tracked southward without making landfall on mainland Africa. Another two weeks later, on 22 February, Emnati made landfall in southern Madagascar as a category 1 cyclone, with winds blowing at 135 km/h and more heavy rain on saturated ground. It too tracked southwards after crossing the island. Two weeks later again, Gombe struck northern Madagascar as a moderate storm. Like Ana, it gathered strength as it crossed the hot waters of the Mozambique Channel and again struck Nampula, but this time with the much greater force of a category 3 cyclone with winds of 185 km/h and 200 mm rain in 24 hours before it weakened over land.[23]

These "back-to-back storms" affected over a million people and 230 people were reported to have died, according to the WMO. Houses, schools, clinics and roads were swept away. Relief agencies on Madagascar were prepared for Batsirai and Emnati, setting up emergency food depots and evacuating vulnerable people ahead of the storms. However, some schools and churches

22 Reliefweb, Madagascar: Drought – 2018-2022, at https://reliefweb.int/disaster/dr-2018-000141-mdg accessed 23 September 2022; Doloresz Katanich, How climate change is turning once green Madagascar into a desert, Euronews, 20 March 2022.

23 Wikipedia, at https://en.wikipedia.org/wiki/2021%E2%80%9322_South-West_Indian_Ocean_cyclone_season, accessed 23 September 2022; Reliefweb, ***Tropical Cyclone Emnati – Feb 2022***, at https://reliefweb.int/disaster/tc-2022-000175-mdg accessed 23 September 2022.

set aside as evacuation centres had their roofs ripped off.[24] Climate change supercharged the intensity and impacts. A World Weather Attribution study found that it made the extreme rainfall heavier. The close succession of storms intensified the impacts and also gave people no time to recover before the next storm hit. And people were already made vulnerable by the conflict in northern Mozambique and by the drought in Madagascar.[25]

Hunger

Hunger is caused by a complex of issues, but the underlying cause is poverty and inequality which, as we argued in gWR 2020, is the product of the political choices made by the global elite: people are made poor. Climate change is also the outcome of political choice and extreme bad weather is now interacting with bad politics to drive up hunger. Oxfam observes, "Extreme weather events have increased five-fold over the past 50 years, destroying homes, decimating livelihoods, fuelling conflict and displacement, and deepening inequality" [2022b: 1]. It looks at the 10 countries with the highest number of appeals for humanitarian aid linked to weather extremes: Somalia, Haiti, Djibouti, Kenya, Niger, Afghanistan, Guatemala, Madagascar, Burkina Faso and Zimbabwe. It finds that "acute hunger has more than doubled in those countries" in just six years, "from 21 million to 48 million people" [2]. Seven of those countries are in Africa.

These countries are collectively responsible for just 0.1% of global carbon emissions but their people bear the brunt of the impacts. Women are particularly exposed to harm. Already, "women eat least and eat last" [7]. They are mostly responsible for collecting water and in times of drought they have to walk further and spend more time getting it. They are then more vulnerable to abuse. And when all else has failed and the overcrowded displacement camps are the last place to go, they are most vulnerable.

24 BBC, ***Cyclone Batsirai: Whole villages swept away in Madagascar***, 6 February 2022.

25 WMO, Climate change increased extreme rainfall in Southeast Africa storms, 12 April 2022 at https://public.wmo.int/en/media/news/climate-change-increased-extreme-rainfall-southeast-africa-storms

South Africa used to be referred to as Africa's largest economy. Having lost that rank to Nigeria, it is now routinely called Africa's most developed economy and is comparatively wealthy. It is also the world's most unequal society. Disgracefully, 25% of the population live below the official food poverty line of R624 a month and hence must be regarded as living in crisis. But the real figure of people living in crisis is much higher. The Household Affordability Index produced by the Pietermaritzburg Economic Justice & Dignity Group (PMBEJD) shows that a basic nutritious diet comes in at about R806 a month, 29% more than the official line. This does not include necessities other than food. On the official statistics, 55.5% of people live below the upper bound poverty line which does include such necessities but similarly undercounts real costs [PMBEJD 2022].

eThekwini in the storm

eThekwini, a sprawling metropolitan municipality centred on the port city of Durban, suffered the worst impact of the April floods. Even in affluent areas, some people lost their homes, mostly because of poor planning approvals driven by avaricious property developers who cleared land of vegetation and created hard surfaces that concentrated runoff onto properties below.

As previously, however, the poorest people were hardest hit. Following the 2019 floods, the shack dwellers' movement Abahlali baseMjondolo (AbM) commented:

> To be poor in South Africa means that you must constantly live with fire, floods and armed and violent evictions and disconnections. You can never really relax. There is constant worry and stress. There is no holiday in the shacks [quoted in gWR 2019].

In the 2022 flood, AbM members "witnessed people, including at least two babies, being taken by the water … Huge numbers of people have lost their homes and all their possessions and are now entirely destitute … Many people

have been unable to go to work."[26] They saluted the emergency services rescue workers who risked their lives to save others. Two weeks later, as they prepared for a prayer vigil, they said, "Many people are still missing. Many are homeless and desperate. People are traumatised and in despair. They do not know who to turn to."[27]

Bad politics made bad weather worse. Just one day before the flood, the ruling ANC elected former eThekwini mayor Zandile Gumede as ANC chairperson for the influential eThekwini region, putting her in the running to return to the mayoral post. Gumede is charged with corruption relating to R320 million in outsourced waste management contracts issued during her tenure and the indictment says that the rewards were spread to secure political support.[28]

AbM observe that "natural disasters become entwined with political disasters, often resulting in devastation for the poor." As in 2019, there was no support from the eThekwini Municipality as the ruling ANC "is only giving support to its members".

> The ANC in Durban are happy to elect gangster politicians … The focus is on support for business rather than on the poor and working class. The ANC does not care about the poor. All they do is to steal from the poor and then murder our leaders when we stand up for truth, justice and dignity.[29]

Twenty four AbM leaders have been assassinated to date. Lindokuhle Mnguni, a leader of the eKhenana Commune, was shot down on 20 August 2022. He was the third activist from the commune to be killed this year. AbM report:

26 Abahlali baseMjondolo, ***The floods have affected the poorest of the poor the most***, Press Statement, 12 April 2022.

27 Abahlali baseMjondolo, ***Abahlali baseMjondolo to hold a Prayer Vigil at the eNkanini Occupation***, Press Statement, 24 April 2022

28 Kaveel Singh, ***Data movement reports, cellphone records and bank statements outline Zandile Gumede corruption case***, News24, 23 August 2022.

29 Abahlali baseMjondolo, ***The floods have affected the poorest of the poor the most***, Press Statement, 12 April 2022.

> The Commune faced severe repression. There were regular arrests and periods of imprisonment on fake charges, people's homes were burnt and there were two assassinations. Ayanda Ngila, another leader of the Commune who spent six months in prison with Mnguni on bogus charges, was assassinated on 8 March. Nokuthula Mabaso was assassinated on 5 May.[30]

People who fled the rising waters found refuge in 135 community, school and church halls designated as 'mass care centres'. Government promised that they would be rapidly rehoused in 'temporary residential units' (TRUs). By August 2022, however, only 134 units had been built in the whole of eThekwini.[31] People who went to City Hall to protest the abysmal conditions in the halls were met with the threat of violence from the police.[32] By November, the province said 1 592 TRUs had been built and 71 mass care centres closed. Most of these halls are in eThekwini and the City said all the centres would be closed and the people rehoused in "decent temporary accommodation" by Christmas.[33]

On the edge of the uMlazi River in Lamontville, people fled from 'temporary' accommodation, sometimes called 'government shacks', as the river burst its bank. Some "had been displaced previously during the April 2019 and October 2017 floods and have not recovered financially or emotionally from that trauma," says community activist Vanessa Burger. People from Mega Village, a shack settlement on the banks of the uMlazi, lost everything in 2019. They were then "housed for two years in … a tent at Tehuis Hostel" before being "dumped in a hastily constructed transit camp that sprang up almost overnight next to the much larger, older transit camp in Lamontville's Gwala Street". It had no water or power but was illegally built by the City in a servitude on top of underground high voltage power lines.

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30 Abahlali baseMjondolo, ***Lindokuhle Mnguni has been assassinated,*** Press Statement, 20 August 2022.

31 Kaveel Singh, ***Despite promises, only 134 temporary housing units built in eThekwini metro 4 months after floods***, News 24, 24 August 2022.

32 Chris Makhaye, ***More than two months later, destitute Durban deluge victims still wait for promised housing***, Daily Masverick, 16 June 2022.

33 ***KZN floods: mass care centres decreasing, flood victims moving into various forms of accommodation, housing units***, Independent on Line, 17 November 2022.

This camp, across the river from Mega Village, was flooded in 2022 and the people found refuge in local halls. In April, speaking as ANC regional chairperson, Gumede told them they would not go back to the transit camp but would be provided with permanent homes. In May, with no housing in sight, the local ANC councillor told them that they must go back to what is self-evidently a disaster zone. After initial resistance, a group of about 100 families, mostly women, children and babies, felt compelled to do so. The 'new' Gwala Street transit camp has standpipes but no electricity or ablutions. It is very damp and floods after moderate rainfall, and people say they can hear high voltage lines humming beneath them at night. In December, a couple of the new TRUs were erected on the site and allegedly given to people who support the councillor. Burger comments that this community has been punished for asking too many questions about money meant for flood relief.[34]

Another group from Mega Village meanwhile occupied an empty Transnet hostel in Montclair but were promptly evicted. Finding nowhere to shelter, people camped on the road. Finally, following court action and an agreement between Transnet and the City, they were allowed back into the Montclair hostel for six months. Conditions are relatively good, with electricity and running water, but the future is uncertain. Others were less fortunate, being crowded into a disused student hostel where some had to sleep in the passages and cooking and ablution facilities were inadequate.[35]

Land, rivers and infrastructure

That poor people end up living in dangerous places – on steep hillsides prone to mudslides as well as on river banks and flood plains – is no accident. They find space on land which is not valued in the market. Durban's apartheid history also has a bearing on where people died. Most deaths were in the urban periphery previously governed by the KwaZulu homeland and handed on to the Ngonyama Trust on the eve of the first democratic elections in 1994. This has left these areas under dual management of the municipality and local

34 Vanessa Burger, ***Displaced again: uMlazi / Lamontville floods***, 12 April 2022; ***Dispossessed flood refugees sent back to flood-prone, damaged Lamontville transit camp***, 6 May 2022; pers com 13 December 2022.

35 Vanessa Burger, per com 13 December 2022.

traditional authorities. The result is that development takes place without urban planning. Further, urban services and the infrastructure of drains and sanitation were neglected under apartheid and are little improved since. This has made these areas prone to landslides and flooding according to Cathy Sutherland of the University of KwaZulu-Natal.[36]

However, where the infrastructure was developed in areas directly under municipal control, maintenance has been neglected. The waste management system is untransformed and deteriorating. There is no serious programme of waste minimisation and recycling was outsourced, in common with all other things 'green', and is failing. The extension of waste removal to townships was also outsourced on the rationale of supporting black business, thus maintaining an unequal system. The charges against Gumede show the results. The neoliberal dogma, handed down from Treasury – that private business is always more efficient – created a hot bed for fast spreading corruption. The consequence of failed management was immediately apparent in blocked drains and rivers dammed up under bridges during the floods.

The supply of potable water to large areas of eThekwini was reduced or cut off in the floods. Major aqueducts carrying raw water to the central Durban Heights treatment plant were washed away and the Tongaat water treatment plant was badly damaged. The first response was to send in water tankers. This immediately ran into controversy when a tanker destined for Tongaat was diverted to the home of the provincial premier, Sihle Zikalala. The water supply to Durban Heights was incrementally restored over the next three months. Tongaat was still without water five months after the floods. According to the Tongaat Civic Association (TCA), there was little help from the city beyond three water tankers for a population of 40 000. Gift of the Givers drilled a number of boreholes at schools, hospitals and places of worship, a local business set up a temporary plant for non-potable water (for washing, not drinking), and local volunteers set up water distribution networks. In August, the TCA organised a major protest against the apparent indifference of government. It

36 Julia Evans, ***Early warning systems on floods are not enough; climate crisis literacy saves lives – experts***, Daily Maverick, 7 June 2022.

was accompanied by writing letters to the city, going on a national media blitz, protesting and issuing legal threats. They first secured a temporary diversion of water from a pipeline running past Tongaat to supply affluent areas to the north. They also forced eThekwini to prioritise the restoration of the water treatment works which was finally commissioned on 1 November.[37]

The sewerage system suffered major damage from the floods but this was in part because it was already falling apart. In January 2022, with the beachfront still packed with new year holiday makers, a dark stream of sewage flowed from the Northern Waste Water Works into the Mgeni River and thence out to sea. The northern works is a major sewerage plant in this part of the city and was once well maintained and staffed, with its own offices and laboratories. The facility is now more or less abandoned. Even security fencing is broken down, opening the gate to what a City spokesman called "unceasing vandalism" of pump stations.[38] Apparently fearing bad press in the holiday season, City officials lied about the water quality and blamed a plume of visibly dirty water on water hyacinth washed down by recent rains. Independent sampling showed e-coli levels at 81 000 cfu/100ml on a scale where below 250 cfu is regarded as safe and 500 cfu is bad.[39]

The habit of lying has carried over into the post-flood period, even as the e-coli count at the Northern Works ranged up to 24 000 000 cfu, fish washed up dead in the Mgeni estuary and the Isipingo lagoon, and raw sewage flowed from pump stations and sewerage works across the city. In October, with the holiday season in mind, the City promised "an aggressive plan" to clean up. However, a total overhaul of the sewerage infrastructure was needed. Disaster relief funding from Treasury had just then come in but was not enough. "While most welcome, this funding of R184-million is inadequate, so we have reprioritised our budget to fast-track these much-needed repairs. The estimated cost of the

37 Benita Enoch, ***135 days without water: KZN community at breaking point***, GroundUp, 24 August 2022; Des Erasmus, ***This is how Tongaat got running water after 200 dry days***, Mail & Guardian, 17 October 2022.

38 Yogashen Pillay, ***Concerns as E coli closes some beaches***, The Mercury, 10 January 2022

39 Tony Carnie, ***eThekwini accused of deliberately misleading the public over sewage-polluted beaches***, Daily Maverick, 9 January 2022. A cfu is a 'colony forming unit'. So the measure is for the number of cfus in every 100 millilitres (one tenth of a litre) of water.

repairs is R160 million for pump stations and over R300 million for water treatment works," said Mxolisi Kaunda, the metro mayor.[40]

By December, sewage was still flowing and the City was trying publicity stunts – the mayor took a swim at one of the few beaches that were safe on that day – but its credibility was at zero. Many of the beaches were still not safe depending on the direction of wind and currents at any particular time. This is extreme but not new. "The failure of water infrastructure and wastewater treatment works has been an ongoing issue over the past two decades, escalating every year," says Anja du Plessis of the University of South Africa. And water quality has declined over the same period. The causes are obvious: underfunding, a lack of human capacity, failure to maintain the ageing infrastructure, and 'poor governance' – with little accountability, misappropriation of funds and managerial apathy.[41]

Along with the sewage and litter, chemicals, heavy metals and other toxics are also carried downstream and out to sea. In July 2021 widespread rioting was instigated following the jailing of former president Jacob Zuma. A warehouse belonging to United Phosphorus Ltd (UPL), an Indian transnational agrochemicals producer, was torched on the night of 12 July. The chemical fire raged for two days and smouldered for another week, filling the north Durban air with toxic smoke while a cocktail of poisons spilled into the Ohlanga River. The firefighters had no knowledge of what was in the warehouse and, for over a month, UPL refused to release an inventory. When investigative journalists dug out the information, they found that numerous very toxic chemicals, several of them banned for use in other countries including India, were stored there in large quantities, "many times more than the warehouse could legally hold without environmental authorisation". In short, UPL – which has a track record of taking environmental short cuts in India – was operating unlawfully. Had the proper authorisations been carried out, the firefighters would have

40 Tony Carnie, ***Big stink as eThekwini hides its Durban beach water lab results***, Daily Maverick, 4 September 2022; ***Durban pledges 'aggressive plan' to clean up beach sewage pollution crisis before Christmas holidays,*** Daily Maverick, 6 October 2022.

41 Anja du Plessis, ***Durban coastline: sewage polluted beaches pose threat to holiday makers and the environment***, The Conversation, 11 December 2022.

known what they were walking into and other safeguards might have mitigated the pollution.[42]

Following the incident, no air sampling was done until four days later. An atmospheric impact study, released in February 2022, had to model evidence based on what 700 burning chemicals would emit but, in the absence of direct sampling data, serious pollutants such as dioxins and furans were not accounted for. The study found that most people in the neighbouring suburbs were exposed to pollutants that would cause temporary symptoms, "but a significant number experienced levels capable of causing 'irreversible or other serious, long-lasting adverse health effects'". However, government did not establish a comprehensive health surveillance system immediately following the incident and has not done so since. Consequently, said Rico Euripidou of groundWork, health impacts are going undetected. They would likely include an increase in heart attacks among the elderly or miscarriages in pregnant women.[43]

The water pollution killed just about all aquatic life in the Ohlanga estuary, just north of Umhlanga, and forced the closure of local beaches for months, interrupting the livelihoods of small scale fishers as well as the recreation of residents. Tonnes of dead fish and contaminated sediments from the river had to be removed to a toxic dump. Nevertheless, the soils below the warehouse and the sediments in the estuary are still contaminated with organic chemicals and metal toxins which are mobilised with even moderate rainfall. In the April flood, a pollution retention pond built below the warehouse following the fire, overflowed. The pollutants were said to be diluted but they flowed into the Ohlanga even as the toxins in the soils and sediments were again mobilised and washed into the sea.[44]

42 Susan Comrie and Dewald van Rensburg, ***Here it is: The toxic stockpile of chemicals in torched Durban warehouse***, AmaBhungane, 17 August 2021; Tony Carnie, ***Minister Barbara Creecy pledges clampdown on South Africa's hidden toxic chemical storehouses after UPL disaster***, Daily Maverick, 3 October 2021; Rico Euripidou, ***Who bears the costs?*** groundWork Newsletter Vol.23, No.3, September 2021.

43 Susan Comrie, ***UPL chemical disaster: Toxic smoke finally identified***, AmaBhungane, 14 February 2022.

44 Thabiso Goba, ***KZN flood: Chemical depot's dam with toxins overflows***, News24, 12 April 2022.

On the other side of town in south Durban, the flood waters inundated Sapref, the oil refinery owned by BP and Shell, when the Umlaas Canal burst its banks. Some 130 workers had to be airlifted out. The refinery was nearing the end of a process of closing down and said the hydrocarbon content in the refinery units was at a minimum. Nevertheless, some units still tripped out, resulting in flaring through the night of 12 April. The flood waters flushed out refinery waste dams and carried the contents, said to be between one and two million litres, out to sea. Some part of it then washed up to leave a line of oil sludge on the beach at Isipingo just south of the refinery. The refinery said it had cleaned up but local people say the beach is still contaminated. On site, some very large tanks were left leaning at precarious angles as if they had lost their foundations. The refinery said they were 'almost' empty and an assessment "showed no major leaks from storage tanks".[45] So perhaps there were 'minor' leaks. The flood will also have flushed less visible toxics from the soil contaminated with the residues of 60 years of operation.

Slow money

In the week following the flood, Ramaphosa declared a national state of emergency and said that the Treasury had made R1 billion "immediately available". He also announced that the Auditor General and Treasury would audit flood relief spending in real time. He said it was "a great source of shame" that public debate was focused on whether disaster funding would be misappropriated.[46]

Treasury's 'immediate' was a long time coming. In June, people from the mass care centres protested at the City Hall, saying that conditions at the centres were deteriorating and donations and relief funding was not reaching them. At the same time, provincial and City officials said that the billion promised from

45 Suthentira Govender, ***Sapref continues contaminant cleanup a month after KZN floods***, Times Live, 16 May 2022; Tony Carnie, ***Oh crap! Prolonged closures likely for Durban's flood-polluted beaches***, Daily Maverick, 12 May 2022.

46 Thabi Madiba, ***Treasury, Auditor-General to conduct real-time audits on flood relief funds***, Engineering News, 26 April 2022.

Treasury had not materialised. Sipho Hlomuka, KZN MEC for Co-operative Governance and Traditional Affairs, said Treasury "will ask us to reprioritise. However, we have reached our limit. We can't reprioritise our budget any further."[47]

In August, the Auditor General, Tsakani Maluleke, released her first 'real time' audit report and castigated government for its slow response. Of R2 billion budgeted, only 6% had been spent by the end of July. But money was not the only issue. Government's capacity to respond was weakened by poor controls, weak pre-existing systems and poor inter-governmental coordination. It did provide temporary relief but lacked urgency in assessing damage and needs. In the Eastern Cape, posts were left vacant and the province had yet to address the impact of previous disasters. There was also a lack of capacity in KZN, where poor project management meant contractors were not monitored for delivering quality services on time. In short, and despite prior experience, government was not prepared. Maluleke concluded, "Government's priority should be to urgently strengthen its disaster management capacity and capabilities, as disasters such as these floods are becoming more common due to climate change."[48]

Finally, in November, the KZN Treasury announced receipt of R1.1 billion from National Treasury against R5.3 billion requested. Over half of it, R589 million, was allocated to the provincial Transport Department to fix roads, R326 million went to Human Settlements for constructing TRUs, R95 million to Education to fix schools, and R48 million to Social Development to support people in the mass care centres. The departments also reprioritised another R3.1 billion from their own budgets.[49] The overall cost of flood damage in KZN has been variously put at R17 and R25 billion.

47 Khethukuthula Xulu, ***Treasury called to urgently release funds for KZN flood disaster relief***, The Mercury, 1 June 2022.

48 Victoria O'Regan, ***Auditor-General report: Only 6% of emergency relief funds for KZN flood victims spent,*** and '***Far too slow' — AG slams government's epic failure to respond to floods in KZN and Eastern Cape***, Daily Maverick, 31 August 2022.

49 Address to KZN legislature by MEC for Finance, Neliswa Peggy Nkonyeni, On 2022/23 Adjustments Budget, 24 November 2022.

Timeline of deceit

America's oil and gas industry knew in 1959 that CO_2 emissions from burning fossil fuels would lead to climate change and that the impacts would be devastating. Some insiders suggested they might look at alternatives to fossil fuels but, as the evidence of climate change started to accumulate, the industry turned to disinformation. The timeline below, based on the work of Inside Climate News and Benjamin Franta, tells the story.[50]

1958: Mauna Loa Observatory, run by US National Oceanic and Atmospheric Administration, starts measuring CO_2 concentrations in the atmosphere. The observatory was founded by Charles Keeling, so the measurements are represented in the 'Keeling curve'. It started at 315 ppm and is now at 420 ppm. The pre-industrial concentration was about 280 ppm.

1959: At the American Petroleum Institute's (API) "Energy and Man" symposium, held at Columbia University, big oil corporate bosses are told what that meant by Edward Teller, father of the hydrogen bomb and scientific hero for right wing America: "Whenever you burn conventional fuel, you create carbon dioxide. … Its presence in the atmosphere causes a greenhouse effect. … a 10 per cent increase in carbon dioxide will be sufficient to melt the icecap and submerge New York [and] all coastal cities …"

1963: The US National Science Foundation warns that rising CO_2 emissions will cause global warming.

1965: President Johnson's Science Advisory Committee repeats the warning. At the API annual meeting, API president Frank Ikard notes the scientists' conclusion: "… there is still time to save the world's peoples from the catastrophic consequences of [CO_2] pollution, but time is running out".

1978: Exxon starts its own studies on CO_2.

50 Benjamin Franta, ***What Big Oil knew about climate change in 1959***, Greenbiz, 3 November 2021; ***On its 100th birthday in 1959, Edward Teller warned the oil industry about global warming***, The Guardian, 1 January 2018; Neela Banerjee, ***Exxon's Oil Industry Peers Knew About Climate Dangers in the 1970s, Too***, Inside Climate News, 22 December 2015.

1979: API forms secret CO_2 and Climate Task Force composed of senior scientists and engineers from all the supermajors. They share work and write a background paper for API members confirming that emissions are driving climate change and the impacts will become noticeable in the next few decades.

1982: Exxon internal report gives accurate predictions of global warming and impacts. It is widely circulated to Exxon management but they keep it as an inhouse secret. Investigative journalists from Inside Climate News dig it out in 2015.

1983: API puts lobbyists in charge of the CO_2 and Climate Task Force.

1986: Shell internal report, also kept secret, shows emissions driving climate change with severe impacts forcing whole countries to be abandoned.

1989: API joins with other industry associations to form the Global Climate Coalition (GCC) to dispute climate science and start funding climate denial. Through the 1990s, they promote the view that there is no scientific consensus, that global warming is uncertain and/or not necessarily driven by burning fossil fuels. They also start using smear tactics against climate scientists.

2001: GCC shuts up shop as industry members leave because its positions are untenable and they are getting flack from climate activists. But GCC has a last victory when US President George Bush pulls out of the Kyoto Protocol and maintains climate denial through to 2009.

2010s: The API argues that "fossil fuel development and environmental progress are not mutually exclusive" while focusing debate on economic growth requiring fossil fuel expansion.

2022: The API says its members "commit to delivering solutions that reduce the risks of climate change while meeting society's growing energy needs" and they will "reduce greenhouse gas emissions through industry-led solutions".[51] The message may change but the basic logic remains to prevent by any and all means possible government regulation enforcing emission reductions. The industry has invested very little in 'industry-led solutions', just enough to serve for public relations, and the solutions lack credibility.

51 https://www.api.org/news-policy-and-issues/climate-change at 20 December 2022.

December 2022: Sixteen municipalities in Puerto Rico bring racketeering charges against seven big oil corporations and three coal corporations amongst others for conspiring to deceive the public. Puerto Rico is severely affected by climate change. In 2017, the municipalities were hit by two hurricanes in a row – Irma and Maria – killing thousands of people and causing widespread destruction.[52]

Big oil has done very nicely from the decades of delay. Since 1970, the oil and gas industry has captured $2.8 billion a day in unearned profit for petrostates and companies, according to a study by Aviel Verbruggen, an energy and environmental economist at the University of Antwerp. That adds up to $52 trillion. "They captured 1% of all the wealth in the world without doing anything for it," says Verbruggen. Enough to "buy every politician".[53]

Russia's invasion of Ukraine has lifted profits to record levels. In the first nine months of 2022, profits of the private supermajors were expected to come in at around $173 billion, up from $65 billion for January to September 2021. ExxonMobil took $43 billion; Shell $30 billion; TotalEnergies $29 billion; Chevron $27 billion; BP $21 billion; ConocoPhillips $14 billion; Eni $10 billion. A windfall tax in the UK amounted to little more than window dressing, and in Europe, a windfall tax more or less equalled subsidies.[54]

Industry-led solutions, meanwhile, are clearly focused on fossil fuel expansion and further profit, not on the climate. Globally, private and state-owned oil and gas corporations are driving a massive expansion with 195 'carbon bomb' projects – each with lifetime CO_2 emissions of one billion tonnes or more – planned or under development. Together, emissions produced from these projects will come to 646 billion tonnes ($GtCO_2$).[55] This does not include new

52 Nina Lakhani, ***Big oil is behind conspiracy to deceive public, first climate racketeering lawsuit says***, The Guardian, 20 December 2022.

53 Damian Carrington, ***Revealed: oil sector's 'staggering' $3bn-a-day profits for last 50 years***, The Guardian, 21 July 2022.

54 Jasper Jolly and Jessica Elgot, ***Profits at world's seven biggest oil firms soar to almost £150bn this year***, The Guardian, 27 October 2022

55 Damian Carrington and Matthew Taylor, ***Revealed: the 'carbon bombs' set to trigger catastrophic climate breakdown***, The Guardian, 11 May 2022.

coal, but should be added to 936 $GtCO_2$ remaining in existing coal mines and oil and gas wells.[56] That comes to 1 582 $GtCO_2$.

These numbers compare with a 'carbon budget' from January 2020 of about 500 $GtCO_2$ for a 50% chance of coming in at 1.5˚C above the preindustrial temperature, and 900 $GtCO_2$ budget for an 83% chance of coming in at, not 'well below', 2°C [IPCC 2021: 38].[57] The budget is being used up by annual emissions of about 42 $GtCO_2$ (less about 2 Gt in the Covid year of 2020). So, 2023 starts with 376 Gt left in the budget for the half chance of limiting warming to 1.5°C.

Climate change is already dangerous at 1.2°C. It will be much more so even at 1.5°C while 2°C, as James Hansen et al [2008] warned around 14 years ago, is a recipe for disaster. This year, a group of leading climate scientists have assessed the status of 16 major 'tipping points' – that is, the points at which change in a major element of the climate system becomes irreversible and self-perpetuating. A problem with tipping points is that we may cross them before we know it and the study by David Armstrong McKay et al [2022] shows that five critical tipping points will likely be crossed at about 1.5°C but may have been crossed already. These include:

- The collapse of both the Greenland ice sheet and the West Antarctic ice sheet, which will result in accelerating sea level rise and, over many decades, add several metres to sea levels;
- The die off of tropical coral reefs, which will have a devastating impact on marine life;
- The abrupt thawing of the northern permafrost, releasing immense volumes of CO_2 and methane into the atmosphere and greatly accelerating climate change;

56 Kelly Trout, Greg Muttitt, Dimitri Lafleur, Thijs Van de Graaf, Roman Mendelevitch, Lan Mei and Malte Meinshausen, 2022, ***Existing fossil fuel extraction would warm the world beyond 1.5°***, Environ. Res. Lett. **17** 064010

57 The IPCC's Special Report on 1.5 increased the carbon budget by about 300 Gt over that given in AR5. It said this was based on "updated understanding and further advances in methods". The budget does not include climate feedbacks from melting permafrost or methane release from wetlands [SPM 16].

- The collapse of the Labrador Sea current, a very cold current that flows south along the Canadian coast to meet the warm Gulf Stream flowing north. It is one of the drivers of the global system of ocean currents.

The study did not look at how crossing one tipping point might trigger others or combine to accelerate global heating. The scientists comment that earth may have already left a 'safe' climate state but it remains critical to fight to stop "every fraction of a degree" of additional warming.[58]

58 Damian Carrington, ***World on brink of five 'disastrous' climate tipping points, study finds***, The Guardian, 8 September 2022.

2 A nationally determined consensus

'We don't understand or want your just transition'

On 3 November 2022 around 100 people filled the Koornfontein Laerskool (primary school) hall to listen and respond to plans to decommission Komati coal-fired power plant. There were many plans: to implode the four cooling towers, to keep certain buildings for a technical college, to install up to 150 MW of solar power on where crop fields currently are, to install up to 70 MW of wind turbines along the boundary of the Komati property, and to install a 150 MW of Battery Energy Storage System (BESS). The ash heap would be covered to stop the ash blowing, while some of the ash would be sold. There were maps of these plans[59] and officials from Eskom on hand to explain in whichever South African language you preferred.

The Komati power station, which started producing electricity in 1961, would be the first in the current Eskom fleet to be decommissioned and repurposed. It would be followed in the next five years by Hendrina, Camden and Grootvlei stations.[60] Consultants explained that these power stations were old and breaking down which led to loadshedding; it would be too expensive to fix them, and it would also be too expensive to install scrubbers to bring the sulphur dioxide emissions within legal limits to protect the health of people living on the Highveld. In fact, the coal-fired power stations would have to be shut down as part of a deal with international climate financiers in which South

59 See Eskom Holdings, Komati Power Station Solar Photovoltaic, Battery Energy Storage System, Wind Energy Facilities and Ancillary infrastructure. Draft Environmental and Social Impact Assessment report

60 Denene Erasmus. Eskom starts decommissioning old coal plants https://www.businesslive.co.za/bd/national/2022-09-25-eskom-starts-decommissioning-old-coal-plants/

Africa would drastically decarbonise its economy, starting with a transition of the coal based electricity system to one based on renewable energy.

The people in the Komati Laerskool hall were scared and outraged. They were worried about how they were going to survive the shutdown and how they would find work and earn money to sustain themselves "after coal". The coal mines around Komati had already started shutting down, and people had already lost jobs. They were not convinced that it was necessary to shut down coal. This transition was the agenda of overseas forces, they argued, and the consultants were talking from a white, elite, colonial perspective.

The consultants shook their heads in disbelief. All these questions were 'political' and had no place in their meeting. With some charity, the questions could be interpreted as concerning the socio-economic conditions, which was the subject of another report, and a completely different work stream and another set of consultants. That report – on socio-economic conditions – had been released the day before, on the 2nd November. Nevertheless, argued one consultant, there had been consultations, that is to say interviews and focus groups, with local households before the report was written, so how could people say they knew nothing about the transition?

But that was the crux of the matter: the people in the spotlight of the transition, nationally and internationally – see below – were saying that they did not understand what the so called "Just Transition" was for, why it had to happen and, in particular, how it would affect them. And they did not want it.

There was a lot to know about the transition, and it was complex. What the people in the hall were immediately confronted with was the outcome of an Eskom specific planning process with little consultation. This had two parts: the plans for the decommissioning and repurposing of the power station, and the plans to deal with the socio-economic impact of the power station closure. But both of these were supposed to fit into a much broader, national process for which the Presidential Climate Commission (PCC) was responsible. The appointment of the commission was agreed to at the Presidential Jobs Summit in October 2018. Two years later, 22 commissioners were appointed to the commission (on 17 December 2020). The PCC was preceded, in 2018 and

2019, by a consultation process for the revision of Chapter 5 of the National Development Plan – Transitioning to a low carbon economy – as well as a history of developing resources for the transition (and false starts) as detailed further on in this chapter.

The Commission started work in February 2021, with representatives from a broad range of stakeholders – including communities, workers, trade unions and civil society, business and government.[61] Their work was to construct and maintain a national consensus for the just transition, and monitor that process. This process was meant to bring South Africans to an understanding of the need for the transition, the pathways that it would follow, and how to deal with people disadvantaged by the change, such as workers losing their jobs and the fate of businesses – including very small scale informal businesses – as local coal economies shut down. In other words, what the fate of places like Komati would be.

We take up the story of the Komati shutdown in a later chapter, Chapter 6. For now, we look at the contours of the huge transition process that South Africa is going through in the light of climate pressures and the politics informing it.

A nationally determined consensus

In 2021 and 2022 the South African Just Transition debate finally got going in all seriousness. President Ramaphosa tasked the new PCC with advising him on South Africa's climate response and facilitating a common understanding of a just transition.[62] The PCC declared on its website that it would build a social partnership around the just transition, on a solid foundation of science and research, and was committed to "improving the lives and livelihoods of all

61 The community representatives consisted of prominent individuals like Dr Bonwani Mwale "community activist and philanthropist from Mpumalanga" and Ms Tsakani Nkambule, "entrepreneur, community builder, motivational speaker and best-selling author". See https://www.climatecommission.org.za/commissioners.

62 https://www.thepresidency.gov.za/press-statements/presidential-climate-change-coordinating-commission-appointed. The president did not mention ministers, but they joined in the work of the commission anyway, testimony that they view it as an important forum. The minister of health has not been among them.

South Africans... particularly those who have been historically marginalised, or those who will be most affected by the transition in the years ahead". They also committed to working in an open and transparent way with all stakeholders.[63]

The commission, with the support of civil society and labour commissioners, did start out with splendid transparency – for those who were able to go on line. Almost all meetings were available on line live. The process was surrounded by a flood of research papers, webinars and dialogues, as well as engagements in working groups – with one important exception: the financial plan that the South African government took to the Conference of the Parties (CoP) 27 meeting in Egypt at the end of 2022.

In this chapter we track the work and the implications of decisions and agreements made by the PCC. We start by exploring socio-technical transition theory, including how it helps us think about purposive transitions and the importance of policy resources: policy agendas, clear policy alternatives, the knowledge to support it, monitoring, evaluation and agenda setting, as well as participation in national debates.

Our objective is to understand the nature of the South African transition as it is developing**.** Two socio-technical systems in transition feature prominently: the coal and electricity systems which, while overlapping, have fundamentally different trajectories. The future for coal lies in winding down, regardless of the profits that can be made in its final days, while the electricity system is set to go through a transformation and expansion as it is loosened from coal and state ownership in generation. Coal use in electricity is the main reason for the country's extraordinary carbon intensity. Historically coal and electricity were closely tied together at the heart of the Southern African minerals energy complex, whose underlying dynamics continue to play into the transition: the colonial, extractivist nature of the South African economy and the injustices and dangers of capitalism; gender injustice and gender based violence; the desperate situation of youth denied opportunities to use their talents; and the many dangerous barriers being crossed in natural systems, beyond the singular preoccupation with climate change.

63 https://www.climatecommission.org.za/our-work

A host of other sectors will be affected by the decarbonisation imperative, or are important in terms of a transformative transition: socio-technical systems involved in transport, heavy industry such as steel and cement manufacture, food production, health, local government services, disaster management and adaptation.

The PCC created an opportunity to overcome the decades' long stalemate between the Department of Minerals and Energy (DMRE), the promoters of coal, and the Department of Forestry, Fisheries and Environment (DFFE, previously DEAT), responsible for regulation and the custodians of South Africa's climate change politics since 1994. As a junior department, in practice it was subordinated to the DMRE. During this stalemate, however, the DFFE developed a South African climate response system [see Lukey 2020 and discussion below], the labour unions developed positions on a just climate transition for workers, and there was extensive work on renewable energy policy alternatives by groups such as groundWork, Earthlife Africa, WWF and Greenpeace, as well as academic work. In the two years before the PCC, there was a consultation process to revise Chapter 5 of the National Development Plan, which in 2012 had already announced the need for a just transition. At the start of the PCC's work, there was also a sizeable national energy policy community, including analysts who held progressive perspectives, and a wealth of resources that could be used for the transition.

The PCC established – or in many cases consolidated – a strong evidence base, leaning largely on research by the Trade and Industrial Policy Strategies (TIPS)[64] South African think tank, which works closely with the Department of Trade and Industry. The PCC established an expansive website with knowledge resources on the transition. This included earlier work like the Sector Jobs Resilience Plans, aimed at protecting vulnerable groups that may lose their jobs or livelihoods in the coal, metals, petroleum, agriculture and tourism value chains [see discussion below] as a result of climate change impacts, or as a result of the transition to alternatives.

64 https://www.tips.org.za/

Box 1: What are policy communities?

Policy communities consist of policy specialists with expertise in a specific sector (such as energy), who regularly share information and analysis of policy options in this area. These communities share knowledge resources, influence each other and also influence public opinion and the development of policy alternatives – in other words policy plans and scenarios [see below for explanation of policy cycle]. Policy communities may be divided on what options to follow and why, and often debate these issues in public. Policy communities may or may not include government officials working on policy. Policy communities are useful to state actors as they consolidate and articulate broad policy arguments, and in return policy communities gain influence on the development of policy alternatives beyond policy agenda setting. The South African energy policy community covers a wide range of positions, with business friendly analysts in the majority, but includes strong progressive elements.

Based on Marquard 2006. The Origins and Development of South African Energy Policy. Unpublished PhD UCT.

As commissioners engaged, various topics were surveyed, including gender and youth perspectives. The PCC produced a number of important outputs. By the middle of 2021 – in the April and July PCC meetings[65] – a parade of leading businesspeople expressed their support for the transition, and cast it in the form of ecological modernisation: an energy intensive reindustrialisation of the country, which would include a large build-out of renewable energy infrastructure, mining for renewables, a renewable energy value chain, electric vehicles and a whole new industry based on hydrogen. This report explores whether this means that the minerals energy complex is reinventing itself via renewable energy.

Then, the PCC turned to the Nationally Determined Contribution (NDC), originally drafted by the DFFE, and infused it with a little "more climate ambition" – but not enough, in the view of a number of civil society

65 See https://www.climatecommission.org.za/events for recordings of and resources for the meetings of 30 April and 30 July 2021.

commissioners. The South African government accepted the new version and presented it at CoP 26 in Glasgow, Scotland, at the end of 2021, where it helped – together with Eskom's work and negotiations on finance – to trigger an offer for climate finance assistance from the UK, US, Germany, France and the European Union, dubbed the International Partners' Group (IPG). This process is pursued in detail in Chapter 4 of this report.

A third output was to produce the JTF document through a process of debate and consultation, culminating in a summit in May 2022. (This is covered in more detail in the next chapter, Chapter 3.) This document was accepted by cabinet, and published in July 2022. This was the building of a national consensus in action. The JTF frames a discursive field, which was decisively shaped by the definition of what "justice" is in a just transition on the one hand, and the requirements of decarbonisation on the other. It took as a starting point the original international trade union definition of compensating for the burden of losing or moving jobs as a result of decisions made for the good of society (for example, moving to a green economy). But it added to it three important justice dimensions, namely: fair process (procedural justice); fair sharing of benefits and burdens (distributive justice); and dealing with – that is fixing – the legacies of the past (restorative justice).

A fourth output was developed not so much by the PCC – PCC commissioners complained publicly about being excluded – but by another task team outside of it and also reporting to the president: the Presidential Climate Finance Task Team (PCFTT). This task team created a plan and budget for the just transition amounting to R1 500 billion (R1.5 trillion) and negotiated with the IPG on how their $8.5 billion (R130 bn) should be spent. The plan allocates about half the budget to transforming the South African electricity system, with the rest going to electric vehicles, green hydrogen and supporting municipalities in the transition [see details in Chapter 4]. The PCC and its commissioners were not given access to the document, or an opportunity to discuss it before it was accepted by cabinet and presented at CoP 27 in early November 2022. It was the first serious blow against the developing national consensus process, and it made it very clear that money – climate finance, finance capital – would not be subordinated to the PCC process or to questioning by civil society and

labour. It revealed where true public power lies: with a neoliberal Treasury.[66] The PCFTT's plan is discussed in Chapter 4.

Both the JTF and the climate finance deal are arenas for intense contestation about the future of the country and the way in which transitions in the South will be shaped, as South Africa is part of a cohort of carbon heavy countries – including Vietnam, Indonesia and India – whose transitions have attracted the attention and potential funding of developed nations.

Transition in theory

The 'just transition' has been commonly accepted by all participants in the South African transition as describing the project they are working on. Many commentators have pointed to the contested nature of the concept and its insincere adoption by many [Cock 2019]. The 'just transition' covers at least two distinct dimensions: (1) a decarbonisation of the economy, in which sectors like electricity, mining, transport and food reduce their carbon emissions; and (2) a societal transformation that is just.[67] The first is a technological transition from fossil fuels to renewables, and the second is a transformation in society that both accompanies and determines the technological transition. To pick these very different but closely related dimensions apart, and put them back together again in order to understand what we are dealing with, we can turn to a body of theory that has developed very fast over the past two decades to understand what happens in socio-technical transitions – whether just or not.

Transition theory starts with the insight that technologies – like coal-fired electricity or the internal combustion engine – are not socially and politically neutral, but socially constructed and therefore reflect the agendas – and the power – of the people or sectors of society who construct them rather than

66 See Baker et al, 2014, for an account of how Treasury intervened on the side of capital rich multinationals in the procurement process for RE. The treasury has also recently become more powerful because of its saviour role in the state capture drama.

67 These are not necessarily separate in the final analysis. Schot and Kanger (2018) for example, talk about "Deep Transitions" in which a number of systems change in the same direction over a longer span of time (like 200 or 300 years) because they are influenced by the same broad set of dynamics.

being the outcome of "rational" choices between neutral technologies. The history of the bicycle shows this. The first bicycles, penny farthings, had a huge front wheel and a little back wheel and were very difficult to ride. This difficulty was welcomed by aristocratic young men who used these contraptions to show off their skills to young women of their class. But as bicycles became a working class means of transport, their shape changed to support easy and reliable use. Bicycles went through other transitions, as their use expanded into sports racing, with a different set of requirements [Bijker, 1995].

Society and technology are tightly interwoven. Each technology is brought into being and continuously supported by a whole assembly, network or configuration of social actors, institutions, rules, procedures and objects or things, as well as infrastructure in the landscape.[68] Motor car transport, for example, in the shape of the internal combustion (ICE) vehicles, depends on a network of roads (which originally had to displace other means of transport and pedestrians), traffic cops and driving licences. It depends on the manufacture and maintenance of vehicles, and the import, refining and distribution of petroleum through a vast network of boreholes, pipelines, oil ships at sea as well as oil spills and, more often than not, wars and/or installing puppet dictators to keep the oil flowing [Coll 2012].

Modern society is full of and dependent on these socio-technical-ecological systems, such as electricity, transport, water, industrial food and communication systems. These systems have histories, with the result that there are layers of technologies, not only archeologically speaking but also in the sense that a new technology may be critically dependent on one that had emerged earlier. Information and communications technology, for example, relies on electricity supply – and as we know can be interrupted and rendered useless in the absence of electricity during loadshedding [Schot and Kangur, 2018].

68 The term 'soft infrastructure' is sometimes used for this, but fails to capture the heterogenous or mixed nature of the 'support system' of a technology regime.

Technology, society and nature

These technologies are in intimate relationships with nature. They draw resources from nature, such as coal and oil, and in the process reconstruct nature to suit these technologies, as well as, often carelessly, creating wastelands such as Johannesburg's radioactive mine heaps created by the gold and uranium mining industry, and ongoing processes of acid mine drainage in the dolomitic rock underlying parts of the gold fields on the Rand [Coetzee et al, 2010].

Some archaeologists are now studying this "reconstructed nature", calling it the "technosphere", consisting of "our complex social structures together with the physical infrastructure and technological artefacts supporting energy, information and material flows that enable the system to work, including entities as diverse as power stations, transmission lines, roads and buildings, farms, plastics, tools, airplanes, ballpoint pens and transistors" [Zalasiewicz et al, 2017: 10]. The technosphere extends underneath the earth, into the oceans, and into the sky with satellites and space debris. It is huge: "preliminary estimates suggest a technosphere mass of approximately 30 trillion tonnes (Tt), which helps support a human biomass that, despite recent growth, is ~5 orders of magnitude smaller" [2017: 9]. It has become difficult to distinguish "nature" from "human made nature". Nature is thoroughly socialised. It is...

> ... *pervaded by the social*, by the thousand and one socio-technical interventions that are historically situated… above all a 'second nature' fostered by powerful institutions (the great networks of capitalism, technological systems, military apparatuses, etc.) which does not rule out the alterity of nature nor the fact that the Earth is not just a social construct.

And equally,

> *Societies [are] pervaded by nature*, in which social relations and cultural norms are structured and rigidified by mechanisms that organise metabolisms of matter and energy, and that govern the social uses of

> nature. Far from surrounding the social, the environment traverses it, and the history of societies, cultures and socio-political regimes cannot ignore the flows of matter, energy and information that frame them [Bonneuil and Fressoz 2015: 36].

The result is that we are always talking about technology, society and nature at the same time, as the one is unthinkable without the others. To emphasise that it is technology, answering to social needs and power structures, which mediates society's relationships to nature, some authors [Ahlborg et al, 2019] refer to socio-technical-ecological systems, or STES. Properly considered, leaving out the ecological dimension from understanding and decision making is an intellectual choice to deny the close interweaving of society, technology and nature, and a political choice to disregard or undervalue nature and often non-monetary aspects of society with it.

For example, analysis of the 'coal value chain' [see Makgetla and Patel 2021], currently part of both the coal mining and coal burning electricity systems, counts actors and activities that produce monetary value or, put differently, allows the operators to extract value by costing certain activities (selling coal, paying for inputs like machinery, paying labour and paying dividends to owners of capital) while treating the costs imposed on others – for example the health costs of air pollution impact on people living on the Highveld, the impact on water (acid mine drainage) and on soil (e.g. acid deposition and degradation of topsoil removed for mining) – as 'externalities', or not part of the real costs. In the STES perspective, these 'externalised' costs are part and parcel of the system and its core production processes. It recognises that externalities are the result of an active process of externalisation of costs. The government, as representative of the public interest, can choose to internalise some of these costs onto the books of the business: for example requiring mines to put funds aside for rehabilitation, to spend money on water treatment before releasing it to the rivers – where the cost of bad water is then imposed on other parties, including "nature" and people who most immediately use nature, such as farmers. The costs of climate change are being slowly internalised into decision making, and the PCC is part of that process. In some cases, however,

these measures are so weak, for example Treasury's carbon tax, that they are no more than a pretence.

An example is the Treasury's carbon tax, which claims to internalise externalities but carefully avoids doing so. Government plays an important role in governing the boundaries within which STS operate, as well as influencing the hierarchies within them. How much and how effectively government regulates and which costs it regards as externalities, depends on the degree to which the political system is responsive to people's agendas, as well as to the resources that regimes can muster in contestations about these systems.

We can think of a socio-technical-ecological regime as consisting of a core of decision making and resource control – in other words, a powerful core with the ability to maintain a socio-technical-ecological regime – and other parts that are more peripheral to the regime, such as occasional users or clients of a technology who are simply "technology takers" [Smith et al 2005]. However, these technology takers can change their position by becoming organised and exerting pressure on the regime when provoked into action [Chilvers and Longhurst 2016]. This is what has happened with Eskom as loadshedding has become a daily, and disruptive, occurrence.

A big part of understanding the SA transition is to see how the electricity and coal systems are separating from each other as the electricity system is decarbonised and coal mining is phased out. Historically, cheap and dirty coal, subsidised by cheap and dangerous labour, and careless waste and pollution management, has been at the heart of the minerals energy complex. Migrant labour, with its strict discipline of labour migration and segregation of workers into hostels, subsidised in turn by mostly female headed households in the rural sending areas, made both coal and gold production cheaper than it would have been, by externalising the real cost of labour. The MEC extracted gold that enabled the Bank of England and the City of London to dominate the world's gold market [Ally 1994]. Gold mine owners needed coal to power their mines. As they also, in most cases, owned the coal mines, they established an energy system that was cheap – and consequently dirty. It was only in the 1970s, with the building of the Richards Bay terminal, that coal became a commodity in

its own right, rather than a support for gold mining [Lang 1995]. By then the pattern was set, of very large (eventually up to around 4 000 MW) coal-fired power stations run by the parastatal Eskom, burning low quality coal, whilst the better quality coal was increasingly exported. It led to a business formula for coal mines: roughly a third of mined coal was exported, and earned two thirds of coal mine income, while two thirds (earning a third of the income) low quality coal went to Eskom. Cheap electricity led, in turn, to the most carbon intensive economy in the world as energy intensive industries were added to the South African economy in the 1970s and 1980s [Marquard 2006].

How technology transitions happen

Transition theory started out by explaining transitions as a result of innovation and competition, where the dominant system is challenged and outcompeted by a new technology and its support system.[69] In a fascinating hundred-year history, Frank Geels traced how steam ships replaced sailing ships [Geels 2002]. External pressures (for example Irish migration and changing trade conditions) as well as technology developments internal to the ship design, formed part of the slow, stepwise reconfiguration that took place

> on all dimensions of the socio-technical regime (e.g. markets, user groups and user practices, technologies, production networks, policies). The steamship transition was not just a story of markets and technologies. The transition occurred as a shifting mosaic of elements, as changes building upon each other, and processes gradually linking up and reinforcing each other. The introduction of new elements changed the incentive structures and situation of other elements. New opportunities opened up which guided actors in different directions. Technical transitions thus appear as a process of shifting assemblies or a reweaving and reconfiguration of sociotechnical elements [Geels 2002: 1272].

69 Or undermines itself to the point of collapse.

The multiple level perspective analysis uses a three-part conceptualisation of technology change as determined by

1. a dominant, incumbent and stable technology regime to which many aspects of society, use, training, regulation, financing and support infrastructure, are aligned. It is this alignment that gives the dominant regime its stability and which also explains its resistance to change;
2. new technologies emerging from protected niches, such as military development (with huge defence subsidies) from which innovations may emerge, or more environmentally benign energy technologies – such as renewable energy technologies. These niche technologies can become mainstream and directly threaten established technologies;
3. the landscape or context for these changes and challenges, in particular how changes in the landscape lead to pressures on old and new technology regimes.

How a transition happens depends on how these pressures emanating from the landscape are articulated, who has the resources to deal with the transition and how the transition is governed (Smith et al 2005). Theoretically there are four options. The first is a smooth transition, as a process of endogenous renewal or renewal from within. This happens when a dominant regime (in other words the regime members, the firm, supply chains, customers and regulators) has the resources to understand (conceptualise or articulate) and respond to pressures from the landscape or context (finances, technical know-how, political support). This usually results in a gradual transition, with the incumbents keeping their power and assets while transforming them. Bar other factors, endogenous renewal excludes or prevents radical ruptures from taking place, does not usually change the social structure and does not lead to broader transformations. This is the strategy at work when fossil fuel companies, like Total, BP or Shell, gradually extend their operations into renewables without abandoning fossil fuels.

But this is not the situation for Eskom. Their transition started out more in the region of the second option: an internal effort at adaptation in response to external and internal shocks. Eskom has had to respond to the gradual

transformation of the business models in its interface with coal: first, its long-standing system of tied mines close to power stations allowing for conveyor belt delivery of coal (and low transport cost and accompanying quality assurance) has been replaced by a system of short term contracts of spot coal buying, with the coal delivered from all over, as part of a successful attempt to disrupt established, apartheid era, big business's stable contracts with opportunities for new coal mine owners and truckers. This has resulted in rising costs and increasing coal quality issues [see Cowan, 2022]. At the same time, Eskom has also had to deal with the shock of state capture, which led to mine closures, a policy of delaying maintenance at power stations to avoid loadshedding (which is now coming home to roost), debt and losses, internal distrust and sabotage, all of this in the glaring public spotlight of discontent from loadshedded households and businesses. It also became stuck in a cycle of debt, which prevented it from making any new investments because its dodgy balance sheet prevents it from borrowing money.

However, Eskom was not left alone to adapt – everybody got on its case. A number of diverse proposals were put forward to deal with the Eskom debt, and these became crucial parts of the SA transition. Eskom is still a strong actor, and with its importance for and alliances with, for example, the Energy Intensive Users Group, still has many policy, technical and social resources. It has succeeded in playing a semi-independent role in its dealings with the World Bank, for example in the decommissioning of power stations like Komati, but this is a far cry from the Eskom that was able to "keep politicians out of the engine room" at the end of the 1980s [head of Eskom, Ian McRae, quoted in Marquard 2006: 172].

With this, it would be fair to say that the transition in both the electricity and the coal systems are closer to the third possible scenario, an 'emergent transformation', which is characterised by "random pressures and new trajectories, as a result of uncoordinated responses and adaptation from the outside of the technology regime ... This type of transformation arises from uncoordinated pressures for change and responses based on resources and capabilities lying outside of the incumbent regime." Long term examples include the changes from wood, to coal, to oil and gas and nuclear, in other

words transitions that are driven by technology competition without a significant governance component [Smith et al, 2005: 11501].

In 2016, Swilling et al came to the conclusion that South Africa was experiencing an emergent transformation of this type because:

> There is little evidence of the coordinated capacity needed for an 'endogenous renewal' or 'purposive transition'. Instead, continuous delays to address fundamental resource challenges will – and have already started to – produce shock effects, which could accumulate into a (chaotic) "re-orientation of trajectories if learning linkages with external knowledge systems start to get shut down as the regimes turn in on themselves" [Swilling et al 2016: xxxvi].

The groundWork Report 2019 reported that there was a "chaotic and unplanned transition out of coal" in the Mpumalanga Highveld, as the decommissioning of coal-fired power plants and closure of mines became a reality, outside of a transition framework. Towards the end of 2022, Swilling warned that South Africa's energy sector was slipping back from a purposive into an "emergent" or chaotic transformation.

Transitions on purpose

The fourth option is a purposive transition. Theoretically, this consists of a loss of power for the incumbent technology regime, and adaptation from outside of the regime, as society assumes political authority over the technology regimes that serve them, in other words "transitions... which have been deliberately intended and pursued from the outset to reflect an explicit set of societal expectations or interests" [Smith et al, 2005: 1502]. This is the type of transition that the PCC is attempting to facilitate, but this is limited by the ability of the PCC to exert pressure on the trajectory of the transition.

With the rise of environmental (and social) sustainability concerns, interest grew in understanding purposive and managed 'sustainability transitions' [Scoones et al, 2015]. Responding to climate change is only one type of

sustainability transition but, because of its decarbonisation demand, one that dramatically affects the functioning of industrial society (in most countries). Other transitions that have large climate and biodiversity dimensions are food and waste systems. Industrial food systems have problems of poison use, nutritional quality, long production and transport chains, etc., while there are approaches like agroecology, organic agriculture and local food systems that can challenge industrial agriculture. All are potentially affected by a decarbonisation of the South African economy.

Purposive transitions take place as the result of political decisions in society. In reality, purposive and other transition logics may be at work at the same time: the decarbonisation imperative is purposive, but at the same time renewable energy technologies have become cheaper than coal and nuclear electricity generation. There is also a cost to the transition itself as long settled patterns are disturbed. The reconfiguration of hard and soft infrastructure that supports and enabes the use of different technologies is an intensely political process with distinct winners and losers. This calls for transition management – such as the PCC – and raises issues of participation in this decision making process, which in turn raises the question of who is able to bring what resources into the transition process. These resources come in the form of knowledge, capability, hardware and financial resources, particularly the knowledge resources to develop and implement the necessary policy alternatives [Smith et al, 2005; Marquard 2006]. It is very rare that governments are able to command all these resources. Instead, a range of actors from different sectors end up battling it out on the basis of resources that are often unequal, but also of different types. The next sections explore the resources that different actors in the PCC have to influence the trajectory of the transition.

Politics of knowledge in a purposive transition

What are the roles that the different actors in the PCC can play, and what are their resources to articulate the pressures for a just transition and put forward convincing solutions?

Government legitimacy is exhausted after state capture, internal factionalism and more than two decades of disappointing service delivery. There are serious doubts about the ability of government to perform even simple functions, for example to repair roads (potholes), run the water system (raw sewage in the streets), deal with corruption in the health sector during, before and after COVID, etc. This leads to a double demand on government for the transition: to do its basic job, and to deal with climate change in its daily operations – a double demand that anticipates a return or new building of state capacity, or the idea of a capable state.

The trade unions benefit from a strong and international tradition of just transition thinking, which provides the historically core meaning of the phrase, namely job protection when socially necessary changes lead to job losses. On the other hand, trade unions are heavily invested in the fossil fuel economy, and keen to protect coal and other fossil fuel jobs. This prevents them from taking a strong role. Moreover, the politics of splits in leadership inside and between trade union confederations has had a debilitating effect, coupled with a lack of discussion on transition issues at branch level. Recent initiatives by middle level leadership have brought trade unionists together across the lines drawn between different federations. The unions are well organised, for example for strike action and to deal with labour market policies, and the Congress of South African Trade Unions (Cosatu) is closely connected to the governing ANC through the tripartite alliance. However, their members are dependent on business for jobs and as a result the unions share the enthusiasm for large scale, energy intensive reindustrialisation.

Business owns the resources that can redirect financial investments from fossil fuels to more sustainable business. They have superior knowledge of what is possible in their businesses and the various sectors. But they may not reveal all that is possible, because the ignorance of other players allows them space to negotiate in their own narrow interest. Because they are in the money, they are also able to hire consultants and create policy alternatives through research – policy alternatives that suit them. While business often has trouble working in concert, in this case they have banded together under the National Business Initiative, led by an experienced former DFFE official

who brought a large amount of knowledge of decarbonisation options into the business camp.

In a knowledge intensive process on new terrain, academia and an energy policy community of practice, with progressive elements at work since the South African political transition in the early 1990s, can play an influential role. They have the ability to model energy systems and hence to test government models and assumptions, for example the critique of Integrated Resource Plan (IRP) 2019 showing that new coal was forced into it at extra cost, contradicting the principle of "least cost". Another example in the context of the PCC is the challenge to NBI's big gas scenario. It is understood that Energy Systems Research Group and/or Meridian showed them that their own figures and modelling didn't support that outcome. That forced NBI to back down on big gas and keep it only for peaking. But it's also significant that this fight was discrete – behind the scenes. The policy community and its discussions are internationalised – for example engaging with the World Bank, the International Energy Agency (IEA), and international academia. In practice, pro-business and pro-privatisation perspectives are dominant in the policy community.

The role of civil society in a purposive transition

Where does civil society fit in and what role can it play? Here we are thinking particularly of the environmental justice movement.[70]

The movement has a history of mutual solidarity in support of community struggles and of articulating common positions in the face of environmental injustice. To that end, organisations such as groundWork and Earthlife have worked over decades with communities affected by coal and other fossil fuels and helped them link with each other. Together, they are making the voice of the movement for justice and for open and participatory democracy. Throughout the past two years, commissioners from the environmental justice movement in the PCC insisted that they could not speak for communities, and focused

70 Leaving aside, for now, issues of civil society at large and sectional populist movements like the xenophobic Dubula.

their energies on enabling community based activists to participate in debates on the just transition.

Organisations within the movement have strong histories of participating in struggles around the formulation of environmental policy, stretching back to the Consultative National Environmental Policy Process (Connepp) of 1996-98 that resulted in the National Environment Management Act (NEMA) and legislation that followed on from it, including the Air Quality Act and the Waste Act. They have also been engaged, since the 1990s, in climate debates and policies and are now fighting for effective climate legislation. This makes civil society a knowledge resource, not only for government but also other actors in the transition.

The movement has built up large numbers of policy resources, including publications with detailed plans for policy alternatives. Civil society includes legal and other professionals who are able to analyse and engage in policy debates. It can thus force issues, for example the Deadly Air case that resulted in a court order that government is obliged to implement its own legislation on minimum emission standards.[71] It is also able to conduct its own, participatory research, enabling it to come up with concrete policy alternatives. In some but not all cases, civil society actors enjoy close and productive relationships with the energy policy community.

As a civil society actor, the environmental justice movement is agile in public opinion and articulates new ideas, in part derived from its participation in global civil society debates, characterised by both solidarity and sharp North-South debates. It has a special ability and positioning to argue in the public interest, meaning that its arguments are sincerely formulated in the public interest, and these arguments are checked by debates within broader social movements. It has no or far fewer conflicts of interest when compared, for example, to the fossil fuel heavy companies like Sasol which participate in climate negotiation.

Ultimately, the environmental justice movement derives its power from the people in communities who are organising to defend themselves and their

71 Let that sink in for a minute.

environments, who are fighting in the broader public interest for change of the current economic system and an end to the 'externalities' that it imposes on people's health and the ecosystems that support life. It is free from the conflicts of interest that characterise the participation of corporates – which are invariably lobbying for their own narrow interests.

Community activists from affected communities have risen to the challenge of the PCC consultation process, and used their power as "the people at the centre for the transition", testing the validity of the PCC's rhetoric. But the rhetorical phase is over and practical planning and deal making on the details of the transition is currently under way – a phase in which civil society resources may be less strong and less effective.

Agenda setting in the policy cycle

A framework for considering how and when power and existing policy or political resources can be deployed, is the policy cycle [De Coning and Sherwill 2004]. In each part of the cycle, different resources and power opportunities and demands come into play. In the phase of (1) agenda setting, public opinion and debates around values, visions and the like are important because public opinion is the space(s) where the nation can imagine itself – even though there is inevitably an imbalance of resources and the elite plays a leading role [Habermas, 1996; Anderson 1991]. Civil society has strong resources in this phase. Community voices are generally sought after, as other actors strain to understand the perspectives, needs and agendas of the majority of South Africans. Early on in the process the PCC declared, at the behest of the environmental justice commissioners, that it would put communities at the centre of the transition, and "leave no one behind". The very expression is a reminder of the danger that the PCC – or the broader transition process – could in fact leave people behind.

Policy alternatives

Once agendas are set, in the next phase (2) they become policy alternatives – that is ready plans that can enter legislation and implementation [Marquard 2006]. Different knowledges come into play here: alternatives have to be real, they have to be costed and financial sources indicated, existing institutions have to be evaluated as fit for purpose to implement these plans, or in need of reform or restructuring. Ideas that made it onto the (national) agenda in the agenda setting phase may not survive this phase, as they never get worked up into plans. Civil society may still intervene here – if it has policy resources like we argued above – but in general the policy community and officials play the biggest role here, and often behind the scenes. Hostile officials can kill or maim proposed policies. In a neoliberal policy context, policy alternatives may be killed off by treasury officials or the World Bank. New ruling parties or coalitions have often found themselves implementing the policies of their opponents, when they come into office without worked up policy alternatives in hand [Blyth 2002].

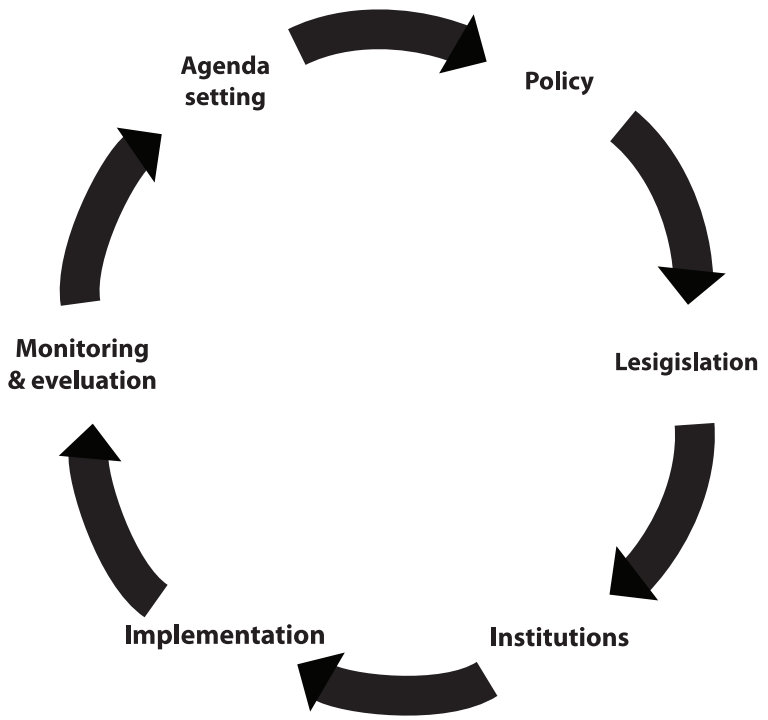

Fig 1: The policy cycle [from De Coning and Sherwill 2004].

Policy alternatives need to go through processes of (3) legislation to become binding government policy, attract government resources, and fund (4) institutions to (5) implement. The Climate Bill, currently in process, is an example of such legislation. Amongst other things, it is meant to coordinate government's response to climate change but, as if to emphasise government's commonly acknowledged weakness, is tardy on getting to implementation.

Institutions, implementation and evaluation

The fourth phase considers the fitness of existing institutions, government or semi-government to implement these policies or, as far as the public is concerned, the agendas that emerged from the first phase. Civil society and the media spend much time in assessing the fitness and performance of institutions. State institutions came under sharp scrutiny as the extent of state capture was revealed.

Implementation is described as Phase 5. It is the work of government, and to some degree other players as they fill spaces left empty but in urgent need, according to the incapability of the state. This phase is closely observed by the 'beneficiaries' or citizens, whether they do or don't receive services, or when absent or bad services oblige them to provide for themselves, whether buying water or forming voluntary organisations to support food security, protect women and children against gender based violence, etc... This leads naturally into Phase 6, which is monitoring and evaluation. This could be both formal and informal. The evaluation kicks off a repeat of the cycle, resulting in the setting of new or refined agendas, changes in policy and legislation, adaptations to institutions, their mandates, and resulting in different implementation strategies.

In the South African situation, there are historical examples of national consensus creation in difficult situations: the Codesa (Convention for a Democratic South Africa), where groups involved in bitter civil war came together and decided, on the basis of 'sufficient consensus', to draft a new,

unitary constitution containing extensive human rights. However, lessons from history include the dodgy deals behind the Codesa consensus, for example the last minute Ingonyama Trust land deal, which placed a large amount of land under the authority of the Zulu royal house, in order to persuade the Inkatha Freedom Party to participate in the elections. Section 35 of NEMA, which allows for voluntary governance for corporates, was also a last-minute deal. The PPC took the example of past consensus building exercises, like Codesa, and applied it to the nascent climate change responses, recognising perhaps that a wide-reaching new social consensus would be necessary for a purposive transition.

30 years of creating climate policy

The PCC has a pre-history of nearly three decades, largely carried by the Department of Environment, academic researchers and civil society. This section focuses on the DFFE.

The South African government[72] did not attend the so called Earth Summit (United Nations Conference on Environment and Development, or UNCED) in Rio de Janeiro, Brazil, where the United Nations Framework Convention on Climate Change (UNFCCC) was agreed by governments. At that stage, the apartheid government was isolated and South Africans were focused internally on the Codesa[73] negotiations, which gave rise to the new constitutional democracy and established the principle of negotiating to reach 'sufficient consensus' on which to act.

As soon as the new government was in place, in 1994, it embarked on a climate change response path by establishing the National Climate Change Council, and in 1997 ratified the UNFCCC. By October 2000, South Africa had started compiling its Initial National Communication on Climate Change to report on national inventories on greenhouse gases, research, education and public awareness programmes, and was exploring mitigation options and possibilities

72 A small number of South African NGOs did attend.

73 See https://www.sahistory.org.za/article/convention-democratic-south-africa-codesa

for adaptation [Lukey 2020].[74] In 2002 it hosted the 10-year return to the Earth Summit in Johannesburg.[75] In 2004, the department published a climate change response strategy, leaning on years of research and conferences that, according to Lukey, had started as far back as 1987. A 2005 National Climate Change Conference gave attention to the following policy issues:

1. Initiating a detailed scenario building process to map out how South Africa could meet its commitment to greenhouse gas stabilisation;
2. Initiating a participatory climate change policy development process;
3. Initiating a participatory national climate change research strategy development process;
4. Driving increased research and innovation for the hydrogen economy;
5. Strengthening the South African Environmental Observation Network to interface with the Global Earth Observation System of Systems;
6. Establishing the South African National Energy Research Institute.

By the end of 2007, the Long Term Mitigation Scenarios study was completed. The LTMS emerged from a cabinet-mandated process that sought to understand what South Africa could do to mitigate climate change. It combined a facilitated stakeholder process and technical work to identify a set of greenhouse gas (GHG) (emission) scenarios and trajectories for South Africa between 2010 and 2050. Its achievements included, argues Tyler [Tyler 2018: 7]:

1. establishing a common understanding of the parameters of climate mitigation in the South African context;
2. establishing and building capacity of a climate mitigation policy community... across business, government, academia and civil society;
3. generating an evidence base of best available data; and
4. a carbon constraint was included in the 2010 IRP.

74 This section leans heavily on the work of Peter Lukey, pioneering activist official.

75 This was an intensely contested process between government, trade unions and civil society, see Munnik and Wilson, 2003.

The carbon constraint was, however, not credible. It allowed a considerable increase in power sector emissions to 275 Mt, up from 224 in 2010. In early 2009 a Climate Change summit brought together 900 representatives from government, business, the scientific and academic communities, and civil society. This led to the first South African climate change response policy in 2011, the hosting of the CoP 17 in Durban (also in 2011), a monitoring strategy published in 2015, and the submission of South Africa's first NDC.

The Department of Environment consistently participated in international climate change diplomacy. But these activities did not have much impact on the rest of government. South Africa's mining, including domestic coal use and export, and energy intensive sectors remained at the centre of what is still the most carbon intense economy in the world. While the department of environment developed these knowledge resources, it remained a junior department out of step with South Africa's overall extractivist orientation. Officials from the department confided in activists that they were not allowed to refer, in their documentation, to "the end of coal" [Burton et al, 2018]. In the meantime, Cosatu, the dominant ANC-aligned trade union, declared its support for a just transition in 2009, and environmental justice organisations were already working on it.

This government impasse on climate change action was still the situation in late 2018, (Averchenkova et al, 2019). This research identified a hiatus in South Africa's climate change response, and identified its roots in the "nine lost years" of Jacob Zuma's presidency (2009 to 2018), characterised by state capture and the hollowing out of state institutions. This period also saw the interruption of the REIPP (2015 to 2018) when Eskom under Brian Molefe refused to sign the power purchase agreements (PPAs). This led to the collapse of early RE equipment manufacturers, for example those who had set up production in Coega.

Building a national consensus on just transition, and a decarbonisation roadmap

Ramaphosa became the South African president in February 2018, after his election as ANC president in December 2017. The roots of the PCC lay in the October 2018 Jobs Summit, where the decision was taken to establish the PCC. It would remain intensely involved with jobs issues.

The PCC was also preceded by an initiative of the National Planning Commission. In 2012, that commission produced the National Development Plan (NDP), which included a weak chapter on an 'equitable transition to a low carbon economy', glaringly contradicted by the chapters on economy. The commission undertook a consultative process in 2018 and 2019 to update the chapter and reframe it as 'just transition'. The results pointed to both points of agreement and points of longstanding difference between participants in the process. The results of the process were officially handed over to the PCC, with the following vision describing what a just transition could achieve by 2050:

> Through putting people and especially vulnerable people at the forefront, South Africa will have achieved a [zero-carbon] [net zero carbon][76] or as near as possible, economy by 2050. We have built the resilience of our economy and our people through affordable, diversely owned renewable energy systems; conservation of our natural resources and eco-systems, equitable access to our water resources and equitable, inclusive and sustainable land-use for all. The high value we place on healthy eco-systems, flora and fauna, land, water and air, improved livelihoods and quality health services and education underpins our future, and ensures a better life for all who live in South Africa.

The themes (or contradictions) announced here continued to run through the work of the PCC, namely disagreement on zero vs net zero carbon; public (or social) vs private ownership of energy systems; and a growing awareness of

76 By convention, the [square brackets] indicate that negotiators have not agreed on the formulation, so two or more alternatives survive, for now, between [brackets].

other sustainability concerns such as biodiversity, air and water quality, and an emphasis on improved livelihoods and inclusion of poor and vulnerable people. But the PCC was intended to do more, to finally build a national consensus around a South African climate change response that would lead to action, informed by an increasing sense of urgency in the global situation, not only about the impacts of climate change, but also the consequences of international climate change policy responses for South Africa's very carbon intensive economy.

The establishment of the PCC indicated a sharp reversal in one aspect: it was prepared to seriously consider the end of coal. This had not happened before. The view of coal as a strategic asset under the watchful eye of the state did not change at the end of apartheid. At the time that South Africa hosted the World Summit on Sustainable Development, in 2002, one time minister of the environment Pallo Jordan warned leading activist Bobby Peek, director of groundWork, not to "fuck with coal". In debates before the World Bank loan to build Medupi and Kusile was approved in April 2010, environmental justice activists from Earthlife and groundWork were called unpatriotic and puppets of the environmental lobby in the North, by ministers Pravin Gordhan, Dipuo Peters and Barbara Hogan. As late as 2018, the Minerals Council of South Africa (MCSA), in its last publication as the Chamber of Mines, which had been the seat of power of the minerals energy complex since 1887, at the start of the minerals revolution in this country, commissioned a report "...to determine what needs to be done to increase the profile of the coal mining industry in the face of seemingly ineluctable negative public opinion around the use of coal ..."

Now, leading activists from Earthlife and groundWork, together with their close ally in the Life After Coal campaign, the Centre for Environmental Rights (CER), were commissioners of the PCC. There were 23 PCC commissioners, plus 10 cabinet ministers. The commission was headed by Valli Moosa, formerly minister of environment from 1999 to 2004. He then chaired Eskom's board while also serving on the ANC's funding committee at the time when Hitachi won the boiler contract for Medupi and Kusile. The ANC's investment vehicle Chancellor House was Hitachi's BEE partner. Crispian Olver, Moosa's director general in the department of the environment, became the executive director.

A secretariat of full-time staff was recruited. The South African government did not provide adequate funding, and as a result the commission became dependent on funds from the African Climate Foundation and others.

The commission included six people from environmental organisations: Earthlife, groundWork, CER, the African Climate Alliance, Greenpeace and WWF. There were four commissioners from trade unions: Cosatu, Saftu, Fedusa and Numsa.[77] The trade unions – as they often reminded the commission – had been the birthplace of the concept of a just transition,[78] one in which workers – and by extension communities – would not be left worse off as a result of the transition. There was a group of six from business and state-owned enterprises: Eskom, Transnet, Sasol, National Business Initiative (NBI), the Industrial Development Corporation (IDC), and the MCSA. Most of these participated in the National Business Initiative (NBI), which had been at work for some years to persuade leaders of big business that climate action was urgent, and to work out detailed pathways for the decarbonisation of various industries. Business was also represented by Business Unity South Africa (Busa). There were two commissioners from state research institutions – the Council for Scientific and Industrial Research (CSIR) and ex-Water Research Commission (WRC) – plus a community activist from Mpumalanga, and two other community activists/influencers, champions of small and medium business.

The PCC was appointed in December 2020. The inaugural meeting on 19 February 2021, at which Ramaphosa welcomed commissioners and explained the background of the commission, was not broadcast. Civil society commissioners immediately appealed for all future meetings to be public and, although this raised some questions from trade unions and business, Moosa readily agreed. Subsequent meetings have been open and, we would argue, it is an important part of the politics of the commission to effect major changes in public opinion leading to structural changes in the economy.

77 This represented a broad and inclusive spread of trade unions. After the split of Numsa (later forming a federation Saftu) from Cosatu, Numsa and Saftu trade unionists had been excluded from a number of bodies where trade unions met with the ANC government, the most important example being Nedlac.

78 This was more true for the international trade union movement than of the South African unions.

During the second PCC meeting, on 30 April, two National Planning Commissioners,[79] Tasneem Essop and Malegapuru Makgoba, officially handed over their work on a Just Transition, including a number of critical considerations that they expected the PCC to take up:

1. That the path forward needed inclusive, participatory planning and decision-making that is transparent and accountable and puts justice at the core.
2. The just transition must be considered from an economy-wide perspective and not only as an energy transition.
3. There needs to be a proactive and managed approach to systemic and structural changes to the economy to avoid social and economic disruption. This includes the negotiation of labour and social plans (SLPs)[80] for sectors impacted by the transition.
4. Collaboration, partnership and good governance is central to achieving a just transition. Without the participation of all stakeholders, especially workers, there will be no just transition.
5. Political will is essential to enable vertically integrated policies and regulations to support the transition.
6. Policy alignment and implementation is critical.
7. Information and knowledge sharing, transparent data, awareness, and communication with all parties, will facilitate the planning for a just transition.
8. Costing the pathways for a just transition, including the identification and mobilisation of resources for this is critical for the achievement of a just transition.
9. It will be critical to invest in education, skilling and reskilling.

79 The National Planning Commission, also with a wide range of commissioners, produced a National Development Plan in 2011, published in 2012 after cabinet approval. It contained a Chapter 5 on the Just Transition, which was updated in 2018 and 2019.

80 SLPs were controversial instruments, at least for civil society and communities.

There were broad areas of agreement, but Essop and Makgoba pointed to what remained, after two years of consultation, as areas of conflict that could be expected to be ongoing in the work of the commission.

1. Zero carbon or net zero? The Concluding Conference reached consensus on achieving a zero carbon economy by 2050. There were some who felt that this was not feasible and thought that net zero was a more viable option. [See box 2 on zero vs net zero carbon at the end of this chapter].
2. The conflict between mining as an economic land use on one hand, and the human right to clean air and water, and uncontaminated land on the other.
3. Resource governance and ownership, specifically related to electricity. The issue of privatisation of electricity is an area of disagreement, with some stakeholders challenging the REIPP projects and calling for socially-owned (community/worker or state-owned) renewable energy.
4. Decentralised resource governance – devolved to municipalities; some strongly disputed the feasibility of doing this given the capacity of municipalities.
5. Energy mix – and timing of coal phase out. While the conference agreed to the phase out of coal, it was strongly felt that this can only happen through an inclusive and transparent just transition planning process.
6. The future of Eskom – there was no agreement on the unbundling of Eskom. Some stakeholders argued that the unbundling was intended to lead to privatisation. Some argued that Eskom should become a state-owned renewable energy entity.

Embracing ecological modernisation

Nevertheless, in the very same meeting of 30 April, and in the following meeting on 30 July 2021, a parade of South Africa's dirtiest and most carbon intensive

corporate and state-owned enterprise speakers affirmed their commitment to the low carbon transition – and in the process cast it in the mould of ecological modernisation. These were the second and third meetings of the PCC, so it is noticeably early in the process. Their inputs set an ecological modernisation frame for the work of the commission. However, this was brought into question during the development of the JTF, see below, which was already in motion.

Eskom CEO Andre de Ruyter was direct: "We can achieve the Eskom stated net zero goal by 2050, and we can be unequivocal on the finance support we need." He argued that the decommissioning of Eskom's inefficient, aging coal-fired power stations opened the door for new, green and clean decarbonised power production: "We can build up to 6 GW of renewables in the next 5 years alone, get financing and derisk the Eskom balance sheet."

> We want to ensure that we can grow investment in RE technologies, because there is a need for affordable, reliable electricity – and stimulate a new economy in Mpumalanga. We must ensure that the technology used to generate electricity is also manufactured here. We could potentially create direct, indirect and induced jobs of up to 600 000 in solar PV and up to 250 000 from wind related to construction, operation and maintenance, if we implement the IRP2019. We are on the cusp of a very significant opportunity to reindustrialise South Africa and create access and opportunities for a new class of industrialist. It is not only a requirement to add to generation infrastructure, we also need to transmit electricity from where it is generated to where it is consumed, so we have identified in the next 10 to 15 years, some 8 000 km of new transmission line capacity. That means we will have significant supply shortfalls from as early as 2024, from transformers to conductors to steel. While this is daunting, it points to the opportunity to grow local manufacturing capacity, and to grow foreign investment as fabricators set up shop in SA. But we need to start investing now, if we don't want to end up importing the bulk of our requirements. It's important to give investors the certainty of demand, that will warrant their investment in factories... by committing to this manufacturing pathway. We know that

> DTIC [Department of Trade, Industry and Competition] discussions are happening.

Sasol CEO Fleetwood Grobler said Sasol was committed to work with all stakeholders "on a transition that is just". Sasol is reducing its GHG emissions, he said, transforming its operations and shifting its portfolio. It saw "immense potential" in the transition, and a useful role for its hitherto immensely polluting Fischer-Tropsch technology. Sasol was interested in carbon capture and storage (although this is not yet feasible and all indications are that it will never be), and green hydrogen (although this is not yet affordable). "Green hydrogen can decarbonise long haul transport, chemicals, iron and steel industry," he said, and Sasol had entered into a partnership with Toyota to develop a "green hydrogen mobility system, and pilot project, possibly on the N3 for long haul trucks".

Exxaro CEO Mxolisi Mgojo said that Exxaro, although a coal miner, was also on a journey to carbon neutrality. It had left the minerals sands business. It had entered the renewable energy industry through the company Cennergi. Exxaro had a three-pronged strategy:

1. How can we get the best out of coal assets, supplying Medupi and other power stations, and ensure that we decarbonise as we continue mining high value coal with lower sulphur and other impurities, whilst not committing any further capital to growing our coal resources, but rather focus on 'minerals for the future', that is minerals used in renewables.
2. Exxaro has built an 84 MW PV plant in Lephalale and we are looking to do that for other companies. We will get 12 to 15% cost savings, and also reduce carbon footprint at the mine by 30%. This is a growth area for us within Africa.
3. How can we use our land holdings to develop a new agro-economy?

The third meeting, on 30 July 2021 and again streamed live, continued the enthusiastic embrace by big business of an ecological modernisation of the

economy through decarbonisation. Over the first six months of its existence, the commission's meetings had succeeded in building a public profile, and Ramaphosa was pleased:

> It is quite clear to me that climate change has become the big topic of our day... What is clear is that we have got to have a just transition. It is a must, otherwise we are left behind... It has to be just and it has to take the position of our people into account.

On 30 July, the troubled national power utility Eskom was again at the top of the agenda. It was subjecting the country to ongoing loadshedding with serious economic consequences and irritating South Africans. Pressure was building up for Eskom to stop its air pollution, but Eskom claimed it would cost around R300 billion to retrofit its coal-fired power stations with sulphur scrubbers, which would almost double its existing debt of R400 bn. But most fundamentally, the coal paradigm was exhausted, renewables were cheaper to build, and options to finance any coal extensions (mining or power stations) was becoming more difficult by the day. De Ruyter, and his 'shareholder', Public Enterprises minister Pravin Gordhan, were quite clear about this:

> We have significant challenges with our electricity supply, and also with our environmental compliance on older coal-fired power stations.[81] With the retirement of many of our old coal-fired power stations, we have an ideal opportunity to pivot from coal to less polluting generation mix.

By decommissioning the coal-fired power stations, Eskom would be saving 270 000 million litres of water per annum in a water scarce country, De Ruyter said, and by producing renewable instead of coal-fired electricity, it would drastically reduce the carbon content in South Arica's exports. The plan was, De Ruyter told the PCC, to interest a consortium of climate funders to bring together a mix of grant, concessionary and loan finance (so that most of it

81 Actually, Eskom has compliance problems on all their stations except Kusile – and even there, the FGD seems temperamental.

would have to be paid back, or would create a debt) in return for decarbonising the South African economy. Eskom's decarbonisation (switching from coal to renewables) would be the first and major move, a type of low hanging fruit, as Minister of Public Enterprises Pravin Gordhan explained:

> It's cheaper to lower carbon in South Africa than deal with the remaining emissions in the developed world. In South Africa, for Eskom, the cost would come to US $6 or 7 per ton, while the last European carbon mitigation would amount to US$30 or even $40. So South Africa presents a good carbon abatement opportunity.

"Of course," said Gordhan, "with this deal comes the geopolitics of technology, of indebtedness, etc. But huge funds are moving away from any new coal projects, making it difficult to fund new coal. On the other hand, many development institutions are keen to support Eskom in its repurposing initiative."

Gordhan explained what was expected from South Africa in order to get the financial assistance. First, energy policy should be clear and lead to the decommissioning of coal-fired power. The IRP 2019 (the government plan that prescribes what primary energy sources should be used to generate electricity, such as wind, solar, coal and nuclear, and in what proportions) would have to be updated. The Nationally Determined Contribution would have to be ambitious. There would have to be practical evidence that South Africa is implementing a transition, for example in the way that the Komati power station would be decommissioned.

De Ruyter explained that the flow of funds in the deal would depend on achieving specific milestones – such as the decommissioning of power stations and the building of RE installations. It would not simply be handed over as a lump sum. He was enthusiastic. South Africa's wind and solar resources are some of the best in the world. And renewables are quick to roll out: solar PV within 18 to 24 months, and wind in 24 to 36 months. Eskom was not planning to build new nuclear or new coal generating capacity, but was planning on gas playing an important transitional role over the next 10 to 15 years. Eskom was also looking at a 'clean coal' project at Majuba, but the capital costs were

so big that it was unlikely that Eskom would deploy this at scale. Separately, the recent enabling of private investors to invest in energy generation of up to 100 MW in embedded generation, would also give an important push to the development of renewables.[82]

De Ruyter insisted that Eskom was very serious that transition must be just, and that it should not leave behind ghost towns like in Wales, saying: "We need to learn from painful lessons elsewhere." Eskom has therefore identified various projects that could make the transition just, such as micro-grids for electricity in poor communities. Eskom expected to create 38 000 direct, 116 000 indirect and 192 000 induced jobs, in the next eight years, via wind and solar PV construction, operation and maintenance. It was planning to build 8 000 km of new transmission lines, and had approached the DTIC about it. De Ruyter warned: "If we are to have an RE manufacturing industry, which is crucial in creating jobs in RE, consistency of demand will be important."

RE minerals boom and reindustrialisation on the back of huge RE roll-out

Mark Cutifani, CEO of Anglo American, historically South Africa's biggest coal, gold and diamond miner and a major force in the minerals energy complex, saw major opportunities for a renewable energy mining boom and a reindustrialisation of South Africa via renewables.

"Now that the science has become clearer," said Cutifani, "we need to do all we can to live up to the Paris Agreement, to get to the 1.5 target, or better." This was such a quick and slick confession of corporate climate denialism that it is easy to miss. But the cynicism is breathtaking, since the science has been clear since the late 1950s, as has been related in Chapter 1.

Cutifani continued: "We need to, by 2030, literally halve our emissions, and reach net zero by 2050. As of today, Anglo is committed to reducing its energy consumption by 30% by 2030, and with that reduce its greenhouse gas emissions by 30% by that time, and try and achieve 50% reductions by 2040."

82 Note that it is assumed to be renewables, while government has not prescribed a generation technology.

And then he made his real point: "Mining is essential to the low carbon future. The metals and minerals we produce are needed for the world to decarbonise. Many of these metals and minerals are available locally."

This means that mining in South Africa would not reduce but shift away from coal to minerals that support that transition. For example, he said, a typical wind turbine requires 2.5 or up to 6.4 tons of copper per megawatt of generation capacity. Batteries for electric vehicles contain 3 times more copper and 20 times more nickel than the internal combustion engine equivalent. The fuel cell vehicle needs 1.7 times more PGMs than its internal combustion equivalent.

And then there was hydrogen. Cutifani – as well as Ramaphosa – was enthusiastic about a 300 tonne hydrogen haul truck "that we are currently putting together for Mogalakwena mine". Cutifani agreed that the president could come and try out this truck on site.

"The transition involves change and risk, but the South African mining sector has knowledge of transitions, and is busy reimagining mining to improve people's lives," said Cutifani. This future includes connection with local communities, a smaller footprint in use of water, land, energy and carbon, and a more sustainable production of metals and minerals. South Africa's wind and solar endowment is among the best in the world, he repeated, not to mention the outstanding minerals endowment. Anglo was committed to carbon neutrality for scope 1 and 2 emissions, by 2040, in all its operations around the world, and was working hard to find technical solutions to decarbonise the sector. Anglo was fully supportive of SA government's ambition to transition to a low carbon economy, and was working with the Council for Inclusive Capitalism, convened by the Vatican. In the meantime, the decision by Ramaphosa to allow up to 100 MW in private (non-Eskom) electricity production, was very encouraging as a crucial step to unlocking energy generation and unlocking a reliable energy supply.

Anglo was also developing a regional decarbonisation programme, consisting of a geographically dispersed network of renewable installations generating at scale, and wheeling it through the grid to sites in the Northern Cape, Northwest

and Limpopo, for Anglo's own use. The plan included offsite wind farms and a large solar plant at Mogalakwena in Limpopo. Anglo's strategy would unlock 3 to 5 billion dollars of new investment in SA. Anglo expected to create up to 40 000 jobs though construction and installation of solar, wind and pumped hydro storage systems. They also intended to, with government, develop a "hydrogen valley" and so move South Africa into the hydrogen economy. Cutifani concluded: "The future is looking great!" Valli Moosa agreed: the transition to a green economy holds the key to South Africa's future prosperity.

Dissenting voice

In both meetings – and in his many public appearances – the one obviously dissenting voice was Gwede Mantashe, Minister of Mineral Resources and Energy. In the next eighteen months he would become a lightning rod for the anger of environmental activists, who accused him of delaying the transition, defending coal, gas and nuclear, and encouraging seismic tests in oceans to find oil and gas. He argued:

1. Let's be careful of leaving the known for the unknown
2. Coal is an endowment that we have – let's investigate clean coal, and carbon capture and storage (so we can keep coal)
3. Let's start a gas industry, based on ocean gas and fracking gas

He added that he was aware of public opinion and complained, "I get beaten for my views on coal." He warned that the commission should have appetite to engage with different opinions, "so to discover what is in our blind spot. We should focus on getting funding, as well as ideas .... Unemployment and poverty are on the rise... we will take the blame for that. Our key priorities remain security of supply, affordable, accessible, reliable energy. Yes, reduce carbon emissions, but we must ensure security of supply... as a catalyst for economic growth.

Mantashe argued for nuclear power – in modular form – for energy security. Renewable energy could not provide baseload. Gas should be factored in since Mozambican gas is available. The DMRE, he said, wants a careful, realistic,

pragmatic transition, and accordingly the department is developing its own overview of all such efforts. “There is no debate on investing in cleaner coal technology, there should be such.” Finally, he was committed to the transition, “but it must be orderly”.

His subsequent pronouncements and actions contradicted that. He told mining conferences that coal should remain part of the energy mix. Then he turned paranoid. He accused activists and researchers (particularly at the University of Cape Town) of pursuing the agenda of foreign forces to undermine South Africa’s economy via the transition. They were directly undermining him and his department – presumably by being critical of the calculations in the IRP 2019, showing that it was not, as claimed, based on least cost, but that further coal and nuclear had been forced into the plan even though they were expensive.

In the 30 July PCC meeting he remarked grumpily: “Many say IRP 2019 should be reviewed, but they do not say what detail should be changed. We are very keen to hear those views, but they’re not coming ... people must come and say what needs to change.”

The meeting’s chair, Valli Moosa, commented: “I particularly noted your invitation for comments on the IRP 2019,” and promised that the PCC would take the minister up on that. On some people, sarcasm is lost. But the events and arguments around Mantashe showed that the fight around the end of coal was far from over. The dynamics of coal that had been formative in the history of South Africa were still very much alive and would inform the future, the possibility and the shape of the transition.

By the end of the 30 July meeting, the process had in effect moved onto a path of ecological modernisation in order to deal with the pressures of the climate crisis. In the corporate view, the economy would not shrink, or use fewer resources. Rather, it would replace coal-fired electricity with renewable energy. This would result in an extension of the electricity grid into areas where good sun and wind resources were available. There would be a massive new build of RE, and some argued for an ‘overbuild’ so that excess capacity would stabilise the grid and also provide for the energy-intensive

manufacture of hydrogen for export. This would be accompanied by locating as much as possible of the production of components for RE systems in South Africa, which possibility was being explored by research under the South African Renewable Energy Masterplan (SAREM). This agreement was a classic example of eco-modernisation, in which technology changes, but nothing else does. It was an attempt to create growth on the basis of RE – including mining for minerals for the new RE economy – so that workers who lost their jobs in coal mining, coal-fired electricity and associated economic activity, could be accommodated in new jobs. It was the exact opposite of what the environmental justice movement sees as a just transition.

Next, the PCC turned to the NDC, originally drafted by the DFFE, to infuse it with "more climate ambition", and present it at CoP 26 in Glasgow, Scotland, at the end of 2021, where it triggered an offer for climate finance assistance from the UK, US, Germany, France and the European Union (the IPG). The processes and debates regarding climate finance are pursued in detail in Chapter 4 of our report.

Ramping up South Africa's climate ambition

When climate diplomacy under the Kyoto Protocol failed to deliver a globally controlled climate action approach, government negotiators changed tack to a 'bottom up' approach. Activists on the ground turned to a strategy of directly blocking each and every new coal mine and coal-fired power station development. Individual countries were required to make 'nationally determined contributions' to carbon emissions reductions, rather than agreeing to a global 'top down' allocation of emission rights within a global carbon budget. The US torpedoed all initiatives for a top down system. China did not. As a 'non-Annex1' (NA1) country, its interests were well served by a global system that required Annex1 countries to act first. What it has refused is any change in its NA1 status. The US has in fact got the sort of deal it wanted from the beginning – no obligations and no liabilities. The most ambitious countries in the South, in terms of mitigation, would be 'rewarded' with concessionary finance.

South Africa had sent in a first NDC in 2015 for CoP 21. Now[83] it had to be updated for CoP 26 in November 2021. After the workshops, and further modelling work on the feasibility and socio-economic implications of different mitigation targets, as well as research on means of support, the PCC recommended increased ambition, which would require moving the band of South Africa's (allowed) carbon emissions over the period. The band consisted of a maximum (we will emit no more than) and a minimum (we will aim to lower our emissions to this minimum). On these recommendations the international watchdog Climate Action Tracker reported[84] that:

> The South African Presidential Climate Commission, a multi-stakeholder group established by President Ramaphosa to advise on the country's NDC update, has recommended that South Africa put forward an even stronger target than currently contained in the government's draft NDC. The lower end of the Commission's proposed emission limit range is close to being 1.5°C compatible.

The Climate Action Tracker remarked that "this kind of target would make South Africa one of the few countries with a 1.5°C compatible target, and turn it into a global leader against climate change," and that the Commission's own analysis had showed that this target was "well within reach".

In the words of the NDC itself, the final, updated September 2021 version:

> … represents a progression within our first NDC, and reflects our highest possible level of ambition, based on science and equity, in light of our national circumstances. As communicated in section 4 (c) the updated mitigation targets demonstrate considerable progression. South Africa shifted from BAU-based targets for 2020 and 2025 in terms of the Cancun Agreement under the UNFCCC, to a fixed level

83 The first version of the updated NDC was released with the date 30 March 2021. The updated version was accepted by cabinet on 14 September 2021 and presented to CoP 26 envoys almost immediately. https://www.sanews.gov.za/south-africa/sa-meets-climate-envoys-ahead-cop-26.

84 https://climateactiontracker.org/blog/south-africas-presidential-climate-commission-recommends-stronger-mitigation-target-range-for-updated-ndc-close-to-15c-compatible/

> target range under the Paris Agreement. This update demonstrates further progression, reducing the upper range of South Africa's 2025 and 2030 targets. These near- to medium-term targets are further informed by a long-term perspective contained in South Africa's recently-communicated Low Emissions Development Strategy 2 to the UNFCCC, and sets the country on a pathway to implement this Strategy.
>
> In 2025, South Africa's GHG emissions will be in a range from 398-510 Mt CO_2-eq. In 2030, South Africa's GHG emissions will be in a range from 350-420 Mt CO_2-eq.
>
> By comparison to the targets contained in South Africa's first NDC submitted in 2015, South Africa's updated mitigation targets represent a very significant progression. The upper end of the target range in 2025 has been reduced by 17%, and the upper end of the target range in 2030 has been reduced by 32%, and the lower range by 12%. The range between upper and lower bounds narrows significantly, from 216 Mt to 112 Mt in 2025 and 70 Mt CO_2-eq in 2030.

These claims deserve scrutiny. According to the Life After Coal (LAC) campaign, the NDC commitment is not adequate. The DFFE holds the Climate Equity Reference Calculator (CERC) as its preferred reference for its fair share of global emissions because it takes account of North-South equity. It claims that the lower bound meets CERC's 1.5° pathway and the upper bound meets the 2° pathway. This is something of a stretch. CERC gives a lower equity range and an upper equity range. As shown in the table, the NDC lower bound just meets the upper equity range for 1.5°. The upper limit misses the upper bound range for 2° by 19 Mt. Moreover, as the CERC notes, its "2°C pathway should not be considered consistent with the '***well below*** 2°C' provision of the Paris Agreement" [their emphasis].

Table 1: 2030 emissions (MT CO_2e): 2021 NDC compared with Fair Share (including FOLU).

			1.5°C pathway	2°C pathway
NDC lower limit	350	**Fair Share lower equity range**	274	350
NDC upper limit	420	**Fair Share upper equity range**	352	401

The LAC argued that the NDC misses the real urgency of an effective response to climate change and hence also the necessary speed of transition. The latest national GHG inventory [DFFE 2021] gives 2017 emissions without land use as 559 $MtCO_2e$, and with land use as 519 Mt. South Africa's 2021 NDC commits to reducing emissions to between 350 to 420 Mt, including land use, which is assumed to sink 12 Mt a year on average by 2030. Meeting the NDC range would require a reduction in emissions of between 20% and 33%. If land use is excluded, the reductions are steeper, at about 23% and 36%.

Beyond this, however, the Northern powers have exceeded their budgets by a very long way and it is not physically possible for them to sink that excess. Hence, if we are serious about meeting either temperature target, Southern countries must reduce by more than their fair shares and claim the difference as the climate debt owed by North to South.

Box 2: The loophole: Net Zero is not Zero

The JTF says the transition is towards a zero-emissions economy and society. We support this position. However, it then uses the term net zero in relation to sectoral transitions. It should be made clear that these terms are not interchangeable. Net Zero is not zero, as Kevin Anderson of the Tyndall Centre puts it. Net zero relies on removing as much carbon as is emitted either through 'nature based solutions' (NBS) counted as offsets or "unproven future technologies for removing carbon dioxide from the atmosphere".[85]

Global CO_2 emissions from 1850 to 2021 add up to about 2 500 billion tonnes (Gt) – 1 718 from burning fossil fuels and 786 from 'land-use change' (the destruction of forests, grasslands, wetlands and the like), according to the IPCC. That leaves about 310 $GtCO_2$ in the budget for a two-in-three (67%) chance of coming in below 1.5°C, or 1 070 Gt for the same chance of coming in at 2°C. Annual CO_2 emissions are now around 43 Gt, so the 1.5° budget will be used up in seven years if emissions are not reduced very fast while the 2° budget will be gone in the early 2040s. If non-CO_2 greenhouse gas emissions, particularly for methane, are not reduced even faster, then the CO_2 budget will be squeezed.

It is critical that the destruction of ecosystems is reversed and that earth is restored. However, this can only compensate for the past destruction of nature. In carbon terms, it may sink a portion of the 786 Gt previously lost through land-use change but does not offset emissions from burning fossil fuels. Living carbon (from the fast carbon cycle of living organisms and the

85 https://www.climatechangenews.com/2020/12/11/10-myths-net zero-targets-carbon-offsetting-busted/

natural flux between land, atmosphere and oceans) is not exchangeable with dead carbon (fossil carbon from the slow carbon cycle).

Moreover, whereas emissions from burning fossil fuels are certain, natural sinks are inherently uncertain. Forests may burn and restored wetlands may be destroyed again. There is also a time difference: the emissions are now (and keep coming), whereas the sink works over time and may be too late. And there is a mismatch of scale: many big corporate emitters and most countries are making net zero declarations substantially reliant on NBS. Shell alone says it will need to reforest an area the size Spain to offset its emissions by 2050. Clearly there is not enough land to go round. Equally clear is that land will be appropriated at least economic and political cost – that is, from peasants and indigenous people in the global South. This is already happening under the rubric of 'reducing emissions from deforestation and forest degradation' (REDD), a programme which in any case has failed to reduce overall emissions.[86]

Carbon dioxide removal relies on large scale sequestration through technologies such as carbon capture and storage (CCS) and, even more destructively, bioenergy with carbon capture and storage (BECCS). CCS is excruciatingly expensive and energy intensive, is primarily used for 'enhanced oil recovery' thus defeating the purpose, and has failed in power station pilots. As to BECCS, burning trees in power stations already consumes whole plantations – as at Britain's Drax station. The land needed to produce net zero or net negative emissions from 2050 will rival the land take for NBS.

86 https://features.propublica.org/brazil-carbon-offsets/inconvenient-truth-carbon-credits-dont-work-deforestation-redd-acre-cambodia/

3 Formulating a Just Transition Framework

By May 2022, the PCC accepted the Just Transition Framework, as a first expression of a national consensus, so demarcating the discursive boundaries – and resources – for debating and evaluating the transition in South Africa. The JTF provided a more progressive discursive space than the early, enthusiastic embrace of ecological modernisation would suggest.

The work started with the PCC consciously creating and consolidating a knowledge base that largely defined the contours of debate. TIPS played an important role, being tasked to deliver five formative policy briefs, on

- Policy dynamics: Framing the policies to achieve the just transition, drawing on international experience (Gaylor Montmasson-Clair);
- The coal value chain, including electricity and how we see employment in coal sector transition to new areas of growth (Neva Makgetla and Ibrahim Patel);
- Financing and the just transition (Sandy Lowitt);[87]
- The just transition, unemployment and sustainable livelihoods, drawing on the modelling exercises by ESRG, CSIR and NBI (Nokwanda Maseko);
- Governance and monitoring structures (Neva Makgetla).

There were also many online dialogues in webinar form, offered by a range of research bodies, exploring decarbonisation paths in increasing detail. In August 2021 the policy briefs, and the dialogues based on them, were consolidated into a draft framework, called "Policy Primers for a South African

87 This work noted that the South African financial system and actors were not well placed to finance just transition projects

Just Transition Framework" [Montmasson-Clair 2021]. Montmasson-Clair's work deepened the definition of a just transition (in the narrow sense of defending jobs threatened by changes in production that benefit society as a whole) to a conception of three dimensions of justice provided by the merging of the traditions of environmental, energy and climate justice [McCauley and Heffron 2018]. "Justice ambition" or the justness of the just transition could be understood in three dimensions: procedural justice, substantive justice and restorative justice [see later in this chapter].

The Just Transition Framework

The JTF justly declares that the transition will be a huge process: "Tackling climate change will require urgent, significant, and transformational changes across all sectors of the South African economy. It will require innovations in urban and infrastructure planning; a massive shift to clean energy sources; and changes to how we use our land, water, and obtain our food."

> The changes will be difficult for some, particularly the workers and communities whose lives and livelihoods are tied to fossil fuel industries, as well as the women, the youth, and the poor, who are already disproportionately bearing the brunt of South Africa's hardships and triple challenges. Managing the transition will require strategies that both deal with the unavoidable burdens arising from the transition, as well as strategies that seize the opportunities offered by the green economy, with wide sharing of benefits.

Therefore: "People must be at the centre of the climate change response... Indeed, the aim is a just transition: seizing the opportunities and managing the risks associated with climate change, with an overarching goal of improving the lives and livelihoods of ALL South Africans, particularly those most impacted" [3].[88]

88 Page references in this section are to the JTF unless otherwise stated.

In developing the framework, the PCC "conducted a series of publicly broadcast workshops and events on these issues, incorporating views of government ministers, civil society, business, labour, traditional leadership, youth, and the research community", commissioned a series of expert essays, consulted with workers, communities [see section on community consultation below], small businesses and social partners, received and responded to 43 written submissions on the draft framework, then consulted again with communities, municipalities and traditional leaders in affected regions, completing the process in a big multistakeholder workshop in May 2022 [5].

A short document of 33 pages, the framework is organised in seven main sections. First, it declares that the "framework stands on the shoulders of years of research in South Africa on the just transition, done by government, business, civil society, academia, and labour unions. The framework incorporates learnings from prior consultation processes on the just transition … complements international best practice guidance on achieving just transitions (ILO 2015)... and particularly celebrates the contributions of the trade unions."

The document is careful to mention the contributions of government departments "who have advanced the just transition agenda". This may seem overly generous, in particular to the DMRE, but is in line with the PCC's concerted efforts to involve government departments in the transition. They name:

> … the Department of Forestry, Fisheries and the Environment (DFFE) was instrumental in creating the National Employment Vulnerability Assessment [Makgetla et al, 2019] and Sector Jobs Resilience Plans [Makgetla et al, 2020c]; the Department of Mineral Resources and Energy (DMRE) has engaged in several scoping studies and developed a draft just energy transition plan [DMRE 2020]; National Treasury has created working groups focused on climate change and the just transition, as well as deepened work on financing a sustainable economy [National Treasury 2021; National Treasury 2022]. The Department of Trade, Industry and Competition (DTIC) has developed a roadmap

> for the local production of electric vehicles and components in South Africa [DTIC 2021]; the Department of Public Enterprises (DPE) has developed a roadmap for Eskom as part of a reformed electricity industry [DPE 2019] [7].

Then the framework defines the just transition:

> A just transition aims to achieve a quality life for all South Africans, in the context of increasing the ability to adapt to the adverse impacts of climate, fostering climate resilience, and reaching net zero greenhouse gas emissions by 2050, in line with best available science.
>
> A just transition contributes to the goals of decent work for all, social inclusion, and the eradication of poverty. A just transition puts people at the centre of decision making, especially those most impacted – the poor, women, people with disabilities, and the youth – empowering and equipping them for new opportunities of the future.
>
> A just transition builds the resilience of the economy and people through affordable, decentralised, diversely owned renewable energy systems; conservation of natural resources; equitable access of water resources; an environment that is not harmful to one's health and well-being; and sustainable, equitable, inclusive land-use for all, especially for the most vulnerable [7].

Despite civil society opposition, the document has kept the 'net zero carbon' definition of the 2050 goal. Nevertheless, this definition presents a vision of a deeply transformed society.

The framework notes that the basic principles guiding the transition are set out in the Bill of Rights in Chapter 2 of the SA constitution. They are

> … first generation democratic and political rights, along with second generation socio-economic rights (e.g. shelter, health care, food, water and social services) and third generation collective development rights (e.g. environment and sustainable development, rights to collective

organisation and economic activities, rights of cultural and linguistic communities). These rights are given further expression in Chapter 1 of the National Environment Management Act (Act 107 of 1998), which contains a justiciable set of principles including putting human development concerns at the centre of decision making, producer and polluter responsibility, equitable access to environmental resources, and equipping people to participate in decision making [8].

To these are added three dimensions of justice specific to the transition:

(1) Distributive justice: "The risks and opportunities resulting from the transition must be distributed fairly, cognisant of gender, race, and class inequalities. It is essential that impacted workers and communities do not carry the overall burden of the transition, and the costs of adjustment are borne by those historically responsible for the problem" [8].

(2) Restorative justice, which means that "historical damages against individuals, communities, and the environment must be addressed, with a particular focus on rectifying or ameliorating the situations of harmed or disenfranchised communities". The framework says that "healing people and the land ... was an immediate need echoed by all communities that the PCC has consulted with" [9].

(3) Procedural justice: "Workers, communities, and small businesses must be empowered and supported in the transition, with them defining their own development and livelihoods. It is about embracing the sentiment, 'nothing about us without us!'" [9].

The framework proposes practical steps to realise each of these dimensions of justice. For example, to achieve procedural justice it is necessary to assist communities "to understand what the just transition entails, specifically, and discuss points of agreement and disagreement openly and transparently" as well as "supporting the design and implementation of just transition projects, as proposed by individuals and communities in affected areas".

At-risk sectors and value chains

The framework focuses on four sectors of the formal economy that are at risk because of climate change as well as risks arising from the transition process – (1) the coal value chain, (2) the auto value chain, (3) agriculture, and (4) tourism – as a first illustration of these risks, but says that further work will be needed on other sectors. It provides a table of risks and impacts anticipated to occur between now and 2050. The framework also identifies opportunities in this period: demand for, and financing for renewable energy; active searches for new livelihood opportunities; demand for more climate resilient agriculture, infrastructure, and housing; and demand for cleaner transport. This will be followed by "very rapid investment ... in new transmission lines and technologies for power generation and storage". In turn,

> … more reliable and cheaper electricity will promote a more sustainable economy and job creation, while there will be growing international and domestic markets for e-vehicles and other technologies to reduce emissions and improve resilience, which South Africa is well placed to respond to. There will also be efforts to diversify local economies now dependent on coal ... Investments in electric vehicles and hydrogen will equip South Africa to meet the global clean energy future. The clean energy transition will also open new markets for the supply of other minerals, like platinum, vanadium, cobalt, copper, manganese, and lithium, opening new export opportunities... [15]

Key policy areas to give effect to the transition

The framework identifies key policy areas necessary for the transition. The first is skills development: (1) reskilling and upskilling existing adult workers to navigate the transition; (2) aligning the skills development system with the anticipated labour force needs of the future, particularly green jobs to support a just transition; and (3) ensuring foundational skills through the education system to improve the adaptive capacity of the broader workforce.

The second is industrial development, economic diversification, and innovation. "New economic clusters will be needed to create new jobs and replace jobs where they may be lost. These clusters can be designed to meet local needs, for instance by producing local necessities such as food, construction materials, entertainment, education, or healthcare; alternatively, these clusters can provide products for regional or global markets. Rising numbers of small and informal business are critical for a more resilient and equitable economy" [2022: 17]. The framework also sees possibilities in the biodiversity economy, which "generates over 418 000 jobs in South Africa" in "restoration of biodiversity, fisheries, wildlife ranching, biodiversity-based tourism, traditional medicine, and indigenous tea production", and in economic diversification and innovation.

The third key policy area consists of social protection measures. The JTF acknowledges that there will be a need for social support for the poor and unemployed, those transitioning jobs as a result of the just transition, and those affected by climate disasters. A Basic Income Grant or BIG has been advocated for by a large group of civil society organisations, and is a prominent demand in the Open Agenda [see Chapter 8 below]. The JTF also points out the need for ongoing support for climate resilience, both of people and physical infrastructure such as houses and roads.

Effective governance arrangements

The framework acknowledges that "state capture, the loss of capable managers, erosion of accountability, and lack of professionalism, has severely hampered the ability of the state to implement good governance at all tiers".[89] Effective governance will be needed to implement plans, build consensus, mobilise resources, avoid decisions and investments that are not aligned with the just transition, coordinate implementation and monitor progress. One such decision is the ongoing Musina Makhado SEZ (MMSEZ) megaproject in Limpopo, which was flagged as a danger to South Africa's climate ambitions.

89 This is a 2022 quote from the Presidency.

Financing a just transition

Based on the work of the Blended Finance Taskforce and Centre for Sustainability Transitions,[90] the JTF says the transition "will require significant capital mobilisation, from both public and private sources, both domestically and internationally" estimated to be at least US$250 billion (R4.25 trillion) over the next three decades to transform the energy system, with at least $10 billion (R170 billion) allocated toward "climate justice outcomes" – which the JTF calls "the heart of the transition" – to support workers and communities in the transition, e.g. compensation, retraining, relocation, and rehabilitation of regions and communities [2022: 24].

A number of other steps are required, including reviewing current taxes and subsidies and eliminating perverse subsidies, reviewing the use of public resources for service delivery and closing the inequality gap, creating business cases for just transition projects, integrating the just transition framework into the national budget and reorienting state spending in support of a just and equitable transition, integrating climate-related risks and the just transition imperative into all investment decisions, tracking just transition finance flows and disclosing them, using green bonds, using blended finance to catalyse private investment, and encouraging public-private partnerships "to deliver capital-intensive infrastructure projects that support a just transition" [2022: 25]. The JTF concludes with an action plan consisting of "priority interventions to give effect to a just transition" [2022: 26].

Community consultations

Coal affected communities that groundWork and Earthlife have been working with for decades, mainly in defence of their health and livelihoods against pollution and other impacts from coal mining and burning, engaged with the transition process at several points. This included a five-year research

90 Eliza Macmillan-Scott, Katherine Stodulka, Mark Meldrum and Mike Kennedy (Blended Finance Taskforce), and Mark Swilling, Nina Callaghan, Nthabi Mohlakoana and Erica Johnson (Centre for Sustainability Transitions), ***Making Climate Capital work: Unlocking $8.5bn for South Africa's Just Energy*** Transition, BFT & CST, 2022.

project with community activist researchers drawn from community based organisations in 14 coal affected communities,[91] various webinars and workshops where communities formulated their own positions, and direct participation in PCC consultations at Emalahleni, Carolina, Secunda and Lephalale as well as the PCC summit in May 2022, where the JTF was agreed. The PCC consultations also included communities affected by fossil fuels other than coal – at South Durban and Xolobeni – as well as the car making centre of Gqeberha and the iron and manganese mining centre of Hotazel. Community perspectives presented below are drawn from this research project, from the One World report summarising the community consultations in the first half of 2022,[92] as well as the authors' personal attendance at some of these consultations.

Communities took up the PCC commitment to procedural justice and interrogated it. Reporting back after attending the consultations, the majority of community activist researchers (CARs) felt that community concerns and agendas had been listened to, because the issues they raised were repeated in commissioners' responses at the conclusions of meetings, and because the commissioners made promises that they would return and report back on how issues were handled. Communities noticed the broad spread of commissioners, including trade unions and business. However, there was also an awareness among communities that the PCC did not have a say over many of these issues, for example local governments' lack of service delivery.

Some CARs felt that their issues had not been listened to. They were shocked that local government was absent in most of the consultations – as were government ministers and, in most cases, commissioners from business. This is indeed a glaring gap in the light of expectations on local government to build communities' resilience (including through better service delivery and urban planning), undertake planning for local economies after the end of coal, and deal with climate disasters through their disaster management units.

91 The research started with three Highveld communities in 2018, and had grown to 14 research sites on South African coal fields by 2022.

92 One World, ***Just Transition Framework – Community and Stakeholder Engagement Report***. There was a 1 April, 26 April and a May version of this report. Page references in this section are to the earliest, 1 April version.

To improve the process, the researchers proposed broader awareness building and ongoing debates to overcome some of these disagreements, noting that there is a lack of knowledge about the just transition, but also that the move away from coal cannot be avoided. There should be workshops on just transition with communities, as well as discussions on local radio stations. Traditional leaders should be part of debates about just transition. They proposed the establishment of district climate committees (or forums). CARs had detailed advice for future participants in the process: participants should learn about what the PCC is and what its mandate is; they should put their issues concisely; they should be comfortable in using their own languages. Community participants should be encouraged that they have the right to speak and express themselves.

Similar responses from the CARs followed on the May summit meeting, on the questions: "How do you evaluate the May 5 and 6 summit in terms of procedural justice? Was it fair, were there opportunities to input and debate freely?" A large number of CARs answered that the summit did create the impression that the PCC tried very hard to make the process fair. One researcher was specifically impressed with the degree of consensus and commitment to a just transition:

> The issue of a just transition and climate change is currently impacting our livelihoods and lives negatively. The KZN floods claiming more than 400 lives, was a wakeup call. Minister Pravin Gordan emphasised the reality of climate change. All ministers, panellists, commissioners and civil society organisations expressed the importance of working collectively towards low carbon emissions. The meeting discussed a just transition that leaves no one behind and creates space for human rights and meaningful participation of communities.

And another:

> The process was quite excellent in terms of procedural justice. It was fair enough. We were all treated the same way, the ministers, the leaders of the communities, the PCC members and us community researchers

> we were all feeling equal. In terms of being given opportunity to talk, it was free to everybody to express themselves, only time was not on our side because we were so many and it was not easy for us all to talk.

This is the type of goodwill with which many community members approached the participation, in stark contrast to the cynicism of some politicians about the value of community participation.

CARs were then asked: "Did other actors (such as business, trade unions and government) listen to the community?" Answers were:

> My observation was that the PCC commissioners are really trying their best to make sure that they listen to every voice on the ground. As community members and stakeholders we should meet them halfway and assist in making sure that as environmental activists we share the knowledge that we get from the conference session or PCC meetings so that no one is left behind. Maybe it might be a matter of budget constraints and time that they cannot reach each and every town but they are doing their level best to make sure that the transition becomes as just as possible. The other thing I picked up is that all stakeholders are in support of the transition. We have differences but they lead to the same destiny. It is just that some want to take the long route, a steady and slow one, while others are seeking radical action.

But this was tempered by a deep-seated distrust and wariness:

> As for government you will never know. They seemed as if they were listening but they are not to be trusted. It varies from one municipality to another. As for my municipality I don't trust them. Trade unions are also not trusted. I think if commissioners can tighten the hand maybe they will co-operate.

Other researchers added:

> As for the government, these people are good in listening and talking: they always know what to tell us to make us believe that they are listening. For example, Minister Ndzimande and Minister Gordhan speeches were like a rehearsed song. They knew what to say to us even if they were not in the conference on the first day but their speeches were on point. Yes, I know that they got reports from their PAs but one would tell that the ministers are not sold on the just transition issue.
>
> I have observed the ministers' presence, the ministers attended the conference. I'm not sure whether it was because the conference was held in Midrand or it was because their diaries were clear and they were not committed maybe. Unlike the community consultations where the ministers will not bother to show up or maybe it is because the venues in our communities don't meet their standards, I don't know. And that Minister Mantashe wasn't there and I didn't hear any apology rendered on his behalf and to me it looks like he never takes the Commission and its purpose seriously. He is just pushing his own agenda.

Or another: "The main concern is that community members were worried if the government was not doing a tick box session with the individuals on that day."

The researchers felt that there was not enough opportunity for input at the summit and the breakaway groups were mostly not easy to participate in. There were ministers "who said the right words", but researchers were cynical about whether they really meant what they said. Minister Mantashe was not there, which researchers found suspicious, since he is supposed to be centrally involved, but does not seem to support the just transition. The Minister of Health was also missing. Some of the CARs expressed concern that there were mostly community members and activists, and not so much representation from business. Are they taking the process seriously? It was also mostly community and trade unions commissioners that attended the community consultations. Bobby Peek, in his role as PCC commissioner, observed that there were no meetings where non-business commissioners could learn what

the perspectives and fears of business were, despite repeatedly requesting such meetings. A community researcher remarked:

> One thing was apparent, that the focus was more on growing the national economy and no specifics about local economy. Also a lot of focus was on how jobs could be created, no emphasis was placed on how to ensure community involvement and the role of the different stakeholders.

The One World report summarised the process issues: language is important. Communities should be able to express themselves in their own languages, and have their knowledges respected. Community researchers observed that their communities understand climate change (older people from observing the weather, younger people from what they learn at school).

Youth was seen to be excluded in consultations and decision making. Speakers from the youth constituency presented passionate arguments about their place in a climate changed world, and expressed their frustration at an education system that did not result in them getting jobs even if they were qualified. Community voices argued that women are often at the forefront of adapting to climate change and economic shifts, and proposed that the Just Transition needs to have gender-focussed interventions and a clear understanding of the gender issues on the ground in these communities. In their reports and discussions, community researchers agreed that gender issues are important. It included the role of women as care givers in difficult circumstances, and fears that pressure will increase as a result of climate change and the energy transition, as it did under Covid and lockdown and the accompanying deprivation.

Communities expressed clearly that they want to participate in the process for as long as it takes – and will not be happy with token consultation. Proper consultation takes time. As One World noted: “This process has to build in sufficient time and space for stakeholders to prepare themselves to engage effectively. Additional engagement is required to build a basis from which stakeholders can engage effectively with the just transition process” [6]. One

World also reported on the role of gatekeepers protecting mining interests, noting that within every community there are those who use violent means to protect their employment in mines. "Environmental and gender activists are routinely targeted. There is no evidence that the government is protecting the interests of communities in this regard, creating the impression that government is complicit in this gatekeeping and attacks on activists" [5]. Many, if not all, communities that were consulted live with poverty, unemployment and bad services. Some are not even part of a minimally stable informal economy – but go out to look for scrap metal, occasional job opportunities or anything that may come up. As a result, it made sense that One World observed that "the bulk of the workshop time will be taken by communities communicating their challenges and frustrations with government processes and low economic development".

Distrust of a dysfunctional government

In all the consultation meetings, it was evident that there is a strong distrust of government, as a result of bad experiences with local and national governments' (lack of) service delivery, including on health, water and land reform. In some meetings, community members accused local councillors of being 'criminals' to loud applause (in Secunda). In the Emalahleni (Witbank) meeting, there was a hostile reception for the representatives of the DMRE. Community and union members said the DMRE does not apply the law insofar as they allow a proliferation of unlicensed coal mining, does not protect communities from these mining operations, and does not respond to community complaints.

One World reported that "the government is widely seen as being unresponsive and negligent in its engagement with communities, or in responding to their concerns". For example, reported One World, "Numsa had made a submission to government in 2017 regarding options for reducing pollution from power plants and have not seen a response to date. This lack of action on the side of government is going to hamper the Just Transition dialogue and implementation process" [5].

This distrust extended to the PCC. Communities asked: Who is the PCC? Who constitutes the PCC? How were the commissioners selected? What authority does the PCC have? How does it fit with provincial structures? Some commissioners never appeared in community settings – with the single exception of Sasol's Shamini Harrington in Sasol's back yard, Secunda. Civil society and some trade union commissioners went to most meetings, but not those from business or the government ministers. One World reported: "It has been evident from all the community engagement workshops/*imbizo* that the commissioners need to be more visible. On average, four to five commissioners participated in each engagement, whereas the commissioners total 23. This is important. Commissioners represent different constituencies, therefore if only a handful are in the room, only a handful of constituencies are seen to be represented" [7].

The transition is complex

The transition is complex and difficult to grasp, but communities understand the complexity of their situation. One World reported: "They are concerned about the negative health and environmental impacts of mining and energy, but also concerned about the potential for job losses. The coal/oil value chain underpins livelihoods in many of these areas. If mines and power stations are shut down, then local livelihoods will be lost and there is no indication that the proposed transition will provide viable and timely alternatives."

As a result communities want more engagement. They want to know what the alternatives to coal are, what economic opportunities there will be after coal, how decisions will be made, what the just transition structures at local and provincial level are. Trade union members specifically voiced a need for "empirical evidence to support the Just Transition". Cosatu, reported One World, "are reticent to endorse the Just Transition because they lack evidence upon which to make decisions or generate a plan". This makes sense but may point to a lack of discussion of just transition issues among Cosatu members on the ground.

One World reported serious concerns among communities about gaps in skills and capacity needed for the transition:

> There are serious skills development/capacity development concerns amongst all communities. They are calling for access to training and reskilling, but it must be fit for purpose. In some cases, such as the South Durban Basin, these skills exist and are even available via a roster. If migration away from fossil fuels to more sustainable industries is what is required, then the communities directly affected by/engaged in the fossil fuel operations should be placed up front for reskilling. These communities should also be at the forefront of leading the repurposing and/or decommissioning of these operations. In other examples, such as Gqeberha where the motor industry creates around 10 000 jobs, a potential industrial shift to electric vehicles necessitates that skills development for these communities to effectively participate in, for example battery storage pack manufacture, is essential.

These concerns should be read in a context of record levels of high unemployment in South Africa.

Community demands: building the transition from the ground up

Communities expressed a keen interest in restorative justice. As the One World Report put it*: "*Every fossil fuel-based community consulted to date cites widespread health impacts from mining and energy operations, particularly respiratory issues. They are calling for reparations and access to affordable and effective health services." In many meetings, workers called for 'clean coal' technologies, and did not see the urgency of a climate response.

Communities repeatedly mentioned their need for more land and effective land reform. They link that to effective and ongoing rehabilitation of affected land and areas, with an emphasis on involving community based enterprises in rehabilitation opportunities. This is seen as a significant small business opportunity across affected areas in South Africa.

Moreover, communities are coming forward with plans to build a just transition from the ground up, reports One World. “It is clear from the site visits and the workshops that communities have their own ideas for how the just transition, or elements thereof, can be achieved in their local context. … They advocate for a communal context in terms of looking at livelihoods, rather than just looking at individuals. Local colleges offering skills development for fit-for-purpose skills development in such a context would be essential. Many communities have recommended that climate change and the just transition be integrated into school and tertiary education curricula.” One World adds: “This should involve financial support for local actors (who) are already working with communities on climate change and the just transition across the country.”

In the latter phases of their research, community activist researchers reported on existing projects that could build the just transition from the ground up, and have imagined new possible projects, as well as possible obstacles to their implementation and what they want local and other levels of government to do to help. It is striking how important the framing conditions for community based just transition projects are for Community Activist Researchers: “The just transition could only be successful though governance that is open and democratic, equal and balances opportunities between youth, men and women.” Projects need to be inclusive, not discriminate against any age group, be supported by local government and be integrated into their plans such as the Integrated Development Plan (IDP). These projects must do urgent work, “creating cleaner transport, building renewable energy, insulating homes and restoring nature”. From another researcher: “These projects must build resilience towards global warming and climate change. What people expect from these projects is stability and sustainability. That is socio-economic stability and sustainability of resources including the preservation and conservation of the natural world.” “Just transition projects from the ground up must consist of integration plans for communities, government and other stakeholders. Consultations in all municipalities, districts, provinces and national spheres must be implemented. IDPs must be compulsory, must include the just transition and it must be budgeted for at local level.” At the

same time: "Civil society organisations must be integrated in all government initiatives on just transition projects or programs."

The largest number of projects that researchers saw as capable of building the just transition from the ground up consisted of information, awareness and training projects: preparing communities, school children, students and workers for the just transition. This points to an urgent need perceived by the CARs to make communities aware and draw them into discussions about the just transition. This is a democratic vision. It also includes longer term preparation – through workers' reskilling, training for youth, and adjustments to the school syllabus.

The second and third highest number of possible projects concerned food, agriculture, greening projects and, in equal numbers, projects aimed at reuse, recycling and developing zero waste systems. Next there was a focus on transport, mine rehabilitation and energy projects, followed by construction (municipal employment), youth employment projects and 'green mining'.

Similar projects already exist. Existing projects were reported in the categories of food and agriculture, and recycling. There was some mention of solar geysers, and one community had no existing projects at all. There are many existing projects that could contribute to the just transition, but they need proper support, especially from local government.

Ideas for new projects still emphasise food projects, but also advance plans for renewable energy projects, more recycling projects, and community based independent power producers. There were proposals for new projects promoting (internet) connectivity, better road construction, as well as "toxic tours", because "over the years we have experienced local and international interest in toxic tours" (showing extreme pollution spots to tourists, researchers, activists and media). There is also a need for "Just Transition Centres" or locally based just transition offices.

Researchers foresee many obstacles to these projects in the current environment (because these limitations already apply to existing projects). Prominent issues are lack of access to land, to water, to funding, in some cases to skills (for example, the youth are seen as having lost or never learnt

agricultural skills). The CARs identified "who must do what to overcome these challenges?" In many cases this is local government. For example: "the municipality will have to make sure that they make land available for the betterment of our community. The lack of access to land is hindering the livelihoods of our community." The researchers see failures of transparent and inclusive planning in local government, land, water, funding, lack of regulation of mines' behaviour, crime, divisions in the community, vandalism and benefits going to a privileged view in the community, on a long list of obstacles that reflect the underlying scarcity of resources in many communities, and the control of these resources by other actors. Communities involved in projects would also have responsibilities, for example practising water wise agriculture and overcoming the stigma of poverty attached to reuse and recycling activities.

"What support do you expect from government?"

CARs responded to the question "What support do you expect from government?" with very clear expectations, which also reflect the often challenging realities on the ground:

> Government must allocate land, water supply and skill training in agriculture, private companies and government must assist with funds and the community must play their role in production, monitoring, maintaining, evaluating and making sure that the project is sustained and beneficial to the community.

Local government featured large in many CAR responses:

> Our municipality must give our people land, to be able to achieve such projects. There is so much land that is available in the area which is not used for anything. If only it was given to the community to able to produce vegetables and assist with food sovereignty. They should also give allowance/funding to the youth for all recycling projects which will assist with just transition and keep the town clean. Such projects don't need much skill and all will be able to do them.

Ward councillors should start working with people on the ground. Community members are looking forward to make changes; the problem is they don't have enough resources that are supposed to be provided.

Government should do their work according to the protocol, not hiring their relatives and friends with no qualifications, while there are so many post graduates staying at home with their qualification.

Local governments should implement health, waste and food projects as their priority mandate and assist with the possible working tools, PPE, seeds, seedlings and required watering systems.

Local service delivery and open democracy, local government that works with people, not taking decisions behind closed doors but communicating with community members.

I expect them to help in terms of informing people because people listen to them.

Create special information centres for just transition.

National and provincial government have important roles to play:

National government should organise a budget in support of innovative projects, whether it's solar, waste or health projects.

On a national level, our government should release funds to the historically disadvantaged individuals who didn't get a chance to go to school but have the knowledge and are able to build gardens to supply vegetables to the community and surrounding farms.

On a provincial level, they should be in a position to accept all proposals given by communities during meetings and interact with them during the IDP and infrastructure meeting.

The Mpumalanga Green Cluster and Mpumalanga government must support community projects on a just transition and climate change.

> Upskilling of workers who are losing jobs based on a Just Transition, e.g. Komati power station workers, they were left stranded. Camden power station workers: currently there is no single project that is aiming to upskill workers. Retrenchment is the only order of the day escalating numbers of unemployment and crime to our society.
>
> Financing and upskilling of communities can prevent poverty and joblessness towards a just transition that leaves no one behind.
>
> Government must join forces with the community to advance the success of just transition projects.
>
> Finance the transition and don't finance coal and other fossil fuels.
>
> Prepare for climate refugees.

Critical view on the Just Transition Framework

The JTF is a crucial document that opens up discursive space for arguments that could advance the Just Transition. But this aspirational document may also be the latest in a long line of noisy gongs and clanging cymbals. The following section takes a critical view.

The PCC was established to advise the president on the country's climate change response and pathways to a low-carbon climate-resilient economy and society. To do so, it "facilitates dialogue between social partners on these issues, defining the type of society we want to achieve, and detailed pathways for how to get there". The scope and purpose, of the framework positions it at

> the nexus of climate and development issues in South Africa. The framework therefore supports South Africa's broader efforts to redesign the economy to the benefit of most citizens to enable deep, just, and transformational shifts (i.e. addressing the triple challenges), in the context of delivering an effective response to climate change (i.e. improving resilience, making substantial cuts to greenhouse gas emissions, and protecting and promoting the health of communities) [5].

A crucial question is whether the framework does in fact contribute to redesigning the South African economy, to enable the deep and just transition that is required, or whether it settles for a comfortable but unjust and ultimately unworkable programme of ecological modernisation that leaves power relations and inequalities intact. Such an approach would not be equal to the vision of a just transition articulated in the JTF's definition quoted above [at p73].

The framework presents three dimensions of justice that are intended to serve as benchmarks for the just transition throughout the process. The framework proposes to achieve distributive justice by increasing people's resilience, and raising their incomes, through sound economic policies and building people's capacities. It is not clear what is meant by 'sound economic policies'. However, we know that neoliberal policies are weak on industrial planning, favour finance capital and result in job losses, so that to achieve distributive justice a fundamental change in economic policies will be required. Evidence of planning for the just transition so far does not show how benefits and burdens are distributed, and how this is taken into planning, either at national level – for example, through the department of trade and industry's SAREM processes – or how it will lead to inclusive local economic development. There is a serious lack of capacity for local economic development planning (plans after coal), and there are also no plans for the informal economy to transition from coal. During the community consultations, local government (with the exception of Gert Sibande in Carolina) was conspicuously absent. There is no clarity in industry plans on what jobs will be created, and there is a bad track record for SA capital in creating jobs – so while the principle is laudable, it needs to be possible in practice and active steps have to be taken, transparently, to make it possible.

Restorative justice is the redress of historical damages against individuals, communities and the environment, with the goal of rectifying or ameliorating the situations of harmed or disenfranchised communities. How will this be done? The document refers to a more decentralised economy, economic inclusion, ownership and participation, youth and women, and moving away from resource intensive sectors and plans to "(1) improve ecosystems with

community ownership and stewardship, (2) improve energy security and eliminate energy poverty, and (3) create opportunities for rehabilitation of degraded land, air sheds, and water systems, the improvement of biodiversity, as well as related employment opportunities" and "remedying past harms by building on, and enhancing, existing mechanisms such as equitable access to environmental resources, land redistribution and Broad-based Black Economic Empowerment" [2022b:9]. It goes some way in acknowledging that there are debts owed to communities in coal and other fossil fuel impacted areas (like Mpumalanga and other coalfields, the Vaal Triangle, South Durban, Richards Bay and Table View in Cape Town). The Highveld communities, for example, have suffered serious health impacts through air pollution from coal-fired power stations, as a forced subsidy for cheap electricity that still endures today.

These injustices do not remain in the past; they affect people as they live in the present and move into the future. In the first place, restorative justice is about redress, and about healing people and the land, the principles of 'polluter pays' and the settling of ecological debt. In the community consultations, and in our ongoing interactions with communities, it is very clear that the immediate community demand is restorative justice – in terms of their health, in terms of the land (both rehabilitation and access to land, including failed land reform programmes); and of water (poor water services and lack of access to water for productive purposes), failure of local government resulting in distrust in government as a whole. Restorative justice needs to be thorough enough to restore trust in government and in the just transition process as it begins.

Procedural justice entails empowering (not only supporting) workers, communities and small businesses, with them defining their own development and livelihoods in the transition – and incorporating their definitions in the ways government, corporates and citizens respond. The ideal of communities defining their own development and livelihoods implies a supportive environment that can overcome obstacles and counter-tendencies, such as the accumulation projects of other actors in the same environment, whether legitimate or corrupt, that result in closing down opportunities, for example the

combination of big agri-business and supermarkets dominating distribution networks, or officials demanding bribes for licences, etc. from street vendors.

The procedural justice ideal, states the framework, could be realised by means of "supporting worker and community organisations (unions, civics, advocacy groups, etc.) to participate actively in just transition policy-making processes, ensuring decisions are made in their best interests and allow them to take advantage of opportunities" as well as "Collaborating actively with a range of stakeholders, allowing each to play to their respective strengths, fostering a more dynamic, competitive, diversified, and equitable economy" [2022b: 9].

Active participation for worker and community organisations is promised, and there may be some imagination of an alternative economy at work here. Following this intention requires that the PCC – together with some broader alliance of interests – would have to work against a number of strong prevailing interests – both corporates and politicians who have so far denied communities a voice – to open this space and keep it open, and would have to support communities in developing their agendas, proposals and ideas into implementable policy alternatives. Communities in the consultations have argued for the just transition to be in the form of community based programmes and projects following the principles of the just transition, but also developing the just transition in a local, context specific way that addresses local issues. This would mean building the just transition from the ground up. Such an approach is possible as the human, planning and other resources exist. The main challenge will be to open and keep open such a space in the light of opposition from global, national and local level accumulation projects. An example would be the implementation of renewable energy projects in communities.

The JTF shows some awareness of the gravity of climate change impact and transition risks, the fact that there is limited time to respond (the report provides a table of impacts and when they are anticipated), and an appreciation of the scale of the challenge in terms of vulnerable groups, sectors affected and the institutional challenges of creating responses within current institutional and economic frameworks.

The JTF points to the high numbers of people in the vulnerable groups it identifies: in agriculture it amounts to 800 000 permanently employed farm workers and an unknown number of seasonal workers, 350 000 small scale and/or subsistence farmers and 55 000 commercial farmers. There are 1.2 million people in the core coal dependent municipalities of Emalahleni, Steve Tshwete, Govan Mbeki and Msukaligwa, with 75% of the country's coal production, who could be affected indirectly. There are 80 000 coal miners plus other groups like coal truckers and power station workers, as well as informal businesses dependent on coal. Changes in internal combustion vehicle use and manufacture could affect 100 000 people in auto manufacturing, 200 000 mechanics and 150 000 people working at petrol stations. The hospitality and tourism sector has 500 000 employees and 110 000 small business owners.

The JTF proposes that in each of the sectors of vulnerable groups that it identifies – namely coal mining and power generation, agriculture, e-vehicles and transport, as well as tourism – there should be forums where stakeholders can agree on strategies for the transition, where agencies will be established (with the support of the PCC and relevant government departments) to implement or oversee implementation of these strategies. The JTF is firm that the working class and communities should be capacitated and supported to participate in these forums and governance of these agencies. This is a massive institution building task to be carried out within the next three to seven years.

In some sectors, serious challenges can be foreseen, for example in agriculture where stakeholders are very segmented and land owners are antagonistic on issues like land and water reform, and are very unevenly resourced. In coal mining, there is a serious trust deficit between the DMRE and coal affected communities and workers, to the point that in community consultations facilitators had to shield DMRE officials (ironically from the newly established just transition unit in the DMRE) from public wrath, for example in Emalahleni, Secunda and Xholobeni. The PCC faces a daunting task in making sure that resources for these activities are secured and that they are carried out in a principled manner. An earlier (February 2022) draft for discussion had concluded:

> In the absence of strategies to ensure fair outcomes, the costs of the transition will fall disproportionately on workers, the poor, poorer communities, and small businesses. This risk is particularly pressing in South Africa, where apartheid entrenched exceptionally high levels of spatial and income inequality, unemployment, and poverty... In this context, the most immediate task is to set up or reorganise structures that capacitate stakeholders, including affected communities, to respond constructively to the climate crisis. Key elements are systems to identify the impacts of the climate crisis and the transition on working people and their communities, and institutions with the capacity and resources to respond [2022a: 33].

The final JTF calls for a sea change in governance. It says,

> The nature of climate risks and the urgency of the transition is such that stakeholders must work intentionally, in concert. Mainstreaming the just transition imperative in planning and budgeting is a crosscutting issue that requires a whole-of-government response... Effective governance at the national, provincial, and municipal levels will therefore be central to achieving a just and equitable transition in South Africa – implementing plans, building consensus, mobilising resources (importantly, avoiding decisions/investments that are not aligned with the just transition), coordinating implementation, and monitoring progress [20].

The challenge of governance is indeed urgent. Recent disasters of Covid and the floods in KZN have seen the emergence of national civil society organisations like Gift of the Givers, as well as countless local volunteer organisations, to deal with these disasters, while public trust in government, as acknowledged by Ramaphosa himself on Freedom Day 2022, has reached very low levels. A new type of governance must be worked out carefully and implemented vigorously and it should be modelled in the practice of the PCC itself. It must herald the

development of a new type of open, participatory democracy without which we will not achieve a just transition.[93]

The JTF, however, remains locked into a form of stakeholder democracy where community, civil society, trade unions, government and business are notionally given equal weight. In practice, big business tends to dominate and investors are made 'more equal than others', as the ruling pigs put it in Animal Farm. The stakeholder model was roundly criticised at the community hearing in Xolobeni. Communities are not just another stakeholder; they are the majority of South Africans. Open democracy must be grounded in community or it will be nothing. In this light, it is urgent that the Nedlac, where communities are not adequately represented, be radically reformed.

Meeting the challenges of multiple crises

The just transition takes place in the face of multiple challenges for South Africa. The just transition cannot avoid dealing with these broader challenges, and the JTF cannot only be evaluated in terms of the criteria it has set for itself. The following should be considered.

Climate change is a crisis of capitalism. There are profound links between fossil fuels – coal, oil and gas – as well as nuclear, and the capitalist economy. The deep transition away from fossil fuels creates the opportunity to fundamentally redesign our economies, the relationships between people and between people and nature.

Capitalism is always expansive and makes growth the central organising principle of the economy. The JTF assumes growth as a prerequisite for development. Never-ending growth, however, is not compatible with serious mitigation.[94] Moreover, growth has been accompanied by growing social inequality compounded by the externalisation of environmental costs mostly

93 See for example the discussion on new governance theory in Swilling, M. The age of Sustainability. Just Transitions in a complex world. Routledge. Open Access at https://www.taylorfrancis.com/books/oa-mono/10.4324/9780429057823/age-sustainability-mark-swilling

94 Anderson, K. and A. Bows, 2008. ***Reframing the climate change challenge in light of post-2000 emission trends***, Philosophical Transactions of the Royal Society. doi:10.1098/rsta.2008.0138, Published online.

onto the poor. The boom years to 2008 took GDP growth to 5.5% but were accompanied by increased pressure on the poor through escalating prices, notably for food and energy. Qualifying growth as 'equitable growth', as the JTF does, merely evades the issue.

In place of organising the economy around growth, we propose it should be organised around justice – economic, social and environmental. The transition should aim for a wellbeing economy in which people live and work in meaningful and positive relationships with each other and the planet.

South African capitalists have been allowed to drain the economy of finances through illicit and licit financial leaks. The PCC needs to recognise the lack of solidarity in the finance sector and propose measures to deal with it. Finance deals should not only focus on international climate finance. Current state expenditure needs to be reoriented within a just transition framework, with a focus on building resilience. All fossil fuel subsidies should be reoriented to renewables and resilience building.

Climate change is fundamentally a crisis of extractivism – of the minerals energy complex and its reproduction, and also crises entrained by the minerals energy complex, such as the vast toxic legacies left by mining, including acid mine drainage, radioactive waste where people are living in Soweto, and the ongoing rifts in the social fabric caused by the migrant labour system. The extraordinary influence of extractive capital, now in its financialised form, has hobbled the liberation of South Africa post-apartheid. These actors are not able to foresee, allow and even less support the radical, deep transition that is required. The incumbents are holding decision making hostage. We are therefore deeply suspicious of accepting ecological modernisation and the simple reproduction of the existing unequal social-political-economic system as an adequate response to the climate crisis.

The climate crisis coincides with a crisis of representative democracy – evident in ANC faction politics, corruption and state failure – which shows specifically in local government, health, and policing, but is actually alive in all facets of public life. This includes increased instances of a 'violent democracy', assassination of politicians as well as environmental activists, including those

refusing mining in their communities, such as Fikile Ntshangase and Bazooka Radebe, and a failure by police to investigate these. Climate change will stress the political system still further.

We also face a broader crisis of crime and violence, and in particular gender violence, part of a broader gender injustice crisis. Climate change will place increasing stress on social systems and make gender injustice worse.

Weak service delivery at local government level robs communities of resilience to face climate change. The KZN floods are an example of how devastating it can be and the results, when the crisis strikes, of a city that has not prepared. Weak service delivery and corruption make the city vulnerable. In response, civil society has started a Durban Coalition, to explore how residents can work together over lines of class and race, in coming crises.

We need to learn from the Covid crisis. It showed us that local government: (1) does not listen to its constituents, and in some cases actively shuts down their political expression; (2) does not deliver services like water, waste management, upkeep of roads and storm water drains; (3) local government and other levels of government do not have real plans for disaster management; and (4) public health services are inadequate and in some cases hostile or indifferent to patients.

The Eskom crisis is the result of an old 'cheap electricity' policy, an equally old policy of ignoring environmental issues, continuing to the present day, including Eskom's refusal to comply with minimum emission standards, and the complicity of DFFE and DMRE in that; state capture; DMRE obstacles to Eskom expanding into renewables; Eskom's parlous balance sheet which cannot accommodate renewables; etc.

Climate change is not the only environmental crisis. For example, we face a deepening water crisis as a result of neglect in the governance of our water systems, despite the availability – on paper – of potentially capable and democratic water governance in the form of catchment management.

Finally, current government plans and decisions ignore the requirements implicit in the work of the PCC. A stark example is the Musina Makhado SEZ (MMSEZ) in Limpopo.

4 Climate finance

The UNFCCC mandates financial transfers from the Northern powers to the global South. This is based on the principle of 'common but differentiated responsibilities' (CBDR), which is a variation on the polluter pays principle – the Northern powers have emitted the larger part of the carbon emissions driving climate change while poorer countries are most vulnerable to climate impacts. Hence, the North should reduce emissions first and fastest but also support Southern countries to reduce their emissions, to adapt to climate change and to pay for loss and damage from climate impacts.

To CBDR is added 'respective capabilities'. Poor countries are more vulnerable to climate impacts largely because they are poor. What might be a severe climate impact in the North is catastrophic for poor countries which do not have the resources for recovery. According to Oxfam, "Flooding in Europe caused $45.6bn in losses [in 2021], while in 2017 Hurricane Maria caused damage [of $1.3 bn] equivalent to 226% of Dominica's GDP" [2022: 3]. Germany was worst hit by the European floods. $45.6bn amounts to about 1.2% of Germany's GDP.

The floods killed 220 people in Europe. Hurricane Maria killed over 3 000 across the Caribbean, mostly in Puerto Rico. It was one of four major hurricanes that hit the Caribbean and US south coast in 2017, ripping out infrastructure in already indebted small island states and causing nearly $300 billion in damage including in the US.[95]

95 https://en.wikipedia.org/wiki/2017_Atlantic_hurricane_season#Season_effects. US monetary losses were by far the highest because the scale of fixed investment is much higher.

This chapter opens with a short introduction to the history of climate finance negotiations, and then gives a detailed account of the Just Energy Transition Partnership (JETP) and South Africa's Just Energy Transition Investment Plan (JET IP).

The $100 billion promise

In 2009 at CoP 15 in Copenhagen, the then US foreign secretary Hilary Clinton announced with great fanfare that they would mobilise US$100 bn a year by 2020. The figure compared with $7 trillion already made available to save the Wall Street banks from the consequences of their own actions. It compared with $600 bn a year that the US then spent on the military. And it compared with estimates that the real need for climate finance was in the order of $1 trillion a year.

Moreover, it was an empty promise made for the moment in front of the cameras. A promise made to be broken. It was included in the Copenhagen Accord, negotiated in back rooms by the US with the BASIC countries – Brazil, South Africa, India and China – and subsequently agreed by Europe. And the wording of the Accord already hedged against any liability: "This funding will come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance." No obligations for the US or for Europe there. Nor was there any hint of how private finance, made available in the expectation of a profitable return, would help poor and already indebted countries caught in the climate crisis.

The Accord was met with disbelief and derision by country delegates who had not been consulted and the Copenhagen CoP broke up in disarray. Nevertheless, a year later at CoP 16 in Cancun, the Accord was effectively adopted to the cheers of the delegates who seemed to forget the issues that made for the discord of 2009. And the $100 bn a year pledge was carried through the next five CoPs, to be written into the Paris Agreement of 2015. And this was to be the funding floor from which more money would be 'mobilised' annually after 2020.

Come 2020, as expected, the promise had not been kept even within the fuzzy definition of 'mobilising'. In 2019, according to the OECD [2021], $79.6 billion had been mobilised with just $16.7 bn in grants, $44.5 bn in public sector loans, and $14 bn private finance variously supported by or blended with the public money. This was a minor increase from $78.3 bn climate funding in 2018.[96] At CoP 26 in Glasgow, the formal Decision "notes with deep regret" that developed countries missed the $100 bn goal and "urges" them to do better but, as Carbon Brief observes, says nothing about making up the shortfall.[97]

Moreover, the claimed climate finance numbers are inflated. Oxfam [2020] observes that loans are counted at full face value rather than grant equivalent value – that is, for example, the difference between concessional and non-concessional interest rates. And climate and non-climate funding are frequently conflated. For 2018, it estimates real climate support to developing countries at $19–22.5 bn – about a quarter of what developed countries claim. On this count, the shortfall is more like $80 bn than $20 bn.

The two main climate funds established under the UNFCCC are the Green Climate Fund (GCF) and the Adaptation Fund (AF). The GCF was 'established' in 2010 at CoP16 in Cancun and took the $100 bn as its own target. It took a while to set up and opened for business with an 'initial resource mobilisation period' from 2015-2019. In that period, it was promised $10.3 bn but got only $8.3 bn. Its 'first replenishment cycle' (GCF-1) runs from 2020-2023 and $10 bn has been pledged. In short, it is close to empty. It was also to provide 'transformational' funding. Apart from the word being sprinkled through the titles of projects applying for funds, there is little sign of it. To the contrary, it has acted as a more or less standard multilateral donor under a pro-business hegemony [Bracking 2015]. Amongst other things, it emulated its 'trustee', the World Bank, to open a 'private sector facility' through which it aims to

96 OECD, 2021, ***Climate Finance Provided and Mobilised by Developed Countries: Aggregate trends updated with 2019 data, Climate Finance and the USD 100 Billion Goal***, OECD Publishing, Paris, https://doi.org/10.1787/03590fb7-en.

97 Simon Evans, Josh Gabbatiss, Robert McSweeney, Aruna Chandrasekhar, Ayesha Tandon, Giuliana Viglione, Zeke Hausfather, Xiaoying You, Joe Goodman and Sylvia Hayes, 2021. ***COP26: Key outcomes agreed at the UN climate talks in Glasgow***, Carbon Brief, 15 November 2021. https://www.carbonbrief.org/cop26-key-outcomes-agreed-at-the-un-climate-talks-in-glasgow

combine climate action and economic growth, promote innovative business models and de-risk investments, and it funded REDD+ projects that enclose forests within markets and are a vehicle for land grabs.[98]

The AF was 'established' in 2001 but didn't get off the ground until 2010. It is liked by Southern countries because its 'direct access' process is relatively easy and puts recipients in charge of their projects. But it is chronically underfunded and has disbursed a total of only $850 million. Donor pledges are routinely not delivered on while its alternative income stream is in suspension. This alternative was supposed to make it relatively independent of donor whims but is from a patently compromised source: under Kyoto, the AF got a 2% tax on the value of North-South carbon trading. This is to be taken up under Article 6.4 of the Paris Agreement, which enables private sector carbon trading, and at Sharm el Sheikh the tax was raised to 3%. Hence, the AF is made dependent on a false solution and the entrenchment of private finance interests while the expectation of income for the AF is a key reason why African countries have pushed for a conclusion to the Article 6 negotiations. They will, however, have to wait another year as the parties negotiate on how wide to open the door to gaming the trading system.[99]

The establishment of a fund for Loss and Damage, the climate impacts that overwhelm adaptive capacities, was claimed as a victory for Southern negotiators at Sharm el Sheikh. It was proposed more than 30 years ago by the Alliance of Small Island States and has been consistently blocked. Following a dramatic diplomatic struggle, the Northern powers finally acceded to the united demand of the Southern country group (G77+China) but were quick to insist that there could be no question of "liability or compensation". Nevertheless, it may be questioned if this is not a distraction, setting the scene for more empty promises and another empty fund.

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98 GCF, ***Eleventh report of the Green Climate Fund to the Conference of the Parties to the United Nations Framework Convention on Climate Change***, 2022; REDD stands for 'reduced emissions from deforestation and forest degradation'. It means more or less the opposite of what it says and is predicated on providing offsets for carbon trading.

99 UNFCCC 2022, Draft decision -/CMA.4: Guidance on the mechanism established by Article 6, paragraph 4, of the Paris Agreement; Hilary Kung, ***Contentious issues over Article 6 of Paris Agreement on "cooperative approaches"***, Sharm el-Sheikh climate news update 17, Third World Network, 29 November 2022.

Box 3: Lies by the dozen

Mendacious is a grand adjective for habitual liars and lying statements. But the world of climate finance goes much further. Mendacity is coded into its foundation. The polluter pays principle stands behind climate finance: the rich countries of the North did the polluting, not to mention the plundering, but poor countries in the South get the worst of the damage. So the rich owe a climate debt to the poor. And this is where the mendacity begins. The rich want to be seen as generous donors, not as recalcitrant debtors.

So how do they lie?

1. By refusing any working definition of climate finance. So no-one knows what counts and the technically expert rich countries can add it up any way they please. 'Mobilising' is pure genius for the purpose. Private capital is ever obscure and ducks behind 'commercial confidentiality' at the first whiff of scrutiny.
2. By exaggeration. Big figures boggle the brain but the numbers shrink on scrutiny, with the noughts dropping off the end. The greenness of funding is also exaggerated, particularly when private capital issues 'green bonds' which may be half green at best.
3. By claiming innovation in climate finance, which merely obscures new debts.
4. By deploying very clever technical experts to produce highly technical reports which, on scrutiny, turn out to be ideological justifications. The expertise lies in dressing up the World Bank's economic ideology in technical jargon.
5. By 'blending' commercial and concessionary loans into climate finance deals which end up costing the recipient as much or much more than commercial loans.
6. By calling themselves 'donors' even when the grant portion is small. Overall, the larger part of climate finance is loan, not grant.

7. By pretending that climate finance is additional to traditional overseas development aid (ODI). Some is but much isn't. It's merely ODI rebranded and is taken from support for health, education and other social goods.
8. By claiming spending in the 'donor' country – on those very expensive experts amongst other things – as part of the funding transferred to the recipient. This is typical of ODI and particularly galling when recipients must pay back loans for advice designed to benefit 'donors' and donor country investors. By reproducing the forms and practices of ODI, the 'donors' retain power in the relationship with recipients.
9. By promoting insurance as climate finance. Except, of course, that the poor do not have the means to pay for it; insurers tend to bail out with their profits as the risks increase; and some risks are certainties – like small islands sinking beneath the waves of the rising sea – and uninsurable. Meanwhile, the question of responsibility – of who done it – is erased.
10. By neglecting the promise that adaptation and mitigation would receive equal funding. But adaptation doesn't make a profit so 'mobilised' capital doesn't go there. So, with deep concern, promise again what you will neglect again.
11. Rising seas, fiercer storms, hotter heatwaves, longer droughts, more intense wildfires all add up to 'loss and damage'. At CoP 27, after years of stalling, the Northern powers agreed that a fund for loss and damage be established but on the condition that it does not imply liability. No-one should ask who done it. And no-one should expect that more than a token will be tossed into this empty bag.
12. By entwining climate finance with carbon trading: not only a false solution to climate change but a way of disguising land grabs and the dispossession of poor people as a public good. This form of mendacity is set to rise exponentially with a new round of carbon trading given the green light at CoP 26 in Glasgow.

Glasgow was called the finance CoP. Perhaps to be known as the liars' CoP. CoP 27 in Sharm el-Sheik was to be about consolidating the rules to make profiteering look like generosity. They did indeed make progress, notably on permitting themselves to declare information on carbon trades between countries secret, but much was held over to CoP 28 in Dubai. This seems appropriate given that city's reputation as a gathering place for cheats, fraudsters and gangsters of every stripe.

[Sources: Bracking 2021; Oxfam 2020]

Coming to the JETP

The Just Energy Transition Partnership was announced with great fanfare at Glasgow through a 'political declaration' between South Africa and five Northern 'partners': the US, the UK, France, Germany and the European Union (aka the IPG). As the South African presidency put it, "partner countries will mobilise an initial $8.5 billion (R131 billion) over the next three to five years through a range of instruments, including grants and concessional finance, to support the implementation of our revised NDC through a just transition to a low carbon and climate resilient economy".[100]

This is the first climate finance deal to recognise the need to fund the transition – the process of change rather than just the end point defined by counting carbon saved. It "emphasises the necessity of a just, equitable and inclusive transition for workers and affected communities" and resolves to "accelerate … the decarbonisation of the electricity system, and to develop new economic opportunities such as green hydrogen and electric vehicles …"

The Life After Coal campaign gave the announcement a very cautious welcome while setting down a number of minimum demands and calling for transparency and accountability in the process of negotiating and implementing the deal. What followed, however was largely opaque.

100 The Presidency, ***South Africa establishes a historic international partnership to support a just transition***, Media Release, 2 November 2021: ***Political declaration on the just energy transition in South Africa***.

In February 2022, Ramaphosa established a Presidential Climate Finance Task Team (PCFTT) under Daniel Mminele, a former banker and central bank official, to negotiate the actual agreements with the IPG – or rather, as it seems, with each of the partners by turn. In September, the PCFTT produced a Just Energy Transition Investment Plan (JET IP)[101] which serves a double purpose:

- first, it produces an overall five-year JET plan which defines what goes into a JET, how much it will cost and where the money should come from; and
- second, it locates the JETP within that plan and identifies what each of the IPG partners will support and how much they will put in.

The overall JET Investment Plan

The overall plan takes direction from the political declaration but is also informed by the debates and consultations hosted by the PCC. The PCFTT also asked for comment and held consultations facilitated by the PCC. But this was a blind process. Consultation was limited to submissions "made without the benefit of access to the draft investment plan," remarked Melissa Fourie and Wandisa Phama of the Centre for Environmental Rights. "This made it impossible for stakeholders outside of the inner circle, even more so for communities who will be directly affected by the investments it contemplates, to engage substantively with the plan."[102]

Democratic participation seemed particularly important as it was evident that the plan would call for a makeover of the South African economy, a reindustrialisation centred on a revamped minerals energy complex. This was largely confirmed when it was finally published in November, just ahead of CoP 27, where the deal was sealed with a flourish of signatures. As is routine in South African planning documents, it cites government's alleged priority to address the "systemic challenges of poverty, inequality, and unemployment"

101 The Presidency, ***South Africa's Just Energy Transition Investment Plan (JET IP) for the initial period 2023-2027***, November 2022. Page references in this section are to this document unless otherwise indicated.

102 Melissa Fourie and Wandisa Phama, ***Will South Africa's 'green deal' deliver as promised?*** Mail & Guardian, 18 October 2022.

[16] but the primary framing is economy rather than society. It does not have the breadth of vision of a just transition centred on transforming relations between people and between people and the earth, but quotes the PCC definition of just transition and locates the just *energy* transition within that broader frame. This narrower JET framing means that it remains within the box of economic orthodoxy even if it occasionally strains against it. It cannot, for example, support proposals for a universal basic income grant (UBIG) as integral to a just transition. On the other hand, it is able to propose a pragmatic working definition of a JET for immediate implementation over the next three to five years:

> A just energy transition in South Africa builds resilient economies and people to meet the NDC targets. It does so by: (i) accelerating affordable, decentralised, diversely owned renewable energy systems; (ii) restoring previous and future ecosystems and natural resources impacted by coal mining and energy production; (iii) reskilling present workforces and educating future ones in green and other new and viable development pathways; (iv) building new productive models for comprehensive economic transitions; and (v) supporting various impacted constituencies to play an active role in decisions and implementation of energy transition programs (be it government or non-government actors) [26].

Following from this, JET interventions need to consider "impacted and vulnerable groups": workers and small local businesses; local communities and "those currently excluded from the existing structure of the economy (due to education, gender, race, or disability)". We might observe that this last group amounts to nearly half the population. Interventions must also look for new opportunities particularly for youth and "underserved communities" [27].

The JET IP therefore focuses on:

- coal areas and the Mpumalanga Highveld in particular, where it "specifically addresses the localised impacts to ensure restorative and distributive justice";

- communities affected by the shift from ICE vehicle manufacturing and maintenance; and
- "forward-looking productive sectors in multiple localities … to support decarbonisation and promote economic diversification and industrial development at a national level …".

In effect, this is a plan for modernising reindustrialisation focused on electricity, 'new energy vehicles' (NEVs) and 'green' hydrogen (GH_2), reflecting discussions between business and government in the PCC and other fora. Supplementing this, the IP calls for substantial investment in municipalities, which are responsible for electric distribution grids, many of which are failing, and "equitable access for the entire grid community" including poor people who may not be getting free basic electricity (FBE). Table 2 shows total investments of R1.48 trillion (US$98.7 bn) needed from all sources – public and private, foreign and domestic – for the next five years, starting now.

Table 2 shows close to half the investment going into the power sector. Skills development crosses all sectors including municipalities but 'social investment and inclusion' is limited to the power sector and comes in at just less than R10 bn. This appears to be part of the larger sum of R60 bn "required investment in Mpumalanga coal communities" [48 ff].[103]

Electricity

The electricity sector accounts for up to 43% of South Africa's total GHG emissions (including land use), almost all of it from Eskom's 15 big coal-fired power stations. In addition to CO_2, Eskom emits large quantities of sulphur dioxide, nitrogen oxides and particulate matter and produces mountains of coal ash. Air emissions are estimated to cause 2 200 premature deaths a year while tens of thousands are made ill. Over the last decade, Eskom has produced less for more: demand declined as Eskom drove up tariffs to pay for Medupi and Kusile and for increasing coal prices, while poor maintenance

103 The numbers are hashed and rehashed across numerous tables and it is not always clear how numbers from the more detailed tables are combined in the overall tables.

Table 2: JET investments 2023-2027

ZAR (US$) billions	Electricity	NEV	GH2	Municipalities	Sub-total
Infrastructure	660	83	313	318	1 374
Planning and implementation capacity	1.35	2	5.5	1.06	9.9
Economic diversification & Innovation	40.4	43	-	-	83.4
Social investment & Inclusion	9.6	-	-	-	9.6
Skills Development				2.7	2.7
Sub-total	*711.4 (47.4)*	*128 (9)*	*319 (21)*	*319.1 (21.3)*	
TOTAL					**1 480 (98.7)**

Source: JET IP Table 26 p.90. US$ amounts in brackets at an exchange rate of R15 to $1. This is either optimistic or dated. Elsewhere in this report, we are using R18 to $1 but this may swing either way in a volatile context.

led to breakdowns and loadshedding. Eskom's emissions are directly linked to how much coal it burns.

Table 3: Eskom emissions in 2021 and 2012 (tonnes)

	Coal Burn	CO_2	SO_2	NO_x	PM 10
2021	105 000 000	206 800 000	1 604 000	805 500	71 350
2012	125 000 000	231 900 000	1 849 000	980 000	72 420

Source: Eskom Integrated Report 2021

Reducing emissions is most easily done in the power sector as energy from renewables is now much cheaper than coal and South Africa's extremely good wind and solar resources make it cheaper still. Moreover, Eskom's fleet is ageing. Six stations totalling 11 GW installed capacity are due for closure by 2030, including Komati which is already shut down, and seven more, nearly 25 GW, are to follow by the early 2040s. Of these seven, Tutuka is the worst performing plant with an availability factor of only 28% and Eskom now proposes closing it in 2030, ten years early.

Big power investments

To end loadshedding in the short term, according to recent research by the Centre for Sustainability Transitions at Stellenbosch University and the Blended Finance Taskforce, 10 GW of renewables and 5 GW storage must and can be built over the next two years. Over the long term, 5 to 6 GW of renewables must be built every year to reach 160 GW installed capacity by 2050. That compares with a total of 6 GW installed or under construction to date.[104]

The JET IP says it aims for the lower end of the NDC carbon emission target range of 420 to 350 Mt/y by 2030. It follows Eskom's closure schedule, including early closure of Tutuka, but says that meeting the 350 Mt target would depend on reducing the utilisation rate of the remaining fleet. That in

104 Mark Swilling, *The long and short of loadshedding solutions – time to call disaster and harness the power of wind and solar energy*, Daily Maverick, 29 May 2022.

turn would require more renewables but, if the DMRE were to implement its 2015 draft National Energy Efficiency Programme, it would greatly reduce the investments in generation and the grid needed to reach that target. Supplying power for electric vehicles and GH_2, however, would greatly increase energy demand even if efficient.

Eskom's power stations are concentrated on the Highveld coal fields and transmission goes one way to where it is used – mostly by big industry and big cities. A renewable energy system requires a grid that can transmit both ways from generators dispersed around the country (or the region) and from where the wind is blowing and the sun shining at any particular moment. At present, Eskom has no grid connection capacity left in the Northern Cape, and just 5 GW capacity in the Eastern and Western Cape together. These are the areas of highest renewable potential. Renewable potential is still good, if not as good, everywhere else in the country where there is greater grid capacity: Mpumalanga itself has the largest available capacity at 6.5 GW, KwaZulu-Natal follows with 6 GW, Gauteng has 4.5 GW, Free State 4.1 GW, North West 3.5 GW, and Limpopo 2.5 GW. Assuming that 5 GW renewables are built every year to support a growth economy, grid capacity must expand rapidly in the coming years, particularly in the Capes.

All energy systems need storage but a renewable system needs much more than a conventional one. Key technologies include:

- Pumped storage, which is already widely used around the world. Water is pumped up to a top dam when there is surplus power in the system and released into a bottom dam to generate power when demand is high. Eskom has two big pumped storage stations and Cape Town has a smaller one used to support the coal-fired system.
- Big battery technology is developing fast and previously high prices are dropping fast. Eskom has awarded two contracts – to Hyosung of South Korea and Pinggao of China – to design and install eight batteries at distribution sub-stations. Batteries are very effective but battery metals are generally toxic and already associated with extractive industry abuses. Vanadium provides an alternative to lithium in big

batteries and South Africa has the best deposits in the world. But it is an extremely aggressive toxic metal and the processing plants – Vanchem at eMalahleni and Vamteco at Brits – are notoriously polluting [see Box 4]. Big batteries from abundantly available sodium are also being developed. They are cheaper and come with lower environmental impacts than lithium or vanadium but also have lower energy density.

- A variety of other technologies are available or in development, including closed circuit 'off-river' pumped hydro, gravity storage which lifts and lowers weights, and thermal storage, which stores energy by heating some material like sand or salt.

The IP's big power infrastructure investments come to R648 bn in the short term (2023-2027) and rise substantially in the period to 2035. The biggest investment is in privatised renewable generation and that is followed by transmission and distribution grid investments needed to get the electricity to users. The batteries provide the additional storage needed by the system operator to accommodate variable renewables on the grid. This reflects the emerging system: generation is increasingly privatised while Eskom generation is left to close down the coal fleet over the next decades; Eskom transmission remains in public ownership, and is to be known as the National Transmission Company of South Africa; distribution remains in public ownership under the municipalities or Eskom.

The IP notes additional and substantial gas power investment (R170 bn to 2035) but says this is not included in the JET IP. This is a bit puzzling. If deemed essential to the future system, one would expect its inclusion. If not – and recent research indicates that it is not – then why add it as a sort of appendage?

Box 4: Vanchem

Vanchem is a rusty and dusty plant that produces vanadium pentoxide, ferrovanadium and vanadium chemicals at the Ferrobank Industrial Township in eMalahleni. Workers say it looks ramshackle because vanadium is extremely corrosive and cladding, conveyors and pipes are constantly replaced. Alongside it is a large slag heap with water pooled in a depression at the top. At the bottom, water seeps out and gathers in a ditch lined with white salts. This black hill of waste overlooks the Transvaal and Delagoa Bay (T&DB) coal mine, abandoned and burning underground for 70 years.

At Vanchem, say the workers, the risks are well known. "When you work there you get smaller – your body shrinks. Your face changes. You feel tension in your body. Nobody can work there for longer than 20 years and not die. The main damage is to the kidneys and lungs. They give us milk every day." The milk ration is meant to prevent vanadium poisoning but it probably works better to prevent discomfort to the conscience of managers.

The Ackerville community is polluted by Vanchem and the neighbouring Ferrometals chrome smelter. They recognise the dust from Vanchem because it is black, shiny and particularly aggressive. Many people suffer from asthma and other respiratory ailments and many have died. People sleep with their windows closed and, if they can afford it, they use nebulisers or air purifiers. But these machines need electricity and loadshedding and outages in eMalahleni are common. In the mornings, sweeping the dust from their verandas instantly triggers a range of symptoms – burning eyes, inflamed sinuses and headaches.

Source: The groundWork Report 2017

Table 4: Electricity sector investments – short and medium term.

Who invests	In what	When and how much: ZAR billions	
		2023-2027	2023-2035
Eskom	Coal plant decommissioning	4	19
Eskom	Transmission grid	132	373
Eskom, municipalities	Distribution grids	14	127
Private sector	Solar and wind plants	475	1 293
Eskom	Big new batteries	23	44
Total		**648**	**1 857**

Source: JET IP [53]. (Rounded to nearest billion)

'Just transition' investments

Table 5 shows transitional investments in Mpumalanga amounting to R60 bn. They are organised under four 'priority areas': 1. Power plants and coal mine land; 2. Economic diversification; 3. Workers and communities; 4. State capacity.

Table 5: Investments in Mpumalanga to 2027

		R Bn
1	Repower and repurpose coal plants: support local communities; invest in RE supply chains	3.4
1	Rehabilitate and repurpose coal mining land for new public and private use	13
2	Upgrade infrastructure: roads, water, digital access, energy access, sustainable housing, shack settlement upgrades.	12.3
2	Diversify local economies: invest in small, local & 'hustle' livelihoods; incubators and accelerators; education and training facilities.	24
3	Caring for coal workers: re-skilling, redeployment, placement, temporary income support	5.6
3	Addressing youth unemployment: education, training, work experience and placements	0.75
4	Assess all coal closures to help provincial and local government plan and prepare.	0.3
4	Develop policies for post-mining development.	0.05
4	Provide budget support and technical assistance to relevant government agencies.	1
	Total	**60**

Source: JET IP [60].

Further 'just transition' investments are not confined to the coal districts but are made country wide to create a local manufacturing supply chain for a renewable power system and to pilot models for community owned renewables.

Table 6: Country wide 'just transition investments' to 2027

	R Bn
Localise manufacture of components for renewables, batteries and grids, etc.	1.6
Pilot and test models for social ownership and build relevant community capacity	1.65
Total	**3.25**

Several of these 'just transition' elements, provincial and national, echo the Open Agenda for a just transition developed by community activists at the 2019 coal exchange. And while the JET IP is restricted to energy, it does note that energy is interrelated with other systems. The Mpumalanga proposals follow this logic beyond energy in the infrastructure upgrades and economic diversification, education and skills, and in state capacity. This last should also bolster governance and the state's capacity for accountability.

An annexure on method describes how the budgets were calculated. Some items are still to be costed and will add to the costs. Notably sustainable housing and shack upgrades are not reflected under infrastructure, but we are assured that the "Mpumalanga Infrastructure Masterplan is currently under development" and "will cover built infrastructure, energy access and social infrastructure" [193]. It is not clear what this will cover. Will it include an holistic approach to fixing people's settlements, integrating mitigation and adaptation, as demanded in the Open Agenda?

Coal mine rehabilitation is substantially under budgeted. For abandoned mines, the IP used DMRE estimates which are not based on "detailed analysis of remediation needs and repurposing investment" [192]. For operating mines, there is no schedule of mine closures for the coming period. The IP used the mine closure provision of big miners "as a guideline" but notes big differences between what is required by the Mineral and Petroleum Resources Development Act and what is required by the National Environmental Management Act. There are also different criteria for rehabilitation: restoring the pre-mining condition of the land or repurposing land for a use that requires a

lower investment. Further, production may fall faster than anticipated because of power station closures or to meet the 'low NDC', so more mines would need to close within the five-year period of the IP. The money for closure should come from the mines, but "many mines do not have sufficient rehabilitation funding even under a 'business as usual' closure scenario" [192 ff].

On the country wide 'just transition investments', IEJ sees the level of support for localising manufacture as woefully inadequate. In a statement titled "Secretly-negotiated South African 'climate finance deal' a gift to private investors while choking local development", they argue that the IP therefore misses the best chance to create quality local jobs.[105]

The budget for social ownership at community level responds to the JTF's call for a "diversely owned renewable system". The JET IP team evidently had some difficulty pinning down a model for social ownership and the method section includes an extended discussion on it. Beyond the national or local state, it sees social ownership including "employee ownership, co-operative ownership, citizen ownership of equity in private companies or vehicles, individual ownership, and collective ownership (and management)". It sees the potential for community scale social ownership to "address energy poverty … especially for women and youth" and says "innovative ownership models can ensure that it is not only wealthy households and industry that benefit from own generation …" [196]. But it notes a variety of institutional and technical challenges as well as the time needed for real community participation. It then settles on pilot projects to test different models. The method section indicates a sum of R555 mn per pilot, which includes equipment and installation as well as support for the process of organising. So the R1.65 bn budget covers three pilots to demonstrate viability in fair sized grid connected settlements. Spreading the model across the country would clearly require substantial resources and intense local engagements.

Environmental justice and labour organisations have called for social ownership of the renewable energy system as a whole – including generation,

105 IEJ statement, *Secretly-negotiated South African 'climate finance deal' a gift to private investors while choking local development*, 10 November 2022.

transmission and distribution. For the JET IP, 'diverse' ownership of new generation includes and is dominated by big private energy corporates as shown in Table 4 above. In this context, community owned renewables may appear as niche operators. Nevertheless, if it is expanded to other communities or groups across the country, it has the potential to bring real benefits of energy sovereignty to communities, to increase the level of community autonomy, and to change the meaning of public ownership, from a state-centric to a people-centric model.

Deregulating power: lubricating privatisation

Overall, the investment plan for electricity reflects a longstanding government preference for privatising renewable energy generation on the one hand, while government's latest response to rolling blackouts and the slow motion wrecking has left Eskom in debt, prey to looting and with broken down machines on the other. In July 2022, following another round of intensive loadshedding, Ramaphosa announced a new big plan to "open the floodgates for private investment in generation".[106]

While Eskom's nominal capacity of 46 GW (not counting IPPs) exceeds peak demand of 32 GW by over 30%, so much of the fleet keeps breaking down that, on Eskom's reckoning, the system is short by 6 GW. The priority is therefore to get as much capacity onto the grid as soon as possible by building renewables which have the shortest lead time. On think tank Meridian Economics' calculations, 5.4 GW of new renewables backed up with 2.3 GW peaking plant and battery storage would eliminate loadshedding by 2025 [2022a].

Ramaphosa said government's electricity crisis plan aims to: 1. improve the performance of Eskom's power stations; 2. accelerate procurement of new generation capacity; 3. massively increase private investment in generation capacity; 4. enable businesses and households to invest in rooftop solar; and

106 Carol Paton, ***Revealed: Ramaphosa's new power plan, which wants 'to open floodgates of private generation'***, News 24, 25 July 2022. Amongst many others, see also: Ethan van Diemen, ***Here it is: Ramaphosa's 'energy action plan' to end SA's rolling blackouts,*** Daily Maverick, 26 Jul 2022; Terence Creamer, ***Eskom moves to ramp up maintenance at six coal plants as it seeks permission to buy up to 1 600 MW of surplus power,*** Engineering News, 1 August 2022.

5. fundamentally transform the electricity sector and position it for future sustainability.[107]

Deregulation is at the core of the plan. Some of this is quite sensible, including cutting red tape that hinders Eskom buying spares, and allowing Eskom to buy surplus electricity – equivalent to 2 000 MW capacity – already available from IPPs or firms with 'own generation' capacity. The 'surplus' from the IPPs is what they generate but must 'curtail' – i.e. waste – because it exceeds the amount specified in their power purchase agreements (PPAs) with Eskom. To buy it, Eskom has to get permission from the minister of energy.

The plan also supports municipalities procuring or building new capacity and embedded generation for households and businesses.

The big move, however, was to deregulate private deals between IPPs and customers. Up until August 2021, embedded generators under 1 MW had to be registered and anything over that threshold had to be licensed by Nersa through a cumbersome process. Organised business and labour (Cosatu) had called for the threshold to be raised to 50 MW for 'embedded' generation. Mining houses in particular wanted to build at large scale to offset both loadshedding and the rising cost of Eskom power. 'Embedded' was understood to mean local, primarily for own consumption or from a dedicated supplier, and connected to a distribution grid rather than the national grid. Meridian went further, calling for such unlicensed generators to be allowed to sell to "multiple customers … to facilitate a decentralised, competitive power market". It calculated that these reforms would result in 5 000 MW being built and so would relieve the national electricity crisis.[108]

In 2021, the Presidency trumped this demand by announcing that the threshold would be raised to 100 MW – the average size of a utility scale REIPP project – as well as allowing multiple customers. A year later, Ramaphosa said the initiative had "unlocked a pipeline of more than 80 confirmed private sector projects with a combined capacity of over 6 000 MW". By then, however,

107 The Presidency, ***Address by President Cyril Ramaphosa on actions to address the electricity crisis***, Union Buildings, Tshwane, 26 July 2022.

108 Meridian Economics, ***A 500-day game plan for South Africa's energy sector***, Briefing note, June 2021.

intensified loadshedding had shifted the mood and Ramaphosa's big plan removed the 100 MW threshold altogether. Henceforth, private generators can build plants of any size for one or more customers and 'wheel' electricity through the transmission and/or distribution grids. And while the mines and big industry will stand first in the queue for deregulated electricity, generators may well begin cherry picking urban commercial and residential markets.

Nor are fossil fuels expressly excluded. It may be thought unlikely that the market will go for coal at present, but gas may be an option although open to the risk of volatile prices. The only constraints will be technical: conformity with grid codes and wheeling agreements with Eskom, subject to grid connection capacity.

Alongside this, the big plan calls for 'accelerated' procurement through the formal regulated channels. The procurement set out in the IRP 2019 would be 'accelerated', with renewable, gas and battery bid windows brought forward. These projects do require licensing by Nersa but will also enjoy the benefit of Treasury guarantees: whatever else happens, they will be paid out according to the power purchase agreement with Eskom. For the gas projects, that will include cover for rising gas prices.

All projects remain subject to environmental regulation, but the requirements would be eased "in areas of low and medium environmental sensitivity". In particular, Eskom would not need an environmental authorisation for power lines and substations in such areas.

The Life After Coal campaign welcomed the sense of urgency but objected to the plan on three main grounds:

- That it used the energy crisis to force gas into the energy mix regardless of climate and health or of the risks of escalating costs and of gas assets being stranded. Gas is not a transitional fuel and does not replace coal but displaces renewables.
- That relaxing environmental regulations would expose people and ecosystems to harm and potentially undermine resilience to escalating climate impacts.

- While the public sector remains subject to the regulatory and IRP planning system, the private deals appear exempt from both.

The plan does indeed "fundamentally transform the electricity sector" but it is doubtful that it "positions it for future sustainability". What is taking shape is a dual system with a freewheeling free market private system developing alongside a public system tethered by regulation and left to carry the legacy costs of coal and historic bad decisions. Even the formal REIPP projects have been elbowed aside by the private projects in the race to secure grid capacity in the favoured locations.[109]

It remains to be seen if Eskom generation will be allowed into renewables or be boxed into 'baseload' coal, gas and nuclear. Energy Minister Gwede Mantashe, already known as a coal fundamentalist, may also be known as a baseload fundamentalist. Speaking to parliament, he recently repeated his faith in clean coal and said, "We ought to guarantee baseload energy supply through a combination of gas, nuclear, coal, and hydro … It must be clear to all, that Eskom is not for sale as it remains the country's baseload energy generator."[110]

Distribution notionally remains in public hands. However, by allowing unlicensed generators to sell to multiple customers, the plan appears to facilitate local 'competition', with private companies reaching customers through municipal grids but selling below the municipal tariff. The division of revenues between private producers and customers and the publicly owned grid will then be a critical point of contestation. Transmission likewise remains in public hands and already wheeling charges for moving electricity between producers and big industrial power users are at issue. Questions have also been raised about how much of Eskom's debt will be imposed on the newly formed National Transmission Company.

109 Terence Creamer, ***Only five solar projects advance to preferred-bidder status following latest renewables round***, Engineering News, 8 December 2022.

110 News24Wire, ***Coal is king, insists Mantashe – as Ramaphosa is feted for green plan in Egypt***, Engineering News, 11 November 2022.

The debt

Ramaphosa's big plan included addressing Eskom's crippling debt. He said the Treasury "is working to finalise a sustainable solution to Eskom's debt" which would be outlined by the Minister of Finance in October, four months later, in the Medium-Term Budget Policy Statement. This phrasing repeated what Finance Minister Enoch Godongwana had already said in the February Budget Speech. "The National Treasury is working on a sustainable solution to deal with Eskom's debt …" Come October, it seems they were still working on it. Eskom remained "the biggest known risk to the economy and the public finances" and government would take over a portion of its debt but "further details will be provided in the 2023 Budget" in February.[111]

Godongwana emphasised that "strict conditions" would be imposed on "Eskom and other stakeholders" in return for the debt transfer. These would address its "structural challenges by managing its costs, addressing arrears due to the utility, and providing greater clarity and transparency in tariff pricing" [33]. The arrears presumably refers to municipal debt, adding up to R50 bn, which Eskom has not been able to collect.[112] The municipalities are, of course, a 'structural challenge' that government has failed to address over decades. Without a bailout of indebted municipalities, it seems unlikely that this will be addressed. But then, given the levels of corruption at local level, a bailout may be appropriated to other purposes. Clarity on tariffs, meanwhile, is Nersa's job. Hence, Treasury appears to be inserting itself into the business of the 'independent' regulator.

Five days after presenting the medium term budget statement, Godongwana apparently went off script in a speech at a South African Chamber of Commerce & Industry conference. He was reported as saying that the country needed coal, gas and nuclear and that Treasury's bailout conditions would include that it bring these "old reliable technologies" into the energy mix as called for in the IRP 2019. He wasn't a coal dinosaur, he said, but South Africa needs electricity

111 National Treasury, 2022 Budget Speech, 23 February 2022; and Medium Term Budget Policy Statement, 26 October 2022.

112 Victoria O'Regan, ***Eskom is owed R50bn by municipalities – This infographic shows which council owes what***, Daily Maverick, 13 September 2022

now.[113] We note that the lead times on building such plants is anything between five and twenty years. For 'electricity now', they are scarcely a solution. And, as Medupi and Kusile demonstrate, there is no guarantee of reliability.

Three days later, the Ministry of Finance said the minister didn't say that. His "point was that South Africa's energy transition will not be an immediate and wholesale abandonment of the country's existing electricity sources … [The IRP] envisions a combination of energy sources, including solar, wind, coal, gas and nuclear, to maintain the security of electricity supply at the most affordable cost to South Africans. Further, his point was that the fundamental purpose of the National Treasury's plan to take over a portion of Eskom's debt is to allow the utility to focus on and invest in increasing its generation capacity."[114]

Which sounds rather like another way of saying what the ministry says the minister didn't say. The statement echoes Mantashe's constant repetition that the transition cannot be instant, as if there is someone who says it can be. Environmental justice groups, along with labour, have been calling for a just transition for decades. And three points need to be emphasised: 1. Any transition takes time and, for a just transition, the time must be well used; 2. The more it is delayed, the less time there is and the greater the likelihood that the time will be chaotic and not well used; 3. Climate change is long since past dangerous and there is no justice in delay. People's lives are being destroyed in ever increasing numbers. And the illegal levels of air pollution from Eskom's power stations kill more people each year.

Nor is there much virtue in appealing to the IRP. It is widely acknowledged to be dated and DMRE has initiated a review process. More importantly, it was compromised from the start for effectively recommending that Eskom be allowed to break the law on minimum emission standards (MES) and for

113 Londiwe Buthelezi, ***Eskom debt takeover: Godongwana says gas, nuclear will be part of conditions***, News24, 1 November 2022; Rene Vollgraaff, ***Finance Chief Punts Coal to Fix S. Africa Power Crisis, N24 Says***, Bloomberg, 1 November 2022.

114 National Treasury media statement, Minister o***f Finance Enoch Godongwana's response to media reports regarding his remarks about Eskom***, 3 November 2022.

forcing coal and gas into the energy mix at substantial added cost. It also called for 'clean coal' technologies to justify its inclusion. Flue gas desulphurisation (FGD), an effective but expensive technology, topped the list. Eskom says it can't afford it, which is why the IRP said it should be allowed to break pollution laws. CCS is the holy grail of clean coal technologies. It is extraordinarily expensive, consumes a third of the energy produced by a power station, doesn't work very well, safe storage is unproven at any scale that would make it worthwhile, and it is most commonly used for 'enhanced oil recovery', that is, to get more oil out of a well. [See gWR 2019 for a more detailed critique of clean coal and the IRP 2019.]

Government picked up on the just transition only in the last five years. Mantashe, and now Godongwana, have used it to delay it and to claim that, magically, fossil fuels are essential to a just transition. The theme was taken up by other African energy ministers at Africa Energy Week which is organised by the Africa Energy Chamber, "the voice of the African energy sector". Under the theme of 'a common African voice for CoP 27', and to loud applause, the Chamber's Executive Chairman AJ Ayuk summed up the message of the conference: "Drill, baby, drill". The view was echoed by a raft of energy ministers.[115]

Two week later, Ayuk took the message to the CoP. He was one of a record number of 636 fossil fuel lobbyists registered for the climate negotiations. He was also there for Team Energy Africa, a joint initiative of the Africa Energy Chamber, the UN Economic Commission for Africa and Sustainable Energy for All, a UN partner organisation, who were due to launch a 'dashboard' showcasing energy investments in Africa. The UN agencies pulled the plug on the partnership when it was reported that Ayuk was convicted of fraud in the US in 2007 and had later faced allegations of money laundering in Ghana.[116]

115 Ethan van Diemen, ***'Drill, baby, drill; gas, baby, gas': African energy ministers solidify pro-fossil fuel position ahead of COP27***, Daily Maverick, 23 October 2022.

116 Chloé Farand, ***UN gives platform to convicted fraudster lobbying for African gas***, Climate Home News, 9 November 2022; and ***UN cancels African energy finance initiative over fraudster's role***, Climate Home News, 11 November 2022.

New energy vehicles

New energy vehicles are mostly electric but include hydrogen. Even for long haul freight, however, it is doubtful that the latter will compete with electric. Transport emissions at 57 Mt CO_2e/y make it South Africa's third biggest source of greenhouse gases with 91% coming from road transport. Auto manufacturing and support industries such as mechanics and petrol stations employ over 500 000 people, "far exceeding the coal mining sector", according to the IP [55]. It is South Africa's leading manufacturing sector and has been sustained by the Department of Trade and Industry's longest running and most successful industrial support programme.

The industry depends on car exports to Europe and the USA because the local and African market is not big enough to sustain it. These markets are already transitioning to electric cars and, unless it gets with that programme, the industry will collapse. Hence, the JET IP focus is about saving the industry. But electric motors are much simpler and cheaper to maintain than internal combustion engines (ICE) and vehicles will not necessarily pull into what was a petrol station for charging, so they will need far fewer workers.

Going electric will substantially reduce pollution and associated health impacts and may be enough to get to the upper part of the NDC range. Getting to the lower part requires 'modal shifts', from road to rail and from cars to public transport – there is no mention of walking and cycling. So this is a somewhat limited shift but it "offers some of the greatest mitigation opportunities and should be prioritised, despite the challenges" [57]. The challenges presumably relate to the taxi mafia's hold on public transport in a context where "apartheid (and post-apartheid) spatial planning forces the majority of workers into an expensive daily commute",[117] and to the place of cars within a consumption culture and the growth economy.

The JET IP does not in fact prioritise a modal shift. Saving the industry is about cars and that is the focus of its investment. The IP proposes investments of R128 bn and all of it is about converting what exists to NEVs. The bulk of investment goes into industrial development, charging infrastructure and

117 Eugene Cairncross, pers com 6 January 2023.

reducing upfront NEV costs. R6 bn goes into public transport but that is to support conversion of the present fleet of buses and taxis, not to support a modal shift.

Petroleum supply chains

The IP says that the impact on the petroleum supply chain, including refineries, road and pipeline transport, and petrol station workers, "is uncertain, but plans being devised for just transition mitigation measures need to be developed" [78]. Just or unjust, the transition at the refineries is already underway.

In Durban, Engen was shut down following an explosion in late 2022 and will not reopen. The company says it will import refined fuels and turn the site into a fuel depot. The South Durban Community Environmental Alliance (SDCEA) opposes this plan as it will lead to even heavier road tanker traffic than they experience at present. They are also demanding a full EIA for the decommissioning of the refinery and decontamination of the site. And they want to participate in deciding the future of the site.

Sapref started shutting down in February 2022 as the joint owners, Shell and BP, decided to freeze spending on the plant and were looking to the state owned Central Energy Fund (CEF) to buy the plant. They have long since argued that it is not worth investing in upgrades necessary to meet new clean fuel standards unless the state paid for it, so it is not clear why anyone would want to buy it. However, Mantashe loudly denounced the closure, saying it would cause job losses and lead to energy insecurity, and pushed for acquisition. The April floods struck as Sapref was completing the shut down process. The plant was flooded to a depth of two or three metres and suffered extensive damage. Oil from its waste dams also polluted the neighbouring beaches.[118] Little has been heard of the deal since and it seems that CEF has dropped it.

The Astron Refinery in Cape Town, bought by Glencore and a BEE consortium from Chevron in 2019, was shut down in June 2020 after an explosion killed

118 Nokwanda Ncwane, *'Greedy and arrogant': Mantashe slams Shell & BP's spend freeze at SAPREF*, The South African, 19 February 2022; Elaine Mills, *S African Sapref refinery's future remains uncertain*, Argus Media, 18 May 2022.

two workers. Glencore said it would restart the plant following repairs and some upgrades before the end of 2022 and that it would meet the new fuel standards. The plant is notorious for high levels of benzene pollution and local residents are concerned that the restart will restart the pollution. They are also concerned about the potential for leaks on the crude oil supply pipeline that runs 107 km from Saldanha Bay.[119]

The Natref refinery in Sasolburg, jointly owned by Sasol and Total, is the only inland refinery and gets its crude by pipeline from Durban. In 2021, Sasol said they would close the plant as they would not get a return on the capital costs of upgrades to meet the new fuel standards. A year later, however, they said they had found a low cost way of meeting the fuel standards by 'co-processing' crude oil and bio-feedstocks.[120] They did not say what the bio-feedstock crop was, how much they would use or what land it would grow on.

In 2019, the South African Petroleum Industry Association (Sapia) said the industry employs 171 000 workers directly with 64 000 in 'refining and manufacturing'. It's not clear what this means since Sapia members – all the refiners – employ only 10 600 including administration and marketing. In 2020, Sapref said it employed 700 people but this would not include contract workers. In 2019, before the refinery shut down, Engen employed 3 100 with perhaps 800 at the refinery and tank farms. Sasol is the biggest employer with 20 000 people at its operations in South Africa, including coal miners and chemicals. Petrol station workers are acknowledged as being amongst the most vulnerable. Sapia says there are 88 400 employed at forecourts and convenience stores. The PCC's JTF gives a much higher number of 130 000.[121]

The fuel quality standards have largely been driven by the auto industry, because modern engines are damaged by dirty fuels, in conflict with the

119 Annamia van den Heever, ***Milnerton refinery is to reopen soon, amid new fears over air safety***, Business Live, 13 October 2022

120 Sasol Integrated Report 2022.

121 Sapia, ***The economic contribution of the downstream oil industry to South Africa in 2019***, Presentation, 27 September 2021; Sapia members are: BP and Shell (owners of Sapref), Engen, Astron, Sasol, Total. Enegen, Intergated Report 2021; Sapref Sustainability Report 2020 (the latest available); Sasol Integrated Report 2022. Most of the industry reports do not give clear breakdowns as to who is employed where or for what.

refiners who have resisted investing in the necessary upgrades. Both these industries have long been protected by government but, as Rod Crompton of Wits Business School argues, "the auto industry … occupies a key position at the heart of South Africa's manufacturing industry and its interests appear to have been chosen over those of the oil refining industry".[122]

In contrast to Mantashe, he does not see the refinery closures as representing a threat to the country's security of supply. "The country has merely swapped reliance on crude oil imports for refined product imports." A transition to EVs would substitute locally produced renewable power for imported petroleum paid for in dollars, thus supporting South Africa's longstanding ambition for import substitution. We note, however, that the stream of dividends from renewable power to international investors and transnational corporations will dilute the benefit. Already dividend outflows – profits paid to foreign investors – weigh heavily on the debit side of South Africa's current account with the rest of the world.

Meanwhile, petroleum (oil and refined product) is the country's biggest ticket import item. South Africa's trade balance is consequently vulnerable to both currency and oil price volatility and both have proved extremely volatile even before Russia's invasion of Ukraine. Going electric would eliminate these imports. Mantashe, on the other hand, argues that South Africa should, as advised at Africa Energy Week, 'drill, baby drill' in order to substitute domestic for imported oil. This presupposes that the oil majors, who are doing the drilling, would sell local oil at below international prices.

Further, given long lead times for oil and gas projects, this strategy seems calculated to deliver stranded assets as the market switches to EVs. Having made a losing bet, however, the DMRE can be counted on to resist a transition in transport as it does in electricity.

122 Rod Crompton, ***SA oil refinery closures, shift to cleaner fuels may improve energy security***, Daily Maverick, 29 July 2022.

Green hydrogen

GH_2 is seen as necessary to replace fossil fuels and so reduce or eliminate GHG emissions from several industries, notably petrochemicals, iron and steel industry, cement and some transport sectors such as air and heavy haulage. The JET IP quotes the International Energy Agency (IEA) saying that 10-20% of the global energy mix must come from GH_2 if the world is to limit global warming to 1.5°C.

However, there is considerable scepticism about this story. In a speech to the World Hydrogen Congress, analyst Michael Liebreich argued that green hydrogen is being hyped up into an economic bubble. Its use will be limited because of the scale of renewables required to make it and because electric options are cheaper and easier.[123] Bubbles, of course, lead to stranded assets and the question then will be who is left holding the debt.

GH_2 is produced by splitting water molecules (H_2O) into oxygen and hydrogen. That is done by passing water over an electrolyser powered by renewables. The leading two electrolyser technologies are alkaline and 'proton membrane exchange' (PEM). Alkaline electrolysers use nickel and a chemical electrolyte whereas PEMs use platinum and iridium (also a platinum group metal) and no chemicals. The latter are more expensive but more compact. PEM fuel cells essentially reverse the process to produce electricity from hydrogen. However, 63% of the renewable energy generated is lost on the path to energy use, says Eugene Cairncross, technical advisor to Life After Coal.[124]

Producing GH_2 is both water and energy intensive. If the water is drawn from the sea, it must be desalinated which is also energy intensive. It is also capital intensive because of the cost of electrolysers, although this cost is expected to decline as manufacturing is scaled up, as well as the large lay out on renewables.

123 Leigh Collins, ***Liebreich: 'Hydrogen is starting to look like an economic bubble — and here's why'***, Hydrogen Insight, 13 October 2022.

124 Eugene Cairncross, presentation to Life After Coal, 26 October 2022.

Big green hydrogen

To establish a viable industry, the IP estimates that about US$120 bn (over R2 trillion) would be needed to build "60 GW of dedicated renewable electricity capacity (both wind and solar) and more than 30 GW of electrolyser capacity" by 2050 [68]. Two pages on, it talks of 100 GW of renewables and 60 GW of electrolyser capacity. Clearly, the numbers are speculative.

South Africa has several competitive advantages, it says, including large scale renewable potential and available land. Further, Sasol's Fischer-Tropsch technology, used in its coal-to-liquids (CTL) plants, can also be used "for the local beneficiation of GH_2 into derivatives … including e-Ammonia, e-Methanol and Sustainable Aviation Fuel" [69].[125] We may question if what is good for Sasol is necessarily good for South Africa. For Sasol, however, GH_2 looks like a ticket to survival.

The JET IP records that there are 18 private sector projects in early stage development with R4.5 bn being spent on feasibility studies. R163 bn will be needed to implement these projects with R109 bn of that going on GH_2 and e-ammonia projects. Major investments would also go into aviation fuel, e-methanol, fuel cells, transport and green steel. A further R150 bn would be needed for port upgrades at Saldanha and Ngqura (Coega) and a new deep water port at Boegoebaai just south of the Orange River mouth on the west coast. Another R13 bn would be spent on other infrastructure.

Sasol in Boegoebaai

Sasol is leading a pre-feasibility study for GH_2 production at Boegoebaai. This would be part of a special economic zone (SEZ) mega project at Alexander Bay which would dwarf the town of 1 700 people. The Northern Cape Economic

125 E-ammonia and e-methanol are 'green' – i.e. made from GH_2. Both are toxic irrespective of how they are made. Ammonia (NH_4) combines nitrogen and hydrogen and is highly toxic. It is widely produced around the world as a fertiliser feedstock for high input commercial agriculture. It can also be used directly as an energy carrier, or as a hydrogen carrier since it can be liquefied and is then easier to transport. Various combinations of nitrogen and oxygen are emitted during combustion or from fertilised land. They are collectively termed NO_x and include nitrous oxide (N_2O), the third most important greenhouse gas and some 300 times more potent than CO_2 tonne for tonne.

Development Agency's (NCEDA) Green Hydrogen Strategy says the SEZ will include 5 GW of electrolyser capacity, requiring 10 GW of renewable power, a sea water desalination plant, an e-ammonia production plant, a liquid storage and loading tank farm, a supplier park, and a renewable energy and battery park. This might cost US$10 bn [R180 bn] and create about 50 000 construction jobs and 6 000 permanent jobs. These job numbers look inflated, particularly for construction, but the scale of the project is evident. Effectively it requires a whole new town with full urban infrastructure of housing, roads, water, sewage, power and waste system and the largest part of that must be temporary. The social impacts that follow from the influx of a very large and almost exclusively male construction workforce will be overwhelming. Nor will they simply disappear as the construction army is 'demobilised'. Further, the town, industrial parks and renewable energy farms will occupy an immense stretch of land. The easy assumption that there is 'available land' comes with a colonial echo as the question of whose land has apparently not been asked. This is the Richtersveld, which the local Nama people won back after a century of dispossession through a fierce court struggle against government and the Alexkor diamond mining corporation.[126]

A slightly smaller project at Lüderitz in Namibia, about 250 km up the coast, is closer to implementation and aiming to start construction in 2025. According to the developer, Hyphen Energy, "This US$9.4 billion [R169 bn] project is roughly equivalent to Namibia's GDP…" The project "is targeting 300 000 metric tons of green hydrogen production a year from 5GW of renewable generation capacity and 3GW electrolyser." There will be 15 000 construction jobs over four years and 3 000 permanent jobs thereafter.[127] Lüderitz is a town of some 12 000 people. The project will not so much diversify the local economy as wash over it like a tidal wave. And it repeats the pattern of transnational corporations dominating national economies.

The Boegoebaai project is to be included in an expanded Namakwa SEZ. This is at present centred on Vedanta's Gamsberg zinc mine some 250 km inland and

126 Staff Reporter, ***Tears of joy as Richtersveld land claim is settled***, Mail & Guardian, 9 October 2007.
127 https://hyphenafrica.com/projects/

is intended to subsidise the development of a zinc smelter through substantial tax breaks and by providing the necessary infrastructure: landfill, water, power and land to accommodate construction workers.

The SEZ would be serviced by the deep water port and rail infrastructure to be developed by Transnet. The port plan includes a liquid bulk terminal primarily to export the e-ammonia, a dry bulk terminal for mineral exports primarily from Vedanta, and a general purpose terminal for agricultural produce from irrigated farms along the lower Orange River. Construction of the port and rail infrastructure would employ 3 000 during construction with 400 permanent jobs thereafter. Boegoebaai provides a rich and relatively unspoilt fishing ground. Local fisherfolk say it will be heavily impacted by the construction of the port and subsequently by heavy port traffic.

Sasol is looking at a second mega project in Saldanha Bay, having signed an agreement with the local IDZ to collaborate on setting up a GH_2 hub. It also has an agreement with Arcelor Mittal which is looking at the potential supplying of GH_2 for green steel production, and so to revive the mothballed Saldanha steel works.

Mega projects invariably promise much, deliver much less and come in way over budget and over time, as we observed in the groundWork Report 2018, *Boom and Bust in the Waterberg*, which documented construction of the Medupi power station. Bent Flyvbjerg analysed 300 projects in 20 countries to answer the question "Which large projects get built?" He found it was:

> ... those for which proponents best succeed in designing – deliberately or not – a fantasy world of underestimated costs, overestimated revenues, overvalued local development effects, and underestimated environmental impacts [Flyvbjerg 2013: 50].

The mega projects nevertheless reshape local geographies as will certainly be the case at Boegoebaai.

Anglo's platinum valley

The second big 'catalytic' GH_2 initiative is the so called Platinum Valley Initiative that stretches from Mogalakwena, Anglo's big open pit platinum mine near Polokwane, through Gauteng and to the KZN coast. The proponents include the Department of Science and Innovation, Anglo, fuel cell maker Bambili Energy, and French transnational Engie. They have published a feasibility study which claims a potential market of between 94 000 and 185 000 tonnes a year by 2030. However, the price of green hydrogen is around double the price of grey hydrogen so it seems likely that they will be calling for subsidies to cover the difference. The study claims the initiative will add between R70 billion and R160 billion to national GDP and between 14 000 and 32 000 jobs. These wide ranges suggest that the numbers are somewhat speculative.

Like the car makers, the platinum miners are also looking for survival as their major market is for catalytic converters which reduce pollution from car exhausts. That market will disappear if electric motors replace petrol and diesel engines, but the industry calculates on an even bigger market in PEM electrolysers and fuel cells. For starters, Anglo has just commissioned a 500 tonne mine truck powered by electricity produced from a fuel cell. It says it will convert its global fleet of 400 trucks, which each consume up to a million litres of diesel a year, by 2040. The feasibility study sees a big market for such trucks with on-site electrolysers to produce the hydrogen at other mines on the platinum belt and in northern KwaZulu-Natal.

The Platinum Valley proponents are also looking to create a market through the conversion of city buses in Pretoria, Jo'burg and Durban with hydrogen refuelling stations at bus depots. Beyond that, they are looking to trains. In Europe, Alstom is already running hydrogen trains to replace diesel engines on non-electrified rail.[128]

128 Creamer Media, ***Hydrogen 2022: Green Hydrogen gaining momentum***, August 2022; Donna Slater, ***Alstom accelerates hydrogen train development with key roll-out in Europe***, Engineering News, 7 October 2022.

Sasol – new vision?

Hydrogen is already produced from coal and gas, respectively called black and grey hydrogen. Sasol produces both as by-products of its pollution intensive coal-to-liquid (CTL) process. Just as going electric is about survival for the motor industry, so too is GH_2 for Sasol. Its Secunda plant remains the largest single point source of GHG emissions in the world as well as a major source of local pollutants.

Table 7: Sasol 2022 emissions to air (tonnes)

	Secunda	Sasolburg	Global total
GHGs	53 262 000	5 176 000	63 572 000
SO_2	137 270	17 410	161 870
NOx	102 200	14 100	118 700
VOCs	26 300	-	26 300
PM	7 400	810	8 220

Source: Sasol Sustainability Report, year to 30 June 2022.
Methane emissions of 130 000 tonnes is included in GHGs. Conversion to CO_2e is calculated on a 100-year time horizon and is about a third what it would be on a 20-year horizon. Using the shorter time frame would increase GHG emissions by 7 Mt. VOCs emissions for Sasolburg are not given.

In April 2022, Sasol CEO Fleetwood Grobler said that the company had not even been thinking about clean fuel just one year earlier.[129] He intended this to show the speed of change provoked by Russia's war on Ukraine. But it really shows the duration of industry stonewalling – it is 30 years since the UNFCCC was agreed in Rio in 1992. Up until 2012, Sasol was planning to build new CTL plants in China, India, Uzbekistan, Indonesia and the USA. In South Africa, Project Mafutha was planned as an 80 000 barrel a day CTL plant in the Waterberg, complete with a whole new town just like Sasolburg.

In 2010, hoping to capitalise on cheap gas produced by America's booming fracking industry, it decided to build a new gas-to-liquids (GTL) and chemicals

129 Paul Burkhardt, ***Sasol is speeding up its green hydrogen plans amid European energy crisis,*** Bloomberg, 26 April 2022.

plant at Lake Charles in Louisiana, USA. In 2012, as oil prices sagged, Sasol dropped all its CTL projects and decided to concentrate instead on GTL, which is only slightly less capital and pollution intensive. By 2017, however, noting the continued volatility of oil prices, it abandoned GTL as the main 'driver' of growth and said it would focus on speciality chemicals instead. By then, the ill-fated Lake Charles mega project was way over budget and over time and Sasol narrowed the focus to producing ethylene, the most widely used industrial chemical from which various plastics and detergents are made. The project dragged Sasol ever deeper into debt and, in 2020 with the oil price in free fall, Sasol's share price collapsed. It was then forced to sell a number of assets, including a 50% share in Lake Charles which was just then coming into production.[130] Windfall profits in 2022, following the massive spike in oil prices induced by Russia's invasion of Ukraine, have enabled Sasol to buy itself out of trouble.

In 2020, the company announced a "strategic reset to create a sustainable Future Sasol".[131] It also set about cutting jobs from 31 000 in 2020 to 28 280 in 2022. South African jobs are down to 24 500, including 4 500 at corporate headquarters. It also restructured into three divisions: chemicals, energy and ecoFT. Sasol has always been innovative in painting itself green. FT stands for its Fischer-Tropsch technology, which is "positioned to thrive in a fossil fuel free world":

> Sasol ecoFT is pioneering sustainable fuels and chemicals through Sasol's proprietary FT technology that converts green hydrogen and sustainable carbon sources into sustainable products. As a global leader in synthetic fuels and chemicals, Sasol has more than 70 years' experience in providing sustainable FT solutions.[132]

Seventy years of extreme pollution sounds something less than sustainable. Nor is FT as magical as presented. In 2020, Sasol said it would reduce emissions

130 See gWR 2020 for a more detailed account of Sasol's near death experience as well as the dispossession of the Lake Charles Mossville community.

131 Sasol, Integrated Report 2020, p.4.

132 Sasol, Integrated Report 2022, p.53. Job numbers are also taken from this report.

by 10% by 2030 on the way to 'net zero' by 2050. Under activist pressure, it now says it will reduce (net) GHG emissions by 30% by 2030. It says this "is considered to be well below 2°C aligned with the Paris Agreement" [sic] but does not say who considers it so. To meet the 1.5°C target, it would need to reduce emissions by 43% by 2030. This "would need mitigation to be available, which it is not" [sic – it seems a noun is not available] and require significant plant closures. "This would have serious implications for the country from a socio-economic perspective and hinder our just transition."[133] Reductions will come through:

Renewables: Sasol is in the process of procuring 600 MW from IPPs by 2026 and 1 200 by 2030. It assumes that, with further reductions in battery costs, this will be sufficient to power the Secunda plant, including units sold to Air Liquide in 2020. The IPP projects are located in the North West, Free State, Northern Cape and Eastern Cape. Hence, the power will have to be 'wheeled' through the grid. Unless Eskom manages a major expansion of grid capacity, it must be questioned if this is feasible. It may also lead to Sasol's privatised power supply competing with public demand for the use of grid capacity.

Coal: Sasol now says all coal assets risk stranding and it will not invest in expanding reserves. It intends to 'turn down' six coal-fired boilers at Secunda, out of a total of 17 boilers, in the second half of the decade. Coal mining fines, which are currently used to fuel boilers, will be briquetted and fed with coarse coal into the gasifiers. Mining output will be reduced by 10 Mt/y or about 25%.

Gas: Despite acknowledging upstream emissions, Sasol maintains its view that gas is a transitional fuel and feedstock to replace coal. It has drilled additional wells to maintain production volumes from offshore Mozambique and plans to extend the drilling campaign into adjacent areas in 2023. It also plans to import LNG through Maputo and/or Richards Bay. It says LNG will be "sourced from reservoirs low in CO_2 and where methane leakage is effectively monitored and minimised".[134] The claim must be open to scrutiny so its credibility can be tested. Sasol calculates the GHG value of methane on a 100-year time

133 Sasol CC Report 2022: p.8.
134 Sasol CC Report 2022, p.37.

horizon rather than the more pertinent 20-year horizon. Hence, what it really minimises is the climate impact.

Green Hydrogen is Sasol's next big play. Sasol says it will start producing green hydrogen in 2023 using an existing 60 MW electrolyser at Sasolburg. This will put significant load on its RE supply. The water use, presumably from the Vaal, is not discussed but would appear to be comparable with Sasol's existing heavy water intensity. The process does have the benefit of not fouling the water.

Beyond that, it is leading the pre-feasibility study for the Boegoebaai GH_2 mega project and looking at a second mega project in Saldanha.

Offsets: For what must go into the 'net' of 'net zero', Sasol has what appears to be a large offset programme. It says it will observe a strict mitigation hierarchy prioritising on-site reductions before offsets. For this year, it got 3.7 million credits from offset projects, including an in-house project, and so avoided R258 million in carbon taxes. Its remaining 2022 carbon tax payment was for R758 million on turnover of R276 bn and profits of R55.5 bn before tax.

Sasol says that carbon pricing is a critical part of decarbonisation policies, but pricing must take account of sector specific issues. Sasol, of course, is in a sector of its own with the most carbon intensive process on earth. Since 2010, when Treasury first proposed a carbon tax, Sasol has been at the forefront of business lobbies to delay its introduction, and keep the tax level low and shot through with 'allowances' – loopholes which, it must be said, Treasury seemed only too anxious to allow.

Treasury has proposed to increase the basic tax level to US$30/tonne CO_2e together with what Sasol describes as an "aggressive removal of allowances". Whereas Treasury has claimed that the tax would internalise externalised costs, calculations of the social cost of carbon generally start at around $50/tonne and rise from there to as high as $3 000. Ultimately, of course, carbon emissions will cost the earth. However, Sasol and its newest lobby group, the Energy Council, now claim that Treasury's proposed increase will obstruct investment in its green transition. In Sasol's own words, "we would need to

consider trade-offs to balance the people, planet and profit agenda".[135] We may doubt that profit is up for balancing.

Municipalities

There are eight metropolitan and 205 local municipalities which are grouped in 44 district municipalities.[136] According to the JET IP, 187 municipalities are licenced for electricity distribution. Eskom is the distributor in the rest, mostly poor municipalities in black areas where there was no local distribution under apartheid.

Several of the metros have now also put out tenders to procure power directly. However, the R400 bn for municipalities is focused on the distribution grids. The JET IP identifies "two clear high impact JET outcomes" [79]:

- Functional distribution grids that accommodate renewables and serve all users; and
- A well managed and financed service delivery model that ensures equitable energy access for all, including poor people.

The IP goes on to list multiple 'challenges', which are perhaps best summed up in the judgement of the South African Institute of Civil Engineering that distribution infrastructure is "at risk of failure" nationally [83]. Under the challenge of 'municipal finances', the IP notes that "inappropriate national assumptions as to the real cost (underestimated) to deliver the service, tariffs, and subsidies lead to insufficient funding for electricity …" [82].

A deeper problem is unspoken here. With the introduction in 1996 of the neoliberal GEAR policy,[137] Treasury squeezed the municipalities even as they were expected to deliver services to the black majority of previously unserved people. 'Cost recovery' was then made mandatory without consideration of

135 Sasol CC Report 2022, p.19

136 https://www.cogta.gov.za/index.php/2022/08/01/municipalities-in-south-africa downloaded 2 November 2022; Confusingly https://www.gov.za/about-government/government-system/local-government and http://www.salga.org.za/Municipalities%20AM.html respectively give 226 and 228 local municipalities.

137 GEAR stood for 'growth, employment and redistribution'. It failed, or rather was misnamed on all counts.

how people without money were to pay. In the 2000s, as these policies failed, the national government rebranded itself as a developmental state but then devolved developmental responsibility to the local level. On the one hand, they were to develop 'world class cities' to attract investors. On the other, they were to deliver to the 'indigent'. Treasury did then allocate more money to local government, notably for free basic services, but simultaneously required means testing to establish that recipients were indeed 'indigent', an administratively heavy task beyond the capacity of most municipalities, as well as being invasive and open to party political manipulation. As Gill Hart puts it,

> Broadly speaking, local government is the impossible terrain of official efforts to manage poverty and deprivation in a racially inflected capitalist society marked by vicious inequalities, which, since 1994, have become simultaneously de- and re-racialised. [Hart 2013: 142]

To address the challenges, the IP proposes "targeted investments" in: 1. infrastructure; 2. operational; 3. capability and capacity; and 4. knowledge generation.

Infrastructure gets the bulk of the funding. The IP notes that there are no national transfers for maintenance and municipal spending is woefully inadequate across all types of infrastructure. Fixing the distribution grids gets R200 bn. At the same time, distribution grids must be modernised to enable: a rapid increase in small scale embedded generation (SSEG); 'wheeling' of power from private generators to their customers; and for powering up electric vehicles. This gets R73 bn. Finally, there is a R45 bn extension to the Integrated National Electrification Programme (INEP) "to accelerate universal energy access in rural municipalities and urban peripheries" whether through on- or off-grid connections.

Operational funding covers two areas. First, "demand side management (DSM) investment in the built environment" gets R500 million. It is not clear exactly what this means. Is it about the administration of DSM through building regulations and the like, or about constructing or retrofitting buildings,

including houses, and reviving the stalled solar water heater programme together with a reliable water supply, so that people can be comfortable without spending money on heating or cooling? If the latter, the sum seems somewhat meagre.

Second, the IP notes the urgent need to address energy poverty. While 84% of people are connected to the grid, many cannot afford the price of electricity and must use wood, coal, paraffin, candles and dung. "Use of such fuels results in severe health impacts from indoor air pollution, burns, poisonings, shack fires, and deaths, with the burden of firewood collection and health impacts from indoor and local air pollution most often falling on women and children" [37]. It calls for R100 million on modelling to explore how increased energy access will impact municipal revenues and "how subsidies and tariffs can be better structured to unlock suppressed demand in low-use households" [84]. The language is that of the market, and is somewhat at odds with the intention that poor people should get enough for their needs. Nor does it directly address energy poverty.

'Capability and capacity' gets R230 million for 'cost of supply' studies and tariff design, electricity system planning and technical skills upgrades. Finally, 'knowledge generation' has two elements: collaborative planning across municipalities gets R30 million; and modelling to understand the relationship between electricity revenues, including subsidies, and municipal finances as a whole gets R200 million.

JETP

When the JETP was announced, $8.5 bn came to about R128 bn. A year later, with the Rand losing value, it comes to R144 bn. The costs of transition will no doubt also go up. The plan assumes R500 bn investments from private corporations and another R150 bn from multilateral development banks (MDBs) including the BRICS' New Development Bank. That leaves the JET IP short of R700 bn over the five-year period.

It is striking that a major part of the contribution does not come from the IPG members but from the Clean Investment Fund (CIF) established by the World Bank (WB), as shown in Table 8. This contribution was negotiated separately from the rest of the JETP and has its origin in a decision of the G7 to provide concessional finance through the CIF's Accelerating Coal Transition (ACT) programme. The DFFE is the ACT 'focal point' and led the negotiations for government on this component.

Also striking is that very little of it looks like what is called a 'financial transfer' in the UNFCCC. As Gaylor Montmasson-Clair and Muhammed Patel put it, "The composition of the offer looks more like business-as-usual than a rebalancing of financing terms in line with a global just transition: 63% in concessional loans, 18% commercial loans, 15% guarantees, and a mere 4% grants." And the JETP's R128 bn compares with "direct investment into South Africa by the UK, US, Germany and France (i.e. the key JET partners) in 2020 [of] R609 billion, R130 billion, R105 billion and R24 billion respectively, coming to R868 billion or about US$52.7 billion".[138] And the grant amount is less than a tenth of development aid grants in the last five year period.

The South African government itself has complained noisily about the miserly grant funding and says it will try to negotiate that up. France and Germany have disbursed concessional loans of €600 million (about R11 bn) at 3.3% interest, which compares with normal bilateral rates of 8% odd. This would make for cheap borrowing except for the likely event of the Rand sliding towards a new debt trap. Moreover, the loans are marked for general budget support so Treasury may decide to use the money for purposes other than just transition finance. The terms of other concessional loans are either not published or not yet negotiated.

138 Gaylor Montmasson-Clair and Muhammed Patel, Briefing Note 1: ***JETPs – just transition finance blueprints or business as usual?*** TIPS Real Economy Bulletin, Third Quarter, 2022.

Table 8: The JETP contributions of the International Partners Group

US$ millions	Grants / TA	Concessional Loans	Commercial Loans	Guarantees	Total (source)
CIF/ACT ($500m to leverage $2bn)	50	2 555	0		**2 605**
European Union – EIB	35	1 000			**1 035**
France	2.5	1 000	0		**1 002.5**
Germany	198	770	0		**968**
United Kingdom	24	0	500	1 300	**1 824**
United States	21.5	0	1 000		**1 021.5**
Total	**329.7**	**5 325**	**1 500**	**1 300**	**8 455**

Source: JET IP.

CIF/ACT

The top line in Table 8 is complicated by the way in which money is channelled through the MDBs. The WB presents itself as one of the "relevant CIF partner multilateral development banks (MDBs)", along with the International Finance Corporation (IFC) and the African Development Bank (AfDB). The IFC is the WB's private sector lending facility and not a separate institution while the AfDB is effectively the WB's junior branch in Africa. The three of them fund the ACT's $500 mn and then 'co-finance' $900 mn more. Unidentified 'country counterparts' are to put in another $300 mn, the private sector is expected to invest $875 mn, and 'other' (whatever that is) is in for $30 mn.

This is to fund three projects which contribute to the JET IP's 'just transition' funding in Mpumalanga [shown in Table 5 above]. The third project is a national project but will be initiated in the province, not only on the Highveld.

1. Retiring and Replacing Coal-based Power Generation Capacity.

This covers decommissioning and 'repurposing' Camden, Hendrina and Grootvlei through 'public private partnerships' (PPPs) between Eskom and private companies. (The transition at Komati is already being funded by a separate WB loan). Repurposing may include using the site and associated grid capacity to build renewable energy and battery storage. CIF/ACT funding can't be used for repowering stations with gas but does not stop Eskom and/or PPPs from doing that without CIF money. This project also includes 'socioeconomic impact mitigation' and will fund a Strategic Environmental and Social Assessment (SESA) to "support upfront planning to make the transition just for workers and communities in coal-dependent areas". It includes reskilling workers, investments in small and medium enterprises (SMMEs), and enabling community engagement. It does not appear to include direct compensation to workers for lost income or to community members for lost health.[139]

2. Mpumalanga Community Development Project.

First, this project will support the Mpumalanga Green Cluster Agency, which will support 'green tech' businesses and "assist" provincial government to attract investment. Second, it will support 'community driven development' composed of: community mobilisation and capacity building for participation, and establishing community development councils to facilitate it; strengthening governance and institutional capacity of provincial and municipal government (we hope this means accountability) and developing a just transition plan for the province; and investing in green community infrastructure and income-generating opportunities according to community priorities. We take it that this means fixing the townships amongst other things. If this part of the

139 Government of the Republic of South Africa, ***Accelerating Coal Transition (ACT) investment plan for South Africa***, 23 September 2022. Para. 104. More detailed descriptions of the projects are given in Annex 5 [A.5]

project really is community driven, it could support a changed dynamic on the Highveld.

However, the allocated funding of $155 mn (R2.6 bn) seems short of what's needed and could only be a partial contribution. ACT funding is $75 mn loan and $25 mn grant. It is not clear what revenue streams would support the debt servicing. The private sector is expected to invest $15 mn, presumably in 'green' business and the mysterious 'other' puts in $30 mn.

3. Energy Efficiency, Distributed Generation and Community Generation Programs

First, the project supports energy efficiency in public buildings and infrastructure. This is supposed to stimulate the formation of energy services companies, implying that the work is outsourced, which may then expand their market to industry. Supporting energy and thermal efficiency for people's homes is not there. Second, the project supports roof top and community systems but, because of high capital costs, concludes that 'fractional ownership', with tradeable fractions, "offer of a way for poorer segments to engage in and experience ownership of renewable energy generation assets". This looks like a market model in which community ownership will be traded away in short order. However, the project also allows for "communal or trust-owned systems" and "hybrid ownership structures".[140] We conclude that the form of community social ownership is still to be fought for and what shakes down on the Highveld may well define what becomes of it nationally.

The international partners

The partners reveal particular interests through what and how they choose to fund. Big loan funding goes to the power system – both the grid and renewable generation. German concessional loans are also for municipal distribution grids and power generation. In addition, the Europeans strongly support green hydrogen and 'low carbon' freight, the latter associated with export capacity.

140 As above: A.5 para. 53 & 63.

All loan money, however concessional, looks for a return. The US and UK are particularly focused on private sector commercial returns. US funding is through the International Development Finance Corporation (DFC) which invests in and lends to the private sector and also provides political risk insurance, feasibility studies and the like. DFC is self-funded through returns on loans and investments and fees. According to its website, it "advances American foreign policy and American commercial competitiveness … [and] helps American businesses gain footholds in many of the world's fastest-growing markets".[141] The UK's British International Investment (BII) will manage its commercial loan contribution in partnership with the Private Infrastructure Development Group. BII seems to have a similar remit to DFC. It is located under the Foreign Office, which has assumed control of development aid following the abolition of the more respected Department for International Development, and gets a 6.1% return on its portfolio of businesses in Africa and Asia.[142] The guarantees offered by the UK will be for lending by the AfDB.

Grant funding tends to be for studies – research and development, pilot projects, feasibility studies, planning – and technical assistance for municipal policy and regulatory reform. German grants also include support for skilling and reskilling the workforce. The German grant funding is notably larger than all the other partners. It will be channelled through the Gesellschaft für Internationale Zusammenarbeit (GIZ) which retains the character of a traditional development aid agency. It has a large presence in South Africa as a donor and is prominent in the climate and energy policy space.

141 https://www.dfc.gov/who-we-are/overview.
142 https://www.bii.co.uk/en/

5 Fixing capital

The transition is not just about climate or ecological breakdown, and very often not at all about climate. The global industrial landscape is littered with rust belts and associated urban decay as capital abandons one area to set up shop somewhere cheaper, or a resource is depleted, or new products, technologies, processes and relationships displace established technologies and associated infrastructure and reconfigure labour and environments. And always capital is looking for the next fix to satisfy its need for expansion and in all dimensions – money, space, material flows, energy.

This chapter looks first at the uneven breakdown of the old industrial model in South Africa. This in itself is compelling transition. The plans outlined in the last chapter offer a new fix but there's still money being made off the last fix. The second part of the chapter looks at climate finance and the JET IP in the broader context of capital's response to a double crisis of its own making – the internal crisis overaccumulation and the externalised ecological crisis.

Minerals energy complex breaking up on the coal fields

Over the last decade, the groundWork Report has documented the disintegration of the minerals energy complex founded on coal and with Eskom as the supplier of cheap power to industry. Critical drivers of that process start with Eskom's 'new build' centred on Medupi and Kusile. That is, it starts with the attempt to reproduce the MEC model of big power stations to supply big baseload to big energy intensive industries. The purpose of the model was to put the profit from energy production into the private pockets of big users.

When the global financial bubble broke in 2008, government boasted that it had 'shovel ready' projects to provide a countercyclical economic stimulus. Eskom, however, was in trouble even as the first shovel bit into the ground at Medupi. It applied to Nersa for a staggering 60% increase in tariffs to pay for the new build. That met with a storm of protest and Nersa awarded it 27%. That was still a very big hike but not big enough for the Wall Street rating agencies who promptly downgraded Eskom. The company, with national government in tow, then went to the World Bank to get a massive US$3.75 billion loan. Since then, the Rand value of the loan has swung between R30 and R70 billion as the ZAR/$ exchange rate soared and slumped from under R8 to as much as R19 to the dollar.

Eskom kept asking for more in each successive round of tariff applications and, over the last 15 years, Eskom's tariff has increased by five times in real terms. Costs have been driven up by:

- The 'new build' construction of Medupi and Kusile, where costs continue to escalate and unsustainable debt is managed only with large government bailouts – and these plants are still duds, operating well below capacity;
- Coal, where costs are driven up by the fact that the Highveld fields are past peak, combined with the determined use of coal procurement for patronage and the reinforcement of the coal lobby; and
- Large scale looting and corruption associated with both the above, notably the initial act of new build corruption in awarding the boiler contract to Hitachi partnered by Chancellor House, an ANC funding vehicle.

Big users ditch the power model

By 2014, the tensions within the MEC were spilling through the cracks. Eskom said it was selling electricity below cost and the biggest users take the biggest subsidy: "wealth is effectively being transferred to large consumers

of electricity".[143] The Energy Intensive Users Group (EIUG) complained that electricity had risen from 9% of total production costs in 2007 to 14% in 2010 and 20% in 2013. In 2012, the 31 EIUG members consumed 112 704 GWh or 55% of Eskom sales in South Africa (202 770 GWh). In 2014, however, their power consumption dropped to 78 637 GWh or 38% of Eskom sales in South Africa (totalling 205 525 GWh). The reduction in demand was accounted for by: higher prices driving greater energy efficiency, previously ignored by industry; the interruption of power supplies due to loadshedding; and a slump in global demand for commodities.[144]

At the same time, big industry observed the falling cost of renewables. In 2016, its comments on a draft IRP said that a least cost future system would be based on renewables and that no new coal or nuclear power was required. Least cost was also the lowest carbon scenario. It chided the Department of Energy planners for putting a constraint on the build out of renewables, exaggerating renewable costs and understating nuclear costs. It concluded:

> Should the promulgated policy adjusted IRP 2016 call for major and inflexible base load investments, … it will likely result in further price increases and a disruptive exodus of energy intensive industries, the stranding of existing coal-fired electricity generation plants, and more premature closures of mines.[145]

In short, big industry abandoned the minerals energy complex model that it previously demanded be reproduced, and looked forward to a largely renewable future with coal capacity shrinking over the next three decades. It also made a first call for registration rather than licensing of embedded generation.

Eskom's collapse is now adding new costs. Maintenance was neglected through the decade of the 2010s as politicians demanded that Eskom avoid loadshedding and as Eskom managers anticipated that the completion of

143 Eskom, 2012, ***Revenue Application: Multi-Year Price Determination 2013/14 to 2017/18 (MYPD 3)***, p.16.

144 EIUG website at http://www.eiug.org.za/about/membership/ visited 18 April 2014 and 20 August 2015. As reported in the groundWork Report 2015.

145 EIUG Comment on the draft IRP 2016, 31 March 2017.

Medupi and Kusile would put the system into surplus. The old and neglected plants are now breaking down with such regularity that the utility's capacity and budgets for maintenance can't keep up. And nor is it just the old plant. On 24 November 2022, it had 6 GW on planned maintenance and another 14 GW breakdowns, including three units (2.4 GW) out of action at Kusile because the chimney duct failed. So more than half the coal fleet (39 GW) was out of action.

No longer to avoid loadshedding, but merely to ameliorate it, Eskom was overusing its diesel-fired 'peaking plants' even as diesel prices surged in 2022. By November, it had blown through double its R6 bn diesel budget. It had no diesel and no money to buy more. Moreover, Nersa has regarded overspending on diesel as inefficient and has refused Eskom's requests that the costs should be added into the tariff. So Eskom cannot recover what it overspends. Without diesel, it said, loadshedding would be more frequent and more erratic. Government ministers then 'found' 50 million litres of diesel, enough for two weeks or so, to be delivered by PetroSA, which is itself in a death spiral. It was not clear how that would be paid for but the ministers organised meetings with Treasury to 'find' money for Eskom to pay for diesel for the rest of the financial year to March. Meanwhile, the utility is failing to pay other suppliers and trust is running short.[146]

The changing face of big coal

Upstream in the coal chain, the clubby relationship between Eskom and the big coal miners, all of them EIUG members, was also breaking down and, in the 2010s, the latter started heading for the exits. Traditionally, they covered the costs of their mines by supplying cheap coal to Eskom on long term contracts and made clear profits exporting higher grade coal to Europe. This model started breaking down for several reasons. First, India and China entered the market for lower grades of coal and Eskom accused the big miners of diverting its coal for more lucrative exports. Second, in 2012 the Department of Public Enterprises (DPE) instructed Eskom that future coal contracts should be with

146 Mandisa Nyathi, Treasury key to Eskom diesel fate, M&G, 25 November 2022; Marianne Merten, *Found: Fifty million litres of diesel for fifteen days of relief – but source of funding future supplies remains uncertain*, Daily Maverick, 23 November 2022.

companies with over 50% black ownership instead of 25% as mandated by national policy. Anglo then stalled on developing the New Largo mine which was to be the long term supplier to Kusile. Third, the use of Eskom to extend patronage to newly established miners, notably the Guptas, eroded big coal privileges. Fourth, the decline of export coal prices over the 2010s eroded the big coal profit margins. Fifth, the Highveld coal fields were already past peak and the big corporations were keen to leave their liabilities behind.

BHP Billiton was first out when it split off a bundle of assets, including all South African assets, to form South32. Four years later, South32 sold off its coal mines. Its Southern African portfolio now consists of the Hillside and Mozal aluminium smelters, which still enjoy special pricing agreements for electricity and, in partnership with Anglo, two manganese mines and the shuttered Metalloys manganese smelter.

Anglo was the dominant coal producer during the apartheid period. With the political transition, it parcelled a number of assets into BEE deals but remained Eskom's major supplier and the biggest exporter. It considered selling off all its coal mines as international prices slumped in the mid-2010s but, when prices recovered in 2016, it held onto its export mines and sold off its Eskom supply mines. With prices declining again in 2019-20, Anglo split off its remaining coal assets to form Thungela in April 2021 – just in time to reap the benefit of rising prices. Anglo retains a major presence in Southern Africa in platinum, iron ore (Kumba) and diamonds (De Beers).

Glencore is the last big transnational corporation still doing coal in South Africa. It started out as Marc Rich & Co, the commodity trader that made a fortune as a sanctions buster, notably to apartheid South Africa. Its moral standing has hardly improved. In 2021, it was under investigation by US, UK and Brazilian authorities for bribing officials in Cameroon, Equatorial Guinea, Ivory Coast, Nigeria and South Sudan, manipulating fuel prices at two US ports, and defrauding Petrobas, the Brazilian oil company. In May 2022, it pleaded guilty and reached 'coordinated resolutions' with the authorities, paying fines of $1.1 billion in the US, $340 million in the UK and $40 million in Brazil. Profits in 2021 came to over $10 billion. It does not appear that the

African countries will get anything back from the fines. Nor are they lining up to prosecute Glencore themselves.[147]

Authorities have not investigated Glencore's businesses in South Africa. These have been built mostly around BEE deals. It entered coal mining in 2011 by taking over Xstrata, making deals with Ramaphosa's Shanduka and, together with Shanduka, buying out Optimum Coal Holdings (OCH) and Mcebo, and doing deals with Patrice Motsepe's African Rainbow Minerals (ARM). Shanduka was later taken over by Phuthuma Nhleko's Phembani Group. In 2015, government and Eskom contrived to force the sale of Optimum to the Gupta's Tegeta group for R2 billion. It was a very bad deal for South Africa and a disaster for the Optimum mine and mineworkers, but not so bad for Glencore which bought the mine in 2011 for R1 billion.[148]

Alongside Glencore, there are now three big black owned coal corporations in the space previously occupied by BHP Billiton and Anglo: Exxaro, Seriti and Thungela.

Exxaro emerged out of a series of BEE deals orchestrated by Anglo. In 2001, Anglo and BHP put together a portfolio of Highveld coal mines to create Eyesizwe as a BEE partner. A year later, Anglo took control of Kumba, previously the mining arm of Iscor, the state owned steel maker that was gifted to Mittal (later Arcelor Mittal). Anglo kept Kumba's iron ore mines but, in 2006, combined its massive Grootegeluk coal mine with Eyesizwe to form Exxaro. Exxaro now produces 42.5 Mt a year. Its portfolio comes with a 12% share in Richards Bay Coal Terminal (RBCT) and it exports 7.6 Mt.

Exxaro sees coal as a declining industry and, as we reported in 2019, says it is extracting "as much value as quickly as possible" while repositioning for other markets.[149] It now aims to "transition at speed and scale" and "be carbon

147 Glencore press statements, ***Glencore Energy UK limited fully resolves investigation by UK authorities***, 3 November 2022; and ***Glencore Reaches Coordinated Resolutions with US, UK and Brazilian Authorities***, 24 May 2022; Tim Cohen, ***Coming to an understanding about Glencore***, Daily Maverick, 26 May 2022.

148 The Optimum story is told in detail in the groundWork Reports 2016, 2017 and 2019.

149 Paul Burkhardt, ***South African Coal Miner Plans New Climate Change Strategy***, Bloomberg, August 22, 2019

neutral by 2050". In 2020, 60% of its income was from coal and 18% from Cennergi, its renewable energy business. By 2030, it says, 45% of income will be from coal, 30% from renewable energy and 35% from minerals (manganese, copper and bauxite) needed "for a low-carbon future".[150] This may speak to its ambitions for growth in energy and minerals but says nothing about reducing coal extraction. It seems rather to leave that to the market. As long as there are buyers, Exxaro will supply and will expand its present operations to do so.

Seriti is a consortium of buccaneer BEE companies put together to buy up the mines from the departing coal majors. It bought Anglo's Eskom supply mines in 2018 and then added the yet to be developed New Largo mine. It followed that by buying South32's coal business, including its 21% share in RBCT. It produces 34 Mt/y for Eskom and exports another 9 Mt. In 2019, it was talking about 'clean coal' – carbon capture and storage – and it still is. According to CEO Mike Teke, "The just transition implies a new chapter, not the end of coal."[151] But it is also now following Exxaro's strategy of diversifying into renewables. These two mining houses supply about two thirds of Eskom's coal. In 2021, they met with Eskom and the three signed an MoU committing to reduce emissions by installing renewables at their mining operations. This provides them with cheaper and more reliable power than their Eskom supply but does nothing to reduce emissions from the coal they sell.

In July 2022, PCC CEO Chippy Olver publicly confronted Teke about the coal industry's failure to get serious about planning for a just transition. When the PCC tried to engage, said Olver, it was met with "this bluster that the transition is … either never going to happen or … carbon capture and storage is going to ride to the rescue". In August, Teke wrote an op-ed denying that the coal industry was in denial about climate change. Like Exxaro, he leaves it to the market to determine if and when to stop digging – or to expand: "… we will continue responsibly to provide coal and other forms of energy to Eskom

150 Exxaro, Integrated Report 2021.

151 Marleny Arnoldi, ***Seriti wholeheartedly backs continued use of coal in energy mix***, Mining Weekly, 27 May 2022;

according to the binding contracts by which we operate. And where it becomes appropriate we could envisage other markets for our products."[152]

Teke also announced Seriti's takeover of Windlab's African business. Windlab is an Australian renewable energy company with projects in Australia and North America. In South Africa, it entered into different partnerships in the first rounds of the REIPP as project developer and sold its interests following completion. The newly formed Seriti Green subsidiary takes 100% ownership of a portfolio of 10 projects-in-process in the Northern Cape and Mpumalanga as well as a 75% interest in projects in Kenya, Tanzania and Mozambique.

A Seriti Green factsheet was released at the same time. It says Seriti supports South Africa's commitments under the Paris Agreement and "embraces" the transition as defined by the IRP 2019. The IRP registers the decommissioning schedule for Eskom's power stations but limits the transition and puts no constraint on carbon emissions. It will have to be updated to take account of reductions required to meet South Africa's latest NDC. Seriti Green says "stakeholders will need to work together to ensure a just and managed transition to tackle climate change and conserve livelihoods" but gives no specifics. Seriti – the parent coal company – says "we empower all stakeholders" and it reserves 10% of equity for workers and local community trusts. This is merely what is required by the latest Mining Charter.[153]

Thungela inherits Anglo's export coal business along with its management under CEO July Ndlovu, a veteran of Anglo Coal. In 2021, it produced 15 Mt, sold 14 Mt and made R10 bn profit. It is, as its chair says, "a single commodity and single geography … business". So it's a one trick pony and the trick is coal. Nor does it have any ambition to look beyond it: "We strongly believe that the coal debate needs to shift from phasing out of fossil fuels to the phasing in of all emission abatement technologies, including those relating to coal." In short, 'clean coal'.

152 Brendan Ryan, ***Angry spat at conference between Govt and coal sector shows SA is far from Just Transition***, MiningMx, 27 July 2022; Mike Teke, ***Seriti began as a coal company but is no longer one***, Business Day, 15 August 2022;

153 Seriti Green Fact Sheet 2022; https://seritiza.com/.

This is the same line given in 2013 by then Anglo Coal boss Godfrey Gomwe at the World Coal Association's (WCA) so called 'coal and climate summit' held in parallel with the climate CoP 19 in Warsaw. Ndlovu is now the chair of WCA, the prime purpose of which is to punt a "sustainable future for coal, to innovate and deliver the clean energy transition". In short, 'clean coal'. Its website headlines 'high efficiency low emissions' technologies and carbon capture and storage (CCS). As we noted in gWR 2014, improving the efficiency of the burn from about 35% to (optimistically) 45% does not make coal clean and adding CCS more than cancels efficiency gains because it consumes about a third of the energy produced by the plant.

The WCA says there are 23 CCS projects in use or under construction, two of which are "in the coal sector": at the Boundary Dam power station in Canada, and at a steel plant in Abu Dhabi. It says Boundary Dam captures 1 Mt CO_2 a year. This is not true. It has been plagued with technical issues since it started in 2014 and captured 800 000 tonnes in its best year and in most years captures less than 600 000 tonnes. The CO_2 is sold for 'enhanced oil recovery' – to restore pressure in the well – at the Weyburn Oil Field and about half of the carbon pumped into the well comes out again – quite apart from the carbon emitted when the oil is burned. And despite selling the carbon, the plant is an economic dud.[154] But if both these plants actually worked as advertised, they would capture about 0.01% of global emissions from coal.

Thungela also inherits Anglo's liabilities. In February 2022, acid mine drainage (AMD) burst from its Kromdraai mine and flooded into the Kromdraaispruit, the Wilge River and the Olifants all the way to the Loskop Dam 60 km downstream. The spill wiped out all life in the river including 23 fish species. Three tonnes of dead fish were taken out and buried to prevent predators eating poisoned meat. Ecologists thought that restoration would take up to two decades assuming that there were no further pollution incidents from mines or municipal sewage systems. That seems unlikely since, as environmental

154 https://www.worldcoal.org/clean-coal-technologies/clean-coal-2/; Karin Rives, ***Only still-operating carbon capture project battled technical issues in 2021, S&P Global Market Intellegence***, 6 January 2022; See also gWR 2019 for a more detailed critique of clean coal.

journalist Tony Carnie reported, there are 6 000 abandoned or derelict mines in the country and many of them are "ticking ecological time bombs".[155]

Thungela said that Kromdraai was an old mine that Anglo shut down in 1966. The spill occurred when a concrete seal broke. The company took action to address the spill but, says Tracey Davies of activist group Just Share, only after it was issued with a directive by the Department of Water and Sanitation. Thungela also blamed 'industrial scale' mechanised illegal mining at the site, claiming that R150 mn worth of critical infrastructure connecting the mine to a water treatment plant had been lost. Just Share retorted that if Thungela – and Anglo before it – had properly rehabilitated the mine, illegal miners would not have had access.[156] Mining industry people say that Thungela has won court interdicts to eject illegal miners but the police have not enforced the orders and "are probably" bribed. NUM officials similarly alleged at the PCC hearings that DMRE officials are enabling illegal mining. This suggests first that the legacy costs of mining include the bill for policing, and second that the ecological time bombs will be actively triggered.[157] For the most part, the polluter has long since left with his profits.

All the big coal companies have made windfall profits following Russia's invasion of Ukraine in February. International coal prices have touched $450/tonne and averaged $266 for the first half of 2022. That compares with a $50/tonne Covid low in 2020 and around $95 in the first half of 2021. Exxaro's half year profits rose to R9.2 bn in 2022 from R5.2 bn in 2021. Thungela's profits jumped by 27 times to R9.6 bn. Both companies paid out massive dividends to investors and share prices shot up.

Fund managers that previously claimed climate and environmental virtue in their investment policies abandoned all restraint and jumped in for the windfall money. Davies cites the case of Coronation Fund Managers. In 2021 they said they had no interest in Thungela and would be "very unlikely to

155 Tony Carnie, ***Acid water trail of death reignites concern over South Africa's abandoned coal and gold mines***, Daily Maverick, 17 March 2022.

156 Lisa Steyn, ***Thungela grilled over toxic spill as criminal probe is launched***, News24, 24 May 2022; Just Share, ***Thungela Resources Limited: Briefing ahead of AGM on 24 May 2022***.

157 Brendan Ryan, ***Illegal mining scourge is tearing through Africa and governments are powerless to respond***, MiningMx, 9 September 2022.

invest in new coal or oil assets". They evidently moved fast in early 2022 to become one of Thungela's biggest shareholders.[158]

The Public Investment Corporation (PIC) is another big shareholder that claims that Environmental, Social and Governance (ESG) principles are "at the core of stocks selection". It is the largest fund manager in Africa, with R2.5 trillion of public money under management. It has been at the centre of the MEC since it was established in 1911 and is heavily invested in fossil fuel corporations. Along with the Industrial Development Corporation (IDC), it has shown no inclination to divest from coal. Its website nevertheless signals virtue by highlighting its investments in renewables and not mentioning coal.[159]

Spatial fix

The old industrial order of the MEC fixed massive investments on the coal fields. With its uneven decline, the JET IP proposes a new 'spatial fix' of capital on a grand scale [Harvey 2001]. First, energy generation will be distributed across the country and particularly to the west in place of the concentration of generation on the coal fields of the Highveld. Second, the GH_2 projects will fix capital investments on the west coast. The massive scale of these projects means that they require an export market because the domestic market is not big enough to yield a return on investment, according to Joanne Yawitch of the PCFTT.

The idea of a spatial fix has several dimensions to it. First, mobile capital must fix onto a place in order to extract value and maintain the flow of physical resources necessary for growth. Alongside the fixed capital in production plant and infrastructure etc., capital is also fixed in mobility: the port needs the ships to transport GH_2, which is itself converted to highly toxic e-ammonia to enable transport, and the port traffic needs to grow to pay off the port. Second, related to that, the fix is for capital's addictive need for spatial expansion, ever increasing productivity through technological innovation which displaces jobs, and never-ending economic growth. We would call this its imperial

158 Tracey Davies, ***Climate be damned when opportunity knocks***, Business Live, 14 April 2022.
159 https://www.pic.gov.za/investment-philosophy-and-approach/environmental-social-governance.

imperative. Third, the fix is to do running repairs responding to the crises constantly produced by capitalism itself.

The core inner crisis of capitalism is 'overaccumulation', the point at which investors have too much money chasing too few safe and profitable investment opportunities. The emphasis there is on profitable. Social needs, people needs, are irrelevant. The question is not 'what does capital do for society', but 'what must society do for capital'. Hence, the mega projects are accompanied by constant demands for 'de-risking', that is, for socialising the risk so as to make it safe for private profit.

From the late 1970s, the glut of capital gave rise to a process of 'financialisation'. That meant first that finance capital took charge as industrial capital failed to provide adequate returns. Indeed, many industrial corporations started trading in financial instruments in order to supplement their profits. Second, finance capital inflated the value of tradeable money assets, such as shares, and invented entirely new derivative assets, to make profits from money chasing money. In short, the market created successive bubbles to produce profits from nothing – finance capital became Ponzi capital.[160] The meltdown on Wall Street in 2008 resulted from the bubble bursting. But rather than address the underlying crisis, the state in the form of central banks led by the US Federal Reserve, conjured extraordinary sums of money into being so as to reinflate the bubble. They did the same again in response to Covid-19. But this strategy is now played out as the new minted money is now feeding into inflation.

Capitalism's other crisis is ecological. Its response is to extend the logic of financialisation, already evident in carbon trading under the Kyoto Protocol, to the natural world. In 2021, three events made for "a turning point in the financial expropriation of the earth", according to John Bellamy Foster [2022]: approval of Article 6 of the Paris Agreement to enable carbon trading at CoP 26 in Glasgow; the launch by the Intrinsic Exchange Group (IEG) of 'natural assets' as a new asset class on the New York Stock Exchange; and the creation of the Glasgow Financial Alliance for Net Zero (GFANZ).

160 A Ponzi scheme is similar to a pyramid scheme – a scam by any other name.

Historically, the plunder of the colonies, the Third World and now the Global South has created a massive transfer of ecological resources to the imperial powers while the externalised costs have been left with the plundered people. Indeed, on the calculations of Trucost [2013] based on data from 2009, the costs of externalities – greenhouse gas emissions, air pollution, land and water use, land and water pollution, and waste – exceed revenues in 16 of 20 high impact 'region-sectors' (coal-fired power in North America and in East Asia represent two region-sectors). Since 2009, the values given to the externalities will have increased substantially. For example, Trucost put the social cost of carbon at $106 per tonne of CO_2e based on the Stern Report of 2006 while recent research shows a range of between $150 and $350 and potentially rising to $3 000 or more with a major part of the costs falling on the global South [Kikstra etal 2021].[161] Finally, we should note, without immediate and steep reductions in emissions, climate change will ultimately cost the earth. Estimates of the health impacts of air pollution have also risen significantly since 2009, while research into the spread and impact of plastic waste in the environment was only just beginning.

Trucost's calculations are for externalities only. They do not include costs resulting from the enclosure of people's common resources, the dislocation of communities or the outright massacres that are an integral part of the expansion of capital. They do not ask who pays. Or who survives. But we might conclude that the entire capitalist system would have run at a loss but for its ability to appropriate natural resources for free and externalise environmental costs. This is not a "market failure", as Trucost and the World Bank tell us, but the condition of profitability for the corporates operating across the economy and for capital in general. For investors it is a market success.

161 See also https://www.ucl.ac.uk/news/2021/sep/economic-cost-climate-change-could-be-six-times-higher-previously-thought. Social cost of carbon studies generally use GDP as a proxy for social welfare and are consequently reductionist. They say little about the impacts on people and society, the lives, livelihoods and homes lost, the trauma suffered, or the social dislocations.

Trading nature

Nevertheless, the managers of capital have put considerable resources into finding ways to make nature profitable, purportedly to save it, by integrating it within the economy. In short, nature becomes a function of economy rather than economy being dependent on nature. And the first step in that process is to calculate the monetary value of nature. This may produce startling numbers about the uncounted costs of destruction that accompanies the counted profits of production. But it also makes nature, or natural processes, tradable. And if it is tradeable, the value will not be fixed by any calculation of intrinsic value, but subject to the volatility of market valuations and the vagaries of state policy under the influence of corporate capital.

Such was the case with carbon credits, brought into being by the Kyoto Protocol and centred on the European Emission Trading System (ETS). ETS trading started in 2005 at around €20/tonne and then collapsed almost to zero in 2007 because the EU issued too many permits to pollute. In 2008, the EU restricted the number of permits and the price recovered and briefly touched €30 – about the price where it might discourage emissions. With the meltdown on Wall Street later that year, the price shadowed the fortunes of oil and plunged to under €10. From 2009 to 2011, prices recovered to around €15 but then again followed the declining oil price. In 2013, the price crashed to under €3 on weak regulation, secured by industry lobbies, combined with weak commodity markets.[162] Rising commodity prices together with stronger regulation lifted the price from 2018, but it took till 2021 to cross the €30 threshold. It has since soared and is now trading in an extremely volatile market between €70 and €90, again following energy prices and tighter regulation – the response of EU elites to popular pressure for climate action.

Speculation has added a new dimension. It is fuelled by the easy money provided by central banks to big finance since 2008 and again after Covid and by the promise of an expanded global carbon market to be created following agreement on Article 6 of the Paris Agreement. In short, this is a carbon bubble and does not reflect the good functioning of the ETS. Moreover, as

162 Damian Carrington, ***EU carbon price crashes to record low***, The Guardian, 24 January 2013;

Steffen Böhm argues, the sky high price is unlikely to make any difference to actual emissions because the scale of scamming is such that "many carbon credits are not worth the paper they are written on". And the loopholes will proliferate as regional trading schemes are linked to create a global market.[163] Nevertheless, whether or not the carbon credits represent a real reduction in emissions, money will still be made off the trade.

The Intrinsic Exchange Group

In September 2021, the Intrinsic Exchange Group (IEG) partnered with the New York Stock Exchange (NYSE) to launch "a new asset class based on nature and the benefits that nature provides (termed ecosystem services). These services include carbon capture, soil fertility and water purification, amongst others. This new asset class is the foundation of a new form of corporation called a 'Natural Asset Company' (NAC)."[164] IEG observes the scale of externalities and concludes that the problem is "incomplete information" leading to inaccurate "price signalling" and hence to the "misapplication of capital".

For the solution then, "IEG harnesses the very market forces that have intensified many social and environmental problems to instead create abundance, resilience and a compelling investment opportunity by including natural assets in the mainstream of the economy" using a "mechanism to convert them to financial capital". And the benefits for capital are "immense" because "nature's economy is larger than our current industrial economy". Natural asset values total $4 000 trillion and produce $125 trillion in goods and services against the present economy's assets of $512 trillion producing $90 trillion. To "capture the value of natural assets" NACs will "hold the rights to and manage [their] Ecological Performance". Essentially, the asset is whatever portion of nature the NAC owns and the income derives from the 'ecosystem services'. Shares in the NAC would be bought and sold and the NAC itself could

163 Energy Editor, ***Booming Prices on the European Emission Trading System: From Market Oversupply to Carbon Bubble?*** French Institute for International Relations; Steffen Böhm, ***There's a massive bubble in the price of carbon – and yet it won't bring down emissions any faster***, The Conversation, 19 January 2022.

164 https://www.intrinsicexchange.com/

of course buy and sell its bits of nature. And those bits could also be diced, spliced and reconfigured into derivatives.

Oddly, the question of who is to pay for the ecosystem services is never addressed. It is as if the "immense" return of money to capital really does grow on trees. Consequently, it does not ask who will be excluded from ecosystem services if they fail to pay. Nor does it suggest that national or local governments are a most likely source of revenue for the NACs. And it is oblivious to the potential for natural asset bubbles, for booms and busts or for the concentration of market power within this new 'asset class'. And there is no hint of the likely transfer of wealth from poor to rich, from country to city, from the global South to global North, from the public to private investors.

IEG lists its own investors as the NYSE, the Rockefeller Foundation, the Inter-American Development Bank (IDB) and venture capitalists Aberdare Ventures. The IDB is dominated by the US, EU and associated Northern powers and is criticised for disregarding indigenous people and the environment.[165] The Rockefeller Foundation says it supports regenerative agriculture. However, it is a partner in the Alliance for a Green Revolution in Africa (AGRA), notorious for promoting genetically modified crops.[166] The IEG also lists 'select partners'. They include several 'big green' NGOs including Conservation International, WWF and Birdlife International and the Conservation Strategy Fund as well as organisations focused on regenerative agriculture.

Glasgow Financial Alliance for Net Zero

GFANZ was launched in April 2021 in collaboration with the UN 'Race to Zero' campaign to coordinate investors' lining up their portfolios to net zero by 2050 with carbon reduction targets for 2030. Members are from all finance sectors – banks, insurers, pension funds, asset managers, export credit agencies, stock exchanges, credit rating agencies, index providers and audit firms – and

165 See the Bank Information Centre, e.g. ***Inter-American Development Bank Audit Shows Project Threatens Panamanian River*** at https://bankinformationcenter.org/en-us/update/inter-american-development-bank-audit-shows-project, on 4 December 2022.

166 https://www.rockefellerfoundation.org/africa/

control $150 trillion. 'Net zero', of course, signifies that carbon trading is very much part of the deal.

The first year has not been too impressive. In June 2022, the UN's Race to Zero clarified that keeping warming below 1.5°C means "phasing down and out all unabated fossil fuels" and excluded any new investments in coal. Major US banks, including JP Morgan, Morgan Stanley and Bank of America, then threatened to quit the alliance and GFANZ quietly dropped a requirement that all members join the Race to Zero and merely encouraged them to do so.[167] Apart from the banks, the two biggest asset managers – BlackRock and Vanguard – are still heavily invested in coal. Amongst others, BlackRock holds shares in Glencore and Thungela. GFANZ members are also invested in deforestation with BlackRock, Vanguard and State Street, the third biggest asset manager, and banks HSBC and Deutsche Bank in the lead. They variously hold shares in Brazilian meat packers and soy corporations and Indonesian palm oil producers, which are driving deforestation. Overall, GFANZ members have reduced their investments in such operations by only 3% in the last year and some of them have actively increased their shareholdings.[168]

GFANZ is not, however, merely a greenwashing exercise. Recognition of the crisis is real. The question is how to respond to it and what GFANZ wants is to transform the global financial system and ensure that private capital leads and controls that process. This is coordinated by the Principals Group composed of 20 finance house CEOs who "set the strategic direction and priorities for GFANZ and monitor progress". They include big names in finance from around the world but Northern transnationals, notably BlackRock, Citi, Bank of America, Banco Santander and HSBC, dominate.

The starting points are familiar enough. First, GFANZ has developed guidance "to provide a voluntary framework for financial institutions". Corporate lobbying on the EU's Climate Finance Strategy, notably by BlackRock,

167 Jasper Jolly, ***Mark Carney denies big banks threatened to quit climate finance group***, The Guardian, 24 October 2022; Reclaim Finance: https://reclaimfinance.org/site/en/gfanz-good-bad-and-ugly/ accessed 5 December 2022.

168 Global Witness, ***Zero Progress? One year on from COP26, GFANZ investors remain heavily exposed to deforestation***, 9 November 2022.

similarly advocates voluntary rather than mandatory standards for finance capital.[169] Second, the function of public policy is to attract investment. Third, 'stakeholder participation' provides for private capital to make the running with its own initiatives and to shape state responses through private-public partnerships. As Whitney Webb observes, the corporates "participate in forming the regulations that govern their own markets and [this gives] them a greatly increased role in political decision making by placing them on an equal footing with national governments".[170]

GFANZ has three core workstreams: net zero transition planning for finance institutions; lobbying for net zero public policy; and mobilising capital for emerging markets and developing economies (EM&DEs). It is not clear what distinguishes an EM from a DE but it is clear that the Third World needs special attention. The vision for this workstream is "supporting the mobilisation of private capital into emerging markets and developing economies through private-sector leadership and public-private collaboration". Asian and African GFANZ networks were established in 2022 and a Latin America network will follow. The African network will work with finance institutions and "with policymakers, regulators, and multilateral development banks as it seeks to further its understanding of the country-specific conditions needed to enable and accelerate financial flows for climate investment opportunities across the continent".[171]

The GFANZ suggests a particularly cosy relationship between private capital and bilateral donors and the multilateral development banks (MDBs). Under the heading of "de-risking" it calls for "efficient channels for blended and commercial capital". Blending with concessional funding provides both a foundation and an assurance for commercial private lending. It guarantees commercial returns to the private funder while reducing the cost of the overall

169 https://reclaimfinance.org/site/en/2021/06/30/hijacked-exposing-blackrocks-grip-on-the-eus-climate-finance-plans/

170 Whitney Webb, ***UN-backed banker alliance announces "green" plan to transform the global financial system***, Monthly Review Online, posted 12 November 2021.

171 GFANZ press release, ***GFANZ Launches Regional Network to Support Climate Finance in Africa***, 7 September 2022. https://www.gfanzero.com/press/gfanz-launches-regional-network-to-support-climate-finance-in-africa/

package to the borrower in terms of interest but not of falling exchange rates. It also provides the coercive power to ensure that the interests of investors take priority over all else.

GFANZ is also looking for big deals. It calls on "country platform participants" to pool "resources and project pipelines … to drive scale … and reduce the cost to the private sector and recipient countries from engaging with a complex web of catalytic donors, development banks, and philanthropic capital providers". And it may be noted that these donors and banks, along with domestic capital and the country government, are the primary country platform participants. Labour and civil society are not mentioned. Finally, "the right enabling environments in recipient countries" needs to align with a new global "financial architecture" that GFANZ says it will work with policymakers to create. This will "unlock" private finance "to transform the current billions of financing into the trillions needed to enable countries to deliver on their Paris commitments".[172] These trillions will, of course, demand a return.

This is the making of "a new era of capitalist central planning", in the view of Larry Lohmann of environmental justice research organisation Corner House. He concludes that "the progressive 'green' state/corporate system being promoted today by capitalist visionaries in fact constitutes both an intensification and an extensification of ecological plunder and degradation" and a "wholesale reorganisation of labour and land" [2022: 10, 12]. Put differently, as Laleh Khalili says of transnational management consultants, several of whom are GFANZ members, they are "focused on enabling capitalists to enrich themselves further without the inconvenient interference of workers, taxpayers or regulation".[173]

172 GFANZ Private Sector Statement, ***The potential for country platforms to mobilise capital for net zero transition in emerging market and developing economies***, Draft, not dated.

173 Laleh Khalili, ***In Clover. Review of When McKinsey Comes to Town: The Hidden Influence of the World's Most Powerful Consulting Firm, by Walt Bogdanich and Michael Forsythe***. London Review of Books Vol. 44 No. 24, 15 December 2022.

6 The end of coal

The end of coal is at the core of the transition. In November 2022, the Just Transition officially hit the ground at the Komati power station, as we saw at the beginning of Chapter 2 – after having been in process unofficially since at least 2019 [groundWork Report 2019]. The Komati decommissioning is supposed to be a demonstration of how the just transition would ideally work [World Bank 2021], and as such contains lessons for a watching world. Not all of those lessons are intended; some are warnings that need to be heeded. This chapter looks at what is already developing in the transition, and what the implications are.

To do so, we first consider the coal value chain. Makgetla and Patel [2021] frame the challenge of the end of coal as a manageable problem with intense coal production concentrated in only four districts of Mpumalanga. They argue that far more businesses and workers are affected by electricity disruptions than are employed in the coal value chain. The implication is that the end of coal can be managed within existing South African capitalism. There are at least three problems with this view. First, the description of the coal chain leaves out both social and ecological dimensions by treating them as "externalities". This view limits the transition, and does not consider restorative justice. This does not have to be the case in value chain analysis [see Cardoso and Turhan 2018]. Second, the coal chain reaches into many other areas – geographically, into labour sending (historical labour reserve) areas, as well as into more difficult to see parts of the value chain, such as in the informal economy that has grown alongside it.[174] And third, the transition itself – along with control over the coal

174 Makgetla and Patel do refer to the informal economy, as does the Just Transition Framework, but do not provide an analysis that can enable support for the informal economy.

and electricity systems – has become embroiled in a struggle approaching a civil war, showing that issues of power and politics are critical.

We then turn to the concrete realities of the transition process as seen in the decommissioning of the Komati Power Station near Middelburg, Mpumalanga, as represented in the long delayed Socio-Economic Impact Study for the Shutdown and Repurposing of Komati Power Station (SEIS)[175] and the World Bank agreement with the SA government. For months, the Life After Coal campaign had been asking to see the Eskom study, but was told it was "only available in power point form",[176] but it was then released on the eve of the first Komati community meeting discussed in Chapter 2. We describe the five-point plan for the Komati area in some detail, including the choice to describe the 4 000 strong community of Komati in terms of its "ownership" of seven types of capital. Finally, we consider whether this first example of the transition measures up to the concept of procedural justice in the JTF.

End days for coal

It is South Africa's extraordinary carbon intensity that makes the transition from coal necessary and urgent. At the same time, the deep dependence of formal and informal economies on coal makes the transition difficult and far reaching. South Africa's carbon intensity can be seen via international comparison:

> It is an international outlier as a producer and consumer of coal. In 2019, it accounted for 3.6% of global coal production compared to 0.4% of the world's gross domestic product and 0.8% of its population... In the 2010s, coal fuelled over 80% of South African electricity and generated 5% of its exports, while Sasol's oil-from-coal refineries produced a fifth of the national petrol supply [Makgetla and Patel, 2021: 4].

175 Eskom, ***Socio-Economic Impact Study for the Shutdown and Repurposing of Komati Power Station, Final Integrated Report***, prepared by Urban-Econ, not dated but released November 2022.

176 According to Mandy Rambaros, at the time head of the ESKOM JET office. She has since left Eskom.

The coal value chain was responsible for 60% of South Africa's greenhouse gas emissions made up of Eskom's 45%, Sasol's 10% and 5% from the two aluminium smelters Hillside (in Richards Bay) and Mozal (in Mozambique but fuelled by Eskom) [Makgetla and Patel, 2021].

But this very carbon intensity also makes South Africa an attractive decarbonisation opportunity for the global climate policy community and global climate finance because, as minister Pravin Gordhan put it to the PCC on 30 April 2021 [see Chapter 2], South Africa presents "a good carbon abatement opportunity" since the cost of avoiding emissions in South Africa is US$6 or $7 per tonne, while the last European carbon mitigation would amount to US$30 or even $40 per tonne.

This is strangely reminiscent of the infamous statement by Lawrence Summers (at the time chief economist of the World Bank) that Africa is under polluted, subsequently echoed by then Eskom CEO Jacob Maroga when he said the Waterberg was not sufficiently polluted to warrant installing FGD, if not of carbon emissions trading (selling the right to pollute the atmosphere as if it were not a commons). The question should be asked whether this five times difference in mitigation cost is really leveraged in South Africa's favour. This may remain as hidden, together with another foundational question in the background to the current negotiations about climate funding: the fact that the rich, developed countries owe a climate debt to the South, much as some carbon intense Southern countries, like South Africa, owe a climate debt to their neighbours.

While climate change and decarbonisation issues are the most important driving factors for the end of coal, there are other reasons that have led to a troubled electricity sector and impelled a decoupling of electricity from coal:

(1) the age and unreliability of coal-fired power stations, made worse by a history of not building replacements, and then building the mega-projects Medupi and Kusile power stations in a period of intense corruption;

(2) the increasingly uncompetitive nature of coal-fired electricity versus renewable energy – as renewable energy develops and world prices come down, including a growing but by no means complete reluctance of financiers to invest in new coal;

(3) a shift in coal rents from Eskom (and its customers) to coal mines, and to some extent coal truckers;

(4) an increasingly violent contestation around coal that involves ANC factions, new pro-coal constituencies and direct sabotage.

(5) the strain that unreliable electricity supplies placed on the rest of the economy.

Makgetla and Patel concluded that South Africa had no choice but to move away from coal and observed:

> The challenge was to manage the value chain in ways that minimised the costs and risks for society while maximising the benefits of the new technologies. If successful, the result would be a more diversified and competitive economy, based on a stable, low-cost electricity system. Despite these potential benefits, the shift will inevitably be disruptive. For over a century, a range of government supports embedded the coal value chain in core economic systems, including electricity, exports, rail infrastructure; most investment portfolios; a range of regulatory and fiscal arrangements; and four municipalities in Mpumalanga.

As a result, Makgetla and Patel argued, three questions loomed large:

1. How fast to move to cleaner energy sources. The timing would have to balance the growth of new RE and other job opportunities with shutting down coal – as well as stopping, as soon as possible, the pollution from coal-fired power stations and their health impacts.

2. How much effort and resources to dedicate to supporting and empowering workers and communities to move out of the coal economy. Makgetla and Patel argued that the problem was manageable: the bulk of it was confined to four municipalities in Mpumalanga, and a relatively small number of workers [see below].
3. How to ensure that all the relevant government institutions could consistently implement the key decisions informing the transition, while promoting the engagement of practical support of stakeholders and civil society.

The coal value chain

The bulk (around 67%) of the coal 'value add' is concentrated in four municipalities in the Central Coal Basin, namely eMalahleni (Witbank), Steve Tshwete (Middelburg), Govan Mbeki (Secunda) and Msukaligwa (Ermelo). These "coal municipalities... accounted for only 2% of the population and 2% of the economy outside of the coal value chain. Their population size varied from 450 000 in Emalahleni to 175 000 in Msukaligwa... They also played a disproportionate role in downstream coal refining, contributing 20% of value added in petrochemicals and 14% in electricity" [Makgetla and Patel, 2021:14]. The Mpumalanga province as a whole produced 75% of coal value add, and 85% of coal employment.

The IRP 2019 scheduled the decommissioning of Eskom's fleet of coal-fired power stations, stipulating the retirement of 5 200 MW of coalfired power capacity by 2022, 11 000 MW by 2030, and 35 000 MW by 2050 [Hermanus & Montmasson-Clair 2021].

Table 9. Direct jobs in the coal value chain[177]

Jobs in coal	Number of workers	Explanation
Coal miners	91 459	In 2020, including 7 433 people at Sasol
Coal rail transport	12 000	Transnet Freight Rail, domestic and export coal lines, estimate
Coal terminal	532	Richards Bay Coal Terminal in 2014
Coal trucking	2 000 to 4 000[178]	200 trucking small businesses in 2018
Power generation from coal	10 000	Eskom Generation's coal-fired power plants[179]
Petrochemical production	17 814	Sasol's South African petrochemical operations
Steelmaking	6 622	ArcelorMittal South Africa in 2020
Cement production	7 000	Industry in 2016
Total	+/- 150 000[180]	

177 Compiled by the authors, based on Hermanus and Montmasson-Clair 2021

178 Mary Phadi of the SA Truckers Association claims "more than 40 000 trucks on the road in Mpumalanga", the majority of them coal trucks. https://www.youtube.com/watch?v=Keg1PhSnPk8

179 Overall Eskom jobs are "opaque" we wrote in groundWork Report 2019, ***Down to Zero, the politics of just transition***. The breakdown then, based on Eskom's 2019 Annual Report, was 46 600 employed by Eskom, 39 300 directly and 7 300 in its Rotek subsidiary. The divisional breakdown was 11 700 in Generation, 2 000 in Transmission and 17 700 in Distribution. Hermanus and Montmasson-Clair are thus only counting the Generation jobs as coal jobs [2019: 164].

180 Makgetla and Patel, 2021, give an estimate of 200 000 jobs.

In Makgetla and Patel's description, the coal value chain consists of the categories in Table 9 above. However, it is possible to see the coal value chain in much broader terms, approaching the description of a coal and electricity socio-technological-ecological system (STES) [see Chapter 2] which emphasises interaction between society and nature via technology, and the political issues that arise from that. Cardoso and Turhan [2018], for example, describe the value chain connecting coal mining in Colombia with coal supply to coal-fired power stations in Turkey in terms of ecological distribution conflicts:[181]

> ...struggles that emerge from structural asymmetries in the distribution of the burdens of pollution, access to natural resources, or the sacrifices made to extract resources. Such conflicts are grounded in unequal distributions of power and income, in social inequalities of ethnicity, social class and gender... These occur at different stages of the commodity chains (from extraction to transportation, consumption to waste disposal) and involve various social actors (peasant or tribal groups, national or multinational companies, national governments, local or international NGOs, consumer groups) that have stakes in different stages of the chain [2018: 5].

The negative values include, for mining in Colombia: soil and water pollution, territory loss via open pit mining, diversion of rivers and groundwater affected, loss of agricultural land and livestock, displacement and relocation of communities and ecosystem services losses. For transport: noise, coal spillage, and lives lost in coal transport accidents. For international shipping: coal spillage in marine and coastal ecosystems, while the transport itself results in CO_2 emissions, sulphur dioxide and nitrogen dioxide pollution. Expansion of ports in Turkey led to degradation of coastal ecosystems. At the coal power plants there is an accumulation of polluting solid waste and sludge, and thermal pollution of the ocean through discharge water, and greenhouse gas emissions and pollutants including sulphur and mercury. Integrating these elements into coal chain analysis would yield a clearer picture of the costs and gains of coal, and be a better guide to transition support. It would make sure

181 Conflicts about the distribution of "goods" and "bads", similar to the concept of distributive justice.

that decisions about coal are taken in a holistic manner, and it would anchor restorative justice issues of health and ecosystems in the analysis, instead of treating it as an add-on. Without a proper view of the coal value chain, formal economies will be privileged, and externalities will be obscured.

The coal-dependent informal economy in Mpumalanga Highveld

There are about 1 800 informal enterprises in South Africa, providing three million livelihoods, according to Makgetla and Patel [2021]. The informal economy has been the subject of many unreasonable wishes and misunderstandings. The second South African president, Thabo Mbeki, famously described it as a second economy, but researchers agree that the formal and informal economies are tightly linked. Informal businesses have many linkages to formal supply chains, while at the same time informal or contract workers may be de facto employees but without rights. Politicians and planners look to the informal economy to create jobs, but evidence is that the informal economy is not counter-cyclical: when the formal economy dives, the informal economy goes down with it [Chen and Carre´ 2020, Skinner and Rogan 2019].

Informal economies have been shaped by colonial histories, explains Thandika Mkandawire [2010]. In the cash crop economies of West Africa, the colonial state allowed informal business networks to flourish, while in the labour reserve economies of Southern Africa, tied to the minerals energy complex, they were criminalised and smashed. Peasant agriculture was marginalised [Bundy 1979] and black business faced numerous obstacles under colonialism, segregation and apartheid [Ndzamela 2021]. This explains why the South African informal economy is small relative to those in other African societies [Meagher, 2022].

For many, informal economy activities are a means of survival, rather than an expression of entrepreneurial spirit, and they would much prefer formal jobs. Nevertheless, the informal economy is crucially important to many people, including those living in coal affected and coal dependent areas. Research

undertaken by the coal team[182] for the Society Work and Politics (SWOP) Institute at the University of the Witwatersrand in 2019, produced 160 profiles of coal workers and coal dependent informal traders in Phola-Ogies, Emalahleni (Empulweni township) and Arbor (a small settlement squeezed in between coal mines and a coal siding).

The following section focuses on traders' profiles in one of the research sites: Vosman and Empulweni in KwaGuqa, Emalahleni. These profiles provide some insight into the informal economy in coal dependent communities, including participants' own understanding of that dependence. We asked traders some questions about their background, their informal sector activities, and their knowledge of and responses to the end of coal in their local economies. They are not identified by name, and financial aspects of their businesses are not revealed. The research captured 35 profiles of informal businesses. While we cannot, strictly speaking, generalise on the basis of these interviews – because we did not follow an academic sampling method – interesting patterns can nevertheless be read from these 35 profiles consisting of 19 women and 16 men.

What types of businesses are there?

- Nearly half of the businesses (15 out of 35) prepare and sell food. Items on sale were *malamogodu*, pap and *inyama yehloko yenkomo* (cow's head), fat cakes, chips and *kota*, fruits and vegetables, chips, fish, russians, atchar, chillies and *kota*, chicken livers, gizzards, pork meat and chicken feet and heads, chicken insides, alcohol, drinks and cigarettes, sweets and "all kinds of food like a restaurant";
- The next biggest business activity (6 of 35) was around cars: fixing cars, panel beating and painting, car washes, spare parts, selling second hand tyres and fixing worn ones and a BMW mechanic;
- Beauty (5 of 35): perfumes, body butters, earrings and watches, barber shops, hair salon and selling hair pieces;

182 In 2019, the university team consisted of Jacqueline Cock, Dineo Skosana and Victor Munnik. The community activist researchers were Elizabeth Malibe, Yvonne Sampear and Promise Mabilo.

- Clothing (5 of 35): three tailors and two shoe repairers;
- Traditional healers (2 of 35) give consultations and sell herbs.
- One tech café providing typing of CVs, sending emails and making photocopies.
- And a general dealer: "I sell all things in my tuck shop that are sold in big shops".

Did the traders choose to be in the informal economy? Only 5 out of the 35 chose an informal business as a first option: "I chose this because when you sell you don't wait for month end and with a job it can end anytime with credit"; "I chose this way because I love business"; "I prefer this job"; "It's a family business"; and "I chose it because my mom bred and fed us this way and we grew up selling".

But the vast majority (30 of 35) had little choice. They tried to find jobs, but "there are no jobs". Others lost jobs and turned to the informal sector. "I didn't choose this. I could not find a job so my parents decided to uplift me and buy me this equipment to start the business". Another trader had lost her job due to illness and fell back on the informal sector; yet another started a business after her divorce. All would far prefer the certainty of weekly or monthly wages – business can be unpredictable. Two unemployed people started their businesses to avoid boredom. Some started unwillingly but now like it. According to one trader: "I did not have a job so I decided to sell chips and it grew to this. I am happy with my business and don't need a job". Two others echo this: "I was preferring a job but now I am good with what I am doing"; and: "I didn't choose but I am happy with what I am doing now".

Finding a job is particularly difficult for non-South Africans. A shoe repairer from Mozambique saved up money and started a business here. He says he would not have started the business if he'd had a work permit. Another Mozambican also said he had saved up money and saw a market for second hand tyres in the township as an opportunity, and a third explained: "Where there is mining there is money." A Pakistani came to set up shop in Emalahleni

because "There was war in my country... here I sold blankets before deciding to rent a garage and open a tuckshop".

The start-up funds for most of these businesses are modest and come from own savings or family members. Not one small business reported getting start-up funds from a bank, although mining companies did invest in local business – see the example below. Most of the informal businesses in this research link back into the formal economy for supplies, whether clothes, cosmetics or food. But there are interesting exceptions. Some food vendors grow their own vegetables, and others get their supplies from family with access to land to grow crops on.

There are, of course, many other aspects to the informal economy – such as piecemeal garden work, collecting and recycling waste, in particular scrap metal, and informal *zama-zama* mining, and all deserve deeper study and more policy attention.

Will life be better or worse without coal? What will a world without coal be like?

Most traders found the thought of the end of coal a scary prospect. Those with negative views of the end of coal were roughly double those who saw the end of coal as positive. Traders not only worried about support for their businesses, but also general economic and social conditions. They said: "Without coal, the world will be full of suffering, poverty and crime all over. Businesses will fall because most customers are mine workers." "It will be a world full of drug dealers because of job loss, rise in crime and businesses failing." "A world without coal will mean we will live like we did in the past, no electricity and development." "It will be a dark world with limited job opportunities. Everything will come to a standstill." "It will be the end of the world."

Some traders saw both sides: "A world without coal will be clean, with clear sky and fewer sicknesses. There will be advantages and disadvantages. Most people work in the mines and would lose their jobs." Or: "It will be more healthy because there would be no dust, clean streams of water, trees would not be cut." "We will be healthy and safe. There was life before coal and we

could go back to farming." However, not many people would go back to the (white) farms, where labour practices were seen by many as a form of slavery.

Box 5: Linkages in the informal economy

Although the majority of informal traders get their supplies from the formal economy – supermarkets, beauty product chains and formal butcheries – some source their stock from inside the informal economy. After not finding a formal job, one trader started selling vegetables, fruit and atchar in Phola. He started with a small loan from a family member. He gets his vegetables from his second home, as he puts it, in Groblersdal, about 140 km away, where he has his own garden. His wife runs a shop in Groblersdal, and he says "we help one another". His customers are coal workers, hawkers, farmers and police, nurses and sales persons. He is against the end of coal: "There will be poverty without coal, no jobs and the economy will be drained".

How to help traders and others in the informal economy transition

It is clear that the informal economies will need support to transition from coal. Meagher [2020] argues for different means of supporting informal economies, referring to differences between African countries:

> In some cases, where informal economies have developed strong entrepreneurial systems, as in Senegal or Nigeria, state support for small enterprise development may be what is most needed. Where informal economies consist largely of pools of vulnerable labour and bare survival activities, as in South Africa or Namibia, an emphasis on social protection[183] may be more appropriate, while facilitating links between informal labour and formal sector firms may intensify rather than reduce the exploitative processes of labour informalisation. Where informal economic systems involve a high degree of criminality and coercion, as in many parts of Central Africa, efforts of corporate

183 Social protection can come in the form of grants, like the child support or basic income grants.

> actors to engage with informal economic systems seem ill-conceived [2020; 237].

While this is based on differences between countries in Africa, the same reasoning could be applied to differentiate between informal economies within South Africa. It underscores the point that the many different informal economies and their dynamics should be well understood through participatory research before decisions are made. Support for informal economies through the transition equally needs to be planned with the participants in informal economies, and not imposed. Some ideas that could be pursued are:

- In the absence of the wages from coal industry, as coal disappears, a universal basic income grant could provide a source of demand for the informal traders as the grant money circulates within the local economy. It would also enable people to take a more active role economically, socially and politically;
- Since there are so many food businesses, they could be integrated into a local food economy, or extend into it by finding their supplies in it;
- Not all informal businesses want to graduate into the formal economy, and nor should they be forced to do so.

The majority of informal traders do not "graduate" into the formal economy, but some do. Mary Phadi, who is now the president of the SA Truckers Association,

> ...used to be a food hawker serving workers at Exxaro's Belfast's digital and connected mine while dreaming one day of being a business owner. Today Phadi's company – Basadi Logistics – owns a fleet of side tippers, flat decks and tankers, where she transports coal, lime, manganese and maize. Basadi Logistics also service the whole of the Mpumalanga region and have clients as far as Zimbabwe.[184]

184 https://witbanknews.co.za/179337/exxaro-backs-women-entrepreneurs-across-mpumalanga/

Phadi is determined to defend the coal economy on which the coal truckers depend. She also led the coal truck boss's siege of Pretoria in 2017. On 15 December 2022, she wrote on her Facebook page:[185]

> On the eve of the ANC Conference the SA coal is going to Europe. I may not be a decision-maker in the ANC Conference but I hope one only one Senior ANC member can see and quote this that Power-stations cannot close, there is no need. There is a solution to a pollution. We don't need green energy we don't need IPP's. The energy *ntoni ntoni* is a lie. The world is going back to the use of coal and they take our own coal while we close our own Power-stations and give them the coal. They all went back to coal. This is unfair and you see the response here that people will respond and say we need IPPs and say we are lying when we give practical information rather than hearsay. These are the Trucks transporting coal to Richard's Bay.

None of these statements are true. But untrue or not, they are part of a collection of narratives that float around the just transition, whose main aims are to extend the mining of coal for as long as possible. These narratives are comforting to those who are not ready for the transition, and therefore popular.

Violent struggles around Eskom

Resistance to the end of coal takes many forms, from the defiant statements by DMRE minister Gwede Mantashe, to the "go slow" approach of the DMRE, to violence, threats of violence and sabotage. In a 2022 publication called *Sabotage*, News24 journalist Kyle Cowan presents a picture of an Eskom under siege. It opens with a detailed description of what could only be sabotage:

> On an evening in mid-November 2021... unknown saboteurs cut eight steel supports – thick steel cables anchored in the ground – and toppled a small pylon in the veld near Lethabo Power Station (in the Vaal close to Vereeniging)... the felled pylon was crucial: it supported power lines

185 https://www.facebook.com/TruckersAssocSA/

> that fed electricity to Lethabo's kilometres long overland coal conveyor, a critical part of the station's operations. Only someone familiar with the station would have known this [2022:1].

An Eskom investigation team was busy with a number of cases of suspected sabotage, including:[186]

- Cables were cut and stolen at the Hendrina power station. The power station failed to start after copper bars on the unit's generator and reactor earth bars had also been removed;
- A power cable leading to a valve at Tutuka power station's unit five was cut, and allegations of theft were made against employees at Tutuka;
- Incorrect oil was added to a unit at Duvha power station in eMalahleni in Mpumalanga, which caused a fire and delayed returning the 570 MW unit to service; and
- At the Camden power station, a senior technician intentionally opened a shut-off valve and allowed dangerous chemicals to flow into the supply of demineralised water.

On 10 November 2022, a contracted maintenance worker removed the bearing oil drain plug from the bearing of one of the units at Camden power station, causing the oil burners to trip repeatedly and the unit to stop functioning. Eskom arrested the man and reported him to the police.[187] These incidents confirmed De Ruyter's earlier suspicions of a campaign of sabotage. De Ruyter himself had received death threats – to himself and his family – and was now surrounded by bodyguards. As we were going to press, there was news of an attempt to poison De Ruyter – someone in his office at Eskom headquarters Megawatt Park laced his coffee with cyanide.

Reports of other incidents of sabotage continued to appear in the media. Some sabotage seemed to be incidental acts of corruption: for example truckers

186 This list taken from Mandisa Nyathi's report for the Mail and Guardian https://mg.co.za/environment/2022-10-06-how-eskom-is-tackling-sabotage-at-its-power-stations/

187 https://businesstech.co.za/news/energy/643639/contractor-nailed-for-sabotage-at-eskom-and-he-confessed-why-he-did-it/

selling the coal meant for Eskom, then replacing it with inferior quality coal containing rocks that could, and in some instances did, damage the coal feeder mechanisms. Others were straightforward theft – such as the theft of R500 000 worth of diesel. Eskom launched a clean-up campaign, deploying detectives, and finally, towards the end of the year, the SA National Defence Force was deployed to protect Eskom power stations.[188]

There is also a war of words. De Ruyter was verbally attacked by minerals and energy minister Mantashe who called him a policeman – apparently in response to Eskom going after corrupt operators and saboteurs when the police did not; and a traitor by saying "Eskom, by not attending to loadshedding, is actively agitating for the overthrow of the State". De Ruyter did not get any political cover from his political principals and so resigned. He was only defended by Gordhan after the fact.[189] The end of coal issue became a political football beyond Mantashe's belligerent pronouncements: Pule Mabe, ANC spokesperson and candidate for the powerful position of ANC secretary-general, declared that he was a candidate aligned with the RET faction and that he would defend coal and coal jobs. In the meantime, the ANC conference just transition commission (a discussion group at the conference) agreed to support the just transition, but wanted to slow it down.

Just transition hits the ground in Komati

The Komati coal-fired power plant decommissioning and repurposing "has been selected as a demonstration project by the government of South Africa to establish that coal plants can be retired in a sustainable manner", declared the World Bank [2022:13]. The Komati power station (KPS) – which started electricity production in 1961, was mothballed in 1987, fully brought back into service in 2008, and finally closed down in (October 2022) – is about 37 km south of Middelburg. According to the SEIS, 4 200 people live in the KPS PSA (project study area), with a population of just over 3 000 [Stats SA

188 https://www.bloomberg.com/news/articles/2022-12-17/south-africa-deploys-army-at-four-eskom-power-stations?leadSource=uverify%20wall

189 Terence Creamer https://www.engineeringnews.co.za/article/gordhan-describes-mantashes-comments-as-unfair-and-uncalled-for-as-he-praises-outgoing-eskom-ceo-2022-12-15

2011] in the two biggest settlements: Komati Village and Blinkpan. The 5 km radius around the power station includes, in addition, Brey Farm, Big House informal settlement, and 26 commercial farms. The Koornfontein mine used to supply coal to the power station via a conveyor belt. Blinkpan and Goedehoop collieries also supplied coal to the power station, as well as Universal's North Block Complex, Dorstfontein Coal Mine, Impunzi Coal Mine, Greenside Colliery Road IMP, Mzimkhulu Mine and Vanggatfontein Coal Mine [2022:85].

Most of the community members have lived in the area for over 25 years, while some families had lived there for at least 16 years, suggesting that many had grown up there. Of the community, 58.8% are male, and 41.2% female. Most individuals in the Komati PSA were of working age (15 to 34 years old (sic)) at the time of Census 2011. The household survey (for Komati Village and Blinkpan) revealed that:

> 16.3% of households had a total monthly income of R7 501 to R12 500. The second-largest income group (13.8%) earned an income of R15 001 to R20 000; this was followed by households earning an income ranging from R12 501 to R15 000 (12.5%). Of the households that were surveyed, 51.3% indicated that they relied on earned income only (salaries or wages). About 11.3% relied on both earned income and self-employment income, while 8.8% indicated that they relied on income from self-employment only. Other sources of income mentioned were grants (3.8%), spousal maintenance and grants (2.5%), and remittances from friends and family members living outside the area (1.3%).

Most of the population had some schooling, with 35% having matric, and a further 8% higher education, and 11% other training – presumably qualifications relevant to mining. There are two primary schools, Blinkpan and Koornfontein (in Komati Village). The only preschool – Wonderland – has closed. Based on Census 2011 data, nearly all of the dwellings in the Komati PSA were considered formal houses, flats or apartments. In Komati Village and Blinkpan, formal dwellings constituted 92.2% and 95.3%, respectively, of all

dwellings. There are also informal settlements at Big House, Geluk Farm and Broodsnyersplaas. Approximately 57.5% of households indicated that they owned the property in which members resided, while the remaining share of households (42.5%) rented the dwellings where they lived. Access to basic services was fairly good: piped water 80.7%, electricity 98.8%, refuse removal 97.4% and sanitation 98.2%. The water is provided by the power station.

The list of primary data sources consulted for the study, according to the report [Eskom 2022] gives a good idea of the institutions in the area. For civil society: Ward committee members representing Goedehoop (now known as Goedehoop South), Banks (now known as Goedehoop North), Blinkpan, Komati/Koornfontein Village, Maphila Traditional Council, community development workers, home-based care and community workers, the church forum, business forum, B and K Structure Forum, Isizwe Sekonsi, Thubalethu Community Structure and Farm Belt Community Development Structure. Local businesses in the area consisted of: "Mechanic, Café/Butchery, Afsol Petroleum, Igwababa Supermarket, OK Foods, Food Zone and Lakama Guest House".

Data was also gathered from the Department of Trade, Industry and Competition (the DTIC); Mpumalanga Department of Economic Development and Tourism, Nkangala District Municipality and Steve Tshwete Local Municipality, the Mine Water Coordinating Body (MWCB), the Impact Catalyst, Development Bank of Southern Africa (DBSA), Minerals Council South Africa, the Middelburg Chamber of Commerce and Industry (MCCI) and GreenCape (now Mpumalanga Green Cluster agency) (2022:6). There is also a police station at Blinkpan, and two mobile clinics every Wednesday at the municipal offices and on Thursday at the SASSA paypoint.

A confusion of capitals

The social capital approach [Narayan 1999], was used in the World Bank internal struggles of some of its social scientists to "bring back social theory" or at least social factors into the World Bank's narrowly economistic perspectives [see Fine 2010 for a detailed history and analysis]. However, argues Fine, the

discourse of 'social capital' degrades social theory, importing it in a weak form, and thus filtering out issues of history, politics and power:

> The policy perspective induced by (the use of the discourse of) social capital, although never put in these terms, is self-help raised to the level of the collective. However good or bad things might be, they could be better if people interacted more, trusted one another, and cooperated. Social capital offers the golden opportunity of improving the status quo without challenging it. Everything from educational outcomes through crime prevention to better psychological health can be improved if neighbours and communities would only pull together and trust and interact with one another [Fine 2015: 4].

While it did not work to bring around the dominant economists, the social capital discourse did prove useful as a cover, expressing social concern while the World Bank continued forcing its neoliberal policies onto unwilling populations and (sometimes) unwilling governments. The social capital approach was meanwhile taken up and refined – and multiplied into several different "capitals" – via rural development thinking and practice [Emery and Flora 2006, Flora and Arnold 2012]. Some approaches include community participation, for example through Appreciative Inquiry. For rural development practitioners, the framework is meant to

> ...identify the diverse resources and activities that make up a local economy, social system, and ecosystem. It provides a systematic framework for identifying asset flows and opportunities to recombine assets to be more inclusive of all community members and to enhance their access to capitals within a community. It also assists with mobilising a community's resources to address a variety of issues and to expand options for responding to changes in ways that enhance the quality of life for all community residents [2012: 3].

The underlying idea is that there can be "flows" between the different capital accounts, and these flows can result in an up-spiral. This is a metaphor for

money as the equivalent of anything, establishing that nothing is beyond the reach of capital. The approach squeezes a vast number of community activities and dynamics into the flat ontology[190] of finance, namely – and this is as telling as it is chilling – accounts at a bank:

> The most fundamental definition of capital is a resource or asset that can be used, invested, or exchanged to create new resources. There are stocks and flows of community capitals... The capitals can be conceived as a variety of bank accounts to store strengths, skills, opportunities, and other kinds of resources. Such a bank might offer seven types of capital accounts, making the assets in each available to the community. These assets can be wisely invested, combined, and exchanged to create more community resources. But they can also be squandered or hoarded if the community doesn't use them wisely [2012: 3].

In the SEIS, seven capitals are used as the framework to understand the impacts of the decommissioning and to build a plan. The capitals are more visible in the diagnosis phase than in the planning. The study that the Eskom and the Urban-Econ economists refer to [Emery and Flora 2006] concerns a development project in Nebraska, in the United States, with the aim of retaining youth by creating economic opportunities for them. The intention was to address the decline in rural populations and economies, triggered by a withdrawal of financial capital, through creating an up-spiral by investing in financial (government funding for these areas) and other forms of capital: "natural, cultural, human, social, political , financial, and built capitals" [Emery and Flora, 2006: 20]. They explain:[191]

1. Natural capital refers to those assets that abide in a particular location, including weather, geographic isolation, natural resources, amenities and natural beauty. It shapes the cultural capital connected to place.
2. Cultural capital reflects the way people "know the world" and how they act within it, as well as their traditions and language. Cultural capital

190 Ontology = what reality is made of

191 The wording is taken from the authors' explanation. The original text contains a large number of references, not repeated here.

influences what voices are heard and listened to, which voices have influence in what areas, and how creativity, innovation, and influence emerge and are nurtured. Hegemony privileges the cultural capital of dominant groups.

3. Human capital is understood to include the skills and abilities of people to develop and enhance their resources and to access outside resources and bodies of knowledge in order to increase their understanding, identify promising practices, and to access data for community-building. Human capital addresses the leadership's ability to "lead across differences," to focus on assets, to be inclusive and participatory, and to act proactively in shaping the future of the community or group.
4. Social capital reflects the connections among people and organisations or the social "glue" to make things, positive or negative, happen. Bonding social capital refers to those close ties that build community cohesion. Bridging social capital involves loose ties that bridge among organisations and communities. A specific configuration of social capital – entrepreneurial social capital (ESC) – is related to community economic development. ESC includes inclusive internal and external networks, local mobilisation of resources, and willingness to consider alternative ways of reaching goals.
5. Political capital reflects access to power, organisations, connection to resources and power brokers. Political capital also refers to the ability of people to find their own voice and to engage in actions that contribute to the wellbeing of their community.
6. Financial capital refers to the financial resources available to invest in community capacity-building, to underwrite the development of businesses, to support civic and social entrepreneurship, and to accumulate wealth for future community development.
7. Built capital, finally, includes the infrastructure supporting these activities.

The Nebraska community of Valley County differed radically from the Komati case, although it had a comparable population, 4 647 people in 2000. It had an unemployment rate of only 2.6% (which was interpreted as hiding a serious problem of underemployment), being home to a "high number of self-employed people and small business owners, including ranchers, farmers, and shopkeepers. Manufacturing was limited, and government, both medical and educational, was – and continues to be – among the largest employers" [2006: 23]. There were 25 businesses that could be inherited by the next generation, and the population included financial planners, attorneys and real estate professionals.

In the Komati Environmental and Social Impact Assessment Report (ESIA),[192] the community capitals framework was used to assess the impact of the closure of the Komati power station. Its impact on financial and economic capital:

> The shutdown of the power station will lead to a total loss of R19 million (in 2020 prices) of income per annum by households in the Komati PSA.... This loss is anticipated to reduce household consumption by approximately R9 million, affecting businesses that are heavily reliant on local purchasing power. The negative effects are likely to be experienced by local street vendors, retail facilities, transportation businesses and community services, including education facilities and personal services such as health and beauty.

Impacts will therefore be felt in the local informal economy. The authors warned:

> If the negative impacts on the prosperity and development of local communities are not adequately mitigated, there is a risk of social unrest – something for which the areas surrounding the power station under analysis are already known. Social unrest can lead to violent

192 Eskom, ***Komati Power Station Shutdown & Dismantling: Draft Environmental & Social Impact Assessment Report***, prepared by Nemai Consulting, August 2022. Note that this is a different document to the SEIS and deals primarily with the decommissioning of Komati.

> protests, which may prompt an escalation of crime in the area. All these risks will need to be closely monitored. [Eskom 2022: 121].

This echoes the World Bank SA Country Project's assessment and concern:

> Over the last decade, poverty, inequality and unemployment increased, which perpetuated the apartheid legacy of socio-economic exclusion. The patience of many historically disadvantaged black South Africans has been running thin. Ideological rifts have opened between and within political alliance partners and societal discontent has been fuelling higher crime levels and calls for radical policies. In addition, business and consumer confidence reached new lows, investment and economic growth have stagnated and public debt has increased [2021: 1].

Its impact on natural capital was defined as land becoming available (although not to the community), water from the Nooitgedacht dam used by the power station becoming available (again, this water would only be accessed through the normal process of applying for a water use licence, unlikely to be available to community members) and improved air quality. The report noted that the area had resources for coal and silver mining – thus counter-intuitively implying a future for coal mining in the area. A fuller description would have taken into account the pattern of land ownership in the area – the community does not have access to sufficient land – and the long term pollution impacts on water and land. Land also appeared in this category as an expected drop in property values, and dilapidation (decay) of built structures in the area, although the report was conflicted over whether cheaper land was a development opportunity or a loss of capital, pointing to the unwieldy nature of 'capital' as a concept here.

Social capital impacts were loss of sense of place, and of social cohesion. Human capital would be affected by loss of skills due to exodus of skilled people (leaving people with fewer skills behind), and a deterioration of community health, due to economic conditions (poverty). This depletes social capital because "poor air quality has adverse long-term implications for human health. It can lead to the development of bronchitis and asthma,

which in turn leads to increased healthcare costs and reduced labour force productivity" [2022:118].

'Political capital' – a potentially more exciting category – gets two substantial mentions[193] in the analysis, once to define it as "the ability of communities to guide or influence policy frameworks and the implementation thereof" [2022:5]; and once to observe that "various groups of community leaders operate in the area; some are radical in their approaches". And maybe not surprisingly: "relationships with some of the stakeholders are strained" [2022: 267]. This echoes a concern with political unrest in both World Bank documents quoted above.

The 'community capitals' framework adds little more than confusion to the analysis. So why would anyone want to describe the situation of 4 000 people immediately affected by the decommissioning and repurposing of the Komati Power Station in terms of their seven capitals? Most likely, the real reason is to turn this situation into an investment opportunity that is 'legible' to capital, part of an overall project to see and manage the transition through the deployment of money – a local version of the financialisation of everything, as discussed in the previous chapter. In the process it obscures real politics, obscures a political economy analysis and displaces chances for a better, more political, community-centred and emancipatory approach – as well as community-centred approaches such as asset based community development (ABCD).[194]

The ABCD approach focuses on communities' own analysis of what assets they have, and their own plans on what to do with them. That this approach was not followed in the development is clear from the long list of documented concerns from communities, and their subsequent "requests", including that they want to become the owners of the Eskom land [2022: 104-105]. It also speaks loudly of the need for Eskom to "communicate" its plans with communities: the communities do not know what the plans are because they did not participate in developing them. This was a tick box consultation, not

193 That is, not just mentioned as part of the list of capitals.

194 See for example https://www.emg.org.za/blog-about/2022/7/28/blog-sustainable-alternatives-and-climate-change-resilience-in-ngqusha-eastern-cape-building-capacity-and-learning-together?rq=ABCD

a process of community development of alternatives, as ABCD, for example, would have been.

This approach normalises the profoundly misleading idea that everybody owns capital (of some kind, even if it is not money). But this is exactly not the case as (1) not everybody owns capital – in fact it's a small minority of people, less than 1% who own real capital, that is money that can be invested to receive a return via the money-commodity-money chain, and (2) solidarity and social goodwill, relationships built on trust, the whole depth of human society and its place(s) in nature, are not capital; they are realms that are being invaded and subordinated by capital. But far from being a silly exercise in padding a consultants' report, it attempts to turn everything into 'capital', and thus into 'investment opportunities'. The choice to plan on behalf of communities, rather than with communities, was not a mistake but a deliberate choice, even if it is a choice that has become so legitimised and routine that it seems natural to the consultants involved. We now turn to the plans to mitigate the impacts of the closure.

The plan for Komati

The actual plan for Komati consists of five "pillars" making up an "up-spiral" sequence: "stabilise", "develop", "strengthen"; "grow" and "communicate".

"Stabilise"

The first pillar is intended to stabilise the economic base of the Komati area by investing around R6.7 billion in 11 interventions, in the light of the expected loss of R19 million (in 2020 prices) of income per annum by households in the Komati PSA due to the shutdown. The elements of the first pillar are:

- Maintenance during the transition period
- Decommissioning of KPS
- Containerised microgrid assembly
- Establishment of agrivoltaics plant

- Eskom Phase 1 Solar PV
- Eskom Phase 2 Solar PV
- Battery Energy Storage Systems
- Wind energy facility
- Synchronous condensers
- Alien vegetation removal and beneficiation
- Crop farming with mine-affected water

Note that six of these are directly about the power system. Together, these proposed 11 interventions are planned to create just over 2 200 direct and 5 300 indirect, temporary jobs during the construction. The target for permanent jobs is 537 direct and 1 489 indirect jobs, totalling to 2 026 jobs, over a time frame of three to five years. "Until then, the employees of the power station will be seconded, retained for the transition period or transferred to other facilities while being reskilled and upskilled to take up new opportunities" [Eskom, 2022: 148]. This compares to 586 people employed by the Komati Power Station in 2017, which shrank to 276 by 2020. Of these, only 41 employees were living within a radius of 5 km around the power station [Eskom 2022: 83].

Transition

This is the maintenance of the power station between shutdown and decommissioning and repurposing. It includes civil and electrical maintenance, maintenance of the water plant, cleaning, garden services, security, pest control, waste management, fire services, etc. This is expected to lead to 330 temporary jobs following shutdown, a possible total of 310 indirect jobs, also temporary, and a contribution of R415 million (directly) and R335 million (indirectly).

Decommissioning of Komati

Decommissioning involves dismantling (in this case) selected equipment, demolishing selected buildings and structures, and cleaning the entire site – including disposal areas (both wet and dry) and coal yards. The main power station complex needs to be decontaminated and then dismantled. Materials are to be salvaged, and then either demolished or disposed of at a new on-site waste facility. Then the footprint area needs to be shaped and rehabilitated. Roads, fences, pipes and conveyors that are not needed for the new land use need to be removed, and the area rehabilitated. The waste that is produced will be sorted, the concrete crushed and disposed of in the on-site waste facility – or at a hazardous waste disposal facility. The coal stockyard will be dismantled, infrastructure removed and the inert waste disposed of onsite at the waste facility, while some recyclable waste will be sold.

The following buildings and structures will remain: the main services building; the main stores complex and the Alstom and DB thermal workshops (among others); the HV yard and switching stations; the main office block, the engineering offices, and the medical centre; the turbine house (following the removal of core equipment and the demolition of the boiler house); and the water treatment plant. The reservoirs will remain as they are the source of raw water supply to the water treatment plant, which will remain in operation under Eskom.

Phase 2 of the decommissioning will deal with the ash[195] dam and related infrastructure. The plan is to evaporate the water, remove the equipment, remove and dispose of the dam liners, excavate and dispose of contaminated sediment on the existing ash heap, fill in the resulting cavities (a borrow pit will be needed for infilling requirements) and revegetate the area. The upper surface of the existing ash dam and its side slopes will be shaped and a one-metre cover added to prevent ingress of rainfall, establish vegetation and manage storm water. The old asbestos facility will also be shaped, put under a similar cover, and vegetated.

195 groundWork Report 2017 "The Destruction of the Highveld: Burning Coal" gave a detailed critique of Eskom's plans to declassify power station ash so that it is no longer toxic, and sell it [2017: 67].

Containerised microgrid assembly

This involves manufacturing of containerised microgrids on 10 assembly lines, which would generate 20 jobs per assembly line. Solar panels will be mounted on a repurposed shipping container with an inverter and batteries for storing the electricity inside. The containers can host other RE technologies as well. Once in communities, these microgrids can create employment for community members including maintenance. The electricity could also support small businesses. The current target is to assemble 500 containers per year, but this could, according to the ESIA, be doubled. According to Eskom [2022], an Eskom pilot project in Ficksburg has demonstrated that a similar (but not containerised) micro-grid could produce 32 kW of electricity to 14 households with a total of 81 family members.

Establishment of agrivoltaics plant

Agrivoltaics entail "positioning solar panels directly above agricultural land or produce". This project is to be funded at R4.2 million. It will contain an aquaponics system for the combined production of fish and vegetables, as well as mushroom domes. Forty people will be trained in aquaponics, and 10 in mushroom farming, which will produce exotic mushrooms for local and export markets. Six individuals will receive in depth training in maintaining the agrivoltaics system. The trained farmers can then compete to participate in the project. The system also allows opportunities for community members with mobility and hearing disabilities to find a job. The solar panels will feed electricity into the grid. Crops will be sold at the Nkangala Agri-hub and local fresh produce markets, and the fish are to be sold to the community. A portion of the income will go to Eskom for maintaining the systems, for which purpose 10 community members will be employed on a permanent basis.

Eskom Phase 1: Solar PV

The objective of the Eskom phase 1 solar PV is to provide electricity to balance the grid through the BESS, rather than feed electricity into the national grid,

although excess electricity may be fed into the grid. During Phase 1, 100 MW of solar PV and 150 MW of battery storage are to be deployed at various locations at the power station. Requirements for capital expenditure (Capex) are R4.1 billion: R1.6 billion allocated to 100 MW solar PV, R2.5 billion for a 150 MW battery, and R20 million for first synchronous condenser. Operating expenditure is estimated at R135 million: for the solar PV plant at R32 million, for the BESS R96 million and for the first synchronous condenser R6 million. Direct jobs to be created come in between 56 and 85 jobs: 50 to 75 jobs for solar PV, 6 to 10 jobs for BESS and all synchronous condensers (this includes jobs created in Phase 2 Solar PV – see below). For this to work, Eskom will retain the switch yards, transformers, grid connections, and overhead electric cable lines at KPS. The ESIA recommends that this investment – the R4.1 billion in capex – be executed as a REIPP project.

Eskom Phase 2: solar PV, wind energy facility and synchronous condensers

A further R1.9 billion will be invested, also through a REIPP project, in renewable energy on site in a second phase: R783 million for 50 MW solar PV, R1.1 billion for 70 MW wind energy, and R40 million for two additional synchronous condensers. Operational expenditure of R63 million is assumed: R16 million for 50 MW solar PV, R34 million for 70 MW wind energy, R13 million for two synchronous condensers. The jobs created should be between 46 and 76 jobs: 25 to 38 jobs for 50 MW solar PV, 21 to 39 jobs for 70 MW wind energy. Jobs for synchronous condensers are included in Phase 1, above.

Manufacture Battery Energy Storage Systems

The deployment of BESS at KPS forms part of a larger localisation drive by Eskom regarding battery storage, with a total of 13 sites (including KPS) identified for the deployment of BESS, with eight sites to be completed by June 2023, and another four by December 2024. South Africa currently "does not have suppliers that have done BESS-related engineering, procurement and construction to the magnitude of Eskom's requirements... As such, investments

in cell producing plants will be required to stimulate other suppliers in the associated value chain." This will be done through Eskom's Supplier Development and Localisation Strategy (SDLS) related to the deployment of renewable energies by using Eskom's procurement spend.

A whiff of gas

At this point the ESIA slips in plans for gas with costs also in the billions of Rands: "Future projects to be considered include a 500 MW combined cycle gas plant with gas storage and a 100 MW biomass gasification plant. The capital investment requirements for these two projects were determined at R10.4 billion and R3.5 billion, respectively" [183]. While other projects are discussed in terms of their sustainability, their role in the food-energy-nexus etc. etc., no words are wasted on explaining the gas component.[196]

Alien vegetation removal and beneficiation

"The removal of alien vegetation is necessary for the protection of ecosystems, the safeguarding of water reserves to facilitate water provision, the sustainability of agricultural activities, and the protection of livelihoods," argues Eskom [2022: 189]. This necessity has already been used in job creation through the government's Expanded Public Works and Working for Water programmes. A biomass energy programme using alien vegetation may be financially viable "on condition that it operates in partnership with Working for Water", according to an Eastern Cape case study. The project is intended to address the problem of invasive species throughout the province and could result in the production of biodiesel and green hydrogen, according to Eskom [2022]. "The project will also focus on equipping participants with skills related to entrepreneurship, which contributes to human capital development. In addition, the SMMEs which it is envisaged will be established

196 The gas investment is clearly indicated in various other Eskom JET documentation. The intention is that gas at repurposed power stations would come in the form of a Public Private Partnership (PPP), with the partner putting up the money.

are anticipated to be moveable, which increases the likelihood of sustained biomass supply" [2022: 190].

The capex requirement is R3 million, for a business plan on the basis of which further funding will be sought. Up to 200 direct jobs may be created. Presumably the terms of these jobs – including the possibility of stipend jobs – will depend on what funding is finally found.

Crop farming with mine-affected water

Eskom anticipates that mining land will become available at the end of coal mining, and that such land will "need to be utilised for sustaining local communities" [2022: 192]. The study explains that "large volumes of acid mine drainage pose significant threats to the quality of South Africa's water resources" and moreover "studies... have found that crops such as maize and stooling rye grow much better when irrigated with mine-affected water than they do under a system of rain-fed crop production"[197] [see Annandale et al 2019 for a study at Mafube colliery]. Research at the Wonderfontein Colliery near Belfast, has "proven (that such crop production) was more profitable than their rain-fed counterparts, thus supporting the argument that agriculture can help sustain communities post-shutdown" [2022:193]. It might be said that the difference between rain-fed and irrigated crops seems like an unreasonable metric for the impact of acid mine drainage on crops. The project was run by Glencore, the industry-oriented MWCB, the International Council on Mining and Metals, and Business for Development. While the ESIA foresees that growing of "salt tolerant crops" like winter wheat, maize, soya and ryegrass may be extended to many ex-mining sites in the province, it recommends that it be implemented at the Goedehoop and Koornfontein mines close to Komati. The cost for establishment is R7 million per site and possible funders are MWCB, AngloCoal, Exxaro, WRC and WRC360. During operation, eight direct jobs per hectare can be created.

How salt tolerant are these crops, and won't the mine water, after a few seasons of planting, lead to very high soil salinity? The use of water contaminated

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with acid mine drainage for crop farming looks suspiciously like a problem (cleaning up acid mine drainage) in search of a cheap answer that will also relieve mines of their liabilities. Why burden community farming projects with contaminated water? Why not rather release to these farmers the high quality water from Nooitgedacht dam no longer used by the power station?

"Develop"

The second pillar of the strategy, "develop", is about upskilling and reskilling Eskom employees and community members, at the new Komati Training Facility (KTF) to be established on the site of the power station, repurposing some of the buildings, and a new small business hub in Komati Village. According to an Eskom HR plan there will be no job losses or retrenchments for Eskom's permanent employees. Some employees will be reskilled for 'repurposing and repowering' options. Skill sets such as those for technicians, engineers and operators, among others, will be reused – allowing for shifts to different technologies. Rotek employees (who work for the wholly Eskom owned subsidiary Rotek, which provides construction, maintenance and transport services to Eskom operations) will be transferred to other sites or operations, and alternatives are being considered through engagements with the suppliers of contract employees. During the incremental period, 140 permanent employees and 190 contractors will be needed to maintain existing infrastructure. Up to 257 permanent employees will receive skills training in line with new technology requirements. The HR plan is to spend around R69 million, made up of the cost for voluntary severance package (R36.9 million), redeployment/transfers (R15.1 million), and retraining (R16.8 million).

The KTF, housed in an existing building at Komati that will not be demolished but repurposed, will operate as a satellite campus of the South African Renewable Energy Technology Centre at the Cape Peninsula University of Technology, for a period of 24 months during which the aim will be to acquire the necessary skills and accreditation through the Eskom Academy of Learning, for employment in the renewables industry. Learners will be selected from

Eskom and local communities, on condition that they meet certain minimum standards and have some level of experience as an artisan.

A separate career development centre will be established in Komati Village itself. Its aim will be to "[link] community members with employment opportunities in the area while providing targeted services to improve the employability of local community members". Eskom states that "This initiative may be driven by the Mpumalanga Provincial Department of Higher Education and Training in partnership with Eskom. In addition, partnerships with other agents may be considered such as the Middelburg Chamber of Commerce and Industry" [161]. Costs will be renting office space at around R150 000 per year, with an operating budget of between R1.5 and R2 million per year, but with the three to five jobs created unlikely to be filled by community members.

An SMME incubation and business skills development programme will aim to "provide training and incubation programmes to capacitate and grow local businesses to be able to benefit from opportunities and create jobs" as well as to provide support to informal traders [162]. The intervention will target small business activities linked to the transition, the waste economy, the agriculture sector, as well as catering, accommodation, telecommunications, food services or local vendors, and hospitality. The intervention will need R1 million to secure the necessary space, as well as running costs of R4 to R5 million per year.

"Strengthen"

The third "strengthen" pillar aims to improve the community's nutritional, physical and emotional health through health education, rolling out "economy scale" communal food gardens,[198] upgrading recreational facilities and early childhood development programmes. It will also provide better internet connectivity and a digital communication platform "for all local stakeholders" [150]. The sports and recreation intervention responds to key findings of the baseline assessment of the KPS PSA, which showed that

198 Presumably meaning that the gardens will produce a surplus for sale.

> ...drug and alcohol abuse are rampant in the area, the result of unemployment and a lack of alternative activities to engage in, among other factors. It was also found that PSA communities are deeply engaged with each other in sporting activities such as soccer/ football, netball, and volleyball, creating more opportunities for these engagements. However, the area has an inadequate supply of sporting facilities, and the existing sporting infrastructure has not been maintained [2022:200].

Eskom will be looking to partner with the Mpumalanga province to do this on land in Komati Village that has been identified. The cost – without buying the land – will amount to between R1.5 and R2 million.

The community health intervention also refers to high levels of substance abuse, particularly among the youth, as well as a high incidence of TB, STDs, and HIV and AIDS and declares "to ensure that the shutdown does not exacerbate these social ills, it will be essential to establish community health and awareness programmes" [202]. The operating cost will be R1.5 million per year, and programmes will be done with the Mpumalanga province and NGOs.

Plans to improve connectivity align with the Steve Tshwete local municipality's smart city plans, which are to:

1. Make social services accessible through the provision of free public wi-fi in underserved areas and through improved internet usage in libraries;
2. Provide communities with access to free portals that present free e-learning opportunities, easy access to career information, and a platform for youth to access job opportunities; and
3. Economic development through the promotion of the digital economy. For SMMEs, entrepreneurs and job seekers, this promotion may occur through public portals that increase access to services, digital noticeboards and digital advertising [2022: 198].

For this project, undertaken with the Steve Tshwete Local Municipality, capital expenditure will amount to R500 000, operating expenditure is anticipated to be R1 million a year, and 10 to 15 employment opportunities could be created. The digital platform should enable community members and projects partners to "share notices of job opportunities and projects in the area, advertise small businesses, access e-services and share any news/information that might socially or economically benefit end users" [220:198].

The community gardens project will be closely aligned to the SMME incubator. It will involve farming projects as well as the upskilling and training of participants to run bigger gardens. The Mpumalanga Provincial Department of Agriculture, Rural Development, Land and Environmental Affairs is seen as the key implementing agent, with support from Eskom. Costs are in the region of R1.5 million and 10 to 15 job opportunities can be expected.

Another intervention is to upgrade and expand Early Childhood Development facilities in the area, in tandem with the community gardens, sports and recreation and health projects. The Mpumalanga Provincial Department of Social Development is seen as the key driver. The costs are capital of R2.5 million for a new facility, and annual costs of around R1.3 million. Depending on the number of children enrolled, up to 20 jobs may be created.

"Grow"

The fourth "grow" pillar is based on broader economic opportunities flowing from the KPS decommissioning – such as demand for goods and services, including for local SMMEs from the 11 projects in Pillar 1. There should also be broader economic opportunities related to the shut down of other power stations in the area, as well as "the establishment of a solar PV assembly plant, the manufacturing of components required in containerised microgrid assembly, the manufacturing of battery energy storage cells and assembly of batteries, and a facility for recycling renewable energy components" (2022: 150).

The procurement strategy for repurposing and repowering activities of the power stations – for now Komati, Hendrina and Grootvlei – forms part of the Eskom's SDLS for RE, focusing on increasing the capacity, capability, competitiveness, and cost-effectiveness of suppliers within the renewable energy value chain. Local accommodation businesses will also be able to host trainees at the KTF. Further jobs will be created in cleaning and cooking services. At least R3 million should be allocated to this development, plus R500 000 to conduct a feasibility study and develop a business plan. "For now, it is estimated that between 45 and 150 new employment opportunities may be created solely for catering for KTF" [2022: 210].

Another opportunity may lie in catering services – that is activities related to food preparation, transportation of food items, and cleaning. To increase local economic impact, "caterers may also procure food items from local retailers such as the OK in Komati Village or the Food Zone in Blinkpan, furthering the economic impact of the intervention. Furthermore, caterers may make use of the interventions focused on the digital activation of the local community to advertise their services" [2022: 211]. This intervention would require R2 million funding (for the refurbishment of existing, though dilapidated, facilities in Komati village), up to R500 000 for a feasibility study and, depending on demand, could create 5 to 15 jobs. Transport is another "grow" option, but it is likely to be provided by a private entity and may well not suit the current skill sets in Komati.

In this plan, Komati is viewed as part of a bigger "economic ecosystem", so for example Nkangala District Municipality IDPs need to be taken into account. These projects, if they happened, could result in around R7.9 billion in investments, 9 000 temporary employment opportunities during construction, between 370 and 750 direct jobs, adding between R305 million and R510 million per year to the regional economy. Provincial and national plans are similarly important.

And then "Communicate"

The fifth "communication" pillar is there to ensure that the strategy gains support from stakeholders, external and internal. It will disseminate the key findings of the study and highlight the mitigation measures that have been identified, "informing, consulting, collaborating, and involving" [2022: 219].

This is not procedural justice

This is not a participatory, shared response to the challenges of climate change and the decommissioning of the power station. The people at the 4 November 2022 meeting about the decommissioning and partial demolition of the Komati Power Station mentioned at the start of Chapter 2, knew this. We can also observe that what was happening was the exact opposite of procedural justice as defined in the JTF, namely:

> A just transition puts people at the centre of decision making, especially those most impacted, the poor, women, and youth – empowering and equipping them for new opportunities of the future... supporting worker and community organisations (unions, civics, advocacy groups, etc.) to participate actively in just transition policy-making processes, ensuring decisions are made in their best interests and allowing them to take advantage of opportunities [2022: 7].

After the consultants had explained their work and their approach, there were many questions. Local resident Mr Shabangu told the meeting, "I have a Bible full of questions". These included:

> Is the just transition just? You only took care of Eskom employees when you closed the power station, why? Why are institutions of just transition and reskilling not here? Why are you only now planning for decommissioning now? What if this meeting says we don't want the decommissioning? The big bosses and capitalists have already made

> decisions. Our economy is in tatters. The coal mines are closed already. The JT is lying when they say local people will benefit.

Other speakers asked:

> How many of us are going to learn new green skills? Most of our people are coming from the farms. How are you going to talk to them and help them? I am worried.
>
> How are you going to identify the affected communities?
>
> The shutdown will affect the trucking business.
>
> Renewable Energy failed in Germany. They went back to coal, so why must we give up coal?
>
> We don't have any health facilities here. I have asthma. I could help myself until my contract with Eskom ended. And what about the other sick people here? Ones who never worked for Eskom? What must we do now? We are waiting now.

People were particularly critical of the timing of events: the power station had shut down on 31 October, four days before the meeting. The ESIA had been released literally the day before the Komati meeting, on 3 November, and not yet discussed with the community. In response to complaints about a lack of participation, one of the consultants pointed out that there were people in the meeting who had been part of focus groups. He argued that they knew about the decommissioning and that, in fact, one could learn a lot more from a focus group than a hall of people. It got heated. groundWork's Thomas Mnguni got up to explain to the consultants what was wrong, and offered them advice, to loud cheers from the people in the hall:

> Eskom knew about the closure long ago. This session is not good. We need a general discussion about the just transition. We need to know about health issues. You did a socio-economic study and did not share it. You only want to meet decommissioning legal requirements. You

> don't want to talk about broader issues like the informal economy. Let's come back here and talk about everything. What all your plans are. Talk about skilling people here. Talk about what will happen to people's livelihoods.

And local cleric, Pastor Mdluli said: "Please respect these people. They don't want to discuss the demolition of the Komati power station. They want you to bring all the decision makers here and discuss what their future will look like before they agree to anything."

What is clear is that outsourcing this essentially political process to consultants outside of a structured process of engagement with the Komati communities, which should really have been driven by the PCC in combination with local, provincial and national politicians and officials, cannot measure up to the promises in the JTF. The transition cannot in practice be run by the same tired old process of fragmented, tick box EIAs that have been so useful in legitimating extractive economy projects in the past.

When communities are not fully and timeously informed, when they are not engaged in the solutions, when consultants shield government from the people, and cannot give answers about what really concerns people, it cannot be called fair process. Substantive justice only happens when the benefits and the burdens of the transition are shared fairly – and transparently. It is not the case in Komati and it is not the case in the broader process.

7 Oil & gas – the comprador's shilling

Russian President Vladimir Putin ordered the invasion of Ukraine on 24 February 2022. He no doubt calculated on driving up oil and gas prices for a quick windfall profit for Russia's main export, much as the oil supermajors have calculated on profit from successive wars in the Middle East. His fantasy quick victory, however, failed as Ukraine defended itself and the wheels of his war machine fell off. The initial invasion was brutal at close quarters. Having suffered a number of battle field defeats, Putin resorted to long range brutality aimed at the civilian population, using drones launched from distant platforms to take out critical power infrastructure as winter closed in.

The price of oil spiked to over $120 a barrel in March and again in June, when Europe appeared most vulnerable to a cut off of Russian fuels, but has been marked by extreme volatility. Since June, the overall trend has been down, ending the year around $85 and falling. Gas prices have been even more volatile, particularly in Europe, spiking to €340/MWh in late August but then crashing to around €70 at year end "as record LNG imports, increased wind generation, and fuller-than-normal stockpiles ease concerns about shortages".[199] Added to that, high prices in Europe's privatised energy markets forced frugal use, including on poor people who could least afford it. Food prices, particularly for wheat, followed much the same trajectory, as Russia and Ukraine are the major exporters. In Africa, fuel and food price inflation pushed millions of people to the edge of starvation. Like big oil, big agriculture, notably the four transnational corporations that dominate world food trade – Archer-Daniels-Midlands, Bunge, Cargill and Louis Dreyfus – made windfall profits.

199 https://tradingeconomics.com/commodity/eu-natural-gas

Coal prices have not yet declined in the same way. In the ten years before 2021, coal prices peaked at around $120/tonne and troughed at below $50. In 2021, prices were high and volatile, briefly peaking at $250 before falling back sharply, as a post-Covid rebound in demand, particularly in China, was not matched by increased production. In the week following the invasion, the price nearly doubled to $420 and it hit another peak just short of $460 in September. At year's end, it was trading around $400. But "the upside for coal … is temporary", according to the International Energy Agency [IEA 2022: 20].

Africa

In the run up to CoP 27, much was made of Europe's hypocrisy in calling for emission reductions from Africa while it was scouring the world for gas and coal. Amongst others, Gwede Mantashe argued that events in Europe have demonstrated the necessity of coal and gas. Renewables, he said, are not "the so-called saviour … Germany has learnt that painfully".[200] The argument is wrong on two counts. First, Europe did not increase consumption of coal or gas but substantially reduced them as imports from the rest of the world did not cover the loss of supply from Russia. Consequently, Europe's CO_2 emissions were reduced to the levels of the early 1990s.[201]

Second, Europe is planning faster deployment of renewables and energy efficiency to reduce "gas and oil demand by 20% this decade, and coal demand by 50%," says the IEA [20]. This is where another hypocrisy kicks in. Europe is pushing for immediate African gas investments but also looking for energy security in renewables in the longer term. This has turbo-charged the dash for gas already under way but raises the risk that African gas projects will be stranded before they are paid off. Oil and gas corporations are alive to the risk and are palming it off onto host countries, which must guarantee corporate profits for the designed life of plant. This adds a new element to public

200 Bloomberg, ***Europe's crisis shows value of coal – Mantashe***, Engineering News, 1 September 2022.

201 Lauri Myllyvirta, ***EU CO_2 emissions reached a 30-year low in November***, Centre for Research on Energy and Clean Air, 22 December 2022.

subsidy for private profit which has a long history even without accounting for externalised social and environmental costs.

For their part, African governments see major gas finds as a bonanza. On discovery, and against all evidence to date, gas is immediately claimed as an essential driver of development, that it will end energy poverty, that renewable energy is 'too weak' to power industrialisation which requires coal and gas 'baseload', that gas is a transitional fuel to a low carbon future, that the North got rich through burning fossil fuels, and that resistance to fossil fuel extraction is part of a neo-colonial agenda driven by Northern donors. And, as a policy brief by the Don't Gas Africa campaign notes, African elites, along with oil and gas lobbies, "have been misappropriating the language of climate justice to legitimise the dash for gas" [Daley 2022: 6]. The basic argument is that Africa has polluted the least and must use all available energy resources to industrialise and achieve universal access to energy.

These arguments were also rehearsed in the 'African Common Position on Energy Access and Just Transition' prepared by an African Union technical committee and supported by African ministers of energy and transport. It was intended as an African position for the CoP 27 climate negotiations in Egypt but was rejected by the African Group of Negotiators, who felt it would distract from established priorities like adaptation and climate finance.[202] Civil society comment on the position notes that its many recommendations do not include a "specific proposal for addressing energy poverty or ensuring universal energy access". Nor does it speak to an energy transition: it makes no recommendations "for scaling up renewable energy deployment or production, and does not mention specific forms of renewable energy such as wind, solar or geothermal". Rather, it focuses on "justifying continued reliance on fossil fuels", particularly fossil gas which it defines as a clean energy along with hydrogen gas and nuclear power.[203]

202 Chloé Farand, ***African climate diplomats reject African Union's pro-gas stance for Cop27***, Climate Home News, 4 August, 2022.

203 Comment prepared by Africa Coal Network, Climate Action Network Arab World, Power Shift Africa, 350Africa.org, #StopEACOP Coalition, Climate Action Network Africa.

Delegates at the 2022 conference of the African Coal Network (ACN)[204] observed that the elite narrative is scarcely credible and raised several points in response:

- Africa is most vulnerable to climate impacts and, if the 1.5°C target is to be met, no more fossil fuel reserves can be developed in Africa or in the world;
- Extractivism focused on fossil fuels has in fact brought pollution, poverty and violence to African countries and communities. The ruin of local environments also ruins people's livelihoods and health. In large parts of the Niger Delta, both land and water are poisoned and the rich farmlands and fisheries are ruined. In Mozambique, communities that live by farming and fishing have been deprived of land and cut off from the sea. The brutal insurgency in Cabo Delgado, met with an equally brutal military response, has its origin in impoverishment of the people and the indifference of Mozambique's elite;[205]
- Extractivism digs countries into debt, not out of debt, as the ruling elites take on debt against future revenues. Debt is frequently taken on when fossil fuel prices are high but, when the price crashes, the debt escalates. Some countries, such as Mozambique, go into debt on discovery, well before any actual projects are planned and years before any revenues are realised;
- The infrastructure is designed for export and does not address energy access or energy poverty. The East Africa Crude Oil Pipeline (EACOP), for example, will run 1 443 km from Lake Albert in Uganda to the port of Tanga in Tanzania and, together with the oil extraction project, will displace 118 000 people;
- Jobs are promised to affected people but not delivered except for basic labour during construction. Higher paying skilled jobs are generally

204 Africa Coal Network (ACN) annual conference & gas meeting, held in Durban, South Africa, 26 to 29 August 2022. The conference was held under Chatham House rules.

205 We gave an account of events in Cabo Delgado in gWR 2020.

reserved for expatriates housed in enclaves separate from the local people and contributing nothing to local economies.

- The baseload narrative is technically dated but promoted by the fossil fuel lobbies. Large parts of Africa are not connected to a centralised grid and, where they are, the grids are often unreliable;
- Fossil gas is not and never was a 'bridge to low carbon development'. It is mostly methane, a greenhouse gas that is about 30 times more potent per tonne than CO_2 on a 100 year time horizon and 83 times more potent over 20 years, according to the IPCC sixth assessment report [2021]. When burned it produces CO_2, but the methane leaks all along the pipeline from extraction to shipping to storage to use. It leaks more from non-conventional technologies, including fracking, deep sea extraction and liquefaction, and from old infrastructure. And it leaks more as the ambient temperatures rise.
- The Northern powers got rich through the plunder of the colonies, the 3rd World, the global South. The making of wealth and poverty is about relationships of power. In so far as fossil fuel enhanced imperial power, it also became the object of plunder. African elites are colluding with fossil fuel majors who are the agents of neo-colonialism.

Renewables, by contrast, do come with emancipatory potential – for energy access and community ownership. As the Don't Gas Africa report observes, they are quick to install, can be deployed at household or settlement scale without the prior development of costly national grids, and "have also been shown to be more resilient in Africa in the face of power shortages and blackouts" [Daley 2022: 48]. In South Africa, however, large scale renewables are privatised by design and effectively reserved for large transnational corporations. So there is a struggle over the future of energy not just in terms of technologies but also of who controls it, who it serves and what it is for. This is a critical part of the just transition.

Gas reserves and production

Africa's known gas reserves are concentrated in just five countries: Nigeria (32%), Algeria (25%), Mozambique (16%), Egypt (10%) and Libya (8.5%). Much of the "undeveloped reserves … are deep-water, ultra-deep water, or within challenging geologies [and] are relatively more expensive to extract". They are therefore at greatest risk of being shuttered "as decarbonisation gathers pace in key export markets, like Europe and Asia" [Daley 2022: 13] or when prices crash in an ever more volatile market.

The main producers – Egypt, Algeria and Nigeria – are all planning big expansions. Major new production is planned in Ghana, Senegal and Mauritania in West Africa, Ethiopia, Uganda, Mozambique and Tanzania in East Africa, and in South Africa. Algeria and Libya export to Europe via pipeline. Everyone else exports 'liquefied natural gas' (LNG), which liquefies at -160°C and is loaded onto special cryogenic ships and must be regasified by the importer. The process is extremely energy intensive. LNG projects are also capital intensive with long lead times from planning to production. In a volatile market, such projects are a gamble – unless the risk can be shifted to another party, i.e. the host country government.

A 6 000 km undersea pipeline, the longest in the world, is proposed to run around the West African coast from Nigeria to Morocco. It would pick up gas from producers all along the way and feed into an existing pipeline across the Straits of Gibraltar to Europe. This is a grandiose project estimated to cost $25 billion and take 25 year to build. That would get gas to Europe just in time for 'net zero'. Whatever parts of it are actually built, it will cut through valued shrimp fisheries. As the Don't Gas Africa report comments, "It is highly likely that this will destroy livelihoods and cut off vital food sources for many communities" [33].

Repression

Following the brief emancipatory moment of the 'Arab spring', many African governments have reasserted patriarchal authoritarianism to buttress their

rule and protect corrupt benefits. Patriarchy subordinates women even as it claims to act in their interests. Thus, energy access is gendered because women are made responsible for maintaining households and more generally for social reproduction. But using gender to justify extractive industries makes for a false framing. Patriarchy also excludes LGBTI+ people and targets them to deflect social conflict. Finally, it subordinates 'nature' and those who depend on nature for subsistence. Patriarchal abuse is not confined to elite politics but is also experienced within people's movements and organisations.

Delegates from all countries at the ACN conference recounted their experience of state and elite repression, including;

- Obstruction of the right to know: refusing or delaying access to information; claiming commercial confidentiality.
- Obstruction of freedom of speech: e.g. preventing activists from talking to affected communities; denying access to media; passing repressive laws to criminalise dissent.
- Bare faced lies: e.g. that offshore gas extraction stimulates fish breeding; extractive projects address energy access; new fossil projects lead to a low carbon future.
- Intimidation through informal and anonymous threats.
- Intimidation by state agents such as the police or army.
- Intimidation by corporates using SLAPP suits (strategic litigation against public participation).
- Political leaders branding activists as unpatriotic or colonial agents or terrorists.
- Imprisonment on false charges.
- Assassination.

Bad politics combine with climate impacts to drive increased migrancy, which in turn leads to resource conflicts and, in South Africa, violent xenophobia.

South Africa

Offshore

In December 2021, energy and minerals minister Gwede Mantashe denounced opposition to Shell's plans to carry out seismic blasting offshore of South Africa's Wild Coast "as apartheid and colonialism of a special type, masqueraded as a great interest for environmental protection".[206]

The news of the plan to carry out the seismic survey broke in early November and came as a shock to the coastal communities and to the environmental movement. Two weeks later, Shell's seismic exploration ship, the Amazon Warrior, arrived in Cape Town. It was met by a large group of protesters and sparked unprecedented demonstrations against offshore oil and gas projects across the country. This surge in resistance grew out of earlier struggles, from the South Durban Community Environmental Alliance's (SDCEA) long struggle against Shell in its neighbourhood, and the more recent campaign linking coastal communities against exploration offshore of the east coast by ENI and Sasol. The campaign did not manage to stop seismic exploration in 2016 but started the process of putting together a network of coastal communities and support organisations primed for resistance. The urgency of the struggle against offshore oil and gas was brought home when Total struck gas condensate off the Cape south coast, first in 2019 with its Brulpadda well and again in 2020 with the Luiperd well.[207] Offshore is no longer out of sight and out of mind.

As the ship started the seismic campaign on 2 December, the struggle went to court. The first case was brought by deep sea anglers, Greenpeace and Natural Justice on the grounds of harm to the marine environment. Shell said they had done many seismic surveys, that there was no scientific evidence of damage and that they mitigated potential damage. The supposed absence of evidence perhaps reflects that big oil avoids finding it but, in this case, the judge found for Shell.

206 Tembile Sgqolana, ***Mantashe calls environmental activism 'colonialism and apartheid of a special type' amid opposition to Shell Wild Coast survey***, Daily Maverick, 10 December 2021.

207 These events are recounted in gWR 2020.

A second case followed shortly on the first. It was brought by communities and fishers from the length of the Wild Coast – the Amadiba and Dwesa-Cwebe communities and fishers from Port St Johns and the Kei River mouth – and supporting non-profit organisations. The respondents were the ministers of minerals and energy and of environment and fisheries, Shell and its local partner Impact Oil & Gas. As reported in gWR 2020, Impact was previously a minority partner with ExxonMobil and Equinor with exploration rights in three offshore blocks including the 'Transkei block' off the Wild Coast. These two transnational corporations sold their rights to Impact which then brought in Shell as a 50% partner.

Mantashe made his 'colonialism of a special type' comments in the run up to this second case. He argued that "these objections [are] meant to ensure … the status quo with regards to energy poverty, high unemployment, high debt-to-GDP ratio at country level, and economies that are not growing and, in some cases, jobless economic growth." Liz McDaid of Green Connection responded tersely that a World Bank study of 12 Sub-Saharan countries where oil and gas was discovered between 2002 and 2020 found that government revenues were lower than predicted, while resources were overvalued. As Business Day commented, "Shell's promised riches are far from assured". And it asked if Mantashe's 'shilling for Shell' had something to do with Thebe, an ANC investment arm, being invested in Shell's downstream business.[208]

Moreover, Mantashe was insulting precisely those people who have resisted colonial and apartheid oppression and who see their resistance to transnational oil corporations as an extension of that struggle. In an open letter to the minister, they said that government was not listening to the people and his department had not ensured that they were consulted about the project. Nor would it create jobs for the coastal communities "marginalised … not just through colonialism and apartheid, but now also by our own supposedly democratic government".

> Blaming white environmentalists, to us, is a demonstration of your arrogance and unwillingness to listen to us, the people of the coast –

208 Business Day editorial, ***Why is Mantashe shilling for Shell?*** 16 December 2021

> the people of Port St Johns, of Centane, of Dwesa-Cwebe, of Xolobeni, of Amathole region. It also saddens us, as it makes us think that you believe that we are unable to think or decide for ourselves how we wish our communities to be developed. You insult us if you imply that this is only their struggle. This is all of our struggle. The sea is our Great Home. It is the source of all life and is a sacred place as it is the home of many of our Ancestors. We are angry that you dare to question our beliefs and our choices. We ask you to respect our culture, our lives and our livelihoods and protect the future of all.[209]

These points reflect the grounds of the court case: that Shell did not have a valid environmental authorisation (EA); that the coastal communities had not been consulted; that because the applicants had not been consulted, the decision to grant an exploration right was taken without paying heed to the anticipated harm to marine and bird life or to climate change and hence to the communities' livelihoods and to their spiritual and cultural rights. They also argued that there was no point in appealing to the minister since he had made his bias for Shell clear. Shell complained that it would lose R1 billion if the seismic survey was called off but counsel for the communities argued that money could not be weighed against constitutional rights.

The case was heard in two parts. On 28 December, the court granted an interim interdict in favour of the communities and ordered Shell to stop the seismic survey pending a hearing of the substantive issues by a full bench of the Eastern Cape High Court. The Amazon Warrior was sent home. Then, in February, a second seismic vessel was interdicted, this time on behalf of west coast small scale fishers. The company Searcher Seismic had been granted a 'reconnaissance right' and planned a survey of a large area off the west coast but, as in the Wild Coast case, the court found that the fishers were not consulted and that the risks to marine and bird life were not assessed. Nor were climate impacts considered.

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209 Coastal Links Eastern Cape, Amadiba Crisis Committee and Dwesa-Cwebe Communal Property Association, ***An open letter from under-threat small-scale fishers to the ministers of mineral resources and energy and forestry, fishing and environment***. 14 December 2021.

In the meantime, marine biologists pointed to "a growing body of evidence of the effects of seismic surveys on marine wildlife … from the smallest organisms to the largest". Impacts on zooplankton affect "the entire aquatic food web" while the seismic blasts interfere with communication and navigation of whales and dolphins.[210] In the west coast case, the potential impact on the reproduction of snoek, critical to fisher livelihoods, was of particular concern.

In September 2022, the Eastern Cape High Court delivered its judgement. It agreed with the communities that the minister had shown bias and appealing to him against the exploration right "would have been an exercise in futility" [81].[211] It also found for the communities on all their arguments:

- the communities were not consulted and consultation with "kings and monarchs on the basis that they spoke for all their subjects … finds no space in a constitutional democracy" [92];
- consideration must be given to people's spiritual and cultural rights and, if they had been consulted, Shell would have been informed of them;
- the potential harm to marine and bird life was disputed by the experts on both sides and the precautionary principle must therefore apply;
- the claims that the seismic survey would create jobs and other economic benefits, and that it would improve the lives of most people, were not substantiated
- consideration of climate change is not irrelevant to an application for an exploration right and cannot be left to a later stage (when companies apply for a production right), as argued by the respondents, because these are "discrete stages in a single process that culminates in the production and combustion of oil and gas, and the emission of

210 Mia Wege, Barend Erasmus, Christel Hansen, Els Vermeulen, James Roberts, Jean Purdon, Michael Somers, ***Planned seismic survey by Shell has kicked up a storm in South Africa. Here's an explainer***, The Conversation, 9 December 2021.

211 Mbenenge JP; Sustaining the Wild Coast and others against the Minister of Mineral Resources and Energy and others, High Court Eastern Cape Division, Case no. 3491/2021. References in the text are to paragraph numbers.

> greenhouse gases that will exacerbate the climate crisis and impact communities' livelihoods and access to food" [123].

The court set aside the decision to grant the exploration right primarily because there was no fair procedure and "the decision-maker failed to take relevant considerations into account and to comply with the relevant legal prescripts" [139].

In September 2022, Total announced that it is applying for a production right in the 'Paddavissie fairway' (Block 11B/12B) where the Brulpadda and Luiperd wells struck gas condensate. It plans to drill up to six production and appraisal wells and another four more exploration wells. A 109 km sub-sea pipeline is to connect the production wells to the existing PetroSA FA platform and double pipeline to the shore at Mossel Bay. The PetroSA infrastructure was constructed in the 1980s to extract gas from the Oribi and Oryx wells, which are now depleted. So these pipelines are over 30 years old. Total expects to produce for another 20 years.

On 12 November, PetroSA said there was a leak in the onshore section of its condensate pipeline. The pipeline is running at minimum capacity and it is not clear how much produce was leaking. Oil droplets washed up on the Garden Route beaches in early December forced a temporary closure of the beaches while municipal teams cleaned them up. The source was not confirmed but seems to be linked with the Mossel Bay leak.[212]

The production application is one of several Total projects along the coast. It has exploration applications in for a 10 000 km^2 area lying between 60 and 170 km off the south west coast between Cape Town and Cape Agulhas, and for a second large area about 180 km off the west coast in the 'Deep Western Orange Basin'. It has another prospect over the border in Namibian waters, also in the Orange Basin, where it claims to have made a 'significant' discovery of light oil and gas. Their planned South African investments are running at around $3 billion (R51 bn).

212 Louise Karsten, ***PetroSA says it's handling leak in pipeline***, George Herald, 24 November 2022.SABC, ***Several beaches along Garden Route reopened following small-scale oil spill***, 1 December 2022.

Activists have responded with the campaign against Total Destruction, coordinated by Green Connection and French group Bloom. They observe that Total's projects are located "in areas of spectacular marine biodiversity" and that they threaten the livelihoods of small-scale fishers. The Paddavissie production project lies in the tempestuous Agulhas current, where the risks of blow outs are magnified, and adjacent to the rich marine breeding grounds of Agulhas Banks marine protected area. On 7 December, people from all around the coast – "from Port Nolloth in Northern Cape to Saldanha and Cape Town to Knysna and Beaufort West in Western Cape, all the way to Gqeberha and Xolobeni Eastern Cape, Durban and Richards Bay in KZN and even inland in Johannesburg – came out to peacefully protest the Total Destruction of the ocean and to demand an end of the exploration and extraction of any new climate change-escalating fossil fuel projects".[213]

Onshore

On 4 November 2022, Gwede Mantashe said, "Our transition is going to be sustainable if we access oil and gas on our shores". The groundwork for fracking shale gas had been done and the DMRE would shortly request proposals for further exploration.[214]

Two weeks later, just as the climate negotiations were wrapping up in Sharm al Sheik, the department duly issued the invitation for proposals for seismic or any other form of data acquisition in two large onshore blocks. Such data is generally acquired either by the setting of a sequence of explosions along a line or by a convoy of massive vibrator trucks shaking the earth. Block A covers the better part of the Karoo from around Sutherland in the west. Block B butts up to Block A and covers much of the former Transkei. The data will be the property of the Petroleum Agency of South Africa (PASA) and bidding companies may partner with PASA. That may include PASA contributing to the costs and the company having a share in marketing rights. A similar invitation has been issued for offshore seismic data acquisition in deep water off the

213 https://thegreenconnection.org.za/2022/12/12/nationwide-picket-activists-unite-against-the-total-destruction-of-the-ocean-by-offshore-oil-gas-call-for-acceleration-of-just-transition/

214 ENCA, ***Mantashe: Groundwork to start fracking has been done***, 4 November 2022.

south west coast and off KwaZulu-Natal as well as for reprocessing of data in PetroSA's Bredarsdorp basin.

The department will open new licensing rounds for exploration and production as soon as the Upstream Petroleum Resources Development Bill is enacted. The new data sets will be a "mandatory purchase for prospective bidders".[215] So PASA, which already has a contradictory mandate of promoting and regulating exploration and production of oil and gas, will also have a direct commercial interest.

As noted in the groundWork Report 2020, there is considerable scepticism concerning the shale gas reserve. As usual, government exaggerates the benefits, particularly for jobs, and understates the costs, particularly relating to water in this arid region. As with offshore exploration, considerable damage can be done on the way to finding nothing much.

Meanwhile, inland in the Free State, Renergen is already producing gas at its Virginia project. The resource includes helium which the company expects to sell at a premium on international markets and fossil gas, which it is liquefying and plans to sell to truckers as a substitute for diesel. The state owned Central Energy Fund has invested R1 billion in the project for a 10% share. It has also been designated a strategic infrastructure project (SIP) which allows it to short cut regulatory approvals.[216] Nevertheless, its share price has followed international gas prices. It hit a high in March but, by year's end, it was halved.

At Amersfoort on the Highveld, Afro Energy has about 30 pilot wells for coal bed methane (CBM) developed over the last decade. This is essentially fracking coal to release gas from otherwise unmineable coal. While it claims environmental benefits relative to coal, in reality it merely expands the use of the coal resource and has severe impacts on water. Afro Energy is a subsidiary of Kinetiko, an Australian company. It has exploration rights over 7 000 square kilometres stretching past Wakkerstroom, Volksrust and Memel

215 Government Gazette, Department of Mineral Resources and Energy, No. 47530, 18 November 2022.
216 Simone Liedtke, ***Phase 2 of Renergen's Virginia gas project awarded SIP status***, Engineering News, 14 December 2022; ***Renergen's share price rises on CEF's R1bn investment in the Virginia gas project***, Engineering News, 28 March 2022.

along the Drakensberg 'water tower'[217] before turning inland in a big sweep to Frankfort. It claims that the resource amounts to 4.9 trillion cubic feet (tcf), which is equivalent to 816 million barrels of oil. Since Kinetiko is looking for investors, this may be exaggerated. It is also looking for markets and says Sasol is interested but it complains of Eskom's "recalcitrance" in committing to gas. In April 2022, it signed a joint development agreement with the state owned Industrial Development Corporation (IDC). Kinetiko will put in R85 million to IDC's R70 million for a 55%-45% split in a joint venture to produce 500 million cubic feet a year (about 83 000 barrels of oil).[218]

Rhino Oil & Gas similarly has an exploration right over about 10 000 square kilometres in the Free State and is looking to drill some 50 exploration wells on the land of 2 500 commercial farmers. The company says it is looking for biogenic methane and helium and is not looking for shale gas and will not use fracking. Biogenic methane is generally produced in the absence of oxygen from organic matter, for example in wetlands. Rhino says much about microbes but nothing about the organic source material. Farmers are sceptical of its claim that it will not frack for shale gas.[219] However, biogenic methane can be produced from coal so CBM seems more probable and probably more damaging.

Burning gas

The IRP 2019 calls for 3 000 MW of new gas to power capacity by 2030. This was reduced from 11 930 MW in the 2018 draft IRP because the gas infrastructure was not, and is not, in place. The IRP 2019 said the gas projects would have a utilisation rate of 12% – so they were to be used as peaking power plants – and would not use enough gas to justify construction of the infrastructure. It therefore decided that the existing peaking plants, which run on diesel, should

217 Water towers refer to strategic water resource areas

218 Vinisha Joshi, ***Kinetiko Energy & IDC sign a JDA for gas production in South Africa***, RunningAfrica, 22 April 2022; Cape Business News, ***More gas, less talk, more action***, 6 June 2022; https://www.kinetiko.com.au/amersfoort-project/

219 Tony Carnie, ***Farmers' alarm over Free State drilling plans — despite 'no fracking' pledge by Rhino oil and gas company***, Daily Maverick, 19 October 2022; http://www.rhinoresourcesltd.com/

be converted to gas to increase demand and so "support the development of gas infrastructure".[220]

Since then the DMRE has worked to increase the gas allocation. As reported in gWR 2020, it also used the provision for emergency procurement – the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) – to favour gas over renewables. In the event, the DMRE awarded three Karpowerships projects – at Richards Bay, Coega and Saldanha Bay – the status of preferred bidders. These gas projects have a combined capacity of 1 220 MW out of the total 2 000 called for under the RMIPPPP. However, all three projects were refused environmental authorisation (EA) and so failed to reach financial close by the DMRE's deadline. While allegations of corruption circled around the award of preferred bidder status, that deadline has been extended several times to keep Karpowerships in the game and the company is now appealing the EA decision. Thus, the greater part of the emergency procurement, meant to be online by June 2022 and to eliminate loadshedding, has been stalled for two years. The minister and the department seem not to recognise that they botched it.

In February 2020, the minister issued a draft 'determination' for the full 3 000 MW IRP allocation for gas and 1 500 MW coal-fired power, as well as 1 600 MW wind and 1 000 solar which made up Bid Window (BW) 5 of the renewable energy independent power producer programme (REIPP). Nersa concurred with the determination in September 2020, the DMRE's IPP office (IPPO) launched the REIPP BW5 in April 2021 and the preferred bidders were announced in October.[221] It has said nothing about the coal procurement and no coal IPPs have put in applications for environmental approval.

Nor has the IPPO launched the gas bid window. In contrast to coal, however, some 28 gas power projects have been proposed with a staggering combined capacity of 25 000 MW. Most of these projects are located on the coast – at

220 DMRE, IRP 2019 p. 47.

221 The process to be followed for procurement is this: The minister issues a draft determination based on the IRP; Nersa must then consult interested parties, which it does through public hearings; Nersa must then formally concur (or not) with the determination; the DMRE IPPO can then launch a bid window based on that determination.

Saldanha Bay, Atlantis, Coega and Richards Bay – and expect to be fuelled by imported LNG. These projects include a massive 3 000 MW closed cycle gas turbine (CCGT) in Richards Bay proposed by Eskom. This project already has an EA issued in December 2019, but it did not fit with the IPP procurement process as Eskom is not an IPP. In July 2022, the minister issued a draft determination for 3 000 MW gas power for concurrence by Nersa. After some confusion on Nersa's part, it was clarified that this was not a repeat of the earlier determination based on the IRP but was specifically for Eskom's plant, thus doubling the IRP allocation for new gas.[222] Add in the Karpowership projects and the existing peaking plants (3 800 MW), and the overall gas allocation comes to 11 000 MW – more or less as it was in the draft IRP 2018.

Eskom is considering further gas options framed as part of its JET. According to a 'preliminary' socio-economic impact assessment, presented in January 2021, four coal plants due for closure would be 'repowered' with new CCGT plants: Komati 1 000 MW, Grootvlei 1 150 MW, Hendrina 2 000 MW, and Camden 1 600 MW for a total of 5 750 MW. Together with the Richards Bay plant, it estimates the capital costs of its gas ambitions at R159 billion – before the inevitable cost escalations, as at Medupi and Kusile. That compared with proposed JET solar projects of 100 MW at each of the old plants for a total of R6.4 billion. In mid 2022, Eskom said that it would not implement the repurposing projects at then high gas prices. At the end of the year, they presented a final SEIS for Komati [see Chapter 6]. It proposes 150 MW solar, 70 MW wind and a 150 MW big battery to be installed in two phases. Thereafter, "future projects to be considered include a 500 MW combined cycle gas plant with gas storage and a 100 MW biomass gasification plant". It notes, however, that renewables "provide independence from the volatility of fuel costs and may provide long-term generation stability".[223]

Subtracting Eskom and Karpowerships, there is still 20 800 MW of proposed new gas projects lined up for the 3 000 MW IRP allocation, suggesting intense competition for preferred bidder status. Or, at least, that would have been the

222 Terence Creamer, ***Nersa says Eskom is seeking deviation from IRP to build3 000 MW of combined cycle gas, Engineering News***, 14 September 2022.

223 SEIS pp: 183 and 180.

case before July 2022 when Ramaphosa announced the next big plan to solve the energy crisis described in Chapter 4 above. Once the relevant amendments are made to the Electricity Regulation Act, any or all of those projects can find their own private customers outside the regulatory framework, providing they can get the power to them either directly or by wheeling through the grid. If they are built outside the system, however, their income will not be guaranteed by Treasury. This may deter private deals because profits and prices will depend on the uncertain supply and price of gas.

No need for gas

The narrative of the 'gas masterplan', developed in a process chaired by the DMRE, sees the power sector providing 'anchor demand' for gas and thus supporting construction of the infrastructure to get gas to non-power users. The ultimate plan for gas pipelines country wide has met with country wide resistance. However, recent modelling and reports by Meridian Economics, CSIR, Rocky Mountain Institute and others shows that no gas power is necessary in South Africa in this decade, if ever. Even business (NBI and BUSA), which initially supported the masterplan's big gas narrative, now concedes that very little gas is needed – for peaking plant use only – in an otherwise renewable system.[224]

A June 2022 report by Meridian Economics [2022b] concludes that the capacity factor for peaking plant should between 3% to 5%, providing very little gas demand. This puts in question the role for any gas whatsoever, since building the infrastructure for small gas-to-power will not be economic unless 'anchor demand' comes from other non-power sectors. It thus inverts and then voids the gas masterplan narrative.

Peaking plants are open cycle gas turbines (OCGT), much like a jet engine, and can be powered up very quickly. Many of the new gas plants, including all those proposed by Eskom, are closed cycle gas turbines (CCGT) which cannot

224 Joanne Yawitch and Lucas Chaumontet, ***It all hinges on renewables: the urgent energy transformation SA needs to get right***, Business Live, 6 June 2022.

be used as peaking plant and are not called for either in the IRP 2019 or in any of the independent studies.

The OCGT fleet is overused at present because of the breakdown of the coal fleet. The power crisis, however, does not justify building new gas. In a separate report, Meridian Economics shows that resolving the energy crisis by 2024-26 requires a suite of measures centred on building new renewables fast [2022a]. In their telling, those measures do include building some additional thermal peaking plant as 'insurance' against late delivery on other measures. In other words, one would hope not to use it at all and diesel is the more practical option given existing infrastructure. Cairncross agrees that what is needed is more energy capacity but argues that Eskom already has more than enough peaking capacity.[225] We conclude that, given limited capacity in the sector and in government, it would be best to focus on energy conservation and early delivery of new renewables.

Gassing the climate

Proponents of gas power claim considerable reductions in greenhouse gas emissions relative to coal. This is true at the point where it is burned in the power station. CO_2 emissions from the most efficient gas plants are around half the emissions from a coal plant. The claim, however, is false on several counts.

First, it relies on the assumption that gas replaces coal. Gas proponents then claim climate credits for 'avoided emissions'. However, if any or all of the projects noted above are built, they will displace new renewables rather than coal plants that are due for decommissioning. So the comparison should be with renewables. If OCGTs are used for peaking power, then the comparison should be with energy storage systems which include batteries, pumped storage and other emerging technologies. In any case, it is actual emissions that should be counted. 'Avoided emissions' is a false metric, precisely because it depends on comparison with something worse, primarily designed to enable carbon trading.

225 Eugene Cairncross, emailed comment on 'system balancing', 15 June 2022.

Second, while burning gas emits CO_2, there are significant upstream emissions both from energy use and gas leaks. Upstream energy use is particularly intensive for non-conventional gas such as LNG, deep sea gas wells and fracking. Gas also leaks, or is intentionally vented, all along the production line from the well head, through transportation by pipeline or vessel, to storage and finally combustion. The non-conventional gas technologies leak most, but all gas infrastructure leaks and it leaks more as it gets older. Further, increased heat under climate change will lead to increased leaks as equipment thresholds are overtaken.[226]

Methane (CH_4) is an extremely powerful but relatively short-lived GHG. After a decade or so, it breaks down to CO_2 and water (H_2O). Its impact as a greenhouse gas is therefore different over different time horizons. Conventionally, a 100 year time horizon has been used and on this measure the climate impact of a tonne of CH_4 is 29.8 times more than a tonne of CO_2. This is the measure favoured in CCIAs for gas projects. On a 20 year time horizon, however, the impact of CH_4 is 82.5 times greater than CO_2.[227]

Given that the 1.5°C 'carbon budget' is nearly spent, that the 2°C budget is also fast closing, and that the risk of triggering natural feedbacks that lead to runaway climate change is already present and escalates between 1.5 and 2°C, the short term impact is now critical. Hence, the 20 year horizon is more relevant than the 100 year horizon.

Explosive gas

Gas burns and explodes easily. Imported LNG has to be offloaded to a regasification unit and then piped to a power station's gas storage tanks for use. The bigger the gas demand, the more ships coming in, the more gas being transferred from one facility to the next, the greater the risk of incidents. And incidents are inevitable. The people of south Durban have lived with repeated fires and explosions at the local refineries and tank farms for decades.

226 This is acknowledged in the climate change impact assessment for the Phakwe power plant proposed for Richards Bay.

227 Global warming potential according to the IPCC 2021, sixth assessment report (AR6), Working Group I: The Physical Science Basis.

Karpowerships plants are located on ships moored in port. They are supplied by Floating Storage Regasification Unit (FSRU) vessels moored alongside. Between the first EIA, which the DFFE rejected, and the second revised EIA, which is being compiled in support of the company's appeal against the earlier decision, the consultants lowered the assessed risk of explosive incidents. "For example," writes journalist Tony Carnie, "the predicted fatality distance of a transfer hose 'flash fire' (previously calculated at 879m) has decreased by almost half to 499m. The maximum fatality distance for a 'jet fire' drops from 568m to 188m, while in another scenario, another jet fire impact distance drops from 220m to just 15m."[228] In particular, the 'fatality contour' is much reduced although the modelled 'flammable gas cloud' is of similar dimensions. At Richards Bay, two million cubic feet of LNG a year will be imported for Karpowerships.

On Christmas Eve 2022, a road gas tanker transporting liquid petroleum gas from Richards Bay to Botswana took a wrong turn in Boksburg and got stuck under a low bridge. The tanker was damaged and started leaking gas and about half an hour later it exploded. The Tambo Memorial Hospital is about 100 metres from the bridge and the emergency unit was badly damaged in the explosion. There were 37 staff and patients at the unit who suffered severe burns and had to be rushed to neighbouring hospitals. It was initially reported that 15 people were killed in the blast. By year's end, the death toll had risen to 34, including 10 health care workers, and 50 patients had been transferred to other hospitals.[229]

Cumulative impacts

Impacts accumulate all along the line from exploration to production and from the gas fields and well heads to the point of use. In Richards Bay, six projects have been proposed with a total capacity of 14 600 MW. They include the

228 Tony Carnie, ***Karpowership's environmental hazards controversially reduced in new EIA specs***, Daily Maverick, 22 December 2022.

229 Alex Patrick, ***Death toll in Boksburg gas tanker blast rises to 34, SACC calls for justice for families***, News24, 30 December 2022; Staff reporter, ***Boksburg tanker explosion: Police arrest driver for culpable homicide after 15 confirmed dead***, News24, 25 December 2022.

Eskom project as well as Karpowerships. It may be that not all of them will get built, but the EIAs are coming in one by one and impacts are counted in isolation. Thus, the impact of a 400 MW gas power plant on air quality may be regarded as relatively minor. But the impacts of clusters of power plants, at Richards Bay, Saldanha and Coega, will likely be significant and will add to already heavy pollution from heavy industry, particularly in Richards Bay.

8 Conclusion

In this brief concluding chapter, we return to the "to do" list that we published as the concluding chapter of gWR 2019. While some things have remained the same, others have changed dramatically in the last three years – including the severe flooding in eThekwini and the work in and round the PCC – so we engage important shifts in the transition process and national and local debates about it. We then ask what challenges and opportunities they present for the environmental justice movement going forward.

To do – then

In our 2019 report, we ended with a to do list [gWR2019:202]. Three years later it remains relevant, even though the institutional ground has shifted. We said we had to:

- Rapidly reduce fossil fuel burning and hence emissions to zero;
- Look to the survival of the people through our democratic organisation and common control of resources;
- Restore the land and its capacity to absorb and store carbon, including through the way we grow food; and
- Claim the climate debt owed by north to south and rich to poor.

Many of these actions remain as relevant now as they were then, namely to:

- Build social power to challenge the current social and economic order, based on shared visions of a different future: "on how we respond to climate change, create a democratic and participatory order and share

our work and the wealth of the land" and how we deal with the energy transition.

- Build understanding and solidarity between communities, workers and activists – keeping in mind that "workers are not only those with formal jobs who belong to trade unions. They include street traders, waste pickers and food gardeners amongst others" [2019: 203].
- Respond to the impacts of climate change – as the floods in Durban illustrated so dramatically;
- Use the opportunity of climate crisis to "transform our current dysfunctional systems – local government, water, health, agriculture and others – into systems that enable and support, and indeed are integral to creating, a just society" [2019: 204].

The 2019 report called on the environmental justice movement to confront the strategies of the rich and powerful to save themselves and abandon the rest of us to intensifying climate change, to protect themselves and their wealth through increased border security, military spending and spying on climate activists, and to pursue politics that divide the working class, such as the stoking of xenophobia. It said then that we needed to "square up to the coal lobby", which has proved itself persistent, deceitful and violent, as well as ongoing plans for oil and gas, including fracking shale and coal bed methane.

The report looked for a rapid transition to renewable energy, but reiterated a longstanding opposition to government's agenda for privatising renewables. And it emphasised the urgent need to address the legacy of the coal economy: the ruined health of people living in the shadows of coal mining and coal-fired power stations, the people who moved to coal areas for jobs, and the land, water and ecosystems injured by the coal economy. Finally, the report called for dialogue and said:

> In order to rise to the challenges of this agenda, we need to commit to a period of intense listening, learning, dialogue, imagination and exploration of alternatives. We will need to talk to each other in earnest, and watch like hawks what decisions are being made where,

> how and by whom. But the core of this process is not only to build mutual understanding, but also political power through organising constituencies that, working together, will be able to fight for a just transition [2019: 207].

Changes

In the three years since that report, while the above challenges remain, there have been important developments. First, the floods in April 2022 along the east coast showed that climate change is a clear and present danger, and that such floods will recur more often and with greater intensity. And it showed that government, from national to local and including the big metropolitan municipality of eThekwini, was almost wilfully unprepared for it and for the consequences, despite prior experience, and that slow disbursement of money, combined with corruption, resulted in displacement and suffering of many people, whose protests were met by oppression.

Next, the PCC has created space for "intense listening, learning, dialogue, imagination and exploration of alternatives" and brought it to the centre of the national debate so that power holders must now position themselves on climate and a just transition. But the process is deeply uneven and unequal and in no way confined to the PCC. On the one hand, community activists are bringing their agendas and perspectives into the process. On the other, exclusive 'policy communities' – from within the state and big corporates – are shaping the macro agendas around economy and 'green' reindustrialisation. Between the noisy public meetings and discrete boardroom discussions, there is a gulf. Tellingly, commissioners representing business did not attend the former.

Business has, early on, declared its enthusiasm for a programme of reindustrialisation based on ecological modernisation. This is a bid to preserve the power and profitability of the minerals energy complex. Our task is to challenge this on a policy level, where we need to speed up the transformation of our political economy from a mining colony to a people's democracy able to

take care of its people, and in the landscape itself, where the members of the minerals energy complex need to be held liable for their existing toxic legacies, and watched and regulated as they embark on a new round of renewables mining which, like the previous rounds, may be destructive of communities and their environments. We also need to defend our country against committing to debt-creating loans that consist of subsidies to big polluters like Sasol.

The PCC processes brought about an increase in the attention of the public, politicians and trade unions to transition issues, spurred on by the reaction to Eskom's increasingly disruptive loadshedding, contested by a vociferous pro-coal rhetoric, while on the ground banditry of plundering, sabotage and violence appears to have intensified. The PCC stimulated the creation of an evidence base on the job implications of decarbonisation for the coal, agriculture, tourism and vehicle sectors. Meanwhile, Eskom itself and then the PCFTT – and a number of think tanks – used the just energy transition to frame a climate finance deal with the Northern 'partners' who have put little more than loan finance on the table.

The PCC also produced the JTF, undertaking to 'leave no one behind' and defining the 'just' in the just transition in terms of fair process, fair distribution of benefits and burdens and restorative justice. Community activists participated in meetings and webinars and made it clear what their agendas are.

Going into its third year, the PCC now operates via four working groups: Net Zero Pathways; Adaptation; Climate Finance and Monitoring and Evaluation. These are the spaces in which the details of decarbonisation, transition and dealing with climate impacts will be debated and contested.

In the meantime, important developments have taken place in civil society. Many people have come together in coalitions across lines of class and race, to resist the destruction of our oceans in the search for gas and oil. A similar broad coalition has so far succeeded in holding off the climate-defying plans for the Musina Makhado SEZ in Limpopo. Activists have partly succeeded in restricting the flow of finance for new coal but have also been confronted by the hollowness of finance capital's commitments. And in eThekwini, after the

floods, a coalition emerged in the absence of adequate government responses. But, while this coalition challenges government, they do not intend to replace it. As citizens of Durban, they intend to participate in the governance of the city and hold it accountable, amongst other things, for its response to climate change, its preparedness for the next extreme event (which, like Covid-19 and the July 2021 riots, might not be extreme weather events), the state of its utilities, and for the care of people who are still displaced and an appropriate settlement policy to reduce future vulnerability.

Thus, the South African transition swings between the chaos of an uncoordinated, emergent transition and the promises and contestations of a purposive transition which is steered politically. Either way it is contested and participants in this contest are working out how and where they are able to determine the trajectory of the transition. A number of factors point to the potential for a radical break or systemic shifts:

1. Communities have expressed their opinions and ideas for the just transition – in particular building a transition from the ground up. It is up to others in the movement and the system to give these projects the support that is implied by JTF commitments to put communities at the centre of the just transition.

2. Established actors like Eskom have lost their footing, while others find that the spaces they have been able to dominate in the past are now crowded by a host of other interested actors, for example the DMRE and its hold on decisions concerning energy and extractives.

3. Trade unions have a critical but ambiguous relation to the just transition, on the one hand looking for a fair deal for workers in a changing labour market and on the other defending existing coal jobs to the point of entertaining denialist narratives such as 'clean coal'. The major challenge for the unions is to lead a worker movement for a just transition from the shop floor up and to link with community groups where they live. This does not imply uncritical acceptance of the transition from above or the work of the PCC and government departments, but a working class response – in concert with communities, as per the long established

but not yet implemented commitment to a united front – to use the opportunity to create a more equal future.

4. The justice movements – for environmental, social, gender and economic justice – as a whole people's intersectional movement is in broad agreement about what is needed, starting with opposing the capitalist project, as can be seen in Open Agenda, the Climate Justice Charter and other documents. There are nevertheless sharp differences in tactics and in practice. As with the unions, the question is how the movement builds power from the ground with communities.
5. The JTF has created a discursive space (and a common acceptance) with progressive elements such as the justice principles which provide a resource for holding government and capital to account and for the struggle of this decade. Beyond that, together we need to deepen the path of the just transition to take it beyond the present imaginary.

What we need to do next

The next to do list for the environmental justice movement can be summarised in five big steps: drive systems change; support communities through the environmental justice movement; practically support measures that drive towards more social justice; use monitoring and evaluation opportunities to make sure communities and activists can oversee and influence the implementation and further development of the transition; and finally, remain involved in local, national and international debates while keeping a hawk's eye on other actors and developments.

1. Drive systems change

'Systems change not climate change' is a widely shared and supported slogan in the broader environmental justice movement. Intrinsic to it is the idea of a deep transition, that the dominant social systems, particularly the capitalist economic system and its empty promises of trickle down wealth creation, but also relationships of power between people, and our way of looking at nature, need to change.

Some of the principles in the JTF and discussions around it can have radical implications, and could change the system as they work their way through it. But systems' change, whether gradual or not, sooner or later comes up against the interests and power of the elites, necessitating a shift in power. Any such shift will depend on whether the various justice movements can build social power by working together, including imagining societies, economies and ecologies beyond fossil fuels and capitalism, and in specific sectors like food, water, connectivity, transport, gender and youth justice as envisaged in the Open Agenda and other documents.

2. Strengthen and support community power

The foundation of social power to influence the course of the transition lies in communities, especially communities who are in daily struggles for justice and against the fossil fuel economies. The role of the movements is to build solidarity, strengthen community organisations and voices, and where necessary defend community agendas against the machinations of corporate and government actors who seek to misdirect communities with empty promises and false solutions to the climate crisis, such as 'clean coal'. Collectively, we need to be strong voices against violence because the assassination of activists, whistle blowers and members of government must come to an end.

Government is obviously central to the transition. The demand, and fight, for open democracy is thus part of the community just transition agenda. This goes beyond 'procedural justice', as exclusion is constitutive of inequality and needed by the powerful to keep power. Democratic decision making is thus a precondition for creating an egalitarian society and implies that present power relations are overturned.

As observed above, however, the state and government are already compromised: first, they are subservient to capital; second, corruption, always a feature of the modern state, is now pervasive and both symptom and cause of a wider societal breakdown; third, energy and economic systems are in crisis; and fourth, the crisis of the biosphere is exacting exponentially increasing costs.

Thus, the prospects for a just transition are scarcely propitious. Communities – the common people – are fighting for their lives as they fight for justice. On the one hand, the fight is for the societal imaginary – creating a counter-hegemony to challenge the common sense of capitalist society – and, on the other, for specific objectives such as political accountability, functional services or technology transitions. The course and outcome of these struggles is not assured: there will be wins, losses and partial wins/losses.

As is already the case, people need to fight through the unfolding situation rather than subordinate strategies to engraved positions which end in paralysis or defeat. Positions need to emerge from struggle. At the same time, people need to increase their autonomous control of resources, for example through food or energy sovereignty programmes, as well as the capacity for coordination and effective solidarity to expand strategic options, including on policy and government resources.

3. Support measures that drive towards more social justice and a better economic system

Such support would include supporting the increasingly popular campaign – even in ANC circles – for the Universal Basic Income Grant, with many advantages for poor communities and the informal sector. Campaigns for land redistribution – urban and rural – are also critical. In the coming few years support should particularly focus on projects initiated by community groups to build the just transition from the ground up. This category also includes practical support for community participation in decisions about creating new regional economies after coal, and transition support for workers, communities and informal livelihoods. Finally, restorative justice is crucial for ecosystem health, healthy water sources and people's health. These projects must be designed with effective community participation and create economic and livelihood opportunities for communities.

4. Monitor and evaluate institutions and implementation of the just transition

The environmental justice movement needs to carefully monitor and critique proposals and actions by other actors, in the broad scope of the just transition, and use the knowledge gained to influence the course of the transition. In particular, hidden 'externalities' must be exposed, whether as impacts on communities or ecosystems, and destructive plans such as for a major expansion of gas, or construction of the MMSEZ in Limpopo, must be resisted. The environmental justice movement should also continue to monitor the fitness of institutions, especially in government: are they fit for purpose, able to do their job, whether DFFE, DMRE or local government, based on a clear understanding of what the roles of these institutions are responding to first hand experiences from the ground.

5. Stay involved in local, national and international debates

Finally, it is important to build global solidarity, understanding how transitions are proceeding in other countries in the South, what the politics of these transitions are and how international solidarity can strengthen the effectiveness of environmental justice movements world wide.

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With the world at 1.2 degrees hotter than the pre-industrial average, the climate impacts are escalating ahead of schedule. The intensity of the heatwaves, floods and droughts in the last two years are forcing scientists to recalibrate their models as the real world data flies off the charts of their projections. The real world casualties escalate too, as extreme bad weather is accompanied by bad politics and criminal deceit.

The groundWork Report 2022 follows the 2019 and 2020 reports in its focus on the just (or unjust) transition. Since 2019, the debate has moved fast with the appointment of the Presidential Climate Commission in December 2020 and the announcement of the Just Energy Transition Partnership between South Africa and the Northern powers at the Glasgow climate negotiations in November 2021. It is also impelled by the ongoing collapse of Eskom and the uneven decline of the minerals energy complex centred on coal, as well as the shutdown of major crude oil refineries.

Corporate South Africa looks for a just transition to bail it out of dirty, dead end businesses and fix capital in bright new 'green' megaprojects, but without disturbing the underlying logic of the system. Against that, communities want to see a just transition for all, one that upends unequal relations of power to transform the lives of ordinary people and make for a society founded on justice. This is the political fight for the future – indeed, for any future.

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